



FUTURA | 10 ANOS
A TECNOLOGIA AO SEU ALCANCE



PROPOSTA DE PREÇOS

 (92) 3646-5335

 www.futuraam.com.br

 Av. André Araújo, 2151 - Sala 211 - Aleixo, Manaus - AM



Manaus, 12 de abril de 2021.

Ao

PODER JUDICIÁRIO
TRIBUNAL DE JUSTIÇA DO ESTADO DO AMAZONAS
COMISSÃO PERMANENTE DE LICITAÇÃO

REFERENTE: PREGÃO ELETRÔNICO Nº. 016/2021 – TJAM

Prezados Senhores,

A empresa FUTTURA DISTRIBUIÇÃO COMÉRCIO E SERVIÇOS DE INFORMÁTICA LTDA sediada à Av. André Araújo, 2151 – Shopping Tropical Center - Sala 211 – Aleixo CEP: 69060-000 – Manaus/AM, inscrita no CNPJ/MF sob nº 12.713.709/0001-13, após ter examinado o Edital da licitação acima identificada e seus anexos, apresenta proposta de preços para o objeto em referência, conforme quadro abaixo:

ITEM	DESCRIÇÃO	Und	Qtd	Marcar/ Modelo / Procedência	Valor Unit. R\$	Valor Total R\$
01	Servidor de Rack tipo gabinete, conforme especificações técnicas constantes no item 1 deste Termo de Referência.	Und	70	HPE DL 360 G10 NACIONAL	39.966,40	2.797.648,00
02	Unidade de Disco de 8TB SAS de 12Gb/s, conforme especificações técnicas constantes no item 2 deste Termo de Referência.	Und	170	HPE 819201-B21 NACIONAL	2.945,00	500.650,00



03	Unidade de Disco de 12TB SAS de 12Gb/s, conforme especificações técnicas constantes no item 3 deste Termo de Referência.	Und	40	HPE 881779-B21 NACIONAL	3.897,30	155.892,00
04	Fonte de alimentação (110/220) de 800W, conforme especificações técnicas constantes no item 4 deste Termo de Referência.	Und	70	HPE 865414-B21 NACIONAL	1.900,00	133.000,00
05	Unidade de memória de 16GB DDR4 de 2666MHz, conforme especificações técnicas constantes no item 5 deste Termo de Referência.	Und	20	HPE P00922-B21 NACIONAL	2.600,00	52.000,00
06	Rack de Torre Fechado, 42U, conforme especificações técnicas constantes no item 6 deste Termo de Referência.	Und	234	IP METAL RACK SERVIDOR NACIONAL	6.124,00	1.433.016,00
07	Rack de Parede Telecom 19", 12U, conforme especificações técnicas constantes no item 7 deste Termo de Referência.	Und	60	IP METAL PAREDE 12U NACIONAL	2.050,00	123.000,00



08	Ponto de Acesso WI-FI com PoE, conforme especificações técnicas constantes no item 8 deste Termo de Referência	Und	170	UBIQUITI UAP-AC-PRO NACIONAL	1.985,00	337.450,00
09	Bateria de Nobreak, conforme especificações técnicas constantes no item 9 deste Termo de Referência.	Und	1500	GET POWER GP12-7AH NACIONAL	70,75	106.125,00
Valor Total da Proposta →					R\$ 5.638.781,00	
Valor Total da Proposta por Extenso: Cinco milhões seiscentos e trinta e oito mil setecentos e oitenta e um reais.						

Declaramos ainda que:

- Declaramos que o objeto cotado atende todas as exigências do edital, relativas à especificação e características, inclusive técnicas e que estamos de pleno acordo com todas as condições estabelecidas no edital e seus anexos.
- Que estão inclusos nos preços supramencionados todos os custos diretos e indiretos, inclusive de embalagens, transportes ou fretes, e ainda os resultantes da incidência de quaisquer tributos, contribuições ou obrigações decorrentes da legislação trabalhista, fiscal e previdenciária a que estiver sujeito.
- Declaramos que a garantia dos equipamentos ofertados no Item 01 – Servidores são de 03 anos + 2 anos totalizando 5 anos, com suporte técnico on-site SLA 8x5, com suporte técnico para abertura de chamado gratuito através do número 0800-0556405.

Lista de Assistência técnica autorizada:

- **DIGITAL PROCESSAMENTO DE DADOS LTDA.**
- Rua Clarindo de Queiroz, 101 – São Francisco – Manaus/AM
- Contato: Michel Fussi – Fone: 19 3272-2290



- Garantia dos demais itens, conforme o edital.
- O local de entrega do objeto será o indicado no Termo de Referência.
- Prazo de Entrega dos Produtos: será de até 45 (quarenta e cinco) dias corridos.
- Condição de Pagamento: Conforme Edital.
- Validade de Proposta: 60 (sessenta) dias.

Dados da empresa licitante:

- Razão Social: FUTURA DISTRIBUIÇÃO COMÉRCIO E SERVIÇOS DE INFORMÁTICA LTDA.
- CNPJ/MF: 12.713.709/0001-13
- Inscrição Estadual: 04.229.855-5
- Endereço: Av. André Araújo, 2151 – Shopping Tropical Center - Sala 211 – Aleixo CEP: 69060-000 – Manaus/AM
- Telefone: (92) 3646-5335
- E-mail: comercial@futuraam.com.br

Dados bancários da pessoa jurídica:

- Instituição bancária: BANCO BRADESCO
- Agência: 3739
- Conta Corrente: 39671-0

Dados do Responsável legal para assinatura da Ata de Registro de Preços e Instrumento Contratual:

- Nome completo: TIAGO PROCESI COUTINHO
- RG: 30.456.221-X e CPF nº 216.087.658-57
- Cargo/Função: Sócio-Diretor
- Endereço: Av. André Araújo, 2151 – Shopping Tropical Center - Aleixo CEP: 69060-000 – Manaus/AM



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A TECNOLOGIA AO SEU ALCANCE



- Telefone: (92) 3646-5335 Celular: (92) 98130-5008
- E-mail: comercial@futuraam.com.br

Atenciosamente,

12.713.709/0001-13
FUTURA DISTRIBUIÇÃO COMERCIO E
SERVIÇOS DE INFORMÁTICA LTDA-ME
Av. Andre Araujo nº 2151 Lj. 211
Edif. Tropical Center - Aleixo
Cep: 69.060-000
Manaus - AM

Tiago P. Coutinho
Gerente Comercial
CPF- 216.087.658-57
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📍 Av. André Araújo, 2151 - Sala 211 - Aleixo, Manaus - AM



FUTURA | 10 ANOS
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PROPOSTA TÉCNICA

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Manaus, 12 de abril de 2021.

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Item 01 - Servidor de Rack		
Nome do Catálogo	DESCRIÇÃO	Página no Catálogo
	Arquitetura e gabinete Os servidores possuem arquitetura de processadores que permitam a execução de aplicativos de 32 e 64 bits.	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 1
	- Compatível com a arquitetura x86/64, na versão mais atualizada do modelo ofertado;	Catalogo Xeon
	Suporte à migração de máquinas virtuais entre diferentes versões de processadores do mesmo fabricante (extended migration/flex migration);	Pagina Ctalogo Vmware CPU



- Suporte à virtualização de servidores;	CPU Xeon
- Ocupa no máximo, 1U no rack;	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 4
- O Gabinete é do mesmo fabricante do equipamento.	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 2
Placa Mãe e microcomponentes - A placa mãe é da mesma marca do fabricante do processador do equipamento, não sendo aceitas soluções de outros fabricantes em regime de OEM ou customizações;	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 3
- O Chipset é do mesmo fabricante do processador ou do fabricante da placa mãe, sendo específico para servidores.	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal



		PAG 11
BIOS ou UEFI		HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal
- O BIOS ou UEFI é desenvolvido pelo mesmo fabricante do equipamento ou o fabricante deve ter direito de cópia sobre esse BIOS, comprovando através de atestado fornecido pelo fabricante do equipamento;		PAG 15
- O BIOS ou UEFI possuir recurso de controle de permissão através de senhas, uma para inicializar o equipamento e outra para acesso e alterações das configurações do BIOS ou UEFI;		Catalogo BIOS UEFI
- Possibilidade de selecionar a unidade de inicialização do sistema contemplando disco rígido, unidade USB ou via rede local;		Catalogo BIOS UEFI
- O BIOS ou UEFI possui recursos de inserção de comandos remotamente através de scripts;		Catalogo BIOS UEFI
- O BIOS ou UEFI possui número de série / Serviço do equipamento, bem como um campo editável que permita inserir identificação de ativo e que possa ser consultado por software de gerenciamento.		Catalogo BIOS UEFI
- BIOS/UEFI é 100% (cem por cento) compatível com software de gerenciamento;		Catalogo BIOS UEFI
- Implementação em memória atualizável por software;		Catalogo BIOS UEFI
- Relógio calendário (ano com quatro posições) de tempo real, não volátil protegido por bateria;		Catalogo BIOS UEFI
- Todos os itens que forem integrados à placa principal possuem recursos para desativação, preferencialmente, via BIOS.		Catalogo BIOS UEFI



Processador - Possui 01 processador x86, com extensão de 64 bits, com dez núcleos ou mais sendo próprio para servidores;	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 40
- O processador está de acordo com a pontuação de desempenho, conforme informado no item abaixo com a devida comprovação;	Catalogo cpu2017
- Suporte a software de gerenciamento remoto do Servidor;	
- Possui memória cachê L3 de 13,75 MB;	Processador Intel® Xeon® Silver 4210
- Possui tecnologia Intel Turbo Boost;	Processador Intel® Xeon® Silver 4210
- Opera com QuickPath InterConnect (QPI) de, no mínimo, 9.6 GTps;	Processador Intel® Xeon® Silver 4210
- Possui tecnologia de otimização para virtualização;	Processador Intel® Xeon® Silver 4210
- Possui tecnologia Hyper Threading para até 10 Cores e 20 threads total;	Processador Intel® Xeon® Silver 4210
- Possui barramento de sistema (bus) com desempenho igual ou superior ao utilizado no respectivo teste (benchmark) publicado pela organização SPEC;	Catalogo cpu2017
- Todos os servidores X86 fornecidos pela CONTRATADA, proverão sistema de detecção de falha	HPE ProLiant DL360 Gen10 -



	<p>dos componentes vitais ao sistema (CPU, memória, discos, ventiladores e fontes).</p>	<p>Red Hat Certified Hardware - Red Hat Customer Portal</p> <p>PAG 17</p>
	<p>Desempenho</p> <p>- O modelo de equipamento ofertado possui índice de desempenho SPEC 2017 INTEGER BASELINE de, no mínimo, 40 pontos auditado pelo Standard Performance Evaluation Corporation, por CPU.</p>	<p>Catalogo cpu2017</p>
	<p>- Os resultados estão publicados no site www.spec.org para comprovação.</p>	<p>Catalogo cpu2017</p>
	<p>Memória</p> <p>- O processador suporta memória RAM do tipo RDIMM DDR4 (Registered DIMM DDR4) com ECC (Error Checkin and Correction) ou tecnologia equivalente e que opere em frequência igual ou superior a 2666MHz;</p>	<p>HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal</p> <p>PAG 11</p>
	<p>- O servidor possui, no mínimo, 32GB de memória RAM em módulos de memória tipo RDIMM DDR4 de pelo menos, 16GB cada, com tecnologia de distribuição de informação detectada pelo recurso ECC, para que, em um caso de falha de memória, as informações possam ser reconstruídas;</p>	<p>HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal</p> <p>PAG 41</p>



	<p>- Possui possibilidade de expansão de memória para, pelo menos, 384GB (registered DDR4 DIMMs) e possuir no mínimo 12 slots de memória.</p>	<p>HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal</p> <p>PAG 11</p>
	<p>Expansão</p> <p>- O sistema suporta, pelo menos, três slots tipo PCI Express versão 3.0 ou superior de 8 vias (x8) ou mais rápido;</p>	<p>HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal</p> <p>PAG 12</p>
	<p>- Tem, pelo menos, 1 slot específico para uma placa 1/10Gbits dual-port. não sendo esse um dos dois slots citados no item acima, podendo ser um slot on-board.</p>	<p>HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal</p> <p>PAG 12</p>
	<p>Porta de E/S</p> <p>- Todos os conectores das portas de entrada/saída de sinal serão identificados pelos respectivos nomes ou símbolos;</p>	
	<p>O equipamento possui, no mínimo, 03 portas USB versão 3.0, sendo pelo menos 01 (uma) delas situadas na parte frontal do gabinete e 02 (duas) na parte traseira;</p>	<p>HPE ProLiant DL360 Gen10 - Red Hat Certified</p>



		Hardware - Red Hat Customer Portal PAG 14
	- O equipamento possui, no mínimo, 01 (uma) porta para monitor de vídeo padrão VGA na parte traseira do equipamento, e possibilidade de incluir mais 01 (uma) porta padrão VGA na parte frontal.	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 14
	Interface de Rede Gigabit RJ-45 - O equipamento possui, no mínimo, 2 (duas) interfaces de rede com conector tipo RJ 45;	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 35
	- As interfaces serão capazes de operar nos padrões 10/100/1000;	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 59
	- IEEE 802.1Qbg Edge Virtual Bridging;	
	- TCP, IP, and UDP checksum offload;	HPE ProLiant DL360 Gen10 -



		Red Hat Certified Hardware - Red Hat Customer Portal PAG 59
	- Large Send Offload (LSO) and Generic Send Offload (GSO)	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 59
	- Permite implementação de load balance e failover;	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 59
	- Admite-se interface de rede embutida na placa principal, desde que mantidas as características descritas nos subitens anteriores.	HPE ProLiant DL360 Gen10 - Red Hat Certified Hardware - Red Hat Customer Portal PAG 59



<p>Fonte de Alimentação e Sistema de Ventilação</p> <ul style="list-style-type: none">- O equipamento suporta fontes de alimentação redundantes e hot, cada uma com potência suficiente para manter o funcionamento do equipamento em sua configuração máxima;	HPE ProLiant DL360 Gen10 - PAG 60
<ul style="list-style-type: none">- No mínimo, 01 (uma) fonte de alimentação por equipamento;	
<ul style="list-style-type: none">- A fonte possui LED indicador de status e suportar uma faixa de tensão de entrada de 100 a 127 VAC e 200 a 240 VAC em 60 Hz, com chaveamento automático de voltagem;	HPE ProLiant DL360 Gen10 - PAG 60
<ul style="list-style-type: none">- Recurso de troca sem interrupção para as fontes;	60
<ul style="list-style-type: none">- A fonte deve possuir, no mínimo 750 W de potência e certificação 80+ Platinum comprovada mediante publicação no site www.plugloadsolutions.com/80pluspowersupplies.aspx;	60+publicação
<ul style="list-style-type: none">- Será fornecido cabo de alimentação para a fonte de alimentação de forma a possibilitar sua instalação;	
<ul style="list-style-type: none">- O equipamento deve possuir ventilação adequada para a refrigeração de seu sistema interno na sua configuração máxima e dentro dos limites de temperatura adequados para operação;	
<ul style="list-style-type: none">- Os ventiladores serão redundantes.	
<p>Software de Gerenciamento</p> <ul style="list-style-type: none">- Será fornecido software de gerenciamento desenvolvido pelo fabricante do equipamento;	62
<ul style="list-style-type: none">- O equipamento ofertado possui placa de gerenciamento remoto in band que possibilite seu gerenciamento através de porta RJ-45, não sendo essa nenhuma das interfaces de rede mencionadas no item interface de Rede;	4



- Solução de gerenciamento de sistemas físicos e virtuais em ambiente heterogêneo, com suporte a vários sistemas operacionais e tecnologias de virtualização;	62
- O Módulo / Placa de gerenciamento deve ser do mesmo fabricante do equipamento, mantendo total compatibilidade com o mesmo e integração total com o software de gerenciamento solicitado. Tal solução possui as seguintes características;	11
- Possui interface de linha de comando e Web. Para interface Web, por meio de browser padrão poder realizar as tarefas de monitoração e controle, sem nenhum software adicional e independente do sistema operacional;	Catalogo iLo
- Permitir visualizar e interagir com aplicativos em um sistema remoto, exibindo a imagem da tela do sistema, utilizando ferramentas de controle remoto padrão de mercado, incluindo o VNC (Virtual Network Computing), RDP (Remote Desktop) e controle remoto baseado na Web para RSA	Catalogo iLo
- O chip/ placa/ módulo será único em cada servidor e fornecer diagnósticos, presença virtual e controle remoto para gerenciar, monitorar e resolver problemas;	11
- Segurança de acesso e utilização do protocolo TCP/IP;	Catalogo iLo
- Ser totalmente compatível com os padrões de gerenciamento IPMI(Intelligent Platform Management Interface) 2.0;	Catalogo iLo
- Permite controle remoto tipo virtual KVM, mesmo quando o sistema operacional estiver inoperante;	Catalogo iLo
- Informa o status do equipamento, indicando os componentes com falha e notificando o administrador via e-mail ou trap SNMP;	Catalogo iLo



- Suporta o envio de mensagens de Pré-Falha para no mínimo processadores, fontes, memória, ventiladores e discos;	Catalogo iLo
- Permite remotamente o acesso as mensagens do equipamento, por serial ou LAN;	Catalogo iLo Catalogo iLo
- Suporte a SSL e SSH de no mínimo 128bits;	Catalogo iLo
- Permite transferir arquivos de um local para outro e sincronizar arquivos, diretórios ou unidades, utilizando uma alternativa segura para o FTP;	Catalogo iLo
- Possui tecnologia de mídia virtual, possibilitando que imagens ISSO sejam montadas remotamente ou através de compartilhamentos CIFS, NFS ou HTTPFS, permitindo inclusive a inicialização (boot) através dessas unidades;	Catalogo iLo
- Permite o desligamento e reinicialização do servidor através da console de gerenciamento, mesmo em condições de indisponibilidade do sistema operacional, além de permitir atualização e configuração remota do BIOS e fornecer indicação de abertura de gabinete e número de série do equipamento;	Catalogo iLo
- Possui gestão automática de chamados ao suporte;	Catalogo iLo
- Permite a descoberta, navegação e visualização de sistemas na rede de dados permitindo o inventário detalhado e relacionamento com os demais recursos da rede.	Catalogo iLo
Documentação Técnica - Certificação de compatibilidade com o sistema Vmware ESXi 6.7 U2 publicada no site https://www.vmware.com/resources/ ;	VMware Compatibility Guide
- Certificação de compatibilidade com o sistema operacional RedHat Enterprise Linux 8.x publicada no site: https://access.redhat.com/ecosystem/hardware/ ;	HPE DI360gen10 REDHAT



		Certified Hardware
	- Certificado da serie ISO-9001 do fabricante do equipamento;	HPE BSI ISO9001
	- Certificado de conformidade contra incidentes elétricos e combustão dos materiais elétricos, (Norma IEC 60950) comprovador através de certificado ou relatório de avaliação de conformidade emitido por um órgão credenciado pelo INMETRO ou Certificado internacional, (Safety of Information Technology Equipment Including Eletrical Business Equipment);	HPE ProLiant DL360 Gen10 Server EUDoC HSTNS-2154-a00036435enw - IEC
	- Certificado quanto à emissão de radiação radiada e conduzida. Expedido por órgãos competentes comprovando que o equipamento detém da norma CISPR 22 / EN55022;	HPE ProLiant DL360 Gen10 Server EUDoC HSTNS-2154-a00036435enw - IEC
	- A documentação solicitada juntamente com a proposta de preços, será apresentada por parte da licitante detentora do menor lance, Caso não remeta a documentação a licitante terá desclassificada a sua proposta de preços;	
	- Todos os periféricos, placas, controladoras, módulos de memória, disco rígido, serão do mesmo fabricante, ou homologados pelo mesmo.	
	Garantia - O prazo de garantia padrão será, no mínimo, de 03 (três) anos acrescidos de 02 (dois) anos de garantia estendida, totalizado 05 (cinco) anos de garantia, contado do recebimento provisório. Caso o licitante não seja o próprio fabricante, deverá ser apresentada junto a proposta comercial a relação atualizada de assistência técnica autorizada do fabricante para todo o território nacional;	Carta do fabricante HPE



	<p>- Todas as características descritas devem ser comprovadas através de catálogos, manuais, etc;</p>	
	<p>- Os produtos fornecidos estarão cobertos por garantia, compreendendo os defeitos decorrentes de projeto, fabricação, construção, montagem ou acondicionamento;</p>	
	<p>- Declaração da licitante informando a rede autorizada de assistência técnica no Estado do Amazonas. Durante o período de garantia a empresa vencedora devera, sem ônus adicional, fornecer as atualizações ("patches") corretivas do software e firmware do equipamento fornecido; A empresa vencedora prestará garantia ao sistema fornecido nas seguintes condições: fornecerá informações detalhadas sobre o suporte técnico gratuito (inclusive a ligação telefônica por meio de DDG) em português durante o período de garantia, incluindo atualização de software. Os serviços serão solicitados mediante a abertura de um chamado efetuado por técnicos da contratante, via chamada gratuita (DDG) em horário comercial, de segunda a sexta-feira (8x5). A contratada deverá possuir central de atendimento técnico, com abertura de chamados via DDG 0800 ou portal web ou e-mail (informar os dados de contato na proposta) realizando a gestão dos processos de suporte e atendimento "on-site". O equipamento deverá possuir 5 anos de garantia "on-site" com atendimento durante horário comercial (8x5) e dias úteis com presença de técnico "on-site"; Os componentes, peças e materiais que substituírem os defeituosos deverão ser originais do fabricante e de qualidade e características técnicas iguais ou superiores aos existentes no equipamento;</p>	
	<p>- Condições de Entrega: O transporte dos equipamentos até o local especificado, será realizado pela empresa vencedora (inclusive os procedimentos de seguro, embalagem e transporte até o local especificado);</p>	-



	- A verificação quanto ao estado dos equipamentos após o transporte será de exclusiva responsabilidade da empresa vencedora, sendo que, quaisquer danos observados no transporte, a qualquer tempo, serão reparados pela empresa vencedora;	-
	- O site onde se encontra o catálogo para confirmação das características do equipamento.	-

Declaramos ainda que:

- Declaramos que o objeto cotado atende todas as exigências do edital, relativas à especificação e características, inclusive técnicas e que estamos de pleno acordo com todas as condições estabelecidas no edital e seus anexos.

Atenciosamente,

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 SERVIÇOS DE INFORMÁTICA LTDA-ME
 Av. Andre Araujo nº 2151 Lj. 211
 Edif. Tropical Center - Aleixo
 Cep: 69.060-000
 Manaus - AM

Tiago P. Coutinho
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Hewlett Packard
Enterprise

UEFI System Utilities User Guide for HPE ProLiant Gen10, ProLiant Gen10 Plus Servers, and HPE Synergy

Abstract

This guide details how to access and use the Unified Extensible Firmware Interface (UEFI) that is embedded in the system ROM of all HPE ProLiant Gen10 servers, ProLiant Gen10 Plus servers, and HPE Synergy compute modules. It details how to access and use both UEFI and Legacy BIOS options provided in BIOS Platform Configuration menus that were formerly known as the ROM-Based Setup Utility (RBSU). All options and available responses are defined. This document is for the person who installs, administers, and troubleshoots servers and storage systems.

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Getting Started

UEFI System Utilities

The UEFI System Utilities is embedded in the system ROM. Its features enable you to perform a wide range of configuration activities, including:

- Configuring system devices and installed options.
- Enabling and disabling system features.
- Displaying system information.
- Selecting the primary boot controller or partition.
- Configuring memory options.
- Launching other preboot environments.

HPE servers with UEFI can provide:

- Support for boot partitions larger than 2.2 TB. Such configurations could previously only be used for boot drives when using RAID solutions.
- Secure Boot that enables the system firmware, option card firmware, operating systems, and software collaborate to enhance platform security.
- UEFI Graphical User Interface (GUI)
- An Embedded UEFI Shell that provides a preboot environment for running scripts and tools.
- Boot support for option cards that only support a UEFI option ROM.

What is UEFI?

Unified Extensible Firmware Interface (UEFI) defines the interface between the operating system and platform firmware during the boot or start-up process. Compared to BIOS, UEFI supports advanced pre-boot user interfaces. The UEFI network stack enables implementation on a richer network-based OS deployment environment while still supporting traditional PXE deployments. UEFI supports both IPv4 and IPv6 networks. In addition, features such as Secure Boot enable platform vendors to implement an OS-agnostic approach to securing systems in the pre-boot environment.

The ROM-Based Setup Utility (RBSU) functionality is available from the UEFI interface along with additional configuration options.

UEFI System Utilities overview

Launching the System Utilities

Procedure

1. Optional: If you access the server remotely, start an iLO remote console session.
 - a. Open a browser and enter `https://<iLO host name or IP address>` to log on to the iLO web interface.
 - b. On the login page, enter a directory or local user account name and password, and then click **Log In**.
 - c. Select **Remote Console & Media** in the iLO navigation tree.



The Launch tab is displayed.

- d. Verify that your system meets the requirements for using the remote console application you want to use.
- e. Click the launch button for your selected application.

You can also launch an iLO Remote Console session by selecting:

- The Integrated Remote Console link on the **Information - iLO Overview** page.
- The Console thumbnail in the low left corner of the iLO web interface, and then choosing the application type to launch.

2. Restart or power on the server.

The server restarts and the POST screen appears.

3. Press **F9**.

The **System Utilities** screen appears.

NOTE: Using System Utilities requires BIOS administrator authorization. If the BIOS administrator requires a password, the server prompts for the password to be entered prior to launching the System Utilities. For information on setting the administrator password, see [Server Security options](#).

Navigating the System Utilities

Procedure

1. Launch the System Utilities and do one of the following.

- To navigate the screens and modify settings, use your pointing device or press any of the navigational keys. Key functions are shown at the bottom of every System Utilities screen.



TIP: When **Setup Browser Selection** is set to **Auto** (the default setting) or **GUI**, you can use your pointing device to navigate the System Utilities screens. When **Setup Browser Selection** is set to **Text**, you must use the navigational keys.

- To access the mobile online help, scan the QR code on the bottom left of the System Utilities screen with your mobile device.
2. To exit the System Utilities screen and reboot the server, press **Esc** until the main menu is displayed, and then select one of the following options:
 - **Exit and resume boot**—Exits the system and continues the normal boot process. The system continues through the boot order list and launches the first bootable option in the system.
 - **Reboot the System**—Exits the system and reboots the system without continuing the normal boot process.

Navigating the System Utilities in GUI mode

System Utilities GUI that allows you to navigate using either your pointing device or navigational keys. In GUI mode, selected menu items turn green.

NOTE: GUI mode is not supported when you access the System Utilities using a serial console.



To set the browser mode to GUI:

Prerequisites

- The System Utilities is accessed through Integrated Remote Console or a physical terminal.
- **Setup Browser Selection** is set to **Auto** or **GUI**.

Procedure

1. From the **System Utilities** screen, select **Setup Browser Selection**.
2. Select **Auto** or **GUI**.
3. Save the setting.
4. Reboot the system.

UEFI System Utilities GUI

HPE ProLiant Gen10 and HPE Synergy compute modules support a GUI UEFI System Utilities. Both mouse and keyboard devices are supported on the UEFI System Utilities GUI.

Regions

The System Utilities GUI has the following regions:

1. **Caption Bar**—This region shows the UEFI form title and the system buttons. The Form title shows the name of the form that you are currently navigating.
2. **Navigation History**—This region shows the forms to which you navigated previously. A Navigation History node is added to the navigation history each time you visit a new system utility form.
3. **Server Information**—This region shows server information and function key information.
4. **System Utilities Form**—This region shows the menu options of the current form.
5. **Activity Bar**—This region shows the system wide functions, such as function keys and the system status indicator.

Keyboard support in the GUI

The GUI has support for basic keys to navigate the system utilities form. The **Tab** key is used to change the focus on the different regions of the form. Supported keys include:

- Up and Down arrows
- Enter
- Function keys
- Esc key

Navigation History region and keyboard support

Navigation History shows system utility forms which user navigated previously. A Navigation History node is added to the Navigation History each time you visit a new form. You can Click a Navigation History node to return to the utility form that you previously visited.

If there are too many Navigation History nodes to fit on the Navigation History bar, the Home node is collapsed. To view a pop-up list of the navigation history node that you visited, you can select the Home node. To return to a previously accessed form, you can Click a Navigation History node from the list.



To move through the Navigation History region, you use the:

- Tab key to change focus in the Navigation History region.
- Enter key to get in to the Navigation History node selection mode and to select a node.
- Arrow keys to move to the node you want to select.
- Esc key to exit the Navigation History node selection mode.

Gen10 Plus features

- Language selection—Located in the Caption Bar.
- Pending Changes—Lists changes that have not been saved.
- Forced Write Settings—Displays options that are forced to change due to changing an option.
- Search—Search for an RBSU option.
- Dependency viewer— Press the question mark button located in the Caption Bar. The information about why the option is greyed out will be showed up in red.

System Utilities key functions

- Up or down arrow—Selects a menu option. When selected, the color of a menu option changes from white to yellow in text browser mode, or to green in GUI mode.
- **Enter**—Selects an entry. A selected option changes color from white to yellow in text browser mode, or to green in GUI mode. When a submenu is available, the submenu appears.
- **Esc**—Returns to the previous screen.
- **F1**—Displays online help about a selection in text mode.

NOTE: To display online help in GUI mode, click the **?** icon on the upper right corner of the System Utilities main screen.

- **F7**—Loads default UEFI BIOS configuration settings.

NOTE: Pressing **F7** only resets the BIOS configuration. It does not reset other entities, such as option cards or iLO.

- **F10**—Prompts you to save changed settings.
- **F12**—Prompts you to save changed settings, and then exits the System Utilities.
- **Reboot Required** (radio button)—Is selected and turns red when changes require that you reboot the server.
- **Changes Pending** (radio button)—Is selected and turns red when changes are pending that must be saved to take effect.

When a reboot is required

For certain configuration changes to take effect, a reboot might be required. In such cases, one of the following occurs depending on your **Setup Browser Selection** that prompts you to do so.

- In GUI mode, the **Reboot Required** (radio button) is selected and turns red when changes require that you reboot the server.
- In text mode, a prompt appears on the applicable System Utilities screen.



System Utilities menu overview

NOTE: UEFI system configuration options vary by server platform. Therefore, you might not see some of the options that are documented here.

The System Utilities screen is the main screen in the UEFI menu-driven interface. It displays menu options for the following configuration tasks:

- **System Configuration**—Displays options for viewing and configuring:
 - **BIOS/Platform Configuration (RBSU)**
 - **iLO 5 Configuration Utility**
 - Other system-specific devices, such as installed Smart Array devices, PCIe cards, and NICs. For example, **Embedded FlexibleLOM Port 1**.
-

NOTE: Throughout the menus, the interface attempts to display the proper marketing name for installed PCI devices. If the interface does not recognize a device, it assigns a generic label to the device, such as a `non-HP` name. This generic labeling does not affect the functionality or operation of the device. Devices vary based on your system.

- **One-Time Boot Menu**—Displays options for selecting a boot override option and running a UEFI application from a file system.
- **Embedded Applications**—Displays options for viewing and configuring:
 - **Embedded UEFI Shell**
 - **Integrated Management Log (IML)**
 - **Active Health System Log**
 - **Firmware Update**
 - **Embedded Diagnostics**
 - **Intelligent Provisioning**
- **System Information**—Displays options for viewing the server name and generation, serial number, product ID, BIOS version and date, power management controller, backup BIOS version and date, system memory, storage devices, and processors.
- **System Health**—Displays options for viewing the current health status of all devices in the system.
- **Exit and resume system boot**—Exits the system and continues the normal boot process.
- **Reboot the System**—Exits the system and reboots it by going through the **UEFI Boot Order** list and launching the first bootable option in the system. For example, you can launch the UEFI Shell, if enabled and listed as the first bootable option in the list.
- **Select Language**—Enables you to select a language to use in the user interface. English is the default language.
- **Setup Browser Selection**—Enables you to select the browser.

Common setup and configuration FAQs

1. **How do I access the UEFI System Utilities?**
See [Launching the System Utilities](#).
2. **How do I transition from RBSU settings to UEFI settings?**



The BIOS/Platform Configuration (RBSU) menu replaced the ROM-Based Setup Utility (RBSU). Use this menu to access and use UEFI options. See [BIOS/Platform Configuration \(RBSU\)](#).

3. How do I update the firmware or system ROM?

See [Updating firmware or system ROM](#).

4. How do I select a boot device?

See [Launching the System Utilities](#). To access the One-Time Boot Menu where you can select an option for a one-time boot override, do one of following:

- Press **F11** during server POST.
- On the **System Utilities** screen, select **One-Time Boot Menu**. See [One-Time Boot Options](#).

To modify the boot order for all boots, see [Changing UEFI boot order](#).

5. How do I enable or disable Intel Hyperthreading?

By default, Intel Hyperthreading is enabled. To disable or re-enable this setting, see [Enabling or disabling Intel Hyperthreading](#).

6. How do I configure the Minimum Processor Idle Power Package State to No Package State?

By default, this is set to Package C6 (retention) State, the lowest processor idle power state. To change this setting, see [Minimum Processor Idle Power Package C-State](#).

7. How do I configure the time zone?

See [Setting the Date and Time](#).

8. How do I save my configuration changes and reboot the system?

a. When you are done making changes, if you do not see the prompt `Changes are pending. Do you want to save changes and exit?`, press **F10** to display it.

b. Press **Y** to save your changes.

A `Change saved` confirmation prompt appears.

c. Select a reboot option and press **Enter**:

- **Exit and resume system boot**—Exits the system and continues the normal boot process. The system continues through the boot order list and launches the first bootable option in the system.
- **Reboot the System**—Exits the system and reboots the system without continuing the normal boot process.

9. How do I enter the Embedded UEFI Shell?

See [Launching the Embedded UEFI Shell](#).

10. How do I view the health status of all installed options and devices?

See [Viewing System Health](#).

11. How do I use CONREP to replicate UEFI settings?

See [Configuration Replication Utility \(CONREP\)](#).

12. How do I set Jitter Control?

See [Configuring Advanced Performance Tuning options](#).

13. How do I tune performance with Workload Profiles?



See [Workload Profiles and performance options](#).

14. How do I use the RESTful Interface Tool or API to replicate the UEFI settings?

See the RESTful Interface Tool documentation on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/redfish>).

15. How do I change the security settings on my server, such as Secure Boot or TPM?

See [Server Security Options](#). Also see *HPE Gen10 Servers Intelligent System Tuning* at <https://www.hpe.com/support/gen10-intelligent-system-tuning-en>.

16. What is HPE Intelligent System Tuning and how do I use it?

HPE Intelligent System Tuning (IST) includes Jitter Smoothing, Workload Matching, and Core Boosting. See [Configuring Advanced Performance Tuning Options](#) and [Workload Profiles and performance options](#).

Updating firmware or system ROM

To update firmware or system ROM, use one of the following methods:

- The **Firmware Update** option in the System Utilities.
- The `fwupadte` command in the **Embedded UEFI Shell**.
- Service Pack for ProLiant (SPP)
- HPE online flash components.
- Moonshot Component Pack.



System Utilities main menu options

The System Utilities main menu is your starting point for:

- System Configuration
- One-Time Boot Menu
- Embedded Applications
- System Information
- System Health
- Exit and resume system boot
- Reboot the System
- Select Language
- Setup Browser Selection

System Configuration

System Configuration menu options

- BIOS/Platform Configuration (RBSU)
- iLO 5 Configuration Utility
- Other system-specific devices, such as installed PCIe cards, NICs, and Smart Arrays. For example, Embedded FlexibleLOM Port 1.

BIOS/Platform Configuration (RBSU)

The **BIOS/Platform Configuration (RBSU)** menu contains many of the nested options for accessing UEFI options, including:

- Workload Profile
- System Options
- Processor Options
- Memory Options
- Virtualization Options
- Boot Options
- Network Options
- Storage Options
- Power and Performance Options
- Embedded UEFI Shell Options
- Server Security Options



- PCI Device Configuration Options
- Advanced Options
- Date and Time
- System Default Options

Using the iLO 5 Configuration Utility

iLO 5 Configuration Utility options

You can access the iLO 5 Configuration Utility from the physical system console, or by using an iLO 5 remote console session. The utility has the following options:

- **Network Options**
- **Advanced Network Options**
- **User Management**
- **Setting Options**
- **Set to factory defaults**
- **Reset iLO**
- **About**

Network Options

- **MAC Address** (read-only)—Specifies the MAC address of the selected iLO network interface.
- **Network Interface Adapter**—Specifies the iLO network interface adapter to use.
 - **ON**—Uses the iLO Dedicated Network Port.
 - **Shared Network Port**—Uses the Shared Network Port. This option is only available on supported servers.
 - **OFF**—Disables all network interfaces to iLO.
- **Transceiver Speed Autoselect** (iLO Dedicated Network Port only)—Enables iLO to negotiate the highest supported link speed and duplex settings when connected to the network.

This option is only available when **Network Interface Adapter** is set to **ON**.
- **Transceiver Speed Manual Setting** (iLO Dedicated Network Port only)—Sets the link speed for the iLO network interface.

This option is only available when **Network Interface Adapter** is set to **ON** and **Transceiver Speed Autoselect** is set to **OFF**.
- **Transceiver Duplex Setting** (iLO Dedicated Network Port only)—Sets the link duplex setting for the iLO network interface.

This option is only available when **Network Interface Adapter** is set to **ON** and **Transceiver Speed Autoselect** is set to **OFF**.
- **VLAN Enable** (Shared Network Port only)—Enables the VLAN feature.

When the Shared Network Port is active and VLAN is enabled, the iLO Shared Network Port becomes part of a VLAN. All network devices with different VLAN tags will appear to be on separate LANs, even if they are physically connected to the same LAN. This option is only available when **Network Interface Adapter** is set to **Shared Network Port**.



- **VLAN ID** (Shared Network Port only)—When a VLAN is enabled, specifies a VLAN tag.

All network devices that you want to communicate with each other must have the same VLAN tag. The VLAN tag can be any number between 1 and 4094. This option is only available when **Network Interface Adapter** is set to **Shared Network Port**.

- **DHCP Enable**—Configures iLO to obtain its IP address (and many other settings) from a DHCP server.
- **DNS Name**—Sets the DNS name of the iLO subsystem.

This name can only be used if DHCP and DNS are configured to connect to the iLO subsystem name instead of the IP address.

- **IP Address**—Specifies the iLO IP address.
If DHCP is used, the iLO IP address is supplied automatically. If DHCP is not used, enter a static IP address.
- **Subnet Mask**—Specifies the subnet mask of the iLO IP network.
If DHCP is used, the subnet mask is supplied automatically. If DHCP is not used, enter a subnet mask for the network.
- **Gateway IP Address**—Specifies the iLO gateway IP address.
If DHCP is used, the iLO gateway IP address is supplied automatically. If DHCP is not used, enter the iLO gateway IP address.

Configuring Network Options

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > Network Options**.
2. Select any of the **Network Options**, and then select a setting or enter a value for that option.
3. Save your settings.

Advanced Network Options

- **Gateway from DHCP**—Specifies whether iLO uses a DHCP server-supplied gateway.
- **Gateway #1, Gateway #2, and Gateway #3**—If **Gateway from DHCP** is disabled, specifies up to three iLO gateway IP addresses.
- **DHCP Routes**—Specifies whether iLO uses the DHCP server-supplied static routes.
- **Route 1, Route 2, and Route 3**—If **DHCP Routes** is disabled, specifies the iLO static route destination, mask, and gateway addresses.
- **DNS from DHCP**—Specifies whether iLO uses the DHCP server-supplied DNS server list.
- **DNS Server 1, DNS Server 2, DNS Server 3**—If **DNS from DHCP** is disabled, specifies the primary, secondary, and tertiary DNS servers.
- **WINS from DHCP**—Specifies whether iLO uses the DHCP server-supplied WINS server list.
- **Register with WINS Server**—Specifies whether iLO registers its name with a WINS server.
- **WINS Server #1 and WINS Server #2**—If **WINS from DHCP** is disabled, specifies the primary and secondary WINS servers.
- **Domain Name**—The iLO domain name. If DHCP is not used, specifies a domain name.



Configuring Advanced Network Options

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > Advanced Network Options**.
2. Select any of the **Advanced Network Options**, and then select a setting or enter a value for that option.
3. Save your settings.

User Management

- **Add User**
- **Edit/Remove User**

Add User

Use this option to add new local iLO user accounts, with the following privileges and information.

iLO 5 user privileges

- **Administer User Accounts**—Enables a user to add, edit, and delete local iLO user accounts. A user with this privilege can change privileges for all users.
If you do not have this privilege, you can view your own settings and change your own password.
- **Remote Console Access**—Enables a user to remotely access the host system Remote Console, including video, keyboard, and mouse control.
- **Virtual Power and Reset**—Enables a user to power-cycle or reset the host system.
These activities interrupt the system availability. A user with this privilege can diagnose the system by using the **Generate NMI to System** button.
- **Virtual Media**—Enables a user to use the Virtual Media feature on the host system.
- **Configure Settings**—Enables a user to configure most iLO settings, including security settings, and to remotely update the iLO firmware.
This privilege does not enable local user account administration. After iLO is configured, revoking this privilege from all users prevents reconfiguration using the web interface, HPQLOCFG, or the CLI. Users who have access to iLO RBSU, the iLO 5 Configuration Utility, or HPONCFG can still reconfigure iLO. Only a user who has the Administer User Accounts privilege can enable or disable this privilege.
- **Host BIOS**—Enables a user to configure the host BIOS settings by using the UEFI System Utilities.
- **Host NIC**—Enables a user to configure the host NIC settings.
- **Host Storage**—Enables a user to configure the host storage settings.
- **Recovery Set**—Enables a user to manage the recovery install set.

NOTE: By default, the Recovery Set privilege is assigned to the default Administrator account. To assign this privilege to another account, log into the iLO web interface with an account that already has this privilege. This privilege is not available if you start a session when the system maintenance switch is set to disable iLO security.

New User Information



- **New User Name**—Specifies the name that appears in the user list on the **User Administration** page. It does not have to be the same as the **Login Name**. The maximum length for a user name is 39 characters. The user name must use printable characters. Assigning descriptive user names can help you to easily identify the owner of each login name.
- **Login Name**—Specifies the name that must be used when logging in to iLO. It appears in the user list on the **User Administration** page, on the **iLO Overview** page, and in iLO logs. The **Login Name** does not have to be the same as the **User Name**. The maximum length for a login name is 39 characters. The login name must use printable characters.
- **Password** and **Password Confirm**—Sets and confirms the password that is used for logging in to iLO. The maximum length for a password is 39 characters. Enter the password twice for verification.

Adding new user accounts

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > User Management > Add User**.
2. Select any of the **iLO 5 user privileges**.
3. For each option, select one of the following settings.
 - **YES**—Enables the privilege for this user.
 - **NO**—Disables the privilege for this user.
4. Select a **New User Information** entry.
5. Complete each entry for the new user.
6. Create as many user accounts as needed, and then save your settings.

Edit/Remove User

Use this option to edit iLO user account settings, or to delete user accounts.

Editing or removing user accounts

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > User Management > Edit/Remove User**.
2. Select the **Action** menu for the user account you want to edit or delete.
3. Select one of the following.
 - **Delete**—Deletes the user account.
 - **Edit**—Enables you to edit the user login name, password or user permissions.
4. Update as many user accounts as needed, and then save your settings.

Setting Options

Use this menu to view and configure iLO access settings.



- **iLO 5 Functionality**—Specifies whether iLO functionality is available. When this setting is enabled (default), the iLO network is available and communications with operating system drivers are active. When this setting is disabled, the iLO network and communications with operating system drivers are terminated.

The iLO network and communications with operating system drivers are terminated when iLO functionality is disabled.

NOTE: For ProLiant blade servers, the iLO functionality cannot be disabled on blade servers.

- **iLO 5 Configuration Utility**—Enables or disables the iLO 5 Configuration Utility.

If this option is set to **Disabled**, the iLO 5 Configuration Utility menu item is not available when you access the UEFI System Utilities.

- **Require Login for iLO 5 Configuration**—Determines whether a user-credential prompt is displayed when a user accesses the iLO 5 functionality.

If this setting is **Enabled**, provide user credentials for functions, including updating with SUM and RESTful Interface Tool.

- **Show iLO 5 IP Address during POST**—Enables the display of the iLO network IP address during host server POST.

- **Local Users**—Enables or disables local user account access.

- **Serial CLI Status**—Specifies the login model of the CLI feature through the serial port. Settings are:

- **Enabled-Authentication Required**—Enables access to the iLO CLP from a terminal connected to the host serial port. Valid iLO user credentials are required.

- **Enabled-No Authentication Required**—Enables access to the iLO CLP from a terminal connected to the host serial port. iLO user credentials are not required.

- **Disabled**—Disables access to the iLO CLP from the host serial port.

Use this option if you are planning to use physical serial devices.

- **Serial CLI Speed (bits/second)**—Specifies the speed of the serial port for the CLI feature. Settings (in bits per second) are:

- **9600**

- **19200**

- **57600**

- **115200**

For correct operation, set the serial port configuration to no parity, 8 data bits, and 1 stop bit (N/8/1).

NOTE: The 38400 speed is supported in the iLO web interface, but is not currently supported by the iLO 5 Configuration Utility.

- **iLO Web Interface**—Specifies whether the iLO web interface can be used to communicate with iLO. This setting is enabled by default.


Configuring access settings

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > Setting Options**.
2. Update user access **Setting Options**.
3. Save your settings.



Set to factory defaults

 **CAUTION:** This operation clears all user and license data.

Use this option to reset iLO to the factory default settings. When you do so, you cannot access the iLO 5 Configuration Utility until after the next system reboot. If you are managing iLO remotely, the remote console session is automatically ended.

If the server has a factory installed license key, the license key is retained.

Resetting iLO to the factory default settings

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > Set to factory defaults**.

The iLO 5 Configuration Utility prompts you to select **YES** or **NO**.

2. Select **YES**.

3. When prompted to confirm the reset, press **Enter**.

iLO resets to the factory default settings. If you are managing iLO remotely, the remote console session is automatically ended.

4. Resume the boot process:

- a. Optional: If you are managing iLO remotely, wait for the iLO reset to finish, and then start the iLO remote console.

The iLO 5 Configuration Utility screen is still open from the previous session.

- b. Press **Esc** until the main menu is displayed.

- c. Select **Exit and Resume Boot** in the main menu, and then press **Enter**.

- d. When prompted to confirm the request, press **Enter** to exit the screen and resume the boot process.

Reset iLO

If iLO is slow to respond, you can use this option to perform a reset.

Resetting iLO with this method does not make any configuration changes, but it ends all active connections to iLO. When you reset iLO, the iLO 5 Configuration Utility is not available again until the next reboot.

Resetting iLO active connections

Prerequisite

Configure iLO Settings privilege

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > Reset iLO**.

The iLO 5 Configuration Utility prompts you to select **YES** or **NO**.

2. Select **YES**.

3. When prompted to confirm the reset, press **Enter**.

Active iLO connections are reset. If you are managing iLO remotely, the remote console session is automatically ended.

4. Resume the boot process:



- a. Optional: If you are managing iLO remotely, wait for the iLO reset to finish, and then start the iLO remote console. The UEFI System Utilities are still open from the previous session.
- b. Press **Esc** until the main menu is displayed.
- c. Select **Exit and Resume Boot** in the main menu, and press **Enter**.
- d. When prompted to confirm the request, press **Enter** to exit the utility and resume the normal boot process.

About

Use this menu to view information about the following iLO components.

- **Firmware Date**—The iLO firmware revision date.
- **Firmware Version**—The iLO firmware version.
- **iLO CPLD Version**—The iLO complex programmable logic device version.
- **Host CPLD Version**—The server complex programmable logic device version.
- **Serial Number**—The iLO serial number.
- **PCI BUS**—The PCI bus to which the iLO processor is attached.
- **Device**—The device number assigned to iLO in the PCI bus.

Viewing information about iLO

Procedure

1. From the **System Utilities** screen, select **System Configuration > iLO 5 Configuration Utility > About**.
2. View information **about** iLO components.

Viewing and configuring embedded device information

Viewing controller information

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Controller Information**.
2. In the Controller Information screen, view the information.

Configuring controller settings

Modifying controller settings

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Configure Controller Settings > Modify Controller Settings**.
2. In the Modify Controller Settings screen, modify any of the following settings:



Setting	Description
Cache Ratio (Read)	<p>Adjusts the amount of memory for read-ahead cache versus write cache.</p> <p>Range is from 0-100; value can be increased or decreased in increments of 5.</p>
Configured Physical Drive Write Cache State	<p>Enables or disables the setting for the write cache on all configured physical drives.</p> <p>Options are Enabled, Disabled, or Default.</p>
Current parallel surface scan count	<p>Controls how many controller surface scans can operate in parallel:</p> <ul style="list-style-type: none"> • 1: Disabled • 16: Maximum
No Battery Write Cache	<p>Enables or disables write cache when the energy pack is not present or not charged.</p> <p>Options are Enabled or Disabled.</p>
Rebuild priority	<p>Determines the urgency with which the controller treats an internal command to rebuild a failed logical drive.</p> <ul style="list-style-type: none"> • Low: Normal system operations take priority over a rebuild. • Medium: Rebuilding occurs for half of the time, and normal system operations occur for the rest of the time. • Medium high: Rebuilding is given a higher priority over normal system operations. • High: The rebuild takes precedence over all other system operations.
Spare Activation Mode	<p>Predictive Spare Activation mode activates a spare drive any time a member drive within an array reports a predictive failure.</p> <p>Failure Spare Activation mode activates a spare drive when a member drive within an array fails using fault tolerance methods to regenerate the data.</p>

Table Continued



Setting	Description
Surface Scan Analysis Priority	<p>Modifies the amount of delay or idle time of the controller before surface scan analysis is resumed.</p> <ul style="list-style-type: none"> • 0: Disabled • 1-30: Idle with delay • 31: High
Transformation priority	<p>(Does not apply to NVM Express SmartRAID SW RAID Support). Rate at which requests from the operating system are processed:</p> <ul style="list-style-type: none"> • High: Completes as fast as possible at the expense of normal I/O. • Medium: Completes with some impact on normal I/O. • Low: Performs when normal I/O is not occurring.
Unconfigured physical drive write cache state	<p>Enables or disables the write cache on all unconfigured physical drives. Options are Enabled, Disabled, or Default.</p>

3. Click **Submit changes**.

Modifying advanced controller settings

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Configure Controller Settings > Advanced Controller Settings**.
2. In the Advanced Controller Settings screen, modify any of the following settings:



Setting	Description
Alternate Inconsistency Repair Policy	(Does not apply to NVM Express SmartRAID SW RAID Support). Controls the behavior of the controller inconsistency repair Policy. This option is used to tune the controller performance for Video applications and requires the installation of a valid license key. Options are Enable or Disable.
Degraded Mode Performance Optimization	Used to tune controller performance for video applications and requires the installation of a valid license key. Options are Enabled or Disabled.
HDD Flexible Latency Optimization	Reduces the maximum observed latency from a host request.
Maximum drive Request Queue Depth	Controls the maximum number of physical drive requests that the firmware will submit to a drive at any given time. This option is used to tune controller performance for video applications. Options are 2, 4, 8, 16, 32, or Automatic.
Monitor and Performance Analysis Delay	Controls the behavior of the controller Monitor and Performance Analysis Delay and is expressed in values ranging from 0 to 60. This option is primarily used to tune controller performance for video applications and requires the installation of a valid license key.
Physical Drive Request Elevator Sort	Controls the behavior of the controller cache write Elevator sort algorithm. This option is used to tune controller performance for video applications and requires the installation of a valid license key. Options are Enabled or Disabled.
RAID 6/60 Alternate Inconsistency Repair Policy	Sets the Inconsistency Repair Policy for the controller. Options are Enabled and Disabled.

3. Click **Submit changes**.

Clearing the controller configuration

Clearing the controller configuration destroys the controller metadata, including array configurations and partition information.

⚠ CAUTION: When you clear the controller configuration, all data on the attached media is no longer accessible and cannot be recovered.



Procedure

1. From the System Utilities screen, select **System Configuration > controller > Configure Controller Settings > Clear Configuration**.
2. In the Clear Configuration screen, select one or both of the following:
 - **Delete All Array Configurations**—deletes all the arrays in the controller. All the data in the arrays is also deleted.
 - **Delete Configuration Metadata on All Physical Drives**—deletes RAID metadata on the drives that are not part of the array.

Viewing the backup power source status

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Configure Controller Settings**.
2. In the Backup Power Source screen, view the status of the backup power.

Status options are:

- Failed
- Not present
- Charging
- Charged

Managing power settings

The power management features do not apply to NVM Express SmartRAID SW RAID Support.

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Configure Controller Settings > Manage Power Settings**.
2. In the Manage Power Settings screen, update any of the following settings.



Setting	Description
Power Mode	<p>Options are:</p> <ul style="list-style-type: none"> • Maximum performance (default)—Power savings options that affect performance are disabled. • Balanced—Use this setting to save power with minimal effects on performance. • Minimum power—When settings are selected without regard to system performance, maximum power savings is achieved. <p>NOTE: Hewlett Packard Enterprise recommends the minimum power setting for specific applications, but it is not appropriate for most customers. Most applications will suffer significant performance reduction.</p>
Survival Mode	Allows controller to throttle back dynamic power settings to minimum when temperature exceeds the threshold. This minimum setting allows the server to run in most situations, but performance might decrease.

3. Click **Submit changes**.

Configure arrays

Creating an array using UEFI System Utilities

When you create an array, you can select drives, specify RAID level, and configure array settings, including strip size and logical drive size.

Procedure

1. From the UEFI System Utilities screen, select **System Configuration ><controller name> > Array Configuration > Create Array**.

2. In the Create Array screen, select each drive that you want to include in the array and click **Proceed to next Form**.

NOTE: SAS drives are not supported on the NVM Express SmartRAID SW RAID Support.

3. In the Set RAID Level screen, select the RAID Level from the drop-down menu and click **Proceed to next Form**.
4. In the Set Logical Drive Configuration screen, specify the configuration settings or use the default selection.



Setting	Description
Logical Drive Label	Use the default selection for the drive label or enter a new label. The characters in the label can be alphanumeric or spaces.
Strip Size/Full Stripe Size	<p>Strip size is the amount of data that is stored on each physical drive in the array. The full stripe size is the amount of data that the controller can read or write simultaneously on all the drives in the array. For RAID levels that support fault tolerance through parity, the parity information is calculated one full strip size at a time.</p> <p>For hardware RAID, you can specify from 16KiB up to 1024KiB, depending on the number of disks and RAID level. The default value is all available space.</p> <p>For SmartRAID NVM Express SmartRAID SW RAID Support, the minimum size is 16KiB and the maximum size is up to 256KiB, depending on RAID level and device type.</p>
Size	Values in decimal; minimum RAID size is 16 MiB.
Unit Size	Logical drive unit size (MiB/GiB/TiB).
Acceleration Method	Logical drive acceleration method (controller cache or none).

5. Click **Submit Changes**.
6. Return to the main menu.
7. Click **OK** when prompted to save your changes.
8. Reboot the server.

Managing an array

Viewing logical drive properties

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > List Logical Drives > logical drive > Logical Drive Details**.
2. In the Logical Drive Details screen, view the details.

Creating a logical drive

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > Create Logical Drive**.
2. In the Create Logical Drive screen, select the RAID level, and then click **Proceed to next Form**.
3. In the Set Logical Drive Configuration screen, use the default values for the configuration or specify different values.



Setting	Description
Logical Drive Label	Use the default selection for the drive label or enter a new label. The characters in the label can be alphanumeric or spaces.
Strip Size/Full Stripe Size	<p>Strip size is the amount of data that is stored on each physical drive in the array. The full stripe size is the amount of data that the controller can read or write simultaneously on all the drives in the array. For RAID levels that support fault tolerance through parity, the parity information is calculated one full strip size at a time.</p> <p>You can specify from 8KiB to 1024KiB, depending on the number of disks and RAID level. The default value is all available space.</p> <p>If you use SmartRAID S100i SW RAID, the minimum size is 16KiB, and the maximum size is 256KiB.</p>
Size	Values in decimal; minimum RAID size is 16 MiB.
Unit Size	Logical drive unit size (MiB/GiB/TiB).
Acceleration Method	Logical drive acceleration method (controller cache or none).

4. Click **Submit Changes**.

Assigning spare drives

A spare is a drive that automatically replaces a failed drive in a logical drive.

Prerequisites

A spare drive must meet the following criteria.

- It must be an unassigned drive or a spare drive for another array.
- It must be the same type as existing drives in the array (for example, SATA or SAS).
- The drive capacity must be greater than or equal to the smallest drive in the array.

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > Manage Spare Drives**.
2. In the Manage Spare Drives screen, select the spare activation type:
 - **Assign Dedicated Spare**
 - **Assign Auto Replace Spare**
3. Select the drive that you want to assign as a spare.

NOTE: Only drives that meet the criteria listed in the prerequisites are displayed.



Deleting a spare drive

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > Manage Spare Drives > Delete Spare Drives**.
2. From the Delete Spare Drives screen, select the spare that you want to delete, and click **Delete Spare Drives**.

Identifying a device

Use the UEFI System Utilities to identify a drive by turning on its device identification LED.

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > Identify Device**.
2. In the Identify Device screen, specify the duration (in seconds) that you want the LED to be on, select the drive configuration type, and click **Start**.

To turn off the LED, click **Stop**.

Deleting an array

This procedure deletes:

- All the logical drives on the array.
- All data on the logical drives that are part of the array.

If the deleted array is the only one on the controller, the controller settings are erased, and the default configuration is restored.

To delete an individual logical drive, see "Deleting a logical drive."

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > Delete Array**.
2. In the Delete Array screen, click **Submit Changes**.

Editing a logical drive

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > List Logical Drives > logical drive > Edit Logical Drive**.
2. In the Edit Logical Drive screen, edit any of the following settings.



Setting	Description
Acceleration method	Acceleration method can increase database performance by writing data to the cache memory instead of directly to the logical drives. Options are: <ul style="list-style-type: none"> • Controller cache--writes data to the cache memory. • None--disables caching to reserve the cache module for other logical drives on the array.
Logical drive label	This label value appears in the Logical Drive Details screen. The label can contain alphanumeric characters and spaces only.

3. Click **Submit Changes**.

Deleting a logical drive

Use this procedure to delete an individual logical drive. To delete all logical drives in an array, see "Deleting an array."

- !** **IMPORTANT:** If you delete the logical drive, any data on the logical drive is deleted as well. If the logical drive that you are deleting is the only logical drive in the array, the array is also deleted.

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Array Configuration > Manage Arrays > array > List Logical Drives > logical drive > Delete Logical Drive**.
2. In the Delete Logical Drive screen, click **Submit Changes**.

Disk Utilities

Viewing disk device information

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Disk Utilities > disk > Device Information**.
2. In the Device Information screen, view the information.

Identifying a disk device

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Disk Utilities > disk > Identify Device**.
2. In the Identify Device screen, specify the duration (in seconds) that you want the LED to be on, select the drive configuration type, and then click **Start**.

To stop blinking the LED, click **Stop**.



Setting bootable devices for Legacy Boot Mode

Setting the primary and secondary bootable devices (Legacy Boot Mode)

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Set Bootable Device(s) for Legacy Boot Mode > Select Bootable Logical Drive > logical drive**.
2. In the *Logical Drive* screen, select either of the following:
 - **Set as Primary Bootable Device**
 - **Set as Secondary Bootable Device**

Setting the number of OS bootable drives (Legacy Boot Mode)

Procedure

1. From the System Utilities screen, select **System Configuration > controller > Set Bootable Device(s) for Legacy Boot Mode > Number of OS bootable drives**.
2. In the Number of OS bootable drives screen, specify the number of OS bootable drives.
3. Click **Submit Changes**.

Viewing and configuring NIC and FCoE settings

Use the **System Configuration** screens to view information about and configure installed system devices, such as embedded NICs and FCoEs. Devices listed and configuration options available vary by system.

Procedure

1. From the **System Utilities** screen, select **System Configuration**.
2. Select a device.
A **System Configuration** screen displays information about the embedded device.
3. View, select, or enter settings.
4. Save your settings.

One-Time Boot Menu

One-Time Boot Menu options

Use the **One-Time Boot Menu** to select a UEFI boot option for a one-time boot override. The option you select does not modify your predefined boot order settings. If you use a USB key or virtual media through the iLO Remote Console, exit and re-enter the System Utilities to refresh this menu so that the devices appear.

Boot options include:



- OS boot manager, such as **Windows Boot Manager**—Lists the boot manager for your installed OS.
- **Generic USB Boot**—Provides a placeholder for any USB device that is bootable in UEFI. You can set the boot priority of this option, and retain this priority for use with USB devices you might install in the future. Setting this priority does not affect priorities set for individual USB devices in the **UEFI Boot Order** list.

NOTE: This option is only available in UEFI Mode. The system attempts to boot all UEFI bootable USB devices in the order you specify in the **Generic USB Boot** entry, even if installed individual USB devices are configured lower in the boot order.

- Internal SD Card
- Embedded Flexible LOMs
- Embedded UEFI Shell
- Embedded SATA Port
- **Run a UEFI Application from a file system**—Enables you to select a UEFI application to run from a file system. You can browse all FAT file systems that are available in the system. You can also select an x64 UEFI application (with an .EFI extension) to execute (can be an OS boot loader or any other UEFI application).
- **Legacy BIOS One-Time Boot Menu**—Exits and launches the **Legacy BIOS One-Time Boot Menu**, where you can select a specific override option for this boot only. This option does not modify your boot order mode settings.

Selecting an option for a one-time boot

Procedure

1. From the **System Utilities** screen, select **One-Time Boot Menu**.
2. Select a **One-Time Boot Menu** option.

If you select Legacy BIOS One-Time boot option, the system reboots.

Embedded Applications

Launching the Embedded UEFI Shell

Use the **Embedded UEFI Shell** option to launch the Embedded UEFI Shell. The Embedded UEFI Shell is a preboot command-line environment for scripting and running UEFI applications, including UEFI boot loaders. The Shell also provides CLI-based commands you can use to obtain system information, and to configure and update the system BIOS.

Prerequisites

Embedded UEFI Shell is set to **Enabled**.

Procedure

1. From the **System Utilities** screen, select **Embedded Applications > Embedded UEFI Shell**.

The **Embedded UEFI Shell** screen appears.

2. Press any key to acknowledge that you are physically present.

This step ensures that certain features, such as disabling **Secure Boot** or managing the **Secure Boot** certificates using third-party UEFI tools, are not restricted.



3. If an administrator password is set, enter it at the prompt and press **Enter**.

The `Shell>` prompt appears.

4. Enter the commands required to complete your task.
5. Enter the `exit` command to exit the Shell.

Viewing or clearing the Integrated Management Log

Use the **Integrated Management Log (IML)** option to view or clear the record of historical events that have occurred on the server. Entries in the IML can help you diagnose issues or identify potential issues. The IML time stamps each event with one-minute granularity.

Procedure

1. From the **System Utilities** screen, select **Embedded Applications > Integrated Management Log**.
2. Select an option.
 - **View IML**—Displays the Integrated Management Log records.
 - **Clear IML**—Clears all entries in the Integrated Management Log.

Downloading Active System Health data

HPÉ Support used the Active Health System (AHS) log file for problem resolution. The high level steps for submitting a case are:

Procedure

1. Download an AHS Log from the server experiencing a support issue.
2. Upload the AHS Log to the Active Health System Viewer (<https://www.hpe.com/servers/AHSV>).
3. Review the Fault Detection Analytics for any self-repair actions/recommendations. See the *AHSV User Guide* for more information.
4. Create a support case using the AHSV Navigation menu. See the *AHSV User Guide* for more information.

More information

[Downloading an Active Health System Log](#)

[Uploading an AHS log to AHSV](#)

Downloading an Active Health System Log

By default, the system downloads an **Active Health System Log** from the previous seven days if you do not use the **Range Start Date** and **Range End Date** fields to specify a different time period. When requested by Hewlett Packard Enterprise Support, you can copy your stored `.ahs` file, and email it to your customer support representative.

Procedure

1. From the **System Utilities** screen, select **Embedded Applications > Active Health System Log**.
2. Select **Download Active Health System Log**.
3. Select or enter the following.



- **Download Entire Log**—Unless a support representative advises you to download AHS records for the life of the server, leave this disabled (not selected). The default setting is disabled.
- **Range Start Date**—Enter a starting date for log collection.
- **Range End Date**—Enter an ending date for log collection.
- **Select File Location**—Select this option to open a File Explorer screen and select the FAT16 FAT32 partition on local or virtual writable media on which to download the AHS log.

NOTE: Hewlett Packard Enterprise recommends storing AHS logs on USB or HDD media. Storing logs on SD cards is not supported.

- Optional: Add your customer information, including support case number, and contact information.

4. Select **Start Download**.

The UEFI firmware communicates with iLO to download the requested AHS log files and package them into one .ahs file.

- #### 5. When requested by Hewlett Packard Enterprise Support, copy your stored .ahs file, and email it to your customer support representative or use the *Uploading an AHS log to AHSV* task.

NOTE: You can also download AHS log files by selecting **System Utilities > System Health > Download Active Health System Log**.

More information

[Uploading an AHS log to AHSV](#)

Logging in to Active Health System Viewer

Procedure

1. To access the AHSV webpage, go to <https://www.hpe.com/servers/ahsv> in a supported browser. Supported browsers include:
 - Internet Explorer 11
 - Chrome v51 or later
 - Firefox v46 or later
2. Enter your **User ID** (email address) and **Password**, and then click **Sign In**.

NOTE: To log in using an HPE Passport account, or to create an HPE Passport account, go to <https://www.hpe.com/info/insightonline>. In most cases, your HPE Passport account is the same as the email address you used during the HPE Passport account registration process. If you changed your user ID in the Hewlett Packard Enterprise Support Center, be sure to log in with your user ID and not your email address.

NOTE: To have the system remember your log in credentials, select **Remember Me** before clicking **Sign In**.


Uploading an AHS log to AHSV

The maximum file size limit is 250 MB. For logs that are larger than 250 MB, contact the HPE Support Center for assistance.

Perform this task in AHSV.



Prerequisites

 **IMPORTANT:** The server from which the AHS log was created must have a valid warranty. If the server is out of warranty, an error message is displayed: `Server is not Entitled`. Check these options for renewing your license. The options include:

- Buy more licenses.
 - Find partner for license purchase.
 - Contact HPE Support.
-

Procedure

1. Select **Upload AHS Log**.
2. Navigate to your log file, and then click **Open**.

A window is displayed that shows parsing and log loading states. As the AHS log loads, the screen displays the estimated time of completion.



TIP: This window also displays videos for different platforms. You can search and play different videos while you are waiting for the log file to load.

To cancel the load process, click **Cancel**.

Embedded Diagnostics

Use this option to launch the Hardware Diagnostics menu. From there, you can view health summary status, run system tests and component tests, and view test logs.

Launching Embedded Diagnostics

Use the **Embedded Diagnostics** option to launch the Hardware Diagnostics menu. From there, you can view health summary status, run system tests and component tests, and view test logs.

Procedure

1. From the **System Utilities** screen, select **Embedded Applications > Embedded Diagnostics**.

The Hardware Diagnostics screen appears.

2. Select an option.
 - **System Health**—Lists a Health Summary (status for BIOS hardware, fans, temperature, battery, memory, network, and storage), Fans (zone, label, status, and speed), Temperature (label, location, status, current reading, and cautions), Power Supplies (power supply summary and smart storage battery), Processors, Memory, NIC Information, Storage, and Firmware Information.
 - **System Tests**—Lists information and gives you options for checking hardware subsystems to ensure that they are working properly. The Quick Test option performs a 10-minute check of the hardware. The Extensive Test option performs a full check of the hardware and can take two or more hours to complete.
 - **Component Tests**—Lists information and gives you options for checking Processor, Memory, Hard Drive, Keyboard, Mouse, Network, Optical Drive, System Board, USB Port, and Video tests.

- **Test Logs**—Displays test logs, which contain information about test type and results, including failures.
- **IML Log**—Displays all IML log files, which include information about the severity, class, initial time, and update time.
- **Language**—Selects your language for the Embedded Diagnostics.
- **Exit**—Exits the **Embedded Diagnostics** menu and returns you to the **System Utilities** screen.

Launching Intelligent Provisioning

Intelligent Provisioning is an embedded, single-server deployment tool that simplifies server setup, providing a reliable and consistent way to deploy server configurations. The **Intelligent Provisioning** option lets you select the Intelligent Provisioning host override option for this boot only. It does not modify the normal boot order or boot mode settings. For more information, see the *Intelligent Provisioning user guide* on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/intelligentprovisioning/docs>).

Procedure

1. From the **System Utilities** screen, select **Embedded Applications > Intelligent Provisioning**.
2. To return to the **System Utilities** menu, reboot the server.

System Information and System Health

System Information

Use this option to view:

- **Summary**—Shows a summary of system settings, including:
 - **System Name**
 - **Serial Number**
 - **Product ID**
 - **BIOS Version Power Management Controller FW Version User Defaults**
 - **Boot Mode**
 - **System Memory**
 - **Processor types**
 - **iLO Firmware Version**
 - Embedded **Network Devices**
- **Processor Information**—Shows detailed processor information, including:
 - **CPU** number, **Socket** number, and **Socket Locator** label
 - Whether the CPU socket is **Populated** with a CPU package
 - A brief CPU **Manufacturer Description** and a list of **Characteristics** that the CPU supports
 - The **Core Count**, the number of enabled cores, and **Thread Count** (number of logical cores) in the CPU package
 - The **Rated Speed** and **External Clock Speed** of the CPU



- The **Voltage** of the CPU package
 - A list of **Microcode Patches** installed by the BIOS
 - L1, L2, and L2 cache size and speed
 - **Memory Information**—Shows detailed memory information, including:
 - **Total System Memory**
 - **Total Memory Slots**
 - Operating frequency and voltage
 - The **Number of Slots** connected to the CPU
 - The number of **Installed Modules** that are directly connected to the CPU
 - **Storage Information**
 - **PCI Device Information**—Shows detailed information about each PCI device.
 - **Firmware Information**—Shows detailed firmware information.
- Export System Information to file**—Opens a screen where you can:
1. **Select file location**—Select or specify a new file for the exported information.
 2. Select which type of system information to export:
 - Summary
 - Processor
 - Memory
 - PCI device
 - Firmware
 3. To export the information, save your selections, and then exit the System Utilities.

Viewing System Information

Procedure

1. From the **System Utilities** screen, select **System Information**.
2. Select an **option** to display related information.

NOTE: You can also view firmware information using the RESTful Interface Tool. See the RESTful Interface Tool documentation at <https://www.hpe.com/info/restfulinterface/docs>.

Viewing System Health

Use the **System Health** option to check the health status of all devices in the system. This screen shows, for example, the presence of any unsupported devices found during the boot process.



Procedure

1. From the **System Utilities** screen, select **System Health**.
2. Select **View System Health**.
3. Optional: Download an AHS log. For more information, see [Downloading an Active Health System Log](#).

Rebooting the system, selecting a language, and setting the browser mode

Rebooting the system

Exiting and resuming system boot

Use the **Exit and resume system boot** option to exit the system and continue the normal boot process. The system continues through the boot order list and launches the first bootable option in the system. For example, you can launch the UEFI Embedded Shell, if it is enabled and selected as first bootable option in the UEFI Boot Order list.

Procedure

1. From the **System Utilities** screen, select **Exit and resume system boot**.
A confirmation message appears.
2. Click **OK** or press **Enter**.

Rebooting the system

Use the **Reboot the System** option to exit the system and reboot without continuing with the normal boot process.

Procedure

1. From the **System Utilities** screen, select **Reboot the System**.
A confirmation message appears.
2. Click **Yes, Reboot**, or press **Enter**.

Selecting a language and browser mode

Selecting a system language

Procedure

1. From the **System Utilities** screen, select **Select Language**.
2. Select a language.



- **English**
- **Japanese**
- **Simplified Chinese**

3. Save your setting.

Selecting a browser mode

Procedure

1. From the **System Utilities** screen, select **Setup Browser Selection**.

2. Select a setting.

- **GUI**—Opens a GUI-based browser when you access the System Utilities using the Integrated Remote Console or a physical terminal.
- **Text**—Opens a text-based browser when you access the System Utilities using a serial console.
- **Auto**—Depending on how you access the System Utilities, opens either a text-based browser, or a GUI-based browser.

3. Save the setting.

More information

[Navigating the System Utilities in GUI mode](#)



BIOS/Platform Configuration Options

Workload Profiles and performance options

Workload Profiles is one of the HPE Intelligent System Tuning (IST) features and allows you to tune the resources in your HPE ProLiant server by choosing a preconfigured workload profile. The server will automatically configure the BIOS settings to match the selected workload.

System provided Workload Profiles

The system provides these Workload Profiles:

General Power Efficient Compute

This profile is the default profile for most ProLiant servers and HPE Synergy compute modules.

This profile applies the most common performance settings that benefit most application workloads while also enabling power management settings that have minimal impact to overall performance. The settings that are applied heavily favor a balanced approach between general application performances versus power efficiency.

This profile is recommended for customers that do not typically tune their BIOS for their workload.

General Peak Frequency Compute

This profile is intended for workloads that generally benefit from processors or memory that must achieve the maximum frequency possible, for any individual core, at any time. Power management settings are applied when they ensure that any component frequency upside can be readily achieved. Processing speed is favored over any latencies that might occur. This profile is a general-purpose profile, so optimizations are done generically to increase processor core and memory speed.

This profile benefits workloads that typically benefit from faster compute time.

General Throughput Compute

This profile is intended to be used for workloads where the total maximum sustained workload throughput is needed. Increased throughput does not always occur when the processor runs at the highest individual core speed. Increased throughput can occur when the processor is able to perform sustained work across all available cores during maximum utilization. Power management settings are disabled when they are known to have impact on maximum achievable bandwidth.

Best throughput is achieved when the workload is also (Nonuniformed Memory Access) NUMA aware and optimized so settings that benefit NUMA awareness are applied.

Virtualization - Power Efficient

This profile is intended to be used for virtualization environments. The profile ensures that all available virtualization options are enabled. Certain virtualization technologies can have possible performance impacts to nonvirtualized environments and can be disabled in other profiles. Power management settings can have an impact on performance when running virtualization operating systems and this profile applies power management settings that are virtualization friendly.

Virtualization - Max Performance

This profile is intended to be used for virtualization environments. The profile ensures that all available virtualization options are enabled. Power management settings are disabled in favor of delivering maximum performance.

Low Latency

This profile is intended to be used by customers who desire the least amount of computational latency for their workloads. This profile follows the most common best practices that are documented in the HPE Low Latency Whitepaper. Maximum speed and throughput are often sacrificed to lower overall computational latency. Power management and other management features that might introduce computational latency are also disabled.



The profile benefits customers running Real-Time Operating Systems (RTOS) or other transactional latency sensitive workloads.

Mission Critical

This profile is intended to be used by customers who trade off performance for server reliability above the basic server defaults. The profile enables advanced memory reliability, availability, and serviceability (RAS) features that are known to have more than a measurable impact to computational performance. Enabling this profile will have an impact to maximum memory bandwidth and will increase memory latency.

Transactional Application Processing

This profile is intended to be used for business processing environments, such as online transaction processing (OLTP) applications that require a database back-end. For example, workloads typically comprised of a high number of user-based, transactional applications running on a single server with cohosted database component. The profile balances the requirement of managing both peak frequency and throughput.

High Performance Compute (HPC)

This profile is intended for customers running in a traditional HPC environment. Typically, these environments are clustered environments where each node performs at maximum utilization for extended periods of time to solve large-scale scientific and engineering workloads. The default for our Apollo series servers, power management is typically disabled in favor of sustained available bandwidth and processor compute capacity. This profile is similar to the Low Latency profile except that some latency is accepted to achieve maximum throughput.

Decision Support

This profile is intended for Enterprise Business Database (Business Intelligence) workloads that are focused on operating and/or accessing data warehouses, such as data mining or online analytical processing (OLAP).

Graphic Processing

This profile is intended for workloads that are run on server configurations which utilize Graphics Processing Units (GPUs.) GPUs typically depend on maximum bandwidth between I/O and Memory. Power management features that have impact on the links between I/O and memory are disabled. Peer to Peer traffic is also critical and therefore virtualization is also disabled.

I/O Throughput

This profile is intended to be used for configurations that depend on maximum throughput between I/O and memory. Processor utilization driven power management features that have performance impact to the links between I/O and memory are disabled.

Custom

This option on the Workload Profiles menu disables Workload Profiles. Use this option if you want to set specific BIOS options for your deployment manually. When you select Custom, all the settings for the previously selected profile are carried forward. You can edit all or some of the options.

Custom is not a profile and settings that you specify are not saved as a template.

Default profiles for servers

Workload Profile options support a variety of power and performance requirements. For most HPE ProLiant Gen10 servers and HPE Synergy compute modules, Workload Profile is set to **General Power Efficient Compute** by default. This Workload Profile provides common performance and power settings suitable for most application workloads. For ProLiant XL servers in an HPE Apollo system, the Workload Profile is set to **High Performance Compute** by default.

Selecting a Workload Profile other than the Custom profile affects other setting options. For example, selecting the **General Peak Frequency Compute** profile automatically sets **Power Regulator** mode to **Static High Performance**. This setting cannot be changed and is grayed out.



Workload matching

The default BIOS settings on Hewlett Packard Enterprise servers provide a balance between performance and power efficiency. These settings can be adjusted to match specific application workloads.

HPE Gen10 and later servers offer a UEFI configuration option to help customers tune their BIOS settings by using known workload-based tuning profiles. When matching your workload profile setting to your actual deployed workload, you can realize performance gains versus just using the out-of-box BIOS defaults.

For more information, see the *UEFI Workload-based Performance and Tuning Guide for HPE ProLiant Gen10, ProLiant Gen10 Plus Servers, and HPE Synergy* at <https://www.hpe.com/support/Workload-UG-en>.

Workload Profiles dependencies overview

Dependencies

There are multiple options that are available for BIOS configuration. Not all profiles set the same options to specific settings. Each profile is designed to obtain specific performance results and sets different options to meet those results. The options that a profile sets are called dependencies. All other options are unaffected by the Workload Profile and are referred to as nondependent settings.

Dependencies and switching profiles

When you change a profile, only the dependent settings for that profile are changed. Nondependent settings remain what they were before you changed your profile.

For example:

1. Select the General Power Efficient Compute profile, which has the Energy Performance Bias set to Balanced Performance.
2. Select the General Peak Frequency Compute profile, which has no dependency on Energy Performance Bias. The Energy Performance option is set to Balanced Performance because that setting is carried forward from the General Power Efficient Compute profile.
3. Select the General Throughput Compute profile, which has the Energy Performance Bias set to Maximum Performance.
4. Select the General Peak Frequency Compute profile which has no dependency on Energy Performance Bias. Energy Performance Bias is set to Maximum Performance because that setting is carried forward from the General Throughput Compute profile.

There is no way to revert to a previous profile and dependencies. Once you change to a new profile, the new dependencies are applied. The only way to revert to older profiles, is to exit without saving your changes. Exiting without saving reverts to where you were when you entered RBSU. Once you save a profile, you cannot revert from that profile to any intermediate dependencies.

Dependencies and options matrix

The tables show the Workload Profiles and their dependencies. The Workload Profiles are listed in the order that they are listed on the user interface. In the table, "X" means that the option setting has no requirement for the profile and can be edited. Dependencies cannot be edited.

NOTE: Not all the options listed are adjustable on all servers. However, even if you do not have the option of adjusting some of these settings, they default to the values shown here.

Workload Profile Dependencies—Intel-based servers

NOTE: Options vary based on hardware installed on the server.



Table 1: Workload Profiles General Power Efficient Compute—Low Latency

	General Power Efficient Compute	General Peak Frequency Compute	General Throughput Compute	Virtualization - Power Efficient	Virtualization - Max Performance	Low Latency
SR-IOV	X	X	X	Enabled	Enabled	Disabled
VT-D	X	X	X	Enabled	Enabled	Disabled
VT-x	X	X	X	Enabled	Enabled	Disabled
Power Regulator	Dynamic Power Savings	Static High Performance	Static High Performance	OS Control	Static High Performance	Static High Performance
Minimum Processor Idle Power Core C-state	C6	X	X	C6	No C-states	No C-states
Minimum Processor Idle Power Package C-state	Package C6 Retention	Package C6 Retention	Package C6 Retention	Package C6 Retention	No C-states	No C-states
Energy Performance Bias	Balanced Performance	X	Max Performance	Balanced Performance	Max Performance	Max Performance
Collaborative Power Control	Enabled	Disabled	Disabled	Enabled	Disabled	Disabled
Intel DMI Link Frequency	Auto	Auto	Auto	Auto	Auto	Auto
Intel Turbo Boost Technology	Enabled	Enabled	Enabled	X	Enabled	Disabled
Intel NIC DMA Channels (IOAT)	Enabled	X	X	X	X	X
HW Prefetcher	Enabled	Enabled	Enabled	X	X	Enabled
Adjacent Sector Prefetch	Enabled	Enabled	Enabled	X	X	Enabled
DCU Stream Prefetcher	Enabled	Enabled	Enabled	X	X	Enabled
DCU IP Prefetcher	Enabled	Enabled	Enabled	X	X	Enabled
NUMA Group Size Optimization	Flat	Clustered	Clustered	Clustered	Clustered	Clustered
Memory Patrol Scrubbing	X	X	X	X	X	Disabled

Table Continued

	General Power Efficient Compute	General Peak Frequency Compute	General Throughput Compute	Virtualization - Power Efficient	Virtualization - Max Performance	Low Latency
Memory Refresh Rate	X	1X	1X	X	X	1X
UPI Link Power Management	Enabled	Disabled	Disabled	Enabled	Disabled	Disabled
Sub-NUMA Clustering	Disabled	X	Enabled	Disable	Enabled	X
Energy-Efficient Turbo	Enabled	Disabled	Disabled	Enabled	Disabled	Disabled
Uncore Frequency Shifting	Auto	Max	X	Auto	Max	Max
x2APIC	X	X	X	X	X	Disabled
Channel Interleaving	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Memory Bus Frequency	X	X	X	X	X	X
Advanced Memory Protection	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	ECC

Table 2: Workload Profiles Mission Critical—I/O Throughput

	Mission Critical	Transactional Application Processing	High Performance Compute (HPC)	Decision Support	Graphic Processing	I/O Throughput
SR-IOV	X	X	Disabled	X	Disabled	X
VT-D	X	X	Disabled	X	Disabled	X
VT-x	X	X	Disabled	X	Disabled	X
Power Regulator	X	Static High Performance	Static High Performance	X	X	X
Minimum Processor Idle Power Core C-state	X	No C-states	No C-states	X	X	X

Table Continued



	Mission Critical	Transactional Application Processing	High Performance Compute (HPC)	Decision Support	Graphic Processing	I/O Throughput
Minimum Processor Idle Power Package C-state	X	No C-states	No C-states	X	X	X
Energy Performance Bias	X	Max Performance	Max Performance	X	Max Performance	Max Performance
Collaborative Power Control	X	X	Disabled	X	X	X
Intel DMI Link Frequency	Auto	Auto	Auto	Auto	Auto	Auto
Intel Turbo Boost Technology	X	Enabled	Enabled	X	X	X
Intel NIC DMA Channels (IOAT)	X	Enabled	Enabled	X	X	Enabled
HW Prefetcher	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Adjacent Sector Prefetch	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
DCU Stream Prefetcher	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
DCU IP Prefetcher	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
NUMA Group Size Optimization	X	Clustered	Clustered	Clustered	Clustered	Clustered
Memory Patrol Scrubbing	X	X	X	X	X	X
Memory Refresh Rate	2X	X	1X	X	X	X
UPI Link Power Management	X	Disabled	Disabled	X	X	X
Sub-NUMA Clustering	X	X	X		X	X
Energy-Efficient Turbo	X	X	Disabled	X	X	X
Uncore Frequency Shifting	X	X	Max	X	Max	Max
x2APIC	X	X	Disabled	X	Disabled	X

Table Continued



	Mission Critical	Transactional Application Processing	High Performance Compute (HPC)	Decision Support	Graphic Processing	I/O Throughput
Channel Interleaving	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Memory Bus Frequency	X	X	X	X	X	X
Advanced Memory Protection	ADDDC	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	ECC (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)	X (ROM version earlier than 1.50) ADDDC (ROM version 1.50 and later)

Workload Profiles dependencies—AMD-based servers

NOTE: Options vary based on hardware installed on the server.

Table 3: Workload Profiles General Power Efficient Compute—Low Latency

	General Power Efficient Compute	General Peak Frequency Compute	General Throughput Compute	Virtualization - Power Efficient	Virtualization - Max Performance	Low Latency	Mission Critical
Power Regulator	OS Control	Static High Performance	Static High Performance	OS Control	Static High Performance	Static High Performance	X
SR-IOV	X	X	X	Enabled	Enabled	Disabled	X
AMD IOMMU	X	X	X	Enabled	Enabled	X	X
AMD Virtualization Technology	X	X	X	Enabled	Enabled	Disabled	X
Minimum Processor Idle Power Core C-state	C6	X	X	C6	No C-states	No C-state	X
AMD Turbo Core	Enabled	Enabled	Enabled	X	Enabled	Disabled	X
L1 Stream HW Prefetcher	Enabled	Enabled	Enabled	X	X	Enabled	Enabled
L2 Stream HW Prefetcher	Enabled	Enabled	Enabled	X	X	Enabled	Enabled

Table Continued



	General Power Efficient Compute	General Peak Frequency Compute	General Throughput Compute	Virtualization - Power Efficient	Virtualization - Max Performance	Low Latency	Mission Critical
NUMA Group Size Optimization	Flat	Clustered	Clustered	Clustered	Clustered	Clustered	X
Memory Patrol Scrubbing	X	X	X	X	X	Disabled	X
Memory Refresh Rate	X	1X	1X	X	X	1X	2X
x2APIC	X	X	X	X	X	Auto	X

Table 4: Workload Profiles Mission Critical—I/O Throughput

	Transactional Application Processing	High Performance Compute (HPC)	Decision Support	Graphic Processing	I/O Throughput	Custom	EV Name
Power Regulator	Static High Performance	Static High Performance	X	X	X	X	CQHPER
SR-IOV	X	Disabled	X	Disabled	X	X	CQHSRIOV
AMD IOMMU	X	X	X	X	X	X	CQHSKTPROC
AMD Virtualization Technology	X	Disabled	X	Disabled	X	X	CQHAMD
Minimum Processor Idle Power Core C-state	No C-states	No C-states	X	X	X	X	CQHSKTPOWER
AMD Turbo Core	Enabled	Enabled	X	X	X	X	CQHSKTPOWER
L1 Stream HW Prefetcher	Enabled	Enabled	Enabled	Enabled	Enabled	X	CQHSKTPROC
L2 Stream HW Prefetcher	Enabled	Enabled	Enabled	Enabled	Enabled	X	CQHSKTPROC
NUMA Group Size Optimization	Clustered	Clustered	Clustered	Clustered	Clustered	X	CQHNUMA
Memory Patrol Scrubbing	X	X	X	X	X	X	CQHMEM

Table Continued

	Transactiona I Application Processing	High Performance Compute (HPC)	Decision Support	Graphic Processing	I/O Throughput	Custom	EV Name
Memory Refresh Rate	X	1X	X	X	X	X	CQHMEM
x2APIC	X	Auto	X	Auto	X	X	CQHSKTPROC

Applying a Workload Profile

You apply a Workload Profile to have the system manage your workload according to predefined settings provided with the system. Dependent options cannot be changed and are grayed out. You can change any nondependent options in a profile.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Workload Profile**.
2. Select a Workload Profile.
3. Optional: Change any nondependent options that you want to change.
4. Save and reboot to apply your Workload Profile.

More information

[Workload Profiles and performance options](#)

Changing dependent options after applying a profile

There may be one or more dependent options that you want to change in your Workload Profile. Dependent options cannot be changed for a predefined profile. You can change the dependent options in Custom mode. When you are in Custom mode, your deployment is no longer in profile mode and you can manually adjust option settings. When you enter Custom mode, all the settings from the previously applied profile are shown.

The easiest way to change dependent settings is to modify an applied profile. First apply a Workload Profile that has most of the settings that you want to use then change to Custom mode. Then change only the settings you want to have new values.

Prerequisites

Apply a Workload Profile before you do this task.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Workload Profile**.
2. Select the **Custom profile** option.
All of the settings from the previously applied Workload Profile are shown. All options are editable.
3. Change the options that you want to have new values.
4. Save and reboot to apply the changes.



Changing System Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options**.

Configuring Boot Time Optimizations

Setting Dynamic Power Capping Functionality

Use the **Setting Dynamic Power Capping Functionality** option to configure when the system ROM executes power calibration during the boot process.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Boot Time Optimizations > Dynamic Power Capping Functionality**.
2. Select a setting.
 - **Auto**—Power calibration runs the first time the server is booted and is only run again when the hardware configuration settings of the server change.
 - **Enabled**—Power calibration runs on every system boot.
 - **Disabled**—Power calibration does not run, and Dynamic Power Capping is not supported.
3. Save your setting.

Enabling or disabling Extended Memory Test

Use the **Extended Memory Test** option to configure whether the system validates memory during the memory initialization process. When enabled, and uncorrectable memory errors are detected, the memory is mapped out, and the failed DIMMs are logged to the IML.

NOTE: Enabling this option might significantly increase boot time.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Boot Time Optimizations > Extended Memory Test**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Enabling or disabling Memory Fast Training

Use the **Memory Fast Training** option to configure memory training on server reboots. When enabled, the platform uses the previously saved memory training parameters determined from the last cold boot of the server, which improves server boot time. When installed on your server, and this setting is enabled, NVDIMM-N Memory contents are left undisturbed during warm



resets. If Memory Fast Training is disabled, each warm reset is upgraded to a cold reset and results in an NVDIMM-N backup and restore. Hewlett Packard Enterprise recommends that you leave Memory Fast Training enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Boot Time Optimizations > Memory Fast Training**.
2. Select a setting.
 - **Enabled**—Enables the server to use previously saved memory training parameters.
 - **Disabled**—The platform performs a full memory training on every server reboot.
3. Save your setting.

Setting the UEFI POST Discovery Mode

Use the **UEFI POST Discovery Mode** option to control how the system loads UEFI device drivers.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Boot Time Optimizations > UEFI POST Discovery Mode**.
2. Select one of the following:
 - **Auto**—The system only loads the UEFI device drivers that are required for booting the devices in the UEFI Boot Order list.
 - **Force Full Discovery**—The system loads the UEFI drivers for all devices, making all boot targets available.

NOTE: This setting might significantly increase boot time.
 - **Force Fast Discovery**—The system starts the fewest number of devices as possible to increase boot time.

NOTE: Some devices that do not support Fast Discovery might not work properly.
3. Save your setting.

Enabling or disabling Memory Clear on Warm Reset

Use the **Memory Clear on Warm Reset** option to configure when memory is cleared on warm resets. Disabling this option can save boot time by skipping the clearing of memory on warm resets.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Boot Time Optimizations > Memory Clear on Warm Reset**.
2. Select a setting.



- **Enabled**—Memory is cleared on all reboots.
- **Disabled**—Memory is only cleared on a warm reset when requested by the operating system.

3. Save your setting.

Configuring Serial Port Options

Assigning an Embedded Serial Port

Use the **Embedded Serial Port** option to assign a logical COM port address and associated default resources to a selected physical serial port.

Prerequisite

For proper screen resolution, set the console resolution in the terminal software to **100x31**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Serial Port Options > Embedded Serial Port**.
2. Select a setting.
 - **COM 1: IRQ4: I/O: 3F8h-3FFh**
 - **COM 2: IRQ3: I/O: 2F8h-2FFh**
 - **Disabled**
3. Save your setting.

Assigning a Virtual Serial Port

Use the **Virtual Serial Port** option to assign a logical COM port address and the associated default resources used by the Virtual Serial Port (VSP). VSP enables the iLO Management Controller to appear as a physical serial port to support the BIOS Serial Console and the operating system serial console.

Prerequisite

For proper screen resolution, set the console resolution in the terminal software to **100x31**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Serial Port Options > Virtual Serial Port**.
2. Select a setting.
 - **COM 1**
 - **COM 2**
 - **Disabled**
3. Save your setting.



Mirroring serial console to a USB port

Enabling this option allows you to mirror a serial console to a USB port. Mirroring requires the HPE Console Cable Kit.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Serial Port Options > USB Console Redirection**.
2. Select an option:
 - **Enable**
 - **Disable**
3. Save the setting.

Configuring USB Options

Setting USB Control

Use the **USB Options** option to configure how USB ports and embedded devices operate at startup.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > USB Options > USB Control**.
2. Select a setting.
 - **All USB Ports Enabled**—Enables all USB ports and embedded devices.
 - **All USB Ports Disabled**—Disables all USB ports and embedded devices.
 - **External USB Ports Disabled**—Disables external USB ports.
 - **Internal USB Ports Disabled**—Disables internal USB ports.
3. Save your setting.

Enabling or disabling USB Boot Support

Use the **USB Boot Support** option to control whether the system can boot from connected USB devices, such as virtual media devices, and the embedded SD card slot, if supported.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > USB Options > USB Boot Support**.
2. Select a setting.



- **Enabled**—The system can boot from USB devices connected to the server.
- **Disabled**—The system cannot boot from USB devices connected to the server.

3. Save your setting.

Selecting the Removable Flash Media Boot Sequence

Use the **Removable Flash Media Boot Sequence** option to select which USB or SD card devices to search first when enumerating boot devices.

Prerequisites

Boot mode is set to **Legacy BIOS Mode**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > USB Options > Removable Flash Media Boot Sequence**.
2. Select a setting.
 - **Internal SD Card First**—Boots using the internal SD card slot.
 - **Internal Drive Keys First**—Boots using the internal USB drive keys.
 - **External Drive Keys First**—Boots using external USB drive keys.
3. Save your setting.

Enabling or disabling the Internal SD Card Slot

Use the **Internal SD Card Slot** option to control whether the server can access the SD (Secure Digital) nonvolatile flash memory card that is embedded on the system board.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > USB Options > Internal SD Card Slot**.
2. Select a setting.
 - **Enabled**—The server can access the internal SD card slot.
 - **Disabled**—The server cannot access the internal SD card slot.
3. Save your setting.

Configuring the IOS Serial Console and EMS

Enabling or disabling the BIOS Serial Console Port

Use the **BIOS Serial Console Port** option to redirect video and keystrokes through the serial port to operating system boot.

NOTE: This option can interfere with nonterminal devices attached to the serial port. In such cases, set this option to disabled.



NOTE: This option is only supported in English language mode when running in the UEFI preboot System Utilities.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > BIOS Serial Console and EMS Options > BIOS Serial Console Port**.
2. Select a setting.
 - **Auto**
 - **Physical Serial Port**
 - **Virtual Serial Port**
3. Save your setting.

Selecting the BIOS Serial Console Emulation Mode

Use the **BIOS Serial Console Emulation Mode** option to select the emulation mode type. To match the emulation you will use in your serial terminal program, such as HyperTerminal or PuTTY, select this option. The BIOS emulation mode must match the mode selected in your terminal program.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > BIOS Serial Console & EMS > BIOS Serial Console Emulation Mode**.
2. Select a setting.
 - **VT100**
 - **ANSI**
 - **VT100+**
 - **VT-UTF8**
3. Save your setting.

Setting the BIOS Serial Console Baud Rate

Use the **BIOS Serial Console Baud Rate** option to This is the transfer rate at which data is transmitted through the serial port.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > BIOS Serial Console & EMS > BIOS Serial Console Baud Rate**.
2. Select a setting.
 - **9600**
 - **19200**



- **57600**
- **115200**
- **38400**

3. Save your setting.

Configuring EMS Console port settings

Use the **EMS Console** port settings option to configure the ACPI serial port setting, which includes the ability to redirect the Windows Server Emergency Management console (EMS) through either the physical or virtual serial port.

EMS configuration options have changed. See your product documentation for details.

NOTE: Not all BAUD rates are supported by an Operating System for Serial Port Redirection (EMS). Consult operating system documentation for supported modes.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > BIOS Serial Console & EMS > EMS Console**.
2. Select either a physical or virtual port setting.
3. Save your setting.

Configuring Server Availability

Enabling or disabling ASR

Prerequisite

The System Management driver is loaded.

Use the **ASR Status** option to enable or disable Automatic Server Recovery, which automatically reboots the server if the server locks up.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > ASR Status**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

NOTE: The ASR status option is only supported in ProLiant Gen10 servers.

Setting the ASR timeout

Prerequisite



ASR Status is enabled. Use the **ASR Timeout** option to set the time to wait before rebooting the server if an operating system crash or server lockup occurs. When the server has not responded in the selected amount of time, the server automatically reboots.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > ASR Timeout**.
2. Select a wait time.
 - **5 Minutes**
 - **10 Minutes**
 - **15 Minutes**
 - **20 Minutes**
 - **30 Minutes**
3. Save your setting.

NOTE: The ASR timeout option is only supported in ProLiant Gen10 servers.

Enabling or disabling Wake-On LAN

Use the **Wake-On LAN** option to enable or disable the ability of the server to power on remotely using a WOL-capable NIC.

Prerequisite

A WOL-capable NIC, NIC driver, and operating system.

NOTE: If you enable this option, remove all power cords before adding or removing any adapters. Some adapters can cause the system to power on when added or removed.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > Wake-On LAN**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Setting the POST F1 prompt delay

Use the **POST F1 Prompt** option to configure how the system displays the **F1** key in the server POST screen. When enabled and an error occurs, you can press the **F1** key to continue with the server power-up sequence.

A series of system tests execute during POST and:



- If failures occur that allow the system to continue operating, the system continues to boot and then posts a message.
- If critical components fail or are missing, the server attempts to boot. If it can boot, it posts a message and, when enabled, an **F1** prompt.
- If the system cannot run with the missing or failed components, it halts until those components are replaced.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > POST F1 Prompt**.
2. Select a setting.
 - **Delayed 20 seconds**—If an error occurs, the system pauses for 20 seconds at the **F1** prompt, and then continues to boot the OS.
 - **Delayed 2 seconds**—If an error occurs, the system pauses for two seconds at the **F1** prompt, and then continues to boot the OS.
 - **Disabled**—If an error occurs, the system bypasses the **F1** prompt and continues to boot.
3. Save your setting.

Enabling or disabling momentary power button functionality

Use the **Power Button Mode** option to enable or disable momentary power button functionality. This mode does not affect the four-second power button override, or the remote power control functionality.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > Power Button Mode**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Setting the automatic power-on state

Use the **Automatic Power-On** option to configure how the server automatically powers on when AC power is applied. By default, the system returns to its previous power state when AC power is restored after an AC power loss.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > Automatic Power-On**.
2. Select a setting.



- **Always Power On**—The system automatically returns to a power on state, even if it was in the “off” state when power was lost.
 - **Always Power Off**—The system automatically returns to a power off state.
 - **Restore Last Power State**—The system automatically returns to its previous power off state.
3. Save your setting.

Setting the power-on delay

Use the **Power-On Delay** option to set whether to delay the server from turning on for a specified time. This option enables staggering when the server powers up after a power loss, which can prevent power usage spikes.

NOTE: These events override the **Power-On Delay** setting and immediately power on the server:

- Pressing the power button using the iLO Virtual Power Button
 - **Wake-ON LAN** events
 - RTC (Real-Time Clock) wake-up events
-

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > Power-On Delay**.
2. Select a setting.
 - **No Delay**
 - **Random Delay**
 - **15 Second Delay**
 - **30 Second Delay**
 - **45 Second Delay**
 - **60 Second Delay**
3. Save your setting.

Setting the POST ASR

Use the **POST ASR** option to configure POST Automatic Server Recovery (ASR).

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > POST ASR**.
2. Select a setting.



- **Post ASR on**
- **Post ASR off**

3. Save your setting.

NOTE:

The POST ASR option is only supported in ProLiant Gen10 Plus servers.

Setting the POST ASR Timer

Use the **POST ASR Timer** to set the wait timer before rebooting the server of a server lock up.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > POST ASR Timer**.
2. Select a setting.
 - **10 minutes**
 - **15 minutes**
 - **20 minutes**
 - **30 minutes**
3. Save your setting.

Viewing and entering server asset information

Entering server information

Use the **Server Information** option to enter reference information for the server administrator. For text settings, enter a maximum of 14 characters. By default, all values are blank.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Asset Information > Server Information**.
2. Select and complete entries.
 - **Server Name**—Enter a server name.
 - **Server Asset Tag**—Enter a server asset number.
 - **Asset Tag Protection**—Select a setting:
 - **Unlocked**
 - **Locked**—Locks asset tag information. The asset tag is not erased if you restore default system settings.



- **Server Primary OS**—Enter a description of the primary OS of the server.
 - **Server Other Information**—Enter additional text describing the server.
3. Save your settings.

Entering administrator information

Use the **Administrator Information** option to enter contact information for the server administrator. The number of characters allowed for each entry varies by server model. By default, all values are blank.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Asset Information > Administrator Information**.
2. Select and complete entries.
 - **Administrator Name**—Enter the server administrator's name.
 - **Administrator Phone Number**—Enter the server administrator's phone number.
 - **Administrator E-mail Address**—Enter the server administrator's e-mail address.
 - **Administrator Other Information**—Enter additional text relating to the server administrator.
3. Save your settings.

Entering service contact information

Use the **Service Contact Information** option to enter service contact information for the server administrator. The number of characters allowed for each entry varies by server model. By default, all values are blank.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Asset Information > Service Contact Information**.
2. Select and complete entries.
 - **Service Contact Name**—Enter the service contact's name.
 - **Service Phone Number**—Enter the service contact's phone number.
 - **Service Contact E-mail Address**—Enter the service contact's e-mail address.
 - **Service Contact Other Information**—Enter additional text relating to the service contact.
3. Save your settings.

Entering a custom POST message

Use the **Custom POST Message** option to display a custom message on the server POST screen.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Asset Information > Custom POST Message**.
2. Enter a message of up to 62 characters.
3. Save your setting.

Changing Processor Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options**.

Enabling or disabling Intel Hyperthreading

Use the **Intel (R) Hyperthreading Options** option to disable or enable the logical processor cores on processors supporting Intel Hyperthreading technology. Intel Hyperthreading improves overall performance for applications that benefit from a higher processor core count.

NOTE: Hyperthreading is not supported on all processors. For more information, see the documentation for your processor model.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > Intel (R) Hyperthreading Options**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Configuring Intel SGX control options

Use this screen to configure Intel SGX control options.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > Intel SGX Control**.
2. Configure the following options:



- **Intel(R) Software Guard Extensions (SGX):** Enable or disable Software Guard Extensions (SGX).
- **Intel(R) Speed Select:** Speed Select processors have configuration options that support higher base frequencies with fewer enabled core counts. Changing this option results in increasing the CPU base frequency and reducing the number of available cores. Read the documentation for the processor model for more information on configuring these options.
 - **Base**
 - **Config 1**
 - **Config 2**
- **Software Controlled**
- **PRMRR Size:** Select the size of the PRMRR.
- **Select Owner EPOCH input type:** There are three Owner EPOCH modes: no change in Owner EPOCHs, change to new random Owner EPOCHs, and manually enter new Owner EPOCHs. Modifying the Owner EPOCHs will cause all persistent data protected by Intel(R) Software Guard Extensions to be lost.



CAUTION: All persistent data protected by Intel(R) Software Guard Extensions Technology will be lost if the Owner EPOCH value is changed.

- **Software Guard Extensions Epoch:** Software Guard Extensions 128-bit Epoch hexadecimal value.
- **SGX Launch Control Policy:** Software Guard Extensions (SGX) Launch Control Policy. Options are:
 - **Intel Locked:** Select the Intel Launch Enclave.
 - **Unlocked:** Enable OS/VMM configuration of Launch Enclave.
 - **Locked:** Allow owner to configure Launch Enclave.
- **SGX LE Public Key Hash 0:** Bytes 0 - 7 of Software Guard Extensions (SGX) Launch Enclave Public Key Hash
- **SGX LE Public Key Hash 1:** Byte 8 - 15 of Software Guard Extensions (SGX) Launch Enclave Public Key Hash
- **SGX LE Public Key Hash 2:** Byte 16 - 23 of Software Guard Extensions (SGX) Launch Enclave Public Key Hash
- **SGX LE Public Key Hash 3:** Byte 24 - 31 of Software Guard Extensions (SGX) Launch Enclave Public Key Hash

3. Save your options.

Setting the number of enabled processor cores

This option enables limiting the number of enabled processor cores per physical processor. You can set the number of enabled cores to a value supported by the physical processor.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > Enabled Cores per Processor**.
2. Enter the number of cores to enable.
If you enter **0**, or a value that is not supported by the processor, all cores are enabled.
3. Save your setting.



Enabling or disabling Processor x2APIC Support

When enabled, **Processor x2APIC Support** helps operating systems run more efficiently on high core count configurations and optimizes interrupt distribution in virtualized environments. Enabled mode does not enable x2APIC hardware, but provides the support necessary to the operating system. Unless you are using an older hypervisor or operating system that is not compatible with x2APIC support, leave this option enabled. Some hypervisors and operating systems cannot use X2APIC unless **Processor x2APIC Support** is set to **Force Enabled** prior to booting.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > Processor x2APIC Support**.
2. Select a setting.
 - **Enabled**—Generates the ACPI x2APIC control structures, and adds the option of enabling x2APIC support to the operating system when it loads.
 - **Force Enabled**—For certain processors, enables x2APIC support to the operating system when it loads.
 - **Disabled**—Disables x2APIC support.
3. Save your setting.

Enabling AMD Simultaneous Multithreading (SMT)

Use the **AMD SMT Option** to enable or disable the AMD SMT functionality.

NOTE: This option is available on servers with AMD processors.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > AMD SMT Option**.
2. Select one of the following:
 - **Enabled**—Each physical processor core operates as two logical processor cores. Enabling this option can improve overall performance for applications that benefit from a higher processor core count.
 - **Disabled**—Each physical processor core operates as one logical processor core.
3. Save your setting.

Configuring Performance Determinism Options

NOTE: This option is available on servers with AMD processors.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > Performance Determinism**.
2. Select one of the following:

Use this option to configure AMD determinism control.

- **Auto:** Uses the processor fused values.
- **Manual**

3. Select one of the following:

Use this to configure the processor to maximize power or performance, based on your workload requirements.

- **Power Deterministic**
- **Performance Deterministic**

4. Save your setting.

Selecting AMD Page Table Entry Speculative Lock Scheduling options

Use this feature to configure the AMD Page Table Entry Speculative Lock Scheduling options.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > AMD Page Table Entry Speculative Lock Scheduling**.
2. Select **Enabled** or **Disabled**.

Disabling this forces Page Table Entry locks to only be scheduled nonspeculatively. Disabling this feature will impact performance.

Changing Memory Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options**.

Configuring memory remapping

Use the **Memory Remap** option to remap system memory that might be disabled due to a failure event, such as an uncorrectable memory error.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Memory Remap**.
2. Select a setting.
 - **Remap All Memory**—Makes all memory in the system available again on the next boot.
 - **No Action**—Leaves any affected memory unavailable to the system.
3. Save your setting.



Configuring Advanced Memory Protection

Use the **Advanced Memory Protection** option to configure additional memory protection with Error Checking and Correcting (ECC). **Advanced ECC Support** provides the largest memory capacity to the operating system, and is the required setting when NVDIMMs are installed on your server. Other options are not supported when NVDIMMs are installed. Selecting one of the unsupported options when NVDIMMs are installed generates messages that are displayed in the IML, and the NVDIMMs are disabled until the configuration is set to Advanced ECC Support. When **Advanced Memory Protection** is set to **Advanced ECC Support**, the Advanced Memory Protection option is hidden (greyed out) in the menu.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Advanced Memory Protection**.
2. Select a setting.
 - **HPE Fast Fault Tolerant (ADDDC)**—Enables the system to correct memory errors and continue to operate in cases of multiple DRAM device failures on a DIMM. Provides protection against uncorrectable memory errors beyond what is available with Advanced ECC.
 - **Advanced ECC Support**—Provides the largest memory capacity to the operating system while protecting the system against all single-bit failures and some multi-bit failures.
 - **Online Spare with Advanced ECC Support**—Enables the system to automatically map out a group of memory that is receiving excessive correctable memory errors. This memory is replaced by a spare group of memory.
 - **Mirrored Memory with Advanced ECC Support**—Provides the maximum protection against uncorrected memory errors that might otherwise result in a system failure. You must install additional memory to provide mirrored memory to the operating system.
3. Save your settings.

Configuring the Memory Refresh Rate

The **Memory Refresh Rate** option controls the refresh rate of the memory controller and might affect the performance and resiliency of the server memory. It is recommended that you leave this setting in the default state unless indicated in other documentation for this server.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Memory Refresh Rate**.
2. Select a setting.
 - **1x Refresh**
 - **2x Refresh**
3. Save your setting.

Configuring DRAM Burst Refresh Mode

The **DRAM Burst Refresh Mode** option provides mitigation for the TRRpass and the targeted row refresh exploits.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > DRAM Burst Refresh Mode**.
2. Select a setting.
 - **Enabled**—By default the setting is enabled.
 - **Disabled**—The setting is disabled for mitigation to the TRRespass.
3. Save your setting.

Enabling or disabling channel interleaving

Use the **Channel Interleaving** option to enable or disable a higher level of memory interleaving. Typically, higher levels of memory interleaving result in maximum performance. However, reducing the level of interleaving can result in power savings.

When you are enabling NVDIMM-N Memory Interleaving, you must also enable **Channel interleaving**.

Prerequisite

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Channel Interleaving**.
2. Select a setting.
 - **Enabled**—Enables the highest level of interleaving for which the system memory is configured.
 - **Disabled**—Does not enable memory interleaving.
3. Save your setting.

Configuring IMC Interleaving

Use this option to control the Memory Controller Interleaving option.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Memory Controller Interleaving**.
2. Select a setting.
 - **Auto**—(Recommended) The system automatically enables or disables memory controller interleaving based on the system configuration.
 - **Disabled**—You can force disable memory controller interleaving. In some instances, selecting **Disable** showed a performance benefit in all system memory.
3. Save your setting.



Configuring AMD Interleaving

Use this option to control the Memory Interleaving Mode option. You can modify the level of interleaving for which the memory system is configured. Typically, automatic interleaving results in maximum performance.

Prerequisites

You can only configure this option if the Workload Profile is set to Custom.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > AMD Memory Interleaving**.
2. Select one of the following:
 - **Channel Interleaving**
 - **Die Interleaving**
 - **Socket Interleaving**
3. Select a setting:
 - **Enable**
 - **Disable**
4. Save your setting.

NOTE: The AMD Memory Interleaving option is only supported in ProLiant Gen10 servers.

Setting Memory Interleave Size

Use the **Memory Interleave Size** option to change the size of the memory interleave

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Memory Interleave Size**.
2. Select a setting.
 - **256 Bytes**
 - **512 Bytes**
 - **1024 Bytes**
 - **2048 Bytes**
3. Save your setting.

Enabling or disabling Memory PStates

Use the **Memory PStates** option to enable or disable the memory PStates.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Memory PStates**.
2. Select a setting.
 - **Enable**
 - **Disable**
3. Save your setting.

Configuring AMD Remap 1TB

Enable the AMD remap 1TB option to reclaim 12GB of RAM that is marked reserved when IOMMU is enabled on a system with at least 1TB of RAM. Enabling this option will cause a large gap in the accessible memory map that may cause problems with some operating systems.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > AMD Remap 1TB**.
2. Select one of the following:
 - **Enable**
 - **Disable**
3. Save your setting.

Configuring AMD Periodic Directory Rinse

Enable Periodic Directory Rinse which may help manage directory capacity more efficiently. In workloads with significant system-wide sharing, like databases and HPC applications, using a shorter period for a directory rinse operation may improve performance.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > AMD Periodic Directory Rinse**.
2. Select one of the following:
 - **Enable**
 - **Disable**
3. Save your setting.

Setting the maximum memory bus frequency

Use the **Maximum Memory Bus Frequency** option to configure the system to run memory at a lower maximum speed than that supported by the installed processor and DIMM configuration.



Prerequisite

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Maximum Memory Bus Frequency**.
2. Select a setting.
 - **Auto**—Memory runs at the maximum speed supported by the system configuration.
 - **2933 MHz**
 - **2667 MHz**
 - **2400 MHz**
 - **2133 MHz**
 - **1867 MHz**

NOTE: The AMD servers does not support 1867 and 2133 MHz system configurations.

3. Save your setting.

Enabling or disabling Memory Patrol Scrubbing

When enabled, **Memory Patrol Scrubbing** corrects memory soft errors so that, over the length of the system runtime, the risk of producing multibit and uncorrectable errors is reduced.

Prerequisites

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Memory Patrol Scrubbing**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Enabling or disabling node interleaving

Use the **Node Interleaving** option to enable or disable NUMA node interleaving. Typically, you can obtain optimum performance on NUMA nodes by leaving this option disabled. When this option is enabled, memory addresses are interleaved across the memory installed for each processor and some workloads might experience improved performance.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Node Interleaving**.
2. Select a setting.
 - **Enabled**—Memory addresses are interleaved across the memory installed for each processor. All nodes must be of equal memory size. System performance might be impacted.
 - **Disabled**—Disables node interleaving, providing optimum performance in most environments.
3. Save your setting.

Configuring AMD Secure Memory Encryption

Enabling this feature allows you to use the AMD Secure Memory Encryption functionality.

NOTE: This option is available on servers with AMD processors.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > AMD Secure Memory Encryption**.
2. Select an option.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Enabling or disabling Transparent Secure Memory Encryption

Use the **Transparent Secure Memory Encryption** option to enable or disable Transparent Secure Memory Encryption (TSME).

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Transparent Secure Memory Encryption**.
2. Select a setting.
 - **Enable**
 - **Disable**
3. Save your setting.

Configuring the memory mirroring mode

Use the **Memory Mirroring** option to configure how much of the total available system memory is reserved for mirroring.



Prerequisites

To activate this feature, enable the **Mirrored Memory with Advanced ECC Support** option on the **Configuring Advanced Memory Protection** menu.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Memory Mirroring Mode**.
2. Select a setting.
 - **Full Mirror**—Reserves 50% of the total available memory for mirroring.
 - **Partial Mirror (20% above 4GB)**—Reserves 20% of the total available memory above 4 GB for mirroring.
 - **Partial Mirror (10% above 4GB)**—Reserves 10% of the total available memory above 4 GB for mirroring.
 - **Partial Mirror (Memory below 4GB)**—Depending on the memory configuration, reserves 2 GB or 3 GB of lower memory below 4 GB for mirroring.
 - **Partial Mirror (OS Configured)**—Enables the operating system to configure partial memory mirroring.
3. Save your setting.

Configuring Opportunistic Self Refresh

Use **Opportunistic Self Refresh** to allow the memory controller to enter self-refresh mode during periods of low memory utilization.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Opportunistic Self Refresh**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Configuring Persistent Memory

System Utilities only displays this menu if you have installed Persistent Memory.

NOTE: This menu is not available from the F9 boot screen.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Persistent Memory Options**.
2. Configure options.

- **Persistent Memory Backup Power Policy**—Controls whether the system waits during system boot for batteries to charge if sufficient battery backup power for the installed persistent memory is not available.
 - **Wait for Backup Power on Boot**—The system waits during boot for batteries to charge.
 - **Continue Boot without Backup Power**—The system boots even if sufficient battery backup power is not available. If sufficient battery backup power is not available, the configured memory is not used by the operating system as persistent storage or as system memory.
- **Persistent Memory Integrity Check**
 - **Enabled**—Persistent memory is checked during system boot to determine data integrity. Depending on the **Persistent Memory Address Range Scrub** setting, discovered errors during the data integrity check are either presented to the operating system for recovery, or cause the persistent memory to be mapped out and unavailable to the operating system.
 - **Disabled**—Disables data integrity checking. Any persistent memory unable to read data, or that has bad data might cause uncorrectable errors that result a system crash.
- **Persistent Memory Address Range Scrub**
 - **Enabled**—Enables a supported OS to attempt recovery from an uncorrectable memory error detected in the NVDIMM memory.
 - **Disabled**—Disables the NVDIMM memory on the next boot after detecting an uncorrectable memory error in the NVDIMM. If the NVDIMM memory **Memory Interleaving** option is enabled, a disabled NVDIMM includes all the modules or regions within the set.

3. Save your setting.

Creating namespaces using UEFI System Utilities

! **IMPORTANT:** Be sure to observe all pop-up messages displayed in UEFI System Utilities that pertain to persistent memory. Failure to follow the instructions in these messages might cause persistent memory data loss.

NOTE: If you are using HPE Persistent Memory with VMware vSphere, creating namespaces is not required. VMware vSphere automatically creates namespaces upon rebooting.

Namespaces define persistent memory regions on the HPE Persistent Memory modules.

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Persistent Memory Options**.
2. Select **PMM Options > Advanced Options**, and make the following selections:
 - **Apply Default Namespaces**—Enabled or Disabled.
This selection creates namespace metadata on the next boot for interleave sets that do not already have one. For Linux systems, Hewlett Packard Enterprise recommends using OS tools such as ndctl for this purpose.
 - **Delete Namespaces**—Immediately deletes any active namespaces.
3. To save your changes, press the **F12** key.
4. To commit the goal configuration and persistent memory options, reboot the server.



Changing HPE Persistent Memory module passwords

- ❗ **IMPORTANT:** Be sure to observe all pop-up messages displayed in UEFI System Utilities that pertain to persistent memory. Failure to follow the instructions in these messages might cause persistent memory data loss.
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Procedure

1. During POST, press the **F9** key to enter System Utilities.
2. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Device Encryption Options > Device Encryption Settings > Encrypted Devices**.
3. Choose the HPE Persistent Memory module from **Select Device**.
4. Select **Modify Passphrase** from **Select Operation**.
5. Choose the **Passphrase Type**:

This selection is available only when Local Key Management is enabled. When Remote Key Management is enabled, HPE Persistent Memory module passwords are automatically generated, stored, and managed on the key management server.

 - **Auto**—The system automatically generates a 32 byte random password. Hewlett Packard Enterprise recommends using system-generated passwords as a best practice.
 - **Manual**—Enter a 32 byte password manually.
6. Select **Start Operation**.

The HPE Persistent Memory module password is changed.
7. To change the password for each individual HPE Persistent Memory module, repeat the process.
8. Hewlett Packard Enterprise recommends exporting the password database to a USB device for backup purposes:
 - a. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Device Encryption Options > Device Encryption Migration Options > Device Encryption Export Options**.
 - b. Provide a password in the **Transient Passphrase** field.

This password protects the exported file and must be entered when recovering the encrypted HPE Persistent Memory modules after relocation.
 - c. Select **Select File**, and browse to a location on the USB key.
 - d. Select **Export Encryption Settings** to create and export the file.

Viewing the status of HPE Persistent Memory modules

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Device Encryption Options > Device Encryption Status**.

The Device Encryption Status screen displays the name, encryption status, and the password of each HPE Persistent Memory module in the server.
2. Review the status for each HPE Persistent Memory module:

- Not encrypted—The HPE Persistent Memory module is not encrypted.
- Local/TPM—The HPE Persistent Memory module is encrypted with local key management and the password is displayed.
Make note of this password and store it securely. Hewlett Packard Enterprise recommends downloading the password file to a USB drive for backup purposes.
- Unknown key:
 - An encrypted HPE Persistent Memory module from another server was installed, and not yet migrated.
 - The Restore Manufacturing Default Options was selected in UEFI System Utilities.
 - The HPE TPM has failed.

Changing Performance Options using UEFI System Utilities

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- ⓘ **IMPORTANT:** Be sure to observe all pop-up messages displayed in UEFI System Utilities that pertain to persistent memory. Failure to follow the instructions in these messages might cause persistent memory data loss.
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- ⓘ **IMPORTANT:** Always follow recommendations from your software application provider for high-availability best practices to ensure maximum uptime and data protection.
-

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Persistent Memory Options > PMM Options > Performance Options.**
2. Based on your server workload and performance requirements, update the following options:
 - **Performance Setting**—Controls the baseline performance setting, depending on the workload behavior:
 - **Bandwidth Optimized**—Default
 - **Latency Optimized**
 - **Quality of Service**—Controls the Quality of Service profiles:
 - **Disabled**—Default
 - **Profile 1**—Recommended for four or more HPE Persistent Memory modules per socket.
 - **Profile 2**—Recommended for two HPE Persistent Memory modules per socket.
 - **Profile 3**—Recommended for one HPE Persistent Memory module per socket.
 - **FastGo Configuration**—Controls optimization of traffic within the processor:
 - **Auto**—Default
 - **Enabled**
 - **Disabled**
 - **Snoopy Mode for App Direct**—Enable this option to avoid directory updates to HPE Persistent Memory modules for non-NUMA (non-uniform memory access) optimized workloads:



- **Disabled**—Default
- **Enabled**
- **Snoopy Mode for Memory mode**—Enable this option to avoid directory updates to HPE Persistent Memory modules for non-NUMA optimized workloads:
 - **Disabled**—Default
 - **Enabled**

3. To save your changes, press the **F12** key.

Sanitization with UEFI System Utilities

Review the sanitization policies and guidelines in this guide before sanitizing a HPE Persistent Memory module.

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Persistent Memory Options > PMM Options > Sanitize Options**, and select the following:

- **Sanitize/Erase Operation on Reboot:**
 - No Action
 - Cryptographic Erase
 - Overwrite Media
 - Cryptographic Erase and Overwrite Media
- **Policy after Sanitize/Erase Operation on Reboot:**
 - Sanitize/Erase and Reboot System
 - Sanitize/Erase and Power System Off
 - Sanitize/Erase and Reboot to System Utilities
 - Sanitize/Erase to Factory Defaults and Power System Off

2. Enable the **Perform Sanitize/Erase Operation on** selection.

3. Select the HPE Persistent Memory modules to sanitize:

- All PMMs in the System—Sanitizes all HPE Persistent Memory modules in the server.
- All PMMs on Processor X—Sanitizes all HPE Persistent Memory modules on the specified processor.
- Processor X DIMM Y—Sanitizes only the specified HPE Persistent Memory module on the processor.

4. To save your changes and exit, press the **F12** key.

5. If required, reboot the server.

Changing the key management mode

The key management mode can be changed between local and remote key management. Encrypted HPE Persistent Memory modules remain encrypted, but the passwords and the storage of those passwords change, based on the key management mode selected.



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- ❗ **IMPORTANT:** Be sure to observe all pop-up messages displayed in UEFI System Utilities that pertain to persistent memory. Failure to follow the instructions in these messages might cause persistent memory data loss.
-

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Device Encryption Options**.
2. Change the **Key Management** setting to one of the following:
 - **Local**—Enables local key management. The password used for encryption is stored locally on the server.
HPE TPM 2.0 must be installed to view and select this setting.
 - **Remote**—Enables remote key management. The password used for encryption is stored on a remote key server.
HPE iLO must be enrolled in and connected to a key manager to view and select this setting.
3. Press the **F12** key to save and exit.
4. Reboot the server.

Disabling key management

Disabling key management disables encryption for all encrypted HPE Persistent Memory modules in the server. To disable encryption only for a single or specific HPE Persistent Memory modules, see [Disabling encryption for a HPE Persistent Memory module](#).

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- ❗ **IMPORTANT:** Be sure to observe all pop-up messages displayed in UEFI System Utilities that pertain to persistent memory. Failure to follow the instructions in these messages might cause persistent memory data loss.
-

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Device Encryption Options**.
2. Select the **Key Management** setting, and change it to **Disabled**.
3. Press the **F12** key to save and exit.
4. Reboot the server.

Disabling encryption for a HPE Persistent Memory module

Use this procedure to disable encryption for a single or specific HPE Persistent Memory modules.

To disable encryption for all HPE Persistent Memory modules in the server at once, as might be required for migration or service procedures, see [Disabling key management](#).

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- ❗ **IMPORTANT:** Be sure to observe all pop-up messages displayed in UEFI System Utilities that pertain to persistent memory. Failure to follow the instructions in these messages might cause persistent memory data loss.
-

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Device Encryption Options > Device Encryption Settings > Encrypted Devices**.
2. Make the following selections:



- a. **Select Device**—Select the HPE Persistent Memory module.
 - b. **Select Operation**—**Disable Encryption**.
3. Select **Start Operation**.
- If local key management is enabled, enter the passphrase for the HPE Persistent Memory module.
- The selected HPE Persistent Memory module is now unencrypted.
4. Repeat this process to disable encryption for other HPE Persistent Memory modules.

Configuring NVDIMM-N Options

Procedure

1. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options > Persistent Memory Options > NVDIMM-N Options**.
2. Select **Enabled** or **Disabled** for the following options:

- **NVDIMM-N Support**
- **NVDIMM-N Interleaving**
- **NVDIMM-N Sanitize/Erase on Next Reboot Policy**

! **IMPORTANT:** Sanitizing/Erasing an NVDIMM-N results in the loss of **all** user data saved in the NVDIMM-N. Hewlett Packard Enterprise strongly recommends that you perform a manual backup of all user data in the NVDIMM-Ns before sanitizing/erasing the NVDIMM-Ns.

- **Sanitize/Erase all NVDIMM-N in the System**
 - **Sanitize/Erase all NVDIMM-N on Processor**—These menu items differ based on your server configuration.
 - **Sanitize/Erase Processor 1 DIMM 2**—These menu items differ based on your server configuration.
3. Save your changes.

NVDIMM-N Support

This option enables NVDIMM-N support (including backing up the contents of the memory to flash on power down or reset) to be enabled or disabled. If **Disabled** is selected for this option, the NVDIMM-Ns in the system are not presented to the operating system as either persistent storage or system memory.

NVDIMM-N Sanitize/Erase on Next Reboot Policy

This setting is part of the process to sanitize or erase all user data and error status data saved in the selected NVDIMM-Ns. After enabling the NVDIMM-N Sanitize/Erase on Next Reboot Policy, the screen displays various options for sanitizing NVDIMMs. The following selections are available depending on the NVDIMM-Ns installed on the server:

- **Sanitize/Erase all NVDIMM-N in the System**—Sanitizes all NVDIMM-Ns installed in the server on reboot.
- **Sanitize/Erase all NVDIMM-N on Processor X**—Sanitizes all NVDIMM-Ns installed in the DIMM slots for processor X on reboot.
- **Sanitize/Erase Processor X DIMM Y**—Sanitizes the NVDIMM-N installed in DIMM slot Y for processor X on reboot. A selection is available for each Processor X DIMM slot that contains an NVDIMM-N.

Selected NVDIMM-Ns are sanitized on the next reboot of the system. The largest group of NVDIMM-Ns selected is sanitized. For example, if **Sanitize/Erase all NVDIMM-N on Processor 1** is enabled and **Sanitize/Erase Processor 1 DIMM 8** is disabled, all NVDIMM-Ns on processor 1 are sanitized including processor 1 DIMM 8.

The following policies control the action of the system after NVDIMM-Ns are sanitized/erased:

- Power off the system after sanitizing/erasing NVDIMMs
- Boot to the operating system after sanitizing NVDIMMs
- Boot to the System Utilities after sanitizing NVDIMMs

NVDIMM-N Interleaving

This option enables NVDIMM-Ns installed on a particular processor to be interleaved with other NVDIMM-Ns in the memory map. This option does not impact the interleaving of HPE SmartMemory DIMMs. Interleaving is never enabled across NVDIMM-Ns and HPE SmartMemory DIMMs. NVDIMM-Ns installed on different processors are never interleaved together. If this setting is changed (to **Enabled** or **Disabled**), then all installed NVDIMM-Ns must be sanitized. If all installed NVDIMM-Ns are not sanitized, then an error condition is reported on the next boot and the NVDIMM-Ns are not available for use.

Changing Virtualization Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options**.

Enabling or disabling Virtualization Technology

Use the **Intel(R) Virtualization Technology (Intel VT)** to control whether a Virtual Machine Manager (VMM) supporting Virtualization Technology can use hardware capabilities provided by UEFI Intel processors.

NOTE: You do not need to disable Virtualization Technology if you are using a VMM or an operating system that does not support AMD-V virtualization.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > Intel(R) Virtualization Technology (Intel VT)**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Enabling or disabling Intel VT-d

Use the **Intel (R) VT-d** option to enable or disable Intel Virtualization Technology for Directed I/O (VT-d) on a Virtual Machine Manager (VMM).



NOTE: If you are not using a hypervisor or an operating system that supports this feature, it is not necessary to set the Intel (R) VT-d option to disabled. You can leave it enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > Intel (R) VT-d**.
2. Select a setting.
 - **Enabled**—Enables a hypervisor or operating system supporting this option to use hardware capabilities provided by Intel's Virtualization Technology for directed I/O.
 - **Disabled**—Does not enable a hypervisor or operating system supporting this option to use hardware capabilities provided by Intel's Virtualization Technology for directed I/O.
3. Save your setting.

Enabling or disabling Access Control Service

Use the **Access Control Service** option to redirect video and keystrokes through the serial port to operating system boot.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > Access Control Service**.
2. Select a setting.
 - **Enable**
 - **Disable**
3. Save your setting.

Enabling or disabling SR-IOV

The SR-IOV (Single Root I/O Virtualization) interface is an extension to the PCI express (PCIe) specification. It enables the BIOS to allocate more PCI resources to PCIe devices. Enable this option for a PCIe device or operating system that supports SR-IOV. Leave it enabled when using a hypervisor.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > SR-IOV**.
2. Select a setting.
 - **Enabled**—Enables a hypervisor to create virtual instances of a PCIe device, potentially increasing performance.
 - **Disabled**—Does not enable a hypervisor to create virtual instances of a PCIe device.
3. Save your setting.



Setting the Minimum SEV ASID

Use the **Minimum SEV ASID** option to configure the Minimum Address Space Identifier (ASID) that can be used for AMD Secure Encrypted Virtualization (SEV) enabled guests. ASID below this number are only available to SEV enable guest that also enable Encrypted State (SEV-ES).

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > Minimum SEV ASID**.
2. Enter a number between 1 to 16.
3. Save your setting.

Setting the Maximum SEV ASID

Use the **Maximum SEV ASID** option to select the number of AMD Secure Encrypted Virtualization (SEV) Address Space Identifiers (ASID) that can be used for SEV enabled guests. This option affects the amount of system memory supported by the server.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > Maximum SEV ASID**.
2. Enter a number between 1 to 16.
3. Save your setting.

Enabling AMD virtualization options

If enabled, a hypervisor or operating system supporting this option can use hardware capabilities provided by AMD I/O Virtualization (IOMMU) functionality. You can leave this set to **Enabled** even if you are not using a hypervisor or an operating system that uses this option.

NOTE: This option is available on servers with AMD processors.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > AMD (R) IOMMU**.
2. Select one of the following:
 - **Enabled**
 - **Disabled**
3. Save your setting.

Enabling AMD Virtualization Technology

If enabled, a hypervisor or operating system supporting this option can use hardware capabilities provided by AMD VT. You can leave this set to **Enabled** even if you are not using a hypervisor or an operating system that uses this option.



NOTE: This option is available on servers with AMD processors.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Virtualization Options > AMD Virtualization Technology**.
2. Select one of the following:
 - **Enabled**
 - **Disabled**
3. Save your setting.

Changing Boot Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options**.

Selecting the boot mode

This server provides two **Boot Mode** configurations: UEFI Mode and Legacy BIOS Mode. Certain boot options require that you select a specific boot mode. By default, the boot mode is set to **UEFI Mode**. The system must boot in **UEFI Mode** to use certain options, including:

- Secure Boot, UEFI Optimized Boot, Generic USB Boot, IPv6 PXE Boot, iSCSI Boot, and Boot from URL
- Fibre Channel/FCoE Scan Policy

NOTE: The boot mode you use must match the operating system installation. If not, changing the boot mode can impact the ability of the server to boot to the installed operating system.

Prerequisite

When booting to **UEFI Mode**, leave **UEFI Optimized Boot** enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > Boot Mode**.
2. Select a setting.
 - **UEFI Mode** (default)—Configures the system to boot to a UEFI compatible operating system.
 - **Legacy BIOS Mode**—Configures the system to boot to a traditional operating system in Legacy BIOS compatibility mode.
3. Save your setting.
4. Reboot the server.

Enabling or disabling UEFI Optimized Boot

Use **UEFI Optimized Boot** to control whether the system BIOS boots using native UEFI graphic drivers. **UEFI Optimized Boot** is enabled by default. You disable **UEFI Optimized Boot** only if you are using Windows Server 2008, Windows Server 2008 R2, or Windows 7.

Prerequisites

- When **UEFI Optimized Boot** is enabled, Boot Mode must be set to UEFI Mode. UEFI Mode is the default Boot Mode.
- **UEFI Optimized Boot** must be enabled to:
 - Enable and use Secure Boot.
 - Operate VMware ESXi.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > UEFI Optimized Boot**.
2. Select an option.
 - **Enabled**—When set to UEFI Mode, configures the system BIOS to boot using native UEFI graphic drivers.
 - **Disabled**—Configures the system BIOS to boot using INT10 legacy video expansion ROM. This setting is required if you are using Windows Server 2008, Windows Server 2008 R2, or Windows 7 as your operating system.
3. Save your setting.
4. Reboot the server.

Setting the boot order policy

Use the **Boot Order Policy** option to control the system behavior when attempting to boot devices per the UEFI Boot Order list and no bootable device is found.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > Boot Order Policy**.
2. Select a setting.
 - **Retry Boot Order Indefinitely**—The system continuously attempts the boot order until a bootable device is found.
 - **Attempt Boot Order Once**—The system attempts to execute all items in the boot menu once, and halts the system.
 - **Reset After Failed Boot Attempt**—The system attempts to execute all items once, and reboots the system.
3. Save your setting.

Changing the UEFI Boot Order list

Use the **UEFI Boot Order** option to change the order in which entries in the UEFI Boot Order list boot.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > UEFI Boot Settings > UEFI Boot Settings > UEFI Boot Order**.
2. To navigate within the boot order list, use your pointing device or the arrow keys.
3. Select an entry and change its order in the list:
 - To move an entry higher in the boot list, press the **+** key, or drag and drop the entry.
 - To move an entry lower in the boot list, press the **-** key, or drag and drop the entry.
4. Save your changes.

Controlling the UEFI boot order

Use the UEFI Boot Order Control option to enable or disable individual UEFI boot options. Enabled items are selected (checked). Disabled items remain in their location in the UEFI Boot Order list, but are not attempted during the boot process.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > UEFI Boot Settings > UEFI Boot Settings > UEFI Boot Order Control**.
2. Do the following:
 - To enable an option, select the corresponding check box.
 - To disable an option, select the corresponding check box.
3. Save your changes.

Adding a boot option to the UEFI Boot Order list

Use **Add Boot Option** to select an x64 UEFI application with an .EFI extension, such as an OS boot loader or other UEFI application, to add as a new UEFI boot option.

The new boot option is appended to the UEFI Boot Order list. When you select a file, you are prompted to enter the boot option description (which is then displayed in the boot menu), as well as any optional data to be passed to an .EFI application.

Procedure

1. Attach media with a FAT16 or FAT32 partition on it.
2. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > UEFI Boot Settings > Add Boot Option**.
3. Browse for an .EFI application from the list, and then press **Enter**.
4. If necessary, continue to press **Enter** to drill-down through the menu options.
5. Enter a boot option description and optional data, and then press **Enter**.

The new boot option appears in the **UEFI Boot Order** list.
6. Select **Commit changes and exit**.



Deleting boot options from the UEFI Boot Order list

NOTE: If a deleted option points to a standard boot location, such as a network PXE boot or a removable media device, the system BIOS adds the option on the next reboot.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > UEFI Boot Settings > Delete Boot Option**.
2. Select one or more options from the list.
3. Select **Commit Changes and Exit**.

Changing the Legacy BIOS Boot Order list

Prerequisite

Boot Mode is set to **Legacy BIOS Mode**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > Legacy BIOS Boot Order**.
2. To navigate within the boot order list, use your pointing device or the arrow keys.
3. Select an entry and change its order in the list:
 - To move an entry higher in the boot list, press the **+** key, or drag and drop the entry.
 - To move an entry lower in the boot list, press the **-** key, or drag and drop the entry.
4. Save your changes.

Changing Network Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options**.

Network Boot Options

- Pre-Boot Network Environment Policy
- IPv6 DHCP Unique Identifier
- Network Boot Retry Support
- Network Interface Cards (NICs)
- PCIe Slot Network Boot



- HTTP Support
- iSCSI Software Initiator

Setting the Pre-Boot Network Environment

Use the Pre-Boot Network Environment option to set a preference for how your network boot targets appear in the **UEFI Boot Order** list. This option also controls the Pre-Boot network operations from Embedded UEFI Shell.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Network Boot Options > Pre-boot Network Environment**.
2. Select a setting.
 - **Auto**—All network operations initiated in the pre-boot environment occur over IPv4 or IPv6. The order of the existing network boot targets in the **UEFI Boot Order** list is not modified. New network boot targets are added to the end of the list using the default policy of the system BIOS.
 - **IPv4**—All network operations initiated in the pre-boot environment only occur over IPv4. Removes all existing IPv6 network boot targets in the **UEFI Boot Order** list. New IPv6 network boot targets are not added to the list.
 - **IPv6**—All network operations initiated in the pre-boot environment only occur over IPv6. Removes all existing IPv4 network boot targets in the **UEFI Boot Order** list. New IPv4 network boot targets are not added to the list.
3. Save your changes.

Setting the IPv6 DHCP Unique Identifier method

Use the IPv6 DHCP Unique Identifier option to control how the IPv6 DHCP Unique Identifier (DUID) is set.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Network Boot Options > IPv6 DHCP Unique Identifier**.
2. Select a setting.
 - **Auto**—Sets the DUID using the Universal Unique Identifier (UUID) of the server or, if the server is not available, the Link-Layer Address Plus Time (DUID-LLT) method.
 - **DUID-LLT**—Sets the DUID using the Link-Layer Address Plus Time (DUID-LLT) method.
3. Save your changes.

Enabling or disabling Network Boot Retry Support

Use the Network Boot Retry Support option to enable or disable the network boot retry function. When enabled, the system BIOS attempts to boot the network device up to the number of times set in the Network Boot Retry Count option before attempting to boot the next network device. This setting only takes effect when attempting to boot a network device from the **F12** function key and one-time boot options.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Network Boot Options > Network Boot Retry Support**.
2. Select a setting.
 - **Enabled**—Enables network boot retry.
 - **Disabled**—Disables network boot retry.
3. Save your changes.

Enabling or disabling network boot for a NIC

Use the Network Interface Cards (NICs) option to enable or disable network boot for an installed NIC. Devices listed vary from system to system and can include, for example:

- Embedded LOM 1 Port 1
- Embedded FlexibleLOM 1 Port 1

NOTE: You might need to configure the NIC firmware to activate the boot option.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Network Boot Options**.
2. Select a NIC.
3. Select a setting.
 - **Network Boot**—Enables network boot.
 - **Disabled**—Disables network boot.
4. Save your changes.
5. If you selected **Network Boot**, reboot the server so that the NIC boot option appears in the boot order list.

Enabling or disabling PCIe Slot Network Boot

Use the PCIe Slot Network Boot option to enable or disable UEFI network boot for NIC cards in PCIe slots.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Network Boot Options > PCIe Slot Network Boot**.
2. Select a PCIe slot entry.
3. Select a setting.



- **Enabled**—Enables UEFI network boot for NIC cards in PCIe slots.
- **Disabled**—Disables UEFI network boot for NIC cards in PCIe slots.

4. Save your changes.

Setting HTTP support

Prerequisites

Use this option to control the UEFI HTTP(S) boot support when in UEFI Mode and using the **Embedded UEFI Shell > Discover Shell Auto-Start Script using DHCP** setting.

To enable HTTPS boot, either by selecting **Auto** or **HTTPS only**, you must enroll the respective TLS certificate of the HTTPS server under **Server Security > TLS (HTTPS) Options**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Network Boot Options > HTTP Support**.
2. Select a setting.
 - **Auto**—Automatically adds HTTP(S) boot options to the UEFI Boot Order list for every network port that is enabled for Network Boot. Enables the system to boot to the HTTP or HTTPS URLs provided by the DHCP server. Any other URLs provided by the DHCP server are ignored.
 - **HTTP only**—Automatically adds HTTP boot options to the UEFI Boot Order list for every network port that is enabled for Network Boot. Enables the system to boot to the HTTP URLs provided by the DHCP server, and to ignore any HTTPS or other URLs that are provided.
 - **HTTPS only**—Automatically adds HTTPS boot options to the UEFI Boot Order list for every network port that is enabled for Network Boot. Enables the system to boot to the HTTPS URLs provided by the DHCP server, and to ignore any HTTP or other URLs that are provided.
 - **Disabled**
3. Save your changes.

Enabling iSCSI Policy (Gen10) or Software Initiator (Gen10 Plus)

Enables or disables the iSCSI Software Initiator. When enabled, the system's iSCSI Software Initiator will be used to access iSCSI targets on any configured NIC ports. When disabled, the system's iSCSI Software Initiator will not attempt to access any configured iSCSI targets.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Network Boot Options > iSCSI Policy (Gen10) or iSCSI Software Initiator (Gen10 Plus)**.
2. Select a setting.
 - **Enabled**—Enables the UEFI iSCSI software initiator.
 - **Disabled**—Disables the UEFI iSCSI software initiator.



NOTE: This option only controls whether the iSCSI Software Initiator is **Enabled** or **Disabled**. To enable iSCSI boot from the adapter initiator, you must enable iSCSI in the adapter firmware and configure it.

3. Save your changes.

Configuring Pre-Boot Network Settings

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > Pre-Boot Network Settings**.
2. Select any of the Pre-boot Network Settings options.
3. Select additional settings or enter additional values for that option.
4. Save your changes.

More information

[Pre-Boot Network Settings](#)

Pre-Boot Network Settings

Use this option to configure a preboot network interface and related settings.

! **IMPORTANT:** If you plan to run `webclient` or `ftp` over the same interface, you do not need to use the Embedded UEFI Shell `ifconfig` command on a network interface. The **Pre-Boot Network Settings** configured in the System Utilities automatically selects these interface.

If the interface used by `ftp` and `webclient` are configured by `ifconfig`, that setting is erased. Instead, the System Utilities **Pre-Boot Network Settings** menu is applied on the interface when the commands are run.

- **Pre-Boot Network Interface**—Specifies the network interface used for preboot network connections.
 - **Auto** (default)—The system uses the first available port with a network connection.
 - **Select Specific Port**—The system uses the selected NIC port.
- **DCHPv4**—Enables or disables obtaining the preboot network IPv4 configuration from a DHCP server for Network operations from the Embedded UEFI Shell, and Boot from URL.
 - **Enabled**—Enables DHCPv4 network address configuration. Individual settings are not available.
 - **Disabled**—Disables DHCPv4 address configuration, requiring you to configure the following static IP address settings manually.
 - **IPv4 Address**
 - **IPv4 Subnet Mask**
 - **IPv4 Gateway**
 - **IPv4 Primary DNS**
- **Preboot Network Proxy**—Specifies a preboot network proxy. When set, network operations for the Pre-Boot Network Interface are attempted through the configured proxy. The proxy must be in an HTTP URL format, and can be specified as `http://IPv4_address:port`, `http://[IPv6_address]:port` or `http://FQDN:port`.
- **IPv6 Config Policy**



- **Automatic**—Enables preboot network IPv6 configuration to be automatically obtained for Network operations from the Embedded UEFI Shell. Individual settings are not available.
- **Manual**—Enables you to configure static IP address settings individually.
- **Boot from URL 1, 2, 3 or 4**—Specifies a network URL to a bootable ISO or EFI file. Enter a URL in either HTTP or HTTPS format, using either an IPv4 or IPv6 server address or host name. For example, the URLs can be in any of the following formats: `http://192.168.0.1/file/image.iso`, `http://example.com/file/image.efi`, `https://example.com/file/image.efi`, `http://[1234::1000]/image.iso`. When configured, this URL is listed as a boot option in the UEFI Boot menu. Then you can select this option from the boot menu to download the specified file to the system memory and enable the system to boot from the file.

NOTE: Boot from URL uses the IP address settings configured in Pre-Boot Network Settings page.

Booting from an ISO file can involve only booting a preliminary OS environment image, such as WinPE or a mini Linux, or a complete OS install image if the OS supports the HTTP Boot feature (Old OS versions may not support booting from an ISO file or OS install image). Please check your OS documentation for the HTTP Boot feature support.

Prerequisites for Boot from URL

Leave the boot mode set to **UEFI Mode** when using the **Boot from URL**.

iSCSI Boot Configuration

NOTE: You can also configure iSCSI Boot settings using the RESTful Interface Tool. See the RESTful Interface Tool documentation at <https://www.hpe.com/info/restfulinterface/docs>.

Adding an iSCSI initiator name

Use the iSCSI Initiator Name option to set a name for the iSCSI initiator using iSCSI Qualified Name (IQN) format. EUI format is not supported. This option replaces the default name set for the initiator.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > iSCSI Boot Configuration > iSCSI Initiator Name**.
2. Enter a unique name for the iSCSI initiator using iSCSI Qualified Name (IQN) format. For example: `iqn.2001-04.com.example:uefi-13021088`

This setting is saved automatically.

Adding an iSCSI boot attempt

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > iSCSI Boot Configuration > Add an iSCSI Boot Attempt**.

A message appears stating that this boot attempt will not be in effect until the next server reboot.

2. Press **Enter**.
3. Select a port on which to attempt iSCSI connection.
4. Complete the configuration settings:



- **iSCSI Attempt Name**—Enter a name.
 - **iSCSI Boot Control**—Select **Enabled for MPIO**. (The default setting is **Disabled**). Use **Enabled for MPIO** to enable the Multi-Path I/O (MPIO) capability.
 - **IP Address Type**—Select an address type.
 - **Connection Retry Count**—Enter a value from 0 to 16. Default is 3 retries.
 - **Connection Timeout**—Enter a value in ms from 100 to 20000. Default is 20000 (20 seconds).
 - **Initiator DHCP**—This is the default setting. If you must configure static IP addresses for the Initiator, clear this option. The target name, IP address, port, and boot LUN must also be configured manually (disable Target DHCP Config) if you configure static addresses for the Initiator.
 - **Target DHCP Config**—This is the default setting. If you must configure the target settings manually, clear this check box) and enter a target name, IP address, port, and boot LUN.
 - Optional: **Authentication Type**—Default is NONE. If required, select **CHAP**, and then complete the CHAP entries.
5. Select **Save Changes**.
 6. Reboot the system.

Deleting iSCSI boot attempts

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > iSCSI Boot Configuration > Delete iSCSI Boot Attempts**.
2. Select one or more iSCSI boot attempt entries.
3. Select **Commit Changes and Exit**.

Viewing and modifying iSCSI boot attempt details

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > iSCSI Boot Configuration > iSCSI Attempts**.
2. Select an entry from the list.
3. View or modify the details about the boot attempt.

Configuring VLAN Configuration

Use the VLAN Configuration option to configure global VLAN settings for all enabled network interfaces. The configuration includes interfaces used in PXE boot, iSCSI boot, and HTTP/HTTPS boot, and for all preboot network access from the Embedded UEFI Shell.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Network Options > VLAN Configuration**.
2. Complete the following.



- a. **VLAN Control**—Select **Enabled** to enable VLAN tagging on all enabled network interfaces. This setting is disabled by default.
- b. **VLAN ID**—When **VLAN Control** is enabled, enter a VLAN ID between 1 and 4094.
- c. **VLAN Priority**—When **VLAN Control** is enabled, enter a priority value of 0 to 7 for VLAN tagged frames.

3. Save your changes.

Changing Storage Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options**.

Enabling embedded chipset SATA controller support

Use the **Embedded SATA Configuration** option to enable embedded chipset SATA (Serial Advanced Technology Attachment) controller support. You can select AHCI or HPE Smart Array SW RAID Support. Make sure that you are using the correct operating system drivers for your selected option.

CAUTION: Dynamic Smart Array is not supported when the boot mode is configured to Legacy BIOS Mode. Enabling Dynamic SmartRAID RAID results in data loss or data corruption on existing SATA drives. Back up all drives before enabling this option. See your operating system documentation before enabling SATA AHCI support to ensure your base media drivers support this feature.

Prerequisites

- The correct operating system drivers for your selected option.
- **Boot Mode** is set to **UEFI Mode**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > SATA Controller Options > Embedded SATA Configuration**.
2. Ensure that you are using the correct ACHI or RAID system drivers for your SATA option.
3. Select a setting.
 - **SATA AHCI Support**—Enables the embedded chipset SATA controller for AHCI.
 - **SmartRAID SW RAID Support**—Enables the embedded chipset SATA controller for Dynamic SmartRAID RAID.
4. Save your setting.

Enabling SATA Secure Erase

Use the **SATA Secure Erase** option to control whether SATA Secure Erase functionality is supported. This function prevents the Secure Freeze Lock command from being sent to SATA hard drives.

Prerequisites

- The SATA controller on the hard drive is in ACHI mode.
- The hard drive supports the Secure Erase command.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > SATA Controller Options > SATA Secure Erase**.
2. Select a setting.
 - **Enabled**—The Security Freeze Lock command is not sent to supported SATA hard drives, enabling Secure Erase to function.
 - **Disabled**—Disables Secure Erase.
3. Save your setting.

Enabling SATA Sanitize

Use the **SATA Sanitize** option to control whether sanitize functionality is supported.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > SATA Controller Options > SATA Sanitize**.
2. Select a setting.
 - **Enabled**—The Security Freeze Lock command is not sent to supported SATA hard drives, enabling sanitize to function.
 - **Disabled**—Disables sanitize.
3. Save your setting.

Setting the embedded storage boot policy

Use the **Embedded Storage Boot Policy** option to select the UEFI BIOS boot targets for embedded storage controllers. By default, all valid boot targets attached to the storage controller are available to the UEFI Boot Order list.

Prerequisites

Boot Mode is set to **UEFI Mode**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > Embedded Storage Boot Policy**.
2. Select a storage controller.
3. Select a setting.



- **Boot All Targets**—All valid boot targets attached to the storage controller are available to the **UEFI Boot Order** list.
- **Boot Limit to 24 Targets**—A maximum of 24 boot targets attached to the storage controller are available to the **UEFI Boot Order** list.
- **Boot No Targets**—No boot targets attached to the storage controller are available to the **UEFI Boot Order** list.

4. Save your setting.

Setting the PCIe storage boot policy

Prerequisite

Boot Mode is set to **UEFI Mode**.

Use the **PCIe Storage Boot Policy** option to select the UEFI BIOS boot targets for storage controllers in PCIe slots.

NOTE: This setting overrides the Fibre Channel/FCoE Scan Policy setting for Fibre Channel controllers in PCIe slots.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > PCIe Storage Boot Policy**.
2. Select a storage controller.
3. Select a boot target.
4. Save your setting.

Changing the default Fibre Channel/FCoE scanning policy

Prerequisite

Boot Mode is set to **UEFI Mode**.

Use the **Fibre Channel/FCoE Scan Policy** option to change the default policy for scanning for valid FC/FCoE (or boot from SAN) boot targets. By default, each installed FC/FCoE adapter only scans targets that are preconfigured in the device settings. For Fibre Channel controllers in PCIe slots, this setting is overridden by the PCIe Storage Boot Policy setting.

NOTE: Supported in UEFI mode only.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > Fibre Channel/FCoE Scan Policy**.
2. Select a setting.
 - **Scan All Targets**—Each installed FC/FCoE adapter scans all available targets.
 - **Scan Configured Targets Only**—Each installed FC/FCoE adapter only scans targets that are preconfigured in the device settings. This setting overrides any individual device settings configured in the device-specific setup.
3. Save your setting.

Enabling or disabling Embedded NVM Express Option ROM

Use the **Embedded NVM Express Option ROM** option to control how the NVM Express Option ROM is loaded.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > NVM Express Options > Embedded NVM Express Option ROM**.
2. Select a setting.
 - **Enabled**—The system loads the NVM Express Option ROM provided by the system BIOS.
 - **Disabled**—The system loads the NVM Express Option ROM provided by the adapter.
3. Save your setting.

Decommissioning NVM Express drives

Use the following options to decommission NVM Express drives. The drives you select are securely erased during the next boot.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > NVM Express Options > NVM Express Drive Decommission Option**.
2. Select the drives you want to decommission.
3. Save your settings.

Changing Power and Performance Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options**.

Setting the Power Regulator mode

Use **Power Regulator** settings to help increase server efficiency and manage power consumption.

NOTE: Certain processors only support one power state and operate at their initialized frequency, regardless of the selected power regulator mode.

Prerequisite

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Power Regulator**.
2. Select a setting.



- **Dynamic Power Savings Mode**—Automatically varies processor speed and power usage based on processor utilization. This mode uses an ROM-based algorithm to monitor processor activity. It can reduce overall power consumption with little or no impact to performance, and does not require OS support.
- **Static Low Power Mode**—Reduces processor speed and power usage. Guarantees a lower maximum power usage for the system. This mode is useful in environments where power availability is constrained and it is critical to lower the maximum power use of the system.
- **Static High Performance Mode**—Processors run in the maximum power and performance state, regardless of the OS power management policy. This mode is useful in environments where performance is critical and power consumption is less important.
- **OS Control Mode**—Processors run in their maximum power and performance state at all times, unless the OS enables a power management policy.

3. Save your setting.

Configuring PCI Peer to Peer Serialization

Use the **PCI Peer to Peer Serialization** option to configure PCI Peer to Peer Serialization.

Certain configurations such as systems populated with multiple GPUs on a processor socket may see increased performance when this feature is enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > PCIe Peer to Peer Serialization**.
2. Select a setting.
 - **Enabled**—When enabled, PCIe transactions are interleaved across PCIe root ports of a processor which can result in increased performance in peer to peer communication.
 - **Disabled**
3. Save your setting.

Configuring IO Direct Cache

Use the **IO Direct Cache** option to configure PCI Peer to Peer Serialization.

Some configurations, such as systems populated with multiple GPUs on a processor socket, may see increased performance when this feature is enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > IO Direct Cache**.
2. Select a setting.



- **Enable/Disable IODC (IO Direct Cache)**—Generate snoops instead of memory lookups, for remote InvItom (IIO) and/or WCiLF (cores).
- **Enable for Remote InvItom Hybrid Push**
- **InvItom AllocFlow**
- **InvItom Hybrid AllocFlow**
- **Enable for Remote InvItom and Remote WViLF**

3. Save your setting.

Setting the minimum processor idle power core C-State

Use the **Minimum Processor Idle Power Core C-State** option to select the lowest idle power (C-State) of the processor that the operating system uses. The higher the C-State, the lower the power usage of that idle state.

Prerequisite

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Minimum Processor Idle Power Core C-State**.
2. Select a setting.
 - **C6 State** (default—lowest)
 - **C3 State**
 - **C1E State**
 - **No C-states**
3. Save your setting.

Setting the Minimum Processor Idle Power Package C-State

Use the **Minimum Processor Idle Power Package C-State** option to configure the lowest processor idle power state (C-State). The processor automatically transitions into package C-States based on the C-States in which cores on the processor have transitioned. The higher the package C-State, the lower the power usage of that idle package state.

Prerequisite

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Minimum Processor Idle Power Package C-State**.
2. Select a setting.



- **Package C6 (retention) State** (default—lowest)
- **Package C6 (non-retention) State**
- **No Package State**

3. Save your setting.

Enabling or disabling Intel Turbo Boost Technology

Intel Turbo Boost Technology controls whether the processor transitions to a higher frequency than the processor's rated speed if the processor has available power and is within temperature specifications.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Intel(R) Turbo Boost Technology**.

2. Select a setting.

- **Enabled**
- **Disabled**—Reduces power usage, and also reduces the system's maximum achievable performance under some workloads.

3. Save your setting.

Configuring AMD Core Performance Boost

AMD Core Performance Boost controls whether the processor transitions to a higher frequency than the processor's rated speed if the processor has available power and is within temperature specifications.

NOTE: This option is available on servers with AMD processors.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > AMD Core Performance Boost**.

2. Select a setting.

- **Enabled**
- **Disabled**

3. Save your setting.

Changing the AMD C-State Efficiency Mode

Configure the system to adjust the core frequency in small increments when changing C-States. Enabling this option will monitor the workload and modulate the frequency of the core to maintain a high C0 residency. This has power and latency benefits when the core is not 100% utilized.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > C-State Efficiency Mode**.
2. Select one of the following:
 - **Enable**
 - **Disable**
3. Save your setting.

Setting the Energy/Performance Bias

Use the **Energy/Performance Bias** option to configure several processor subsystems to optimize the processor's performance and power usage.

Prerequisites

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Energy/Performance Bias**.
2. Select a setting.
 - **Maximum Performance**—Provides the highest performance and lowest latency. Use this setting for environments that are not sensitive to power consumption.
 - **Balanced Performance**—Provides optimum power efficiency and is recommended for most environments.
 - **Balanced Power**—Provides optimum power efficiency based on server utilization.
 - **Power Savings Mode**—Provides power savings for environments that are power sensitive and can accept reduced performance.
3. Save your setting.

Setting the Infinity Fabric Performance State

Use the **Infinity Fabric Performance State** option for customizing the performance state (P-state) of the Infinity Fabric when Infinity Fabric Power Performance is disabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Infinity Fabric Performance State**.
2. Select a setting.
 - **P0**
 - **P1**



- **P2**
- **P3**

3. Save your setting.

Enabling or disabling collaborative power control

For operating systems that support the Processor Clocking Control (PCC) interface, enabling **Collaborative Power Control** configures the operating system to request processor frequency changes, even when the **Power Regulator** option is set to **Dynamic Power Savings Mode** on the server. For operating systems that do not support the PCC Interface, or when the **Power Regulator** mode is not configured for **Dynamic Power Savings Mode**, this option has no impact on system operation.

Prerequisite

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Collaborative Power Control**.
2. Select a setting.
 - **Enabled**—The operating system requests processor frequency changes.
 - **Disabled**—The operating system does not request processor frequency changes.
3. Save your setting.

NOTE: The collaborative power control option is only supported in ProLiant Gen10 servers.

Setting Intel DMI Link Frequency

Use the **Intel DMI Link Frequency** option to force the link speed between the processor and south bridge to run at slower speeds. Doing so can reduce power consumption, but can also impact system performance.

NOTE: You can configure this option on systems with two or more CPUs.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Intel DMI Link Frequency**.
2. Select a setting.
 - **Gen 1 Speed**
 - **Gen 2 Speed**
3. Save your setting.

Configuring AMD Preferred IO Device

Use the **AMD Preferred IO Device** option to configure AMD Preferred IO Device settings.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > AMD Preferred IO Device**.
2. Select a setting.

Preferred IO Bus Number— Preferred IO can provide improved PCIe performance. Enter the PCI bus number ranging from 0 to 255 of a device to receive Preferred IO. All endpoints on the same AMD NorthBridge I/O (NBIO) will receive the same improved performance. You must set **Preferred IO Bus Number** to **Enable** for this option to function.

3. Save your setting.

Setting NUMA Group Size Optimization

Use the **NUMA Group Size Optimization** option to configure how the system ROM reports the number of logical processors in a NUMA (Non-Uniform Memory Access) node. The resulting information helps the operating system group processors for application use.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > NUMA Group Size Optimization**.
2. Select a setting.
 - **Clustered**—Optimizes groups along NUMA boundaries, providing better performance.
 - **Flat**—Enables applications that are not optimized to take advantage of processors spanning multiple groups to utilize more logical processors.
3. Save your setting.

Enabling or disabling Intel Performance Monitoring Support

Intel processors include performance counters that software can use to measure DRAM performance (including NVDIMM-N performance). This option is a monitoring tool, and does not impact performance. For example, the Intel Performance Counter Monitor (PCM) tools can report per-channel bandwidth.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Intel Performance Monitoring Support**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Configuring Uncore Frequency Scaling

Use the **Uncore Frequency Scaling** option to control the frequency scaling of the processor's internal busses.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Uncore Frequency Scaling**.
2. Select a setting.
 - **Auto**—Enables the processor to dynamically change frequencies based on workload.
 - **Maximum or minimum frequency**—Enables tuning for latency or power consumption.
3. Save your setting.

Setting UPI Bandwidth Optimization (RTID)

Use the **UPI Bandwidth Optimization (RTID)** option to configure the UPI link between processors which provides the best performance for most applications.

NOTE: This option is only configurable if two or more CPUs are present.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > UPI Bandwidth Optimization (RTID)**.
2. Select a setting.
 - **Balanced**—This option provides the best performance for most applications and benchmarks.
 - **Optimized for I/O (Alternate RTID)**—This option can increase bandwidth from I/O devices, such as GPUs that rely on direct access to system memory.
3. Save your setting.

Enabling or disabling Sub-NUMA Clustering

Sub-NUMA Clustering divides the cores, cache, and memory of the processor into multiple NUMA domains. Enabling this option can increase performance for workloads that are NUMA aware and optimized.

NOTE: Up to 1 GB of system memory might become unavailable when Sub-NUMA Clustering is enabled.

Prerequisite

To enable this option, enable **XPT Prefetcher**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Sub-NUMA Clustering**.
2. Select a setting.

- **Enabled**
- **Disabled**

3. Save your setting.

Enabling or disabling the Energy Efficient Turbo option

Use the **Energy Efficient Turbo** option to control whether the processor uses an energy-efficiency based policy.

Prerequisite

Intel(R) Turbo Boost Technology is enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Energy Efficient Turbo**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Setting a Local/Remote Threshold

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Local/Remote Threshold**.
2. Select a setting.
 - **Disabled**
 - **Low**
 - **Medium**
 - **High**
3. Save your setting.

Setting the LLC Dead Line Allocation

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > LLC Dead Line Allocation**.
2. Select one of the following:



- **Enable**—Opportunistically fill dead lines in LLC.
- **Disable**—Never fill dead lines in LLC.

3. Save your setting.

Setting the Stale A to S

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Stale A to S**.
2. Select one of the following:
 - **Enable**—Enable Stale A to S directory optimization.
 - **Disable**—Disable Stale A to S directory optimization.
3. Save your setting.

Disabling Processor Prefetcher Options

By default, **Processor Prefetcher Options** are enabled to provide optimal performance for most environments. In some cases, disabling these options can improve performance.

-
- ⓘ **IMPORTANT:** To verify that you can improve performance in your environment, perform application bench marking before you disable a processor prefetcher option.
-

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Processor Prefetcher Options**.
2. Select a setting.
 - **HW Prefetcher**
 - **Adjacent Sector Prefetcher**
 - **DCU Stream Prefetcher**
 - **DCU IP Prefetcher**
 - **XPT Prefetcher**

NOTE: This setting must be enabled when **Sub-NUMA Clustering** is enabled.

 - **LLC Prefetch**
3. Select **Disabled**.
4. Save your changes.

Enabling or disabling I/O Options

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > I/O Options**.
2. Select an option.
3. Select **Enabled** or **Disabled**.
4. Save your changes.

Enabling the ACPI SLIT options

Enables or disables the Advanced Configuration and Power Interface System Locality Information Table (ACPI SLIT). ACPI SLIT defines the relative access times between processors, memory subsystems, and I/O subsystems. Operating systems that support the SLIT can use this information to improve performance by allocating resources and workloads more efficiently.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > I/O Options**.
2. For the option ACPI SLIT, select one of the following:
 - **Enabled**
 - **Disabled**
3. Save your changes.

Enabling Intel NIC DMA Channels options

Enables or disables DMA acceleration on Intel NICs. If your server does not have Intel NICs, leave this setting disabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > I/O Options**.
2. For the option **Intel NIC DMA Channels**, select one of the following:
 - **Enabled**
 - **Disabled**
3. Save your changes.

Enabling Memory Proximity Reporting for I/O

Enables or disables whether the system ROM reports the proximity relationship between I/O devices and system memory to the operating system. Most operating systems can use this information to efficiently assign memory resources for devices, such as network controllers and storage devices.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > I/O Options**.
2. For the option **Memory Proximity Reporting for I/O**, select one of the following:
 - **Enabled**
 - **Disabled**

NOTE: Certain I/O devices might not be able to take advantage of I/O handling benefits if their OS drivers are not properly optimized to support this feature. For more information, see your operating system and I/O device documentation.

3. Save your changes.

Enabling or disabling I/O Non-posted Prefetching

Use the **I/O Non-posted Prefetching** option to enable or disable Non-posted Prefetching for I/O.

Disabling non-posted prefetching for I/O can significantly improve performance for a small set of configurations that require a balanced mix of read/write I/O traffic. For example, configurations that include InfiniBand or multiple x16 devices that utilize max bandwidth of the PCI-e bus.

NOTE: Disabling this feature has a slight impact on 100% I/O read bandwidth.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > I/O Non-posted Prefetching**.
2. Select a setting.
 - **Enable**
 - **Disable**
3. Save your setting.

Configuring Advanced Performance Tuning Options

Use Advanced Performance Tuning to control frequency changes that cause jitters and affect latency. You can manage Jitter Control manually or automatically. You can also specify a frequency to use, regardless of whether the processor frequency changes. For more information about Jitter Control, see *HPE Gen10 Servers Intelligent System Tuning* at <https://www.hpe.com/support/gen10-intelligent-system-tuning-en>.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Advanced Performance Tuning Options**.
2. Configure settings.

- **Processor Jitter Control**—Manages processor frequency variance due to technologies, such as Turbo, that varies the frequency based on power, thermals, and active cores. Jitter Control helps to reduce or remove processor jitter and latency, and improve server performance. Select an option:
 - **Auto-tuned**—Monitors frequency variance, and automatically adjusts the frequency to minimize variance over time.
 - **Manual-tuned**—Operates the processor at a fixed frequency, and enables you to select lower or higher frequencies statically.
 - **Disabled**—Disables Processor Jitter Control.
- **Processor Jitter Control Frequency**—Do one of the following:
 - If you selected **Auto-tuned**, enter a starting frequency unit in MHz.
 - If you selected **Manual-tuned**, enter a frequency unit in MHz.

NOTE: If your specified frequency is not supported, the system firmware adjusts the frequency to the nearest higher intermediate frequency supported by the processor.

- **Processor Jitter Control Optimization**—When the auto-tuned function detects fluctuations in processor frequency, this option optimizes the thresholds used. Select one of the following:
 - **Optimizing for Throughput** allows only the amount of fluctuations that doesn't impact overall compute throughput.
 - **Optimizing for Latency** allows for a very small amount of occasional fluctuations to occur before reducing processor frequency.
 - **Zero Latency** attempts to eliminate any frequency fluctuations.
- **Core Boosting**—Use this feature to produce higher performance across more active processors. Servers that include Core Boosting use extra server power and thermal headroom to reduce common setbacks and maximize processor computing power.

NOTE: Available with select HPE ProLiant Gen10 servers, Intel processors, and hardware configurations. Requires an iLO Advanced Premium Security Edition license.

- **Enhanced Processor Performance:** Use this option to enable or disable this feature. When enabled, this option adjusts the processor settings to a more aggressive setting that can result in increased performance, but might result in higher power consumption.
- **Processor Config TDP Level:** This option overrides the default CPU policy for SSE, AVX, and AVX-512 deterministic frequencies. This setting results in lowering the deterministic operational frequency. Disabling Turbo Mode enhances the deterministic behavior, but results in a lower operational frequency. The options are **Normal, Level 1, Level 2.**

3. Save your changes.

Setting Direct to UPI Options

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Advanced Performance Tuning Options > Direct to UPI.**
2. Select an option.



- **Enabled**—Provides a performance benefit in multiprocessor configured systems that rely on the UPI bus for remote memory or I/O accesses.
- **Disabled**

3. Save your changes.

Setting Memory Channel Mode

Use the **Memory Channel Mode** option provides maximum data protection by correcting multiple-bit memory errors in instances not possible in normal Advanced ECC Modes. See your product documentation for memory installation rules for Combined Channel Mode.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Advanced Performance Tuning Options > Memory Channel Mode**.
2. Select a setting.
 - **Independent Channel Mode (Non-Lockstep)**
 - **Combined Channel Mode (Lockstep)**
3. Save your setting.

Setting the Independent Channel Mode (Non-Lockstep)

Performance management

Selected HPE Gen10 and later servers support the following server performance management and tuning features:

- **Workload matching**—Use preconfigured server profiles to maximize application performance.
- **Jitter smoothing**—Use the **Processor Jitter Control Mode** setting to level and balance frequency fluctuation (jitter) resulting in lower latency.
- **Performance monitoring**—View performance data collected from supported sensors on servers with Innovation Engine support. You can configure alerts based on the collected data.
- **Workload advisor**—View selected server workload characteristics. You can view and configure recommended performance tuning settings based on the monitored data.
- **Core boosting**—Enable this feature to produce higher performance across more active processor cores.

This feature is supported on Gen10 servers only. It is not supported on Gen10 Plus servers.

If you reset iLO to the factory default settings, all performance management settings and data are deleted.

When you use the iLO backup and restore feature, the performance management settings are retained. The collected performance data is not backed up or restored.



Performance management feature requirements

Requirement	Workload matching	Jitter smoothing	Core boosting	Performance monitoring	Workload advisor
HPE Gen10 Plus servers	✓	✓		✓	✓
HPE Gen10 servers	✓	✓	✓ ¹	✓	✓
Intel processor		✓	✓ ²	✓	✓
iLO 5	✓	✓	✓	✓	✓
iLO Advanced license		✓	✓	✓	✓
Minimum System ROM	1.00	1.00 static 1.20 dynamic 1.40 optimizations	1.20	2.00	2.00
Minimum iLO firmware	N/A	1.15 iLO RESTful API 1.30 iLO web interface	1.15 iLO RESTful API 1.30 iLO web interface	1.40 iLO RESTful API 1.40 iLO web interface	1.40 iLO RESTful API 1.40 iLO web interface
Minimum HPE Innovation Engine Firmware ³	N/A	1.2.4	1.2.4	2.0.11	2.0.11

¹ Select servers only; requires high performance heatsinks and fans.

² Select Intel processors only (end of life 2019)

³ The iLO web interface **Performance** page is not available on servers without Innovation Engine support. To verify Innovation Engine support, look for the Innovation Engine firmware on the **Installed Firmware** page.

Jitter smoothing

For the past several years, server-class customers have seen processor-based performance increase generation over generation. This increase is due in a large part to increases in core counts and more efficient instruction set architectures. Unlike the preceding decades, the base frequency of the CPU has stayed rather stable with performance improvements coming from increasing core counts and architectural enhancements. However, processor vendors began to realize that not all workloads benefit from increased core counts, so they introduced features that allow some cores to run opportunistically at higher frequencies if power headroom is available or other cores are underutilized.

Although these opportunistic frequency upsides can increase performance, they also introduce an unwanted side effect. Frequency shifting itself introduces computation jitter, or nondeterminism, and undesirable latency. Jitter and the latency associated with it create problems for several customer segments. For example, high-frequency traders rely on time-sensitive transactions. They cannot tolerate the microseconds of delay that can be added non-deterministically to a trade, caused by a frequency shift. These delays over time can cost a trader upwards of millions of dollars. In other environments, servers running RTOS (real-time operating systems) to control critical functionality cannot tolerate random latencies that happen when opportunistic-frequency features are left enabled.

The current trend for latency-sensitive customers is to disable the features that normally would result in increased application performance because of the associated jitter. A trade executes faster if the processor runs faster, but if it comes at the cost of random delay, the benefit of increased performance is lost.



Hewlett Packard Enterprise introduced the Processor Jitter Control feature in its Gen10 and later servers to enable customers to achieve both frequency upside and low jitter. This feature is available for Gen10 and later servers using Intel Xeon Scalable Processors. Servers using AMD processors do not support this feature. This feature allows the customer to remove or reduce jitter caused by opportunistic frequency management, which results in better latency response and higher throughput performance.

Enabling the Processor Jitter Control feature might require changes to power management settings under the operating system.

Auto Processor Jitter Control mode

When Processor Jitter Control is configured to run in auto mode, HPE server firmware disables the impact of power management and dynamically adjusts the processor during runtime to eliminate frequency shift induced jitter. The result of running in auto-tuned mode is that the processor will eventually run at the highest frequency that can be achieved where the processor stops making frequency changes to stay within its thermal, power, and core usage constraints. Auto-tuned mode lowers the frequency upon detection of frequency changes caused by the following sources:

- C-state transitions
- AVX induced transitions
- Turbo transitions (due to power, thermal, and core usage)
- Thermal throttling

Jitter control equally affects all cores on all processors.

Core boosting

Core boosting technology uses a relaxed and optimized turbo profile that adapts the processor to specific use cases, configurations, and environments. Core boosting processors take advantage of extra server power and thermal headroom provided by an innovative HPE voltage regulator design and by cooling technologies. Consequently, systems that have core boosting processors can alleviate common setbacks and maximize processor computing power.

For example, a processor can have a number of cores and a base frequency at which the cores operate. Processors may also have a turbo mode that operates processor cores at a faster frequency than the base frequency. The turbo mode may use thermal and power capacity headroom opportunistically to operate processor cores at an increased frequency. Turbo mode can increase processor performance while maintaining the same TDP (Thermal Design Power) level.

Some processors are preconfigured with a TDP and a maximum power level. To maintain these parameters safely, the predefined settings are typically fused and locked into the processor. These settings ensure that the processor operates within its standard electrical, thermal, and power design specifications. A turbo profile for a processor is bounded by these constraints using fixed frequency registers and core-to-frequency ratio registers. The power limits can be fused to the TDP level. To maintain the specified TDP level, the CPU turbo frequencies are dictated by the number of active cores that were fused in core-to-frequency ratio register. The turbo frequency profile scales from all cores active to a single core active. Accordingly, the turbo frequency increases as the number of active cores being utilized by lower workload demands or by core parking or disabling technologies.

These fused frequency registers and core-to-frequency ratio registers cap the processor computing capacity at certain levels. On a general-purpose computing processor, however, you can set the turbo profile more conservatively to cover various workloads or a worst-case thermal condition. In other words, the turbo mode might have a one-size-fits-all profile that does not consider the specific configuration or environment in which the processor operates. Accordingly, the processor might not be tuned to use its full operating potential.

Setting the redundant power supply mode

Use the **Redundant Power Supply Mode** option to set how the system handles redundant power supply configurations. All High Efficiency Mode settings provide the most power efficient operation when you are using redundant power supplies by keeping half of the power standby mode at lower power usage levels. **Balanced Mode** shares the power delivery equally between all installed power supplies.



Prerequisite

Workload Profile is set to **Custom**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Advanced Power Options > Redundant Power Supply Mode**.
2. Select a setting.
 - **Balanced Mode**—The system shares the power delivery equally between all installed power supplies.
 - **High Efficiency Mode (Auto)**—The system selects between the odd or even power supply based on a semirandom distribution within a group of systems.
 - **High Efficiency Mode (Odd Supply Standby)**—The system places the odd power supply in standby.
 - **High Efficiency Mode (Even Supply Standby)**—The system places the even power supply in standby.
3. Save your setting.

Changing Embedded UEFI Shell Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell Options**.

Enabling or disabling the Embedded UEFI Shell

Use the **Embedded UEFI Shell** option to enable or disable the pre-boot command-line environment for scripting and running UEFI applications, including UEFI boot loaders. The Embedded UEFI Shell also provides CLI-based commands you can use to obtain system information, and to configure and update the system BIOS. When enabled, and **Add Embedded UEFI Shell to Boot Order** is enabled, the Embedded UEFI Shell is added to the UEFI Boot Order list.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell > Embedded UEFI Shell**.
2. Select a setting.
 - **Enabled**—Enables you to launch the **Embedded UEFI Shell** from the pre-boot environment and add it to the **UEFI Boot Order** list.
 - **Disabled**—The **Embedded UEFI Shell** is not available in the pre-boot environment and you cannot add it to the **UEFI Boot Order** list.
3. Save your setting.

Adding the Embedded UEFI Shell to the UEFI Boot Order list

Prerequisite

Boot Mode is set to **UEFI Mode**.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell > Add Embedded UEFI Shell to Boot Order**.
2. Select a setting.
 - **Enabled**—Adds the embedded UEFI Shell to the boot order list on the next reboot.
 - **Disabled**—The embedded UEFI Shell is not added to the boot order list.
3. Save your setting.

Enabling or disabling automatic execution of the Embedded UEFI Shell startup script

Use the **UEFI Shell Script Auto-Start** option to enable or disable automatic execution of the Embedded UEFI Shell startup script during Shell startup.

- You can use the startup script to create a RAM disk, download files from the network, collect data, upload results back to network, and then boot to the OS without rebooting the system.
- You can store the script file on local media, or access it from a network location.
- Name the script file `startup.nsh` and place it on local media or a network location accessible to the server.
- When auto-start is enabled, and the **Shell Auto-Start Script Location** option is set to **Auto**, the Shell looks for the script file in a network location first, followed by any locally attached FAT16, or FAT32-formatted media.
- It is recommended that you have only one `startup.nsh` file on one file system.

Prerequisites

- **Boot Mode** is set to **UEFI Mode**.
- **Embedded UEFI Shell** is enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell > UEFI Shell Script Auto-Start**.
2. Select a setting.
 - **Enabled**—The UEFI Shell startup script executes during Shell startup.
 - **Disabled**—The UEFI Shell startup script does not execute during Shell startup.
3. Save your setting.

Enabling or disabling Shell script verification

Prerequisites

- **Boot Mode** is set to **UEFI Mode**.
- **Embedded UEFI Shell** is enabled.

- **Secure Boot** is enabled.
- Shell scripts are enrolled in the Secure Boot database.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell > Shell Script Verification**.
2. Select a setting.
 - **Enabled**—Enables Shell script verification.
 - **Disabled**—(Default) Does not enable Shell script verification.
3. Save your setting.

Setting the Embedded UEFI Shell startup script location

Use the **Shell Auto-Start Script Location** option to select the location of the Embedded UEFI Shell startup script. When **UEFI Shell Script Auto-Start** is enabled, this setting specifies where the Shell looks for the `startup.nsh` file.

Prerequisites

- **Embedded UEFI Shell** is enabled.
- **UEFI Shell Script Auto-Start** is enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell > Shell Auto-Start Script Location**.
2. Select a setting.
 - **Auto**—The Shell attempts to retrieve the startup script from the network location first, followed by locally attached media.
 - **File Systems on Attached Media**—The Shell looks for the `startup.nsh` script file on a UEFI-accessible local file system, such as a FAT32 partition on a USB disk or HDD.
 - **Network Location**—The Shell looks for a `.nsh` script at an HTTP/HTTPS or FTP location accessible to the system.
3. Save your setting.

Enabling or disabling discovery of the Shell auto-start script using DHCP

Use the **Discover Shell Auto-Start using DHCP** option to let the Shell discover the startup script URL using DHCP. When enabled, the Shell sends DHCP requests with the DHCP User Class option set to the string `UEFIShell`.

Prerequisites

- **Embedded UEFI Shell** is enabled.
- **UEFI Shell Script Auto-Start** is enabled.
- **HTTP Support** policy is enabled, and the URL provided by the DHCP server matches the HTTP Support policy setting.



- **Shell Auto-Start Script Location** is set to **Network Location** or **Auto**.
- The DHCP server is configured to provide HTTP/HTTPS or FTP URLs.
- The DHCP server is configured to respond to the `User Class` option set to `UEFIShell`. When using DHCP over IPv4, the User Class option is Option 77, and Option 15 when using DHCP over IPv6.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell > Discover Shell Auto-Start using DHCP**.
2. Select a setting.
 - **Enabled**—The Shell uses DHCP to discover the startup script URL.
 - **Disabled**—The Shell does not send DHCP requests to discover the startup script URL.
3. Save your setting.

Setting the network location for the Shell auto-start script

Prerequisites

- **Embedded UEFI Shell** is enabled.
- **Shell Auto-Start Script Location** is set to **Network Location** or **Auto**.
- **Discover Shell Auto-Start Script using DHCP** is disabled.
- When specifying an HTTPS URL, the TLS certificate of the HTTPS server is configured using **Server Security > TLS (HTTPS) Options**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Embedded UEFI Shell > Network Location for Shell Script-Auto Start**.
2. Enter the network location of the `.nsh` file. Valid values are:
 - An HTTP/HTTPS URL for either an IPv4 or IPv6 server address or host name.
 - An FTP URL for either an IPv4 or IPv6 server address or host name.

Examples:

 - `http://192.168.0.1/file/file.nsh`
 - `http://example.com/file/file.nsh`
 - `https://example.com/file/file.nsh`
 - `http://[1234::1000]/file.nsh`
3. Save your setting.



Enabling SATA Sanitize

Use the **SATA Sanitize** option to control whether sanitize functionality is supported.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > SATA Controller Options > SATA Sanitize**.
2. Select a setting.
 - **Enabled**—The Security Freeze Lock command is not sent to supported SATA hard drives, enabling sanitize to function.
 - **Disabled**—Disables sanitize.
3. Save your setting.

Enabling SATA Sanitize

Use the **SATA Sanitize** option to control whether sanitize functionality is supported.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Storage Options > SATA Controller Options > SATA Sanitize**.
2. Select a setting.
 - **Enabled**—The Security Freeze Lock command is not sent to supported SATA hard drives, enabling sanitize to function.
 - **Disabled**—Disables sanitize.
3. Save your setting.

Changing Server Security settings

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security**.

Server Security options

- Set Power On Password
- Set Admin Password
- Secure Boot Settings
- TLS (HTTPS) Options
- Trusted Platform Module options
- Intel (R) TXT Support



- One-Time Boot Menu (F11 Prompt)
- Backup ROM Image Authentication

Setting the power-on password

Use the **Set Power On Password** option to set a password for accessing the server during the boot process. When you are powering on the server, a prompt appears where you enter the password to continue. To disable or clear the password, enter the password followed by a / (slash) when prompted to enter the password.

NOTE: In the event of an Automatic Server Recovery (ASR) reboot, the power-on password is bypassed and the server boots normally.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Set Power On Password**.
2. Enter your password.
A password can be:
 - 31 characters maximum
 - Any combination of numbers, letters, and special characters
3. Confirm the password, and then press **Enter**.
A message appears confirming that the password is set.
4. Save your changes.
5. Reboot the server.

Allowing login with iLO accounts

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Allow login with iLO accounts**.
2. To allow users to login with an iLO account with the CONFIGURE_BIOS privilege, select **Allow login with iLO accounts**.
3. Save your changes.

Setting an administrator password

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Set Admin Password**.
2. Enter the password.
A password can be:

- 31 characters maximum
 - Any combination of numbers, letters, and special characters
3. Confirm the password, and then press **Enter**.
A message appears confirming that the password is set.
 4. Save your changes.
 5. Reboot the server.

Secure Boot

Secure Boot is a server security feature that is implemented in the BIOS and does not require special hardware. Secure Boot ensures that each component launched during the boot process is digitally signed and that the signature is validated against a set of trusted certificates embedded in the UEFI BIOS. Secure Boot validates the software identity of the following components in the boot process:

- UEFI drivers loaded from PCIe cards
- UEFI drivers loaded from mass storage devices
- Preboot UEFI Shell applications
- OS UEFI boot loaders

When Secure Boot is enabled:

- Firmware components and operating systems with boot loaders must have an appropriate digital signature to execute during the boot process.
- Operating systems must support Secure Boot and have an EFI boot loader signed with one of the authorized keys to boot. For more information about supported operating systems, see <https://www.hpe.com/servers/ossupport>.

You can customize the certificates embedded in the UEFI BIOS by adding or removing your own certificates, either from a management console directly attached to the server, or by remotely connecting to the server using the iLO Remote Console.

You can configure Secure Boot:

- Using the **System Utilities** options described in the following sections.
- Using the iLO RESTful API to clear and restore certificates. For more information, see the Hewlett Packard Enterprise website (<https://www.hpe.com/info/redfish>).
- Using the `secboot` command in the Embedded UEFI Shell to display Secure Boot databases, keys, and security reports.

Enabling or disabling Secure Boot

Prerequisite

To enable this option:

- Set **Boot Mode** to **UEFI Mode**.
- Enable **UEFI Optimized Boot**.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Attempt Secure Boot**.
2. Select a setting.
 - **Enabled**—Enables Secure Boot.
 - **Disabled**—Disables Secure Boot.
3. Save your changes.
4. Reboot the server.

Configuring server lock settings

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Server Configuration Lock Settings**.

The screen displays the Server Configuration Lock State status.
2. You can change the following options:
 - **Server Configuration Lock Challenge required:** Select **Enabled** or **Disabled**.
 - **Prepare system for Transport:** Select **Enabled** or **Disabled**.
 - **Halt on Server Configuration Lock failure detection:** Select **Enabled** or **Disabled**.
3. Save the settings.

Setting up Server Configuration Lock

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Server Configuration Lock Settings > Setup Server Configuration Lock**.
2. Select the following:
 - **Exclude system board.**
 - **Exclude DIMMs.**
 - **Exclude CPUs.**
 - **Exclude PCIe slots.**
 - **Exclude security configuration.**
 - **Exclude system firmware revisions.**
3. To create a digital fingerprint, click **Generate Server Configuration Lock Digital Fingerprint**.
4. Save the settings.

Advanced Secure Boot Options

- **PK - Platform Key**—Establishes a trust relationship between the platform owner and the platform firmware.
- **KEK - Key Exchange Key**—Protects the signature database from unauthorized modifications. No changes can be made to the signature database without the private portion of this key.
- **DB - Allowed Signatures Database**—Maintains a secure boot allowed signature database of signatures that are authorized to run on the platform.
- **DBX - Forbidden Signatures Database**—Maintains a secure boot blacklist signature database of signatures that are not authorized to run on the platform
- **DBT - Timestamp Signatures Database**—Maintains signatures of codes in the timestamp signatures database.
- Delete all keys
- Export all keys
- Reset all keys to platform defaults

NOTE: Changing the default security certificates can cause the system to fail booting from some devices. It can also cause the system to fail launching certain system software such as Intelligent Provisioning.

Viewing Advanced Secure Boot Options settings

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options**.
2. Select an exchange key or a signatures database option.
3. Select the **View** entry for the exchange key or signatures database option.
4. Select the entry for the option you want to view.

Example: Viewing HPE UEFI Secure Boot 2016 PK Key details

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options > PK - Platform Key > View PK entry > HPE UEFI Secure Boot 2016 PK Key**.

Enrolling a Secure Boot certificate key or database signature

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options**.
2. Select an exchange key or a signatures database option.
3. Select **Enroll <option name>**.
4. Select **Enroll <option name> using file**.
The File Explorer screen shows attached media devices.
5. Select the attached media device where the certificate file is located, and then press **Enter**.



6. Continue selecting the menu path for the certificate file. Press **Enter** after each selection.
7. Optional: Select a **Signature Owner GUID**.
8. Optional: If you selected **Other** for the signature owner GUID, enter a **Signature GUID**.
Use the following format (36 characters): 11111111-2222-3333-4444-1234567890ab
 - For Hewlett Packard Enterprise certificates, enter: F5A96B31-DBA0-4faa-A42A-7A0C9832768E
 - For Microsoft certificates, enter: 77fa9abd-0359-4d32-bd60-28f4e78f784b
 - For SUSE certificates, enter: 2879c886-57ee-45cc-b126-f92f24f906b9
9. Select **Commit changes and exit**.

Example: Enrolling a KEK entry

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options > KEK - Key Exchange Key > Enroll KEK entry**.
2. Select **Enroll KEK using file**.
3. Select the location of the certificate file from an attached media device.
4. Optional: Select a **Signature Owner GUID**.
5. Optional: If you selected **Other** for the signature owner GUID, enter a **Signature GUID**.
6. Select **Commit changes and exit**.

Deleting a Secure Boot certificate key or database signature

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options**.
2. Select an exchange key or a signatures database option.
3. Do one of the following:
 - If there is one option available for deletion:
 - a. Select the **Delete <option name>** check box.
 - b. Click **Yes**.
 - If there is more than one option available for deletion:
 - a. Select **Delete <option name>**.
 - b. Select the check box for the option you want to delete.
 - c. Click **Yes**.

Example: Deleting a KEK entry

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options > KEK - Key Exchange Key > Delete KEK entry**.
2. Select the check box for the entry you want to delete.
3. Click **Yes**.

Deleting all keys

The **Delete all keys** option deletes all keys in the system, including the Platform Key.

-
- !** **IMPORTANT:** After you delete all keys, the system is forced to immediately disable Secure Boot. Secure Boot remains disabled upon system reboot until valid secure boot keys are restored.
-

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options > Delete all keys**.
2. Press **Enter** to delete all keys.
3. Confirm the deletion.

Exporting a Secure Boot certificate key or database signature

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options**.
2. Select an exchange key or a signatures database option.
3. Select **Export <option name>**.
4. Select the entry you want to export.
A File Explorer screen shows attached media devices.
5. Do one of the following:
 - Select an attached media device where you want to export the file, and then continue selecting the menu path for the certificate file. Press **Enter** after each selection.
 - To export to a new file, press **+**, and enter a file name.

Example: Exporting an Allowed Signatures Database signature

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options > DB - Allowed Signatures Database > Export Signature > HPE UEFI Secure Boot 2016 DB Key**.
2. Select the entry you want to export.
A File Explorer screen shows attached media devices.
3. Do one of the following:



- Select an attached media device where you want to export the file, and then continue selecting the menu path for the certificate file. Press **Enter** after each selection.
- To export to a new file, press **+**, and then enter a file name.

Exporting all Secure Boot certificate keys

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options > Export all keys**.

A File Explorer screen shows attached media devices.

2. Do one of the following:
 - Select an attached media device where you want to export the files, and then continue selecting the menu path for the certificate file. Press **Enter** after each selection.
 - To export to a new file, press **+**, and then enter a file name.

Resetting a Secure Boot certificate key or database signature to platform defaults

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options**.
2. Select an exchange key or a signatures database option.
3. Select **Reset to platform defaults**.
4. Click **Yes**.

Resetting all Secure Boot certificate keys to platform defaults

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Secure Boot Settings > Advanced Secure Boot Options > Reset all keys to platform defaults**.
2. Click **Yes**.

TLS (HTTPS) Options

Viewing TLS certificate details

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > View Certificates**.
2. Select a certificate.



Enrolling a TLS certificate

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > Enroll Certificate**.
2. Select **Enroll certificate using File Explorer**.
The File Explorer screen shows attached media devices.
3. Select the attached media device where the certificate file is located, and then press **Enter**.
4. Continue selecting the menu path for the certificate file. Press **Enter** after each selection.
5. Select **Commit changes and exit**.

Deleting a TLS certificate

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > Delete Certificate**.
2. From the list of certificates, select the certificates you want to delete.
3. Select **Commit changes and exit**.

Deleting all TLS certificates

The **Delete all Certificates** option deletes all certificates in the system.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > Delete all Certificates**.
2. Press **Enter**.
3. Confirm the deletion.

Exporting a TLS certificate

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > Export Certificate**.
2. Select a file format for the exported certificate.
A File Explorer screen shows attached media devices.
3. Do one of the following:



- Select an attached media device where you want to export the file, and then continue selecting the menu path for the certificate file. Press **Enter** after each selection.
- To export to a new file, press **+**, and then enter a file name.

Exporting all TLS certificates

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > Export all Certificates**.

A File Explorer screen shows attached media devices.

2. Do one of the following:
 - Select an attached media device where you want to export the files, and then continue selecting the menu path for the certificate file. Press **Enter** after each selection.
 - To export to a new file, press **+**, and then enter a file name.

Resetting all TLS settings to platform defaults

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > Reset all settings to platform defaults**.

2. Click **OK**.

Configuring advanced TLS security settings

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > TLS (HTTPS) Options > Advanced Security Settings**.

2. Configure options.

- To configure which cipher suites are allowed for TLS connections:
 - a. Select **Cipher suites allowed for TLS connections**.
 - b. Select one of the following:
 - Individual check boxes for the cipher suites you want to allow.
 - **Select Platform Default Cipher suites**
 - c. Select **Commit changes and exit**.
- To configure the certificate validation process for every TLS connection:

- a. Select **Certificate validation process for every TLS connection**.
 - b. Select a setting:
 - **PEER** (recommended)—The certificate presented by the peer is validated for secure communication.
 - **NONE**—Does not validate the certificate.
 - To enable or disable strict host name checking:
 - a. Select **Strict Hostname checking**.
 - b. Select a setting:
 - **ENABLE**—The host name of the connected server is validated with the host name in the certificate supplied by the server.
 - **DISABLE**—The host name of the connected server is not validated with the host name in the certificate supplied by the server.
 - To specify which protocol version to use for TLS connections:
 - a. Select **TLS Protocol Version Support**.
 - b. Select a setting:
 - **AUTO**—Negotiates the highest protocol version that is supported by both the TLS server and the client.
 - **1.0**—Uses TLS protocol version 1.0. (Not supported in Gen10 Plus)
 - **1.1**—Uses TLS protocol version 1.1. (Not supported in Gen10 Plus)
 - **1.2**—Uses TLS protocol version 1.2.
3. Save your changes.

Configuring Trusted Platform Module options

Trusted Platform Modules are computer chips that securely store artifacts used to authenticate the platform. These artifacts can include passwords, certificates, or encryption keys. You can also use a TPM to store platform measurements to make sure that the platform remains trustworthy. For servers configured with a Trusted Platform Module, TPM enables the firmware and operating system to take measurements of all phases of the boot process. For information on installing and enabling the TPM module option, see the user documentation for your server model.

When enabling the Trusted Platform module, observe the following guidelines:

- By default, the Trusted Platform Module is enabled as TPM 2.0 when the server is powered on after installing it.
- In UEFI Mode, the Trusted Platform Module can be configured to operate as TPM 2.0 or TPM 1.2.
- In Legacy Boot Mode, the Trusted Platform Module configuration can be changed between TPM 1.2 and TPM 2.0, but only TPM 1.2 operation is supported.

⚠ CAUTION: An OS that is using TPM might lock all data access if you do not follow proper procedures for modifying the server and suspending or disabling TPM in the OS. This includes updating system or option firmware, replacing hardware such as the system board and hard drive, and modifying TPM OS settings. Changing the TPM mode after installing an OS might cause problems, including loss of data.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Trusted Platform Module options**.
2. Select an option. On servers configured with an optional TPM, you can set the following:
 - **TPM 2.0 Operation**—Sets the operation of TPM 2.0 to execute after a reboot. Options are:
 - **No Action**—There is no TPM configured.
 - **Clear**—TPM is cleared during reboot, and **TPM 2.0 Operation** is set to **No Action**.
 - **TPM Mode Switch**—Sets the TPM mode to execute after a reboot. Options are:
 - **No Action**
 - **TPM 1.2**
 - **TPM 2.0**
 - **TPM 2.0 Visibility**—Sets whether TPM is hidden from the operating system. Options are:
 - **Visible**
 - **Hidden**—Hides TPM from the operating system. Use this setting to remove TPM options from the system without having to remove the actual hardware.
 - **TPM UEFI Option ROM Measurement**—Enables or disables (skips) measuring UEFI PCI operation ROMs. Options are:
 - **Enabled**
 - **Disabled**
 - **Backup ROM Image Authentication**—Use this option to enable cryptographic authentication of the backup ROM image on startup. When this option is disabled, only the primary image is authenticated on each startup. Enable this option to also perform cryptographic authentication of the backup ROM image.
3. Save your changes.
4. Reboot the system.

After the system reboots, you can view the **Current TPM Type** and **Current TPM State** settings.
5. Verify that your new **Current TPM Type** and **Current TPM State** settings appear at the top of the screen.

Setting TPM FIPS Mode Switch Operation

If you want TPM 1.2 mode to be FIPS-ready through POST, use the **TPM FIPS Mode Switch Operation** option. By default, TPM 2.0 mode is FIPS-ready through POST.

Prerequisites

- Your operating system supports TPM 1.2 Federal Information Processing Standard (FIPS) mode.
- Trusted Platform Module **TPM Mode Switch** setting is set to **1.2, FIPS**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Trusted Platform Module options > TPM FIPS Mode Switch Operation**.
2. Select a setting.
 - **No Action**—No mode is set.
 - **Regular mode**—TPM does not operate in FIPS mode.
 - **FIPS mode**—TPM operates using the Federal Information Processing Standard.
3. Save your setting.

Enabling or disabling Intel TXT support

Use the Intel TXT Support option to enable or disable Intel TXT (Trusted Execution Technology) support for servers with Intel processors that support this feature.

NOTE: Intel TXT is supported in both TPM 2.0 and TPM 1.2 modes.

Prerequisites

Before you can enable Intel TXT support, you must enable:

- All Intel processor cores
- Hyperthreading
- VT-d
- TPM

Disabling any of these features while TXT is enabled can prevent TXT from working properly.

NOTE: A physical TPM is always enabled, discoverable, and working by default.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Intel (R) TXT Support**.
2. Select a setting.
 - **Enabled**—Enables TXT support
 - **Disabled**—Disables TXT support.
3. Save your changes.

Enabling or disabling the One-Time Boot Menu F11 prompt

Use this option to control whether you can press the F11 key to boot directly to the One-Time Boot Menu during the current boot. This option does not modify the normal boot order settings. When this option is enabled, you can boot directly into the One-Time Boot Menu in the System Utilities by pressing F11 in the POST screen after a server reboot.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > One-Time Boot Menu (F11 Prompt)**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your changes.

Enabling or disabling the Intelligent Provisioning F10 prompt

Use the **Intelligent Provisioning (F10 Prompt)** option to control whether you can press the F10 key to access Intelligent Provisioning from the POST screen.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Intelligent Provisioning (F10 Prompt)**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Enabling or disabling the System Intrusion Detection

The **System Intrusion Detection** option detects if the chassis access cover is opened or closed.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > System Intrusion Detection**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Enabling or disabling processor AES-NI support

Use the Processor AES-NI option to enable or disable the Advanced Encryption Standard Instruction Set in the processor.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Processor AES-NI Support**.
2. Select a setting.
 - **Enabled**—Enables AES-NI support.
 - **Disabled**—Disables AES-NI support.
3. Save your changes.

Enabling or disabling backup ROM image authentication

Use the Backup ROM Image Authentication option to enable or disable cryptographic authentication of the backup ROM image on startup.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Backup ROM Image Authentication**.
2. Select a setting.
 - **Enabled**—The backup ROM image is authenticated on startup.
 - **Disabled**—The backup ROM image is not authenticated on startup. Only the primary image is authenticated.
3. Save your changes.

Changing PCIe Device Configuration options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration**.

Selecting advanced PCIe device settings

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration > Advanced PCIe Configuration**.
2. Select settings.
 - **NVMe PCIe Resource Padding**—Configures PCIe resources to support PCIe hot-add for NVMe drives.



- **Normal**—Only allocates PCIe resources to devices installed at boot time. PCIe hot-add is not supported.
- **Medium**—Allocates additional PCIe resources for each PCIe root port, which might enable a PCIe hot-add event to work without requiring a system reboot to enumerate the device.
- **High**—Allocates a maximum amount of PCIe resources to allow for the best chance of supporting a PCIe hot-add event.
- **Maximum PCI Express Speed**—When **Workload Profile** is set to **Custom**, sets the maximum speed at which the server allows PCI Express devices to operate.
 - **Per Port Control**
 - **PCIe Generation 1.0**

3. Save your settings.

Configuring PCIe bifurcation options

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration > Advanced PCIe Configuration > PCIe Bifurcation Options**.
2. Select the bifurcation option for each PCIe slot.
 - **Auto**
 - **Bifurcate**
 - **Dual Bifurcate**

NOTE:

- Dual Bifurcation is not supported on ProLiant MicroServer Gen10 Plus.
 - Dual Bifurcation is not supported on MicroServer Gen10 Plus and is not supported on AMD Gen10 Plus products (DL325 Gen10 Plus and DL385 Gen10 Plus).
-

3. Save your settings.

Setting GPU Configurations

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration > GPU CFG Selection**.
2. Select an option.
 - **4:1**—Maps 4 PCIe slots to each installed processor.
 - **8:1**—Maps all slots to a single processor.
3. Save your settings.

Selecting PCIe bifurcation options

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration > PCIe Bifurcation Options**.
2. Select an option.
 - **Enabled**—Splits a PCIe slot into two equal-width slots. Use this option for cards that support or require bifurcation.
 - **Disabled**—Does not bifurcate a PCIe slot.
3. Save your settings.

Setting Maximum PCI Express Speed

Use the **Maximum PCI Express Speed** option to lower the maximum PCI Express speed at which the server allows PCI Express devices to operate. The option can also be used to address issues with problematic PCI Express devices. Setting this value to Maximum Supported configures the platform to run at the maximum speed supported by the platform or the PCIe device, whichever is lower.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration Options > Maximum PCI Express Speed**.
2. Select a setting.
 - **Per Port Control**
 - **PCIe Generation 1.0**
 - **PCIe Generation 2.0**
 - **PCIe Generation 3.0**
 - **PCIe Generation 4.0**
3. Save your setting.

Configuring NVMe PCIe Resource Padding

Use the **NVMe PCIe Resource Padding** option to configure PCIe resources to support PCIe hot-add for NVMe drives.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration Options > NVMe PCIe Resource Padding**.
2. Select a setting.



- **Normal**—When this option is selected, PCIe resources are only allocated to devices installed at boot time, and PCIe hot-add is not supported.
- **Medium**—When this option is selected, additional PCIe resources are allocated for each PCIe Root Port, which might enable a PCIe hot-add event to work without requiring a system reboot to enumerate the device.
- **High**—When this option is selected, a maximum amount of PCIe resources are set aside to allow for the best chance of supporting a PCIe hot-add event.

3. Save your setting.

Configuring PCIe Slot to Processor Mapping

Use the **PCIe Slot to Processor Mapping** option to change the PCIe to Processor mapping configuration.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration Options > PCIe Slot to Processor Mapping**.
2. Select a setting.
 - **4:1**—When this option is selected, four PCIe slots are mapped to each installed processor.
 - **8:1**—When this option is selected, all slots are mapped to a single processor.

3. Save your setting.

Enabling or disabling PCIe Device Isolation Support

Use the **PCIe Slot to Processor Mapping** option to configure PCIe Isolation Support.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration Options > PCIe Device Isolation Support**.
2. Select a setting.
 - **Enable**—When enabled, a PCIe device will be disabled at runtime when an error is detected.
 - **Disable**—When disabled, a PCIe device will be enabled at runtime when an error is detected.

Consult Operating System documentation before enabling this option.

3. Save your setting.

Configuring PCIe Error Control

Use the **PCIe Slot to Processor Mapping** option to select firmware or operating system to control PCIe error.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration Options > PCIe Error Control**.
2. Select a setting.
 - **Firmware Control**
 - **OS Control**
3. Save your setting.

Configuring specific PCIe devices

Use the **PCIe Device Configuration** options to enable or disable, and select configuration settings for embedded and added-in PCI devices. Disabling devices reallocates the resources (memory, I/O, and ROM space and power) that are normally allocated to the device. By default, all devices are enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration**.
2. Select a device from the list.
3. Select settings. Depending on the device, options include:
 - **Device Disable**
 - **Auto**—The device is automatically enabled at server boot.
 - **Disabled**—The device is not automatically enabled.
 - **PCIe Link Speed**
 - **Auto**—Sets the link speed to the maximum supported speed of the PCIe link.
 - **PCIe Generation 1.0**—Sets the link speed to a maximum speed of PCIe Generation 1.0.
 - **PCIe Generation 2.0**—Sets the link speed to a maximum speed of PCIe Generation 2.0.

NOTE: If this feature is not supported, the option is not available.

- **PCIe Power Management (ASPM)**
 - **Auto**
 - **Disabled**
 - **L1 Enabled**—The device's link enters a lower power standby state at the expense of a longer exit latency.
- **PCIe Option ROM**



- **Enabled**—The platform optimally loads PCIe Option ROMs to save boot time.
- **Disabled**—The platform disables all PCIe Option ROM optimizations, which might be required for older PCIe devices.

4. Save your settings.

Changing Advanced Options

Procedure

From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options**.

Selecting a ROM image

On a server with redundant ROMs, use the **ROM Selection** option to revert the server to a previous BIOS ROM image.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > ROM Selection**.
2. Select a setting.
 - **Use Current ROM**
 - **Switch to Backup ROM**—Reverts to the image in use before the last flash event.
3. Save your setting.

Configuring an embedded video connection

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Embedded Video Connection**.
2. Select a setting.
 - **Auto**—The external video connection to the embedded video controller is automatically disabled to save power when a monitor is not attached. It is enabled automatically when a monitor is attached (including when the server is operating).
 - **Always Disabled**—The external video connection to the embedded video controller is disabled, and a monitor connected to this port does not display except during system boot.
 - **Always Enabled**—The external video connection to the embedded video controller is always enabled. This option is only required if a monitor is attached with a monitor detection that does not function, causing **Auto** mode to not work properly.
3. Save your setting.



Configuring Power Supply Requirements Override

Use the **Power Supply Requirements Override** option to override the normal power supply requirements of the system.

The server can operate with various workloads and configurations with the required power supplies installed. This option modifies the power supply requirements of the system to enable operation with one power supply and redundancy. It can also modify power supply requirements of the system to enable operation with two power supplies and redundancy with three power supplies.

NOTE: Use the Power Advisor to confirm the power supply requirements of the system before enabling any of the options that override the default power supply requirements.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Power Supply Requirements Override**.
2. Select a setting.
 - **Default Power Supply Requirements**
 - **Configure for 1 minimum required, 2 required for redundancy**
 - **Configure for 2 minimum required, 3 required for redundancy**
 - **Configure for 2 minimum required, 4 required for redundancy**
 - **Configure for 3 minimum required, 4 required for redundancy**
 - **Configure for 4 minimum required, no redundancy**
3. Save your changes.

Enabling or disabling Consistent Device Naming

On supported operating systems, use the **Consistent Device Naming** option to control how NIC ports are named based on their locations in the system.

NOTE: Existing NIC connections retain their names until reinstalled under the OS environment.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Consistent Device Naming**.
2. Select a setting.
 - **CDN Support for LOMs and Slots**—Names all NIC ports on the system.
 - **CDN Support for LOMs Only**—Names Embedded NICs and FlexibleLOMs, but no other NIC ports.
 - **Disabled**—Disables consistent device naming.
3. Save your setting.



Enabling or disabling mixed power supply reporting

Use the **Mixed Power Supply Reporting** option to set whether the server logs messages when a mixed supply configuration is present.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Mixed Power Supply Reporting**.
2. Select a setting.
 - **Enabled**
 - **Disabled**
3. Save your setting.

Changing the POST video support settings

Use this option to configure the POST Video Support setting. This option is only supported in UEFI Boot Mode and only applies to video output during the POST (preboot) environment.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Video Options**.
2. Select a setting:
 - **Display All**: The system displays POST video to all installed video controllers.
 - **Display Embedded Only**: The system only displays POST video to the embedded video controller.
3. Save your setting.

Enabling or disabling High Precision Event Timer (HPET) ACPI Support

Use the **High Precision Event Timer (HPET) ACPI Support** option to enable or disable the High Precision Event Timer (HPET) table and device object in ACPI.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > High Precision Event Timer (HPET) ACPI Support**.
2. Select a setting.
 - **Enabled**—The HPET is available to an operating system that supports it using the industry standard ACPI name space.
 - **Disabled**—The HPET is not available to an operating system that supports it using the industry standard ACPI name space.
3. Save your setting.

Changing UEFI Power Supply Requirements

Use this option to configure the power supply redundancy logic. The server can operate with various workloads and configurations with the required power supplies installed.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options**.
2. In **Power Supply Requirements**, select one of the following:
 - **Configured for 1+1 Redundancy**: One supply is required and an additional supply is required for a redundant configuration.
 - **Configured for 2+2 Redundancy**: Two supplies are required and an additional two supplies are required for a redundant configuration.
 - **Configured for 3+1 Redundancy**: Three supplies are required and an additional power supply is required for a redundant configuration.
 - **Configured for 4+0 Redundancy**: Four supplies are required with no redundancy.
3. Save your setting.

Setting the thermal configuration

Use the **Thermal Configuration** option to select the fan cooling method for the system. Modifying this option is only advised for configurations that differ from typical Hewlett Packard Enterprise-supported configurations that cannot be cooled adequately via **Optimal Cooling**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Thermal Configuration**.
2. Select a setting.
 - **Optimal Cooling**—Provides the most efficient solution by configuring fan speeds to the minimum required to provide adequate cooling.
 - **Increased Cooling**—Operates fans at a higher speed.
 - **Maximum Cooling**—Provides the maximum cooling available for the system.
 - **Enhanced CPU Cooling**—Provides additional cooling to the processors, which can improve performance.
3. Save your setting.

Enabling or disabling thermal shutdown

Use the **Thermal Shutdown** option to configure the system to shut down when a fan failure occurs in non-redundant fan mode. A shutdown is initiated due to non-redundant fan failures or temperature increases beyond the pre-set threshold. If disabled, the System Management Driver ignores thermal events and the system immediately powers off in data-destructive situations.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Thermal Shutdown**.
2. Select a setting.
 - **Enabled**—The server automatically shuts down when the internal server temperature reaches within five degrees of the critical level.
 - **Disabled**—The server does not automatically shut down when the internal server temperature reaches within five degrees of the critical level. Shutdown occurs when the temperature reaches the critical level.
3. Save your setting.

Setting fan installation requirements messaging

Use the **Fan Installation Requirements** option to configure how the server reacts when all required fans are not installed. Operating the server without the required fans can result in damage to the hardware components. By default, the server displays messages and log events to the IML when required fans are not installed. The server can still boot and operate.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Fan Installation Requirements**.
2. Select a setting.
 - **Enable Messaging**—The server displays messages and log events to the IML when required fans are not installed. The server can still boot and operate. This setting is the recommended setting.
 - **Disable Messaging**—The server does not display message and log events when required fans are not installed. All indications that the server is operating without required fans are removed.
3. Save your setting.

Setting the fan failure policy

Use the **Fan Failure Policy** option to configure how the server reacts when fans fail, resulting in the server not having required fans in operation.

NOTE: Operating a server without the required fans installed and operating is not recommended and can impact the ability for the system to cool components properly. It can also result in damage to hardware components.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Fan Failure Policy**.
2. Select a setting.

- **Shutdown/Halt on Critical Fan Failures**—The server cannot boot or operate if it does not have required fans operating due to one or more fan failures. This setting is the recommended setting.
- **Allow Operation with Critical Fan Failures**—The server can boot and operate if it does not have required fans operating due to one or more fan failures.

3. Save your setting.

Enabling or disabling higher ambient temperature support

Use the **Extended Ambient Temperature Support** option to enable the server to operate at higher ambient temperatures than are normally supported.

NOTE: This option is only supported by specific hardware configurations. See your HPE server documentation before enabling extended ambient temperature support. Improper system operation or damage to hardware components can result from enabling these features in unsupported configurations.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Extended Ambient Temperature Support**.
2. Select a setting.
 - **Disabled**
 - **Enabled for 40c Ambient (ASHRAE 3)**—Enables the server to operate in environments with ambient temperatures up to 40 degrees Celsius.
 - **Enabled for 45c Ambient (ASHRAE 4)**—Enables the server to operate in environments with ambient temperatures up to 45 degrees Celsius.

NOTE: Not all servers support both 40c Ambient (ASHRAE 3) and 45c Ambient (ASHRAE 4).

3. Save your setting.

Re-entering a serial number

Use the **Serial Number** option to re-enter the server serial number after replacing the system board. This value must match the serial number sticker located on the back of the chassis.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Advanced Service Options > Serial Number**.
2. Enter the serial number, and then press **Enter**.
3. Save the setting.

Re-entering a product ID

Use the **Product ID** option to re-enter the product ID after replacing the system board. This value must match the product ID sticker located on the back of the chassis.



Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Advanced Service Options > Product ID**.
2. Enter the product ID, and then press **Enter**.
3. Save your setting.

Configuring advanced debug options

Prerequisites

Boot Mode is set to **UEFI Mode**.

Use **Advanced Debug Options** to control the output level of debug and POST boot progress messages.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Advanced Debug Options**.
2. Select settings.
 - **UEFI Serial Debug Message Level**—Sets the level of debug messages output to the serial console.
 - **Disabled**
 - **Errors Only**
 - **Medium**
 - **Network**
 - **Verbose**

NOTE: This setting can significantly increase boot time.

 - **Custom**
- **POST Verbose Boot Progress**—Enables detailed messaging that might be helpful in determining why a server became unresponsive during the boot process.
 - **Disabled**
 - **Serial Only**—Detailed messages are output to the serial console.
 - **All**—Detailed messages are output to the POST screen and serial console.
3. Save your settings.

Obtaining UEFI serial output log data with the UEFI System Utilities

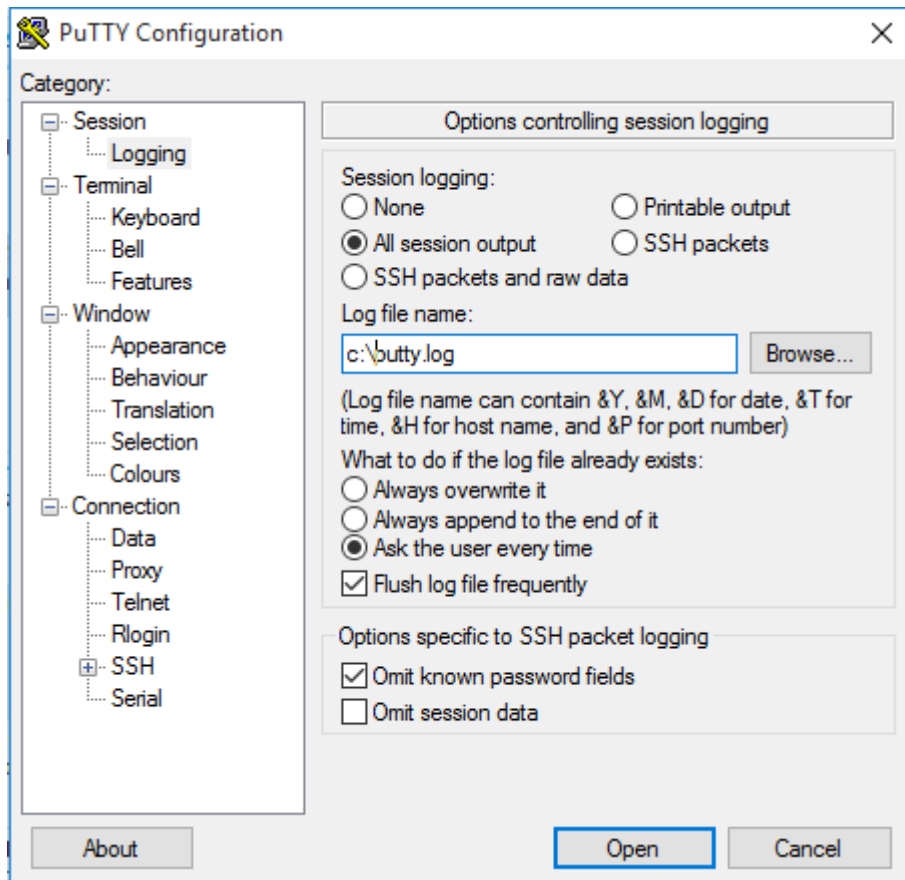
Use this task to obtain serial output log data if physical access to the server is not available. If you are using a PCIe Expansion Card, you can enable debug collection from the card.



Procedure

1. During POST press **F9** to enter **System Utilities**.
2. From the System Utilities screen, select **System Configurations > BIOS/Platform Configuration (RBSU) > Advanced Options > Advanced Debug Options**.
3. Set the debug level.
 - a. Select **UEFI Serial Debug Level**.
 - b. Select **Medium Verbosity**.
4. If you are using an expansion card, enable debug data collection from the expansion card:
 - a. Select **POST Verbose Boot Progress**.
 - b. Select either **Serial Only** or **All**.
5. Save and exit System Utilities.
6. Open an iLO Virtual Serial Port (VSP) session.
7. Use a utility, such as PuTTY, to establish the connection and ensure that you enable logging to a file (select **All session output**).

The following example shows sample PuTTY settings for logging data:



More information

[Launching the System Utilities](#)



Setting the Date and Time

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Date and Time**.
2. Select a setting, and then complete your entry.
 - **Date (mm-dd-yyyy)**—Enter the date in a month-day-year (mm-dd-yyyy) format.
 - **Time (hh:mm:ss)** —Enter the time in a 24-hours format (hh:mm:ss) format.
 - **Hour Format** —Enter the hour in 12 and 24-hours format.
 - **Time Format**
 - **Coordinated Universal Time (UTC)**—Calculates the time stored in the hardware Real Time Clock (RTC) from the associated **Time Zone** setting.
 - **Local Time**—Removes the use of the **Time Zone** setting.

This option is useful for addressing interaction issues between Windows operating systems set in Legacy BIOS boot mode.
 - **Time Zone**—Select your current time zone for the system.
 - **Daylight Savings Time**
 - **Enabled**—Adjusts the local time displayed by one hour for Daylight Savings Time.
 - **Disabled**—Does not adjust the local time displayed for Daylight Savings Time.
3. Save your settings.

NOTE: The hour format option is only supported in ProLiant Gen10 Plus servers.

Changing Backup and Restore settings

Backup files include serial numbers and product ID information. When you restore from a backup, you are prompted whether you want to apply this information to the system or not. If you are using the backup to set up a new system, you can skip restoring the serial number and product ID.

To change device encryption settings, go to **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Device Encryption Options > Device Encryption Migration Options**.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Default Options > Backup and Restore Settings**.
2. Select one of the following:
 - a. **Backup**
 - b. **Restore**
3. Follow the instructions to navigate to the location of a backup file, or where you want to create a backup file.

NOTE: If you are restoring a backup, the backup file must be a `.json` or `.zip` file.

4. Click **Start Operation**.

Resetting system defaults

Restoring default system settings

Use the **Restore Default System Settings** option to reset all BIOS configuration settings to their default values and immediately and automatically restart the server.

Selecting this option resets all platform settings except:

- **Secure Boot** BIOS settings
- **Date and Time** settings
- Primary and redundant **ROM Selection** (if supported)

To save a custom default configuration to use during a system restore, use **User Default Options**. Doing so saves settings you might otherwise lose.

- Other entities, such as option cards or iLO, that must be individually reset.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Default Options > Restore Default System Settings**.
2. Select **Yes, restore the default settings**.
3. Reboot the server.

Restoring default manufacturing settings

Use the **Restore Default Manufacturing Settings** option to reset all BIOS configuration settings to their default manufacturing values and delete all UEFI non-volatile variables, such as boot configuration and Secure Boot security keys (if Secure Boot is enabled). Previous changes that you have made might be lost.

The difference between this action and the **Restore Default System Settings** option is that **Restore Default Manufacturing Settings** erases all UEFI variables. An OS can write UEFI variables that store such things as entries in the boot order and key database information for Secure Boot. When you **Restore Default Manufacturing Settings**, this information is cleared, whereas it is retained when you **Restore Default System Settings**.

To save a custom default configuration to use during a system restore, use **User Default Options**. Doing so saves settings you might otherwise lose.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Default Options > Restore Default Manufacturing Settings**.
2. Select **Yes, restore the default settings**.
3. Reboot the server.



Changing the default UEFI device priority

Use the **Default UEFI Device Priority** option to change the UEFI device priority that is used when default system settings are restored. The initial UEFI Boot Order list is created based on the priorities defined in this option. When the default configuration settings are loaded, the settings from the saved **Default UEFI Device Priority** list are used instead of the system or factory defaults.

Prerequisites

User Default Options are configured and saved.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Default Options > Default UEFI Device Priority**.
2. Select an entry.
3. Use the **+** key to move the entry higher in the list. Use the **-** key to move it lower in the list. Use your pointing device or the arrow keys to navigate the list.
4. Save your settings.

Saving or erasing user default options

Use **User Default Options** to save or erase a configuration as the custom default configuration. Configure the system as necessary and then enable this option to save the configuration as the default configuration. When the system loads the default settings, the custom default settings are used instead of the manufacturing defaults.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Default Options > User Default Options**.
2. Select an option.
 - **Save User Defaults**
 - **Yes, Save**—Saves the current settings as the system default settings.
 - **No, Cancel**—Does not save the current settings as the system default settings.
 - **Erase User Defaults**
 - **Yes, erase the current settings**—Erases (deletes) the current user-defined default settings. Once deleted, you can only restore these settings manually.
 - **No, Cancel**—Does not erase the current user-defined default settings
3. Save your setting.



Using scripted configuration flows

Scripted configuration flow

You can use BIOS/Platform Configuration (RBSU) with the RESTful API Tool to create standard server configuration scripts to automate many of the manual steps in the server configuration process.

iLO RESTful API support for UEFI

ProLiant servers and HPE Synergy compute modules include support for configuring UEFI BIOS settings using the RESTful API. The RESTful API Tool is a management interface that server management tools can use to perform server configuration, inventory, and monitoring. A REST client uses HTTPS operations to configure supported server settings, such as iLO 5 and UEFI BIOS settings. For more information about the RESTful API and the RESTful Interface Tool, see the Hewlett Packard Enterprise website (<https://www.hpe.com/info/restfulinterface/docs>).

Configuration Replication Utility (CONREP)

CONREP is included in the STK and is a utility that operates with the BIOS/Platform Configuration (RBSU) to replicate hardware configuration. This utility is run during State 0, Run Hardware Configuration Utility when performing a scripted server deployment. CONREP reads the state of the system environment variables to determine the configuration and then writes the results to an editable script file. This file can then be deployed across multiple servers with similar hardware and software components. You can find the STK on the Hewlett Packard Enterprise website (<https://www.hpe.com/servers/stk>). For more information, see the *Scripting Toolkit User Guide* for your operating system environment on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/stk/docs>).

HPE Smart Storage Administrator (HPE SSA)

HPE SSA Scripting is a standalone application that is distributed with the HPE SSA CLI application and is used for configuring arrays on Smart Array devices.

- *Scripting Toolkit for Windows User Guide*
https://www.hpe.com/support/STK_Windows_UG_en
- HPE SSA guides
<https://www.hpe.com/info/smartstorage/docs>



Troubleshooting

Cannot boot devices

Symptom

You see a message that the option or device you want to boot cannot be found, or it is listed in the system configuration as an unknown device.

Solution 1

Cause

You are attempting to boot to an option that does not have a UEFI Option ROM driver.

Action

1. Verify that your option card has a UEFI option driver (Option ROM) that supports either x64 or EFI Byte Code for boot functionality.

NOTE:

- UEFI drivers do not display messages on the System Utilities screen or provide function key prompts.
- If you replace the motherboard, UEFI variables are lost.
- You must configure PXE servers with a boot image. For x64 EFI machines, you must also configure the DHCP server to support x64 EFI DHCP boot requests. For more information, see the UEFI Information Library: <https://www.hpe.com/info/ProLiantUEFI/docs>

-
2. Retry the boot procedure.

Solution 2

Cause

You are attempting to boot to an option that is not supported or is not running the latest firmware.

Action

1. Refer to the Quick Specs or Read This First card for your server to make sure that your card is supported before you install it. Although third-party option cards might work, they are not optimized for servers running UEFI System Utilities.
2. Verify that the correct information is listed in the System Health settings for the option.
3. If necessary, use the latest SPP in offline mode to upgrade the firmware to the latest version.

Solution 3

Cause

Your default boot mode settings are different than your user-defined settings.



Action

1. Use **User Default Options** to save a custom default configuration to use during a system restore.
2. Retry the boot procedure.

Cannot restore system defaults

Symptom

- After moving a drive from one server to another in Windows, you see an error message that certain settings cannot be found.
- After replacing a motherboard, you lose your configuration settings, such as Secure Boot.

Cause

Moving drives and replacing system hardware can disrupt pointers to previously configured settings.

Action

1. Use the **Restore Default System Settings** option, or the **Restore Default Manufacturing Settings** option to restore your settings.
2. Retry the procedure.

Cannot download the file in the network boot URL

Symptom

You see an error message when you try to download the file in the URL you specified for a network boot.

Solution 1

Cause

The network URL you specified during static configuration are incorrect.

Action

1. Use the Embedded UEFI Shell `ping` command to check the network connection. See “Ping” in the UEFI Shell user guide.
2. Change your static network connection settings and try to download the file in URL again.

Solution 2

Cause

The DHCP server did not respond.



Action

1. Ensure that there is a DHCP server available and it is operational.
2. Try to download the file in the URL again.

Solution 3

Cause

No cable is connected to the selected NIC port.

Action

1. Ensure that there is a cable connection.
2. Try to download the URL again.

Solution 4

Cause

The file is incorrect or not present on the server, or it cannot be downloaded due to insufficient privileges. Check the file name and that it exists on the server. Make sure that you have admin privileges on the server.

Action

1. Ensure that the file is present, and that you are using the correct file name and have sufficient privileges to download it.
2. Try to download the file in the URL again.

Solution 5

Cause

The HTTP or FTP server is down or did not respond.

Action

1. Ensure that the HTTP or FTP server you specified is available and that it is operational.
2. Try to download the file in the URL again.

Cannot network boot with the downloaded image file

Symptom

Booting from the image specified in the URL fails.

Solution 1

Cause

The image is not signed and **Secure Boot** is enabled.



Action

1. Ensure that the image is signed and that its Secure Boot settings are correct.
2. Try to download the file in the URL again.

Solution 2

Cause

The downloaded file is corrupt.

Action

1. Select a new file.
2. Repeat the URL configuration, specifying the new file.
3. Try to download the new file in the URL.

Cannot deploy from the UEFI Shell script

Symptom

You attempted to deploy an OS using the UEFI Shell script and you see an error message that the deployment failed.

Cause

Configuration settings are not correct.

Action

1. Verify the following.
 - a. The Embedded UEFI Shell interface is added to the **UEFI Boot Order** list or the **One-Time Boot Menu**.
 - b. When added to the **UEFI Boot Order** list, the Embedded UEFI Shell interface is the first boot option in the **UEFI Boot Order** list so that it overrides other boot options to load.
 - c. UEFI Shell Script Auto-Start is enabled.
 - d. The correct `startup.nsh` script file location in attached media or a network location is specified. If it is in attached media, the `startup.nsh` script must be either inside the `fsX:\` or the `fsX:\efi\boot\` directory.
 - e. The `.nsh` script only contains supported commands.
 - f. Your system has enough RAM memory to create RAM disks during automated script execution.
 - g. Any OS boot loader or diagnostics application launched using the `.nsh` script is supported to run in UEFI the environment.
 - h. If the shell script verification is enabled, ensure the script is enrolled in the Secure Boot database and that the script starts with the line `#!NSH`.
2. Try the deployment again.



Cannot execute Option ROM for one or more devices

Symptom

You cannot execute Option ROM for one or more devices.

Cause

The amount of available Option ROM space has been exceeded.

Action

1. Disable any unnecessary option ROMs (such as PXE).
2. Retry the procedure.

Cannot find a new network or storage device in the Boot Order list

Symptom

You connected a network or storage device, and it does not appear in the Boot Order list.

Cause

Newly-added devices do not appear in the boot order list until you reboot the system.

Action

1. Reboot the system.
2. Verify that your device appears in the Boot Order list.

Intel TXT is not working properly

Cause

One of the prerequisites may not be enabled.

Action

- Verify that the prerequisites are enabled:
 - All Intel processor cores
 - Hyperthreading



- VT-d
- TPM

Invalid Server Serial Number and Product ID

Symptom

You see an error message that the Server Serial Number and Product ID are invalid, corrupted, or lost.

Cause

The serial number, product ID, or both, are invalid, corrupted, or lost.

Action

1. Enter the correct values for these fields.
2. Verify that the error message does not appear again.

Invalid time or date

Symptom

You see a message stating that the time and date is not set.

Cause

The time or date in the configuration memory is invalid.

Action

1. Use the Date and Time option to change the settings.
2. Verify that the message does not appear again.

Networking devices are not functioning properly

Cause

Only networking devices on the list of supported server options should be used.

Action

Hewlett Packard Enterprise recommends that networking devices be updated to the latest version of firmware before they are used in the server. Before installing the operating system, use the latest Service Pack for ProLiant in Offline mode to upgrade the firmware to the latest version.



NOTE: If the default boot mode settings are different than the user-configured settings, the system might not boot the OS installation when the defaults are restored. To avoid this issue, use the User Default Options feature in UEFI System Utilities to override the factory default settings.

System unresponsive

Cause

There is a mis-configured or malfunctioning PCIe expansion card.

Action

Enable PCIe debug information collection to identify the problem card.

Single Device Failure

Symptom

Boot failure during POST.

Action

If the server does not boot, refer "POST issues-Boot, no video flowchart" in the [Troubleshooting Guide for HPE ProLiant Gen10 and Gen10 Plus servers](#)

Server will not boot

Cause

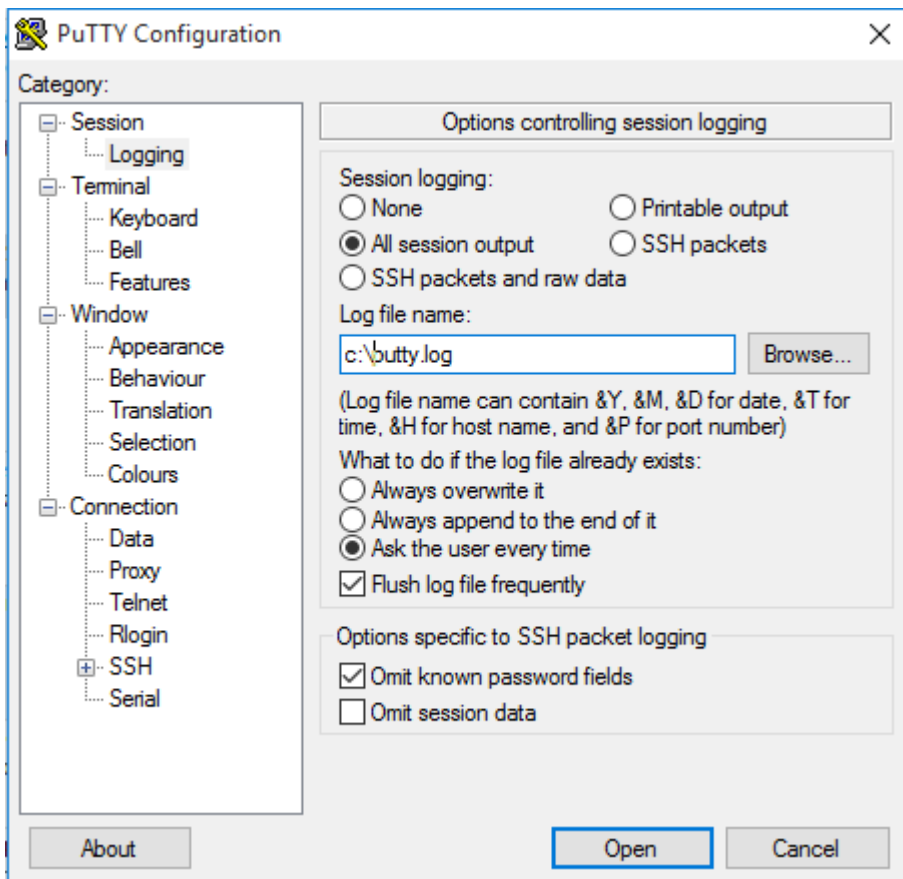
Enable serial debug with the maintenance switch.

Action

1. Power off the server.
2. Locate the Server Maintenance Switch (12 position switch) and set DIP 4 to the ON position. Refer to the chassis hood label for details on the location of the switch.
3. Attach a NULL mode cable to the server serial port or open an iLO Virtual Serial Port (VSP) session.
4. Use a utility, such as PuTTY, to establish the connection and ensure that you enable logging to a file (select **All session output**).

The following example shows sample PuTTY settings for logging data:





Smart Array controllers are not functioning properly

Cause

Other Smart Array controllers are not supported and will not function properly.

For more information on supported options, see the server QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/qs>).

For more information on the latest firmware and driver versions, see the Hewlett Packard Enterprise website (<https://www.hpe.com/support/hpesc>).

Action

Hewlett Packard Enterprise recommends that Smart Array controllers be updated to the latest version of firmware before they are used in the server. Before installing the operating system, use the latest Service Pack for ProLiant in Offline mode to upgrade the firmware to the latest version.

VMware not booting in UEFI mode

Cause

UEFI Optimized Boot is not enabled.



Action

Enable UEFI Optimized Boot.



Websites, support, and other resources

Websites

General websites

Hewlett Packard Enterprise Information Library

www.hpe.com/info/EIL

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

www.hpe.com/storage/spock

Storage white papers and analyst reports

www.hpe.com/storage/whitepapers

UEFI Specification

www.uefi.org/specifications

UEFI Learning Resources

www.uefi.org/learning_center

RESTful API Tool

<https://www.hpe.com/info/redfish>

Contact Hewlett Packard Enterprise Worldwide

<https://www.hpe.com/assistance>

Subscription Service/Support Alerts

<https://www.hpe.com/support/e-updates>

Software Depot

<https://www.hpe.com/support/softwaredepot>

Customer Self Repair

<https://www.hpe.com/support/selfrepair>

Insight Remote Support

<https://www.hpe.com/info/insightremotesupport/docs>

For additional websites, see [Support and other resources](#).

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:
<https://www.hpe.com/info/assistance>
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:
<https://www.hpe.com/support/hpesc>



Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

- To download product updates:

Hewlett Packard Enterprise Support Center

<https://www.hpe.com/support/hpesc>

Hewlett Packard Enterprise Support Center: Software downloads

<https://www.hpe.com/support/downloads>

My HPE Software Center

<https://www.hpe.com/software/hpesoftwarecenter>

- To subscribe to eNewsletters and alerts:

<https://www.hpe.com/support/e-updates>

- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

<https://www.hpe.com/support/AccessToSupportMaterials>

-
- !** **IMPORTANT:** Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HPE Passport set up with relevant entitlements.
-

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

Remote support and Proactive Care information

HPE Get Connected

<https://www.hpe.com/services/getconnected>

HPE Proactive Care services

<https://www.hpe.com/services/proactivecare>

HPE Datacenter Care services

<https://www.hpe.com/services/datacentercare>

HPE Proactive Care service: Supported products list

<https://www.hpe.com/services/proactivecaresupportedproducts>

HPE Proactive Care advanced service: Supported products list

<https://www.hpe.com/services/proactivecareadvancedsupportedproducts>

Proactive Care customer information

Proactive Care central

<https://www.hpe.com/services/proactivecarecentral>

Proactive Care service activation

<https://www.hpe.com/services/proactivecarecentralgetstarted>

Warranty information

To view the warranty information for your product, see the links provided below:

HPE ProLiant and IA-32 Servers and Options

<https://www.hpe.com/support/ProLiantServers-Warranties>

HPE Enterprise and Cloudline Servers

<https://www.hpe.com/support/EnterpriseServers-Warranties>

HPE Storage Products

<https://www.hpe.com/support/Storage-Warranties>

HPE Networking Products

<https://www.hpe.com/support/Networking-Warranties>

Regulatory information

To view the regulatory information for your product, view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the Hewlett Packard Enterprise Support Center:

<https://www.hpe.com/support/Safety-Compliance-EnterpriseProducts>

Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:

<https://www.hpe.com/info/reach>

For Hewlett Packard Enterprise product environmental and safety information and compliance data, including RoHS and REACH, see:

<https://www.hpe.com/info/ecodata>

For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

<https://www.hpe.com/info/environment>

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of



the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.





SPEC® CPU2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_fp_base = 118

SPECrate2017_fp_peak = Not Run

CPU2017 License: 3

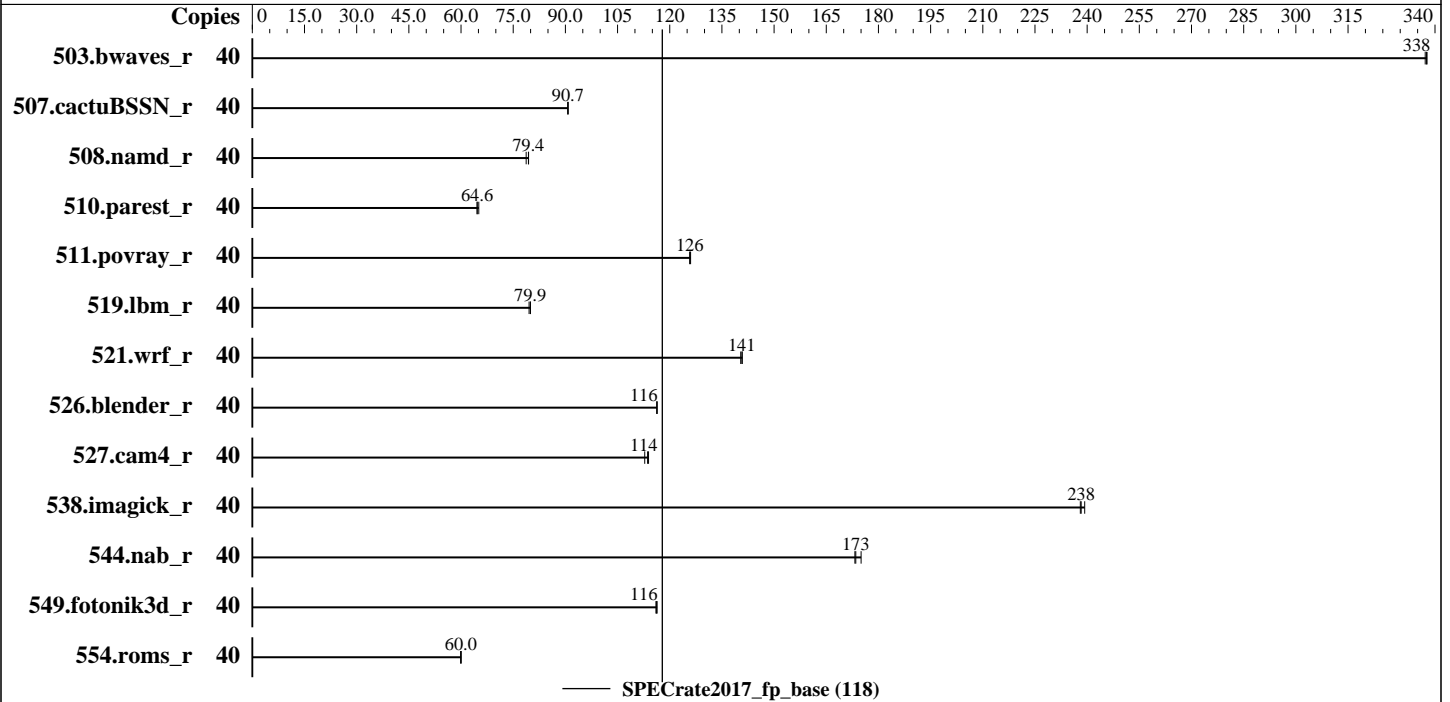
Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019



Hardware

CPU Name: Intel Xeon Silver 4210
 Max MHz.: 3200
 Nominal: 2200
 Enabled: 20 cores, 2 chips, 2 threads/core
 Orderable: 1, 2 chip(s)
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 13.75 MB I+D on chip per chip
 Other: None
 Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933V-R, running at 2400)
 Storage: 1 x 400 GB SAS SSD, RAID 0
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 (x86_64)
 Kernel 4.12.14-23-default
 Compiler: C/C++: Version 19.0.2.187 of Intel C/C++
 Compiler Build 20190117 for Linux;
 Fortran: Version 19.0.2.187 of Intel Fortran
 Compiler Build 20190117 for Linux
 Parallel: No
 Firmware: HPE BIOS Version U32 02/02/2019 released Apr-2019
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_fp_base = 118

SPECrate2017_fp_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	40	1190	337	1188	338	1188	338							
507.cactuBSSN_r	40	558	90.7	558	90.7	558	90.8							
508.namd_r	40	479	79.4	479	79.4	483	78.7							
510.parest_r	40	1607	65.1	1619	64.6	1619	64.6							
511.povray_r	40	743	126	743	126	741	126							
519.lbm_r	40	527	80.0	530	79.6	527	79.9							
521.wrf_r	40	637	141	638	140	636	141							
526.blender_r	40	524	116	524	116	524	116							
527.cam4_r	40	616	114	614	114	620	113							
538.imagick_r	40	418	238	417	238	416	239							
544.nab_r	40	389	173	388	173	385	175							
549.fotonik3d_r	40	1343	116	1340	116	1341	116							
554.roms_r	40	1060	60.0	1061	59.9	1059	60.0							

SPECrate2017_fp_base = 118

SPECrate2017_fp_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3 > /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
```

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_fp_base = 118

SPECrate2017_fp_peak = Not Run

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

General Notes (Continued)

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Platform Notes

BIOS Configuration:

Thermal Configuration set to Maximum Cooling

Memory Patrol Scrubbing set to Disabled

LLC Prefetch set to Enabled

LLC Dead Line Allocation set to Disabled

Enhanced Processor Performance set to Enabled

Workload Profile set to General Throughput Compute

Workload Profile set to Custom

Energy/Performance Bias set to Balanced Performance

sysinfo program /home/cpu2017_u2/bin/sysinfo

Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

running on linux-nub3 Sun Apr 7 10:35:51 2019

SUT (System Under Test) info as seen by some common utilities.

For more information on this section, see

<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz

2 "physical id"s (chips)

40 "processors"

cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

cpu cores : 10

siblings : 20

physical 0: cores 0 1 2 3 4 8 9 10 11 12

physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:

Architecture: x86_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 40

On-line CPU(s) list: 0-39

Thread(s) per core: 2

Core(s) per socket: 10

Socket(s): 2

NUMA node(s): 2

Vendor ID: GenuineIntel

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

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SPECrate2017_fp_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Platform Notes (Continued)

```

CPU family:          6
Model:               85
Model name:         Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz
Stepping:           6
CPU MHz:             2200.000
BogoMIPS:           4400.00
Virtualization:     VT-x
L1d cache:          32K
L1i cache:          32K
L2 cache:           1024K
L3 cache:           14080K
NUMA node0 CPU(s): 0-9,20-29
NUMA node1 CPU(s): 10-19,30-39
Flags:              fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault
epb cat_l3 cdp_l3 invpcid_single intel_ppin mba tpr_shadow vnmi flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
ibpb ibrs stibp dtherm ida arat pln pts pku ospke avx512_vnni arch_capabilities ssbd

```

```

/proc/cpuinfo cache data
cache size : 14080 KB

```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```

available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 20 21 22 23 24 25 26 27 28 29
node 0 size: 193090 MB
node 0 free: 192687 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
node 1 size: 193531 MB
node 1 free: 193205 MB
node distances:
node  0  1
 0:  10  21
 1:  21  10

```

```

From /proc/meminfo
MemTotal:      395900040 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

(Continued on next page)



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SPECrate2017_fp_peak = Not Run

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

Platform Notes (Continued)

From /etc/*release* /etc/*version*

os-release:

```
NAME="SLES"
VERSION="15"
VERSION_ID="15"
PRETTY_NAME="SUSE Linux Enterprise Server 15"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"
```

uname -a:

```
Linux linux-nub3 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

```
CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation,
IBPB, IBRS_FW
```

run-level 3 Apr 7 10:33

SPEC is set to: /home/cpu2017_u2

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdal xfs 373G 94G 279G 26% /home
```

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HPE U32 02/02/2019

Memory:

24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

=====
CC 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
=====

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

(Continued on next page)



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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Compiler Version Notes (Continued)

=====
CXXC 508.namd_r(base) 510.parest_r(base)
=====

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

=====
CC 511.povray_r(base) 526.blender_r(base)
=====

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

=====
FC 507.cactuBSSN_r(base)
=====

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

=====
FC 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
=====

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

=====
CC 521.wrf_r(base) 527.cam4_r(base)
=====

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)

(Continued on next page)



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SPECrate2017_fp_peak = Not Run

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

Compiler Version Notes (Continued)

64, Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using both C and C++:

```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

Base Portability Flags

```
503.bwaves_r: -DSPEC_LP64  
507.cactuBSSN_r: -DSPEC_LP64  
508.namd_r: -DSPEC_LP64  
510.parest_r: -DSPEC_LP64  
511.povray_r: -DSPEC_LP64  
519.lbm_r: -DSPEC_LP64  
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian  
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char  
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG  
538.imagick_r: -DSPEC_LP64  
544.nab_r: -DSPEC_LP64  
549.fotonik3d_r: -DSPEC_LP64  
554.roms_r: -DSPEC_LP64
```



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CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

Base Optimization Flags

C benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte
```

Benchmarks using both C and C++:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4
```

Benchmarks using Fortran, C, and C++:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revJ.html>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-03.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revJ.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-03.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-04-07 01:05:50-0400.

Report generated on 2019-05-30 16:20:30 by CPU2017 PDF formatter v6067.

Originally published on 2019-05-03.



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(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_int_base = 110

SPECrate2017_int_peak = Not Run

CPU2017 License: 3

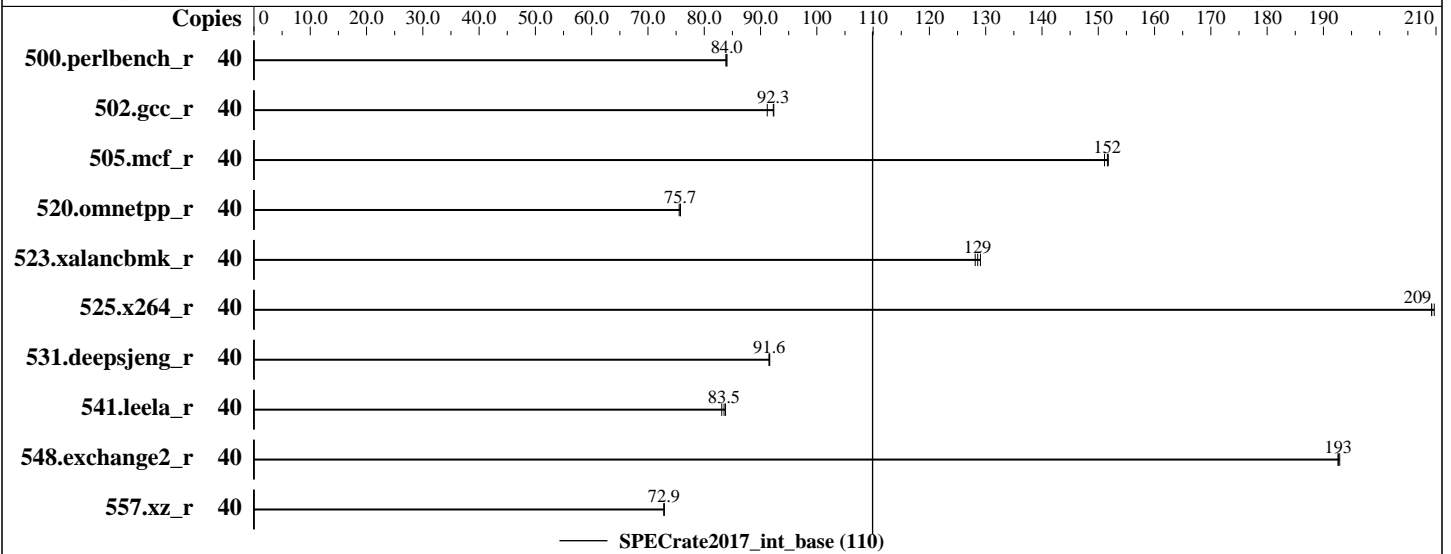
Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019



Hardware

CPU Name: Intel Xeon Silver 4210
 Max MHz.: 3200
 Nominal: 2200
 Enabled: 20 cores, 2 chips, 2 threads/core
 Orderable: 1, 2 chip(s)
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 13.75 MB I+D on chip per chip
 Other: None
 Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933V-R, running at 2400)
 Storage: 1 x 400 GB SAS SSD, RAID 0
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 (x86_64)
 Kernel 4.12.14-23-default
 Compiler: C/C++: Version 19.0.2.187 of Intel C/C++ Compiler Build 20190117 for Linux;
 Fortran: Version 19.0.2.187 of Intel Fortran Compiler Build 20190117 for Linux
 Parallel: No
 Firmware: HPE BIOS Version U32 02/02/2019 released Apr-2019
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None



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(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

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SPECrate2017_int_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	40	760	83.8	758	84.0	758	84.0							
502.gcc_r	40	613	92.4	621	91.2	614	92.3							
505.mcf_r	40	426	152	426	152	428	151							
520.omnetpp_r	40	695	75.5	693	75.7	693	75.8							
523.xalancbmk_r	40	329	129	327	129	330	128							
525.x264_r	40	335	209	334	210	335	209							
531.deepsjeng_r	40	500	91.6	501	91.5	501	91.6							
541.leela_r	40	797	83.1	793	83.5	791	83.8							
548.exchange2_r	40	544	193	544	193	543	193							
557.xz_r	40	593	72.9	593	72.9	593	72.8							

SPECrate2017_int_base = 110

SPECrate2017_int_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3 > /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
```

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)

(Continued on next page)



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ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_int_base = 110

SPECrate2017_int_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

General Notes (Continued)

is mitigated in the system as tested and documented.

Platform Notes

BIOS Configuration:

Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Workload Profile set to General Throughput Compute
Workload Profile set to Custom
Energy/Performance Bias set to Balanced Performance
Sysinfo program /home/cpu2017_u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-nub3 Mon Apr 8 00:23:44 2019

SUT (System Under Test) info as seen by some common utilities.

For more information on this section, see
<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz
 2 "physical id"s (chips)
 40 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 10
siblings  : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:             Little Endian
CPU(s):                 40
On-line CPU(s) list:   0-39
Thread(s) per core:    2
Core(s) per socket:    10
Socket(s):              2
NUMA node(s):          2
Vendor ID:              GenuineIntel
CPU family:             6
Model:                  85
Model name:             Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz
```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

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ProLiant DL360 Gen10

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SPECrate2017_int_base = 110

SPECrate2017_int_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Platform Notes (Continued)

```
Stepping: 6
CPU MHz: 2200.000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0-9,20-29
NUMA node1 CPU(s): 10-19,30-39
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault
epb cat_l3 cdp_l3 invpcid_single intel_ppin mba tpr_shadow vnmi flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
ibpb ibrs stibp dtherm ida arat pln pts pku ospke avx512_vnni arch_capabilities ssbd
```

```
/proc/cpuinfo cache data
cache size : 14080 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 20 21 22 23 24 25 26 27 28 29
node 0 size: 193118 MB
node 0 free: 192706 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
node 1 size: 193502 MB
node 1 free: 193185 MB
node distances:
node  0  1
 0:  10  21
 1:  21  10
```

```
From /proc/meminfo
MemTotal: 395900040 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_int_base = 110

SPECrate2017_int_peak = Not Run

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

Platform Notes (Continued)

```

VERSION="15"
VERSION_ID="15"
PRETTY_NAME="SUSE Linux Enterprise Server 15"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"

```

uname -a:

```

Linux linux-nub3 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

CVE-2017-5754 (Meltdown):          Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation,
IBPB, IBRS_FW

```

run-level 3 Apr 8 00:21

SPEC is set to: /home/cpu2017_u2

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal       xfs   373G   94G  279G  26% /home

```

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HPE U32 02/02/2019

Memory:

24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

```

=====
CC 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
557.xz_r(base)
=====

```

```

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
=====

```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_int_base = 110

SPECrate2017_int_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Compiler Version Notes (Continued)

=====
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
541.leela_r(base)
=====

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

=====
FC 548.exchange2_r(base)
=====

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.20 GHz, Intel Xeon Silver 4210)

SPECrate2017_int_base = 110

SPECrate2017_int_peak = Not Run

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

Base Optimization Flags

C benchmarks:

```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
```

```
-qopt-mem-layout-trans=4
```

```
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
```

```
-lqkmallo
```

C++ benchmarks:

```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
```

```
-qopt-mem-layout-trans=4
```

```
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
```

```
-lqkmallo
```

Fortran benchmarks:

```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
```

```
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
```

```
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
```

```
-lqkmallo
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revJ.html>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-03.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revJ.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-03.xml>

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-04-07 14:53:43-0400.

Report generated on 2019-05-30 16:20:08 by CPU2017 PDF formatter v6067.

Originally published on 2019-05-03.

**Product Environmental Information Declaration
Form for
EU COMMISSION REGULATION No 2019/424**

SUBJECT: Product Environmental Information Declaration

DATE OF DECLARATION: 2020, February 29

Regulatory Reference:	COMMISSION REGULATION (EU) 2019/424 of 15 March 2019 laying down ecodesign requirements for servers and data storage products pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 617/2013
Product Type:	Rack Server, 2 socket
Manufacturer's Name:	Hewlett Packard Enterprise 6280 America Center Drive San Jose, CA 95002 United States of America Contact: sustainability@hpe.com for questions
Product Model Number:	Product Model: DL180 Gen10 RMN: TPS-F026
Year of Manufacture:	2017
Product Category:	Computer Server

Product Environmental Information Declaration Form for EU COMMISSION REGULATION No 2019/424

Number 1.1.1 and 1.1.2

Internal Power Supply efficiency and Power Factor.

Power Supplies- Platinum and Titanium. 3	Internal Power Supply Efficiency at 230 VAC					
	HPE P/S part number	10% load	20% load	50% load	100% load	PF @50% Load
500W FS Platinum 865408-B21	865399-201	88,83	92,37	94,26	93,02	1,000
500W FS Platinum 865408-B21	865399-101	88,85	92,87	94,52	93,70	1,000
500W FS Platinum 865408-B21	865399-501	89,20	92,29	94,60	93,78	1,000
800W FS Titanium 865438-B21	865436-101	93,00	95,28	96,20	94,48	1.000
800W FS Platinum 865414-B21	865412-101	89,12	93,06	94,39	92,93	1.000
800W FS Platinum 865414-B21	865412-201	90,77	93,24	94,60	92,78	1.000
800W FS Platinum 865414-B21	865412-301	89,94	93,40	94,48	92,68	1.000
800W FS Platinum 865414-B21	865412-501	89,33	93,02	94,43	92,81	1.000
800W FS Platinum 865414-B21	827498-101	86,82	91,89	94,39	93,48	1.000
1600W FS Platinum 830272-B21	830270-201	89,42	92,59	94,28	92,89	1,000
1600W FS Platinum 830272-B21	830270-301	90,53	93,76	94,97	93,09	1,000

Product Environmental Information Declaration Form for EU COMMISSION REGULATION No 2019/424

Number 1.2.3 - Firmware

1.2.3 From 1 March 2021, the latest available version of the firmware shall be made available from two years after the placing on the market of the first product of a certain product model for a minimum period of eight years after the placing on the market of the last product of a certain product model, free of charge or at a fair, transparent and non-discriminatory cost. The latest available security update to the firmware shall be made available from the time a product model is placed on the market until at least eight years after the placing on the market of the last product of a certain product model, free of charge.

a) Firmware and security update availability	Specific security issues, resolved in firmware, are identified in the documentation that accompanies the release of each firmware revision. HPE product support, and firmware, are available from the HPE Support Center .
----------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Number 2 SPECIFIC ECODESIGN REQUIREMENTS ONLY FOR SERVERS WITH ONE OR TWO PROCESSOR SOCKETS

2.0- Lot 9- SERT Test Results

2.1. Idle state power

2.2. Active state efficiency

SERT Test Results

Product & Configuration	Power Efficiency					
DL180 Gen 10 2P Rack Server	ETSI EN 303 470 V1.1.1 (2019-03)- Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for servers					
System Configuration- High Performance (2) Gold 6252 Processor 2.1 GHz 28 core (12) 32GB memory DIMMS 2933 384GB (2) 1.92TB SATA Drive (1) HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply System Configuration- Low Performance (2) Bronze 3204 Processor 1.9 GHz 6 core	Test System	CPU Populated	Active	Idle Watts	Idle Calculated Watts	Idle 35 C Watts
	High Performance	CPU Populated 1	33,5	54,5	127,98	58,1
	Low Performance	CPU Populated 1	12,4	52,7	62,83	60,4
	High Performance	CPU populated 2	32	71,2	202,81	80,3
	Low Performance	CPU populated 2	14,9	64,9	113,54	76,9

Product Environmental Information Declaration Form for EU COMMISSION REGULATION No 2019/424

<p>(12) 16GB memory DIMMS 2666 192GB (2) 1.0TB SATA Drive (1) HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply</p>	<p style="text-align: center;">Idle must be lower than the calculated limit to pass. As described in 2.1 of regulation. Active results must be higher than what is in 2.2 Table 5 of regulation</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Number 3.1- for Servers

3.1. From 1 March 2020, with the exception of custom made servers, made on a one-off basis, the following product information on servers shall be provided in the instruction manuals for installers and end-users (when present with the product), and on the free-access websites of manufacturers, their authorized representatives and importers from the time a product model is placed on the market until at least eight years after the placing on the market of the last product of a certain product model:

a) product type;	Rack Server, 2 socket
(b) manufacturer's name, registered trade name and registered trade address at which they can be contacted;	Hewlett Packard Enterprise 6280 America Center Drive San Jose, CA 95002 United States of America
(c) product model number, and if applicable the low-end performance configuration and the high-end performance configuration model numbers;	DL180 Gen10
(d) year of manufacture;	2017
(e) PSU efficiency at 10 % (if applicable), 20 %, 50 % and 100 % of rated output power, with the exception of direct current servers, expressed in % and rounded to the first decimal place;	See PS Efficiency Form above
(f) power factor at 50 % of the rated load level, with the exception of direct current servers, rounded to three decimal places;	See PS Efficiency Form above
(g) PSU rated power output (Watts), rounded to the nearest integer. If a product model is part of a server product family, all PSUs offered in a server product family shall be reported with the information specified in (e) and (f);	See PS Efficiency Form 1 above

Product Environmental Information Declaration Form for EU COMMISSION REGULATION No 2019/424

(h) idle state power, expressed in Watts and rounded to the first decimal place;	See SERT Test Results above
(i) list of all components for additional idle power allowances, if any (additional PSU, HDDs or SSDs, additional memory, additional buffered DDR channels, additional I/O devices).	See SERT Test Results above
(j) maximum power, expressed in Watts and rounded to the first decimal place;	See PS Efficiency Form above
(k) declared operating condition class, as detailed in Table 6;	Declare Operating Condition Class A2 (10-35 C).
(l) idle state power (Watts) at the higher boundary temperature of the declared operating condition class;	See SERT Test Results above
(m) the active state efficiency and the performance in active state of the server;	See SERT Test Results above
(n) information on the secure data deletion functionality referred to in point 1.2.2 of this Annex, including instructions on how to use the functionality, the techniques used and the supported secure data deletion standard(s), if any;	Web Link to Secure deletion document here
(o) for blade servers, a list of recommended combinations with compatible chassis;	if applicable
(p) if a product model is part of a server product family, a list of all model configurations that are represented by the model shall be supplied. If a product model is part of a server product family, the product information required for items e) to m) under point 3.1 shall be reported for the low-end and high-end performance configurations of the server product family.	See SERT Test Results above

Number 3.3- for servers and online data storage products

3.3. From 1 March 2020, the following product information on servers and online data storage products shall be made available from the time a product model is placed on the market until at least eight years after the placing on the market of the last product of a certain product model free of charge by manufacturers, their authorized representatives and importers to third parties dealing with maintenance, repair, reuse, recycling and upgrading of servers (including brokers, spare parts repairers, spare parts providers, recyclers and third party maintenance) upon registration by the interested third party on a website provided

<p>3.3 (a) indicative weight range (less than 5 g, between 5 g and 25 g, above 25 g) at component level, of the following critical raw materials:</p> <p>(a) Cobalt in the batteries;</p> <p>(b) Neodymium in the HDDs</p>	<p>Cobalt in the batteries here</p> <p>Neodymium in the HDDs here</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------

**Product Environmental Information Declaration
Form for
EU COMMISSION REGULATION No 2019/424**

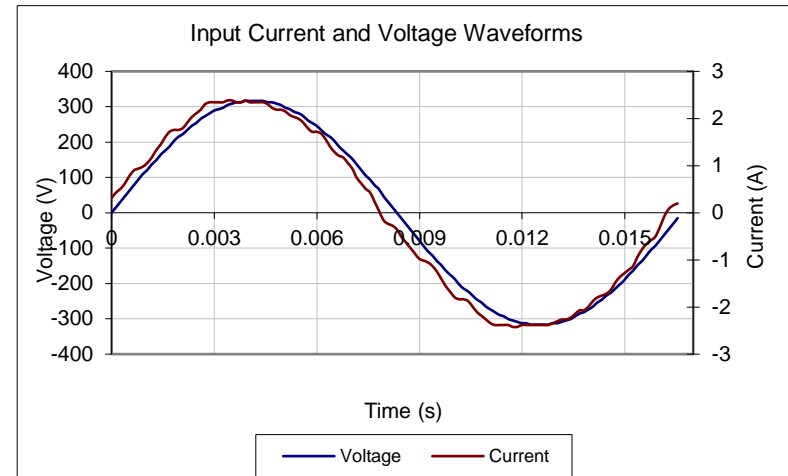
<p>3.3 (b) instructions on the disassembly operations referred to in point 1.2.1 of this Annex, including, for each necessary operation and component: (a) the type of operation; (b) the type and number of fastening technique(s) to be unlocked; (c) the tool(s) required.</p>	<p>Web link to Maintenance and Service Guide here</p> <p>HPE ProLiant DL180 Gen10 Server - Document List here</p>

80 PLUS Verification and Testing Report

TYPICAL EFFICIENCY (50% Load):	94.60%
AVERAGE EFFICIENCY :	93.54%
80 PLUS COMPLIANT:	YES



ID Number	SO-1181
Manufacturer	Hewlett Packard Enterprise Company
Model Number	865412-201
Serial Number	N/A
Year	2016
Type	1U
Test Date	10/19/16



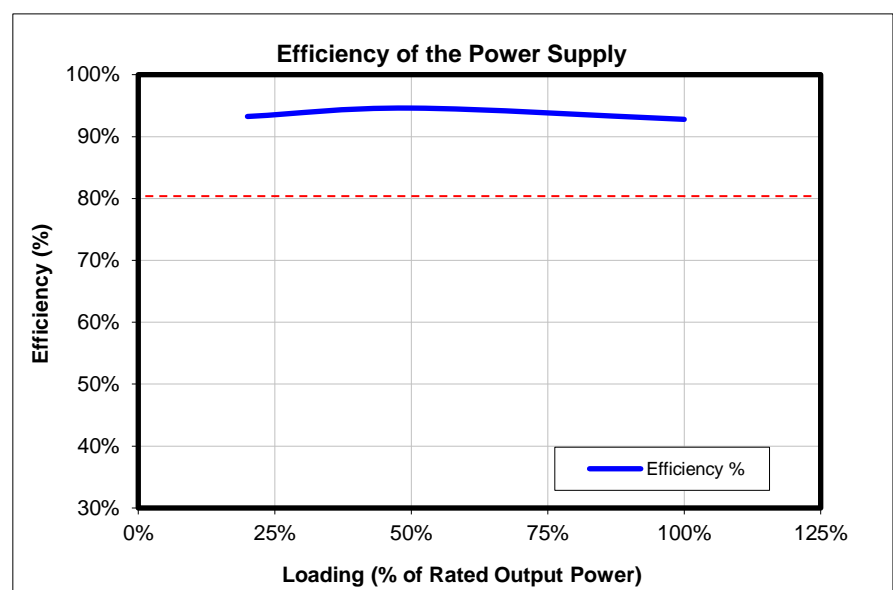
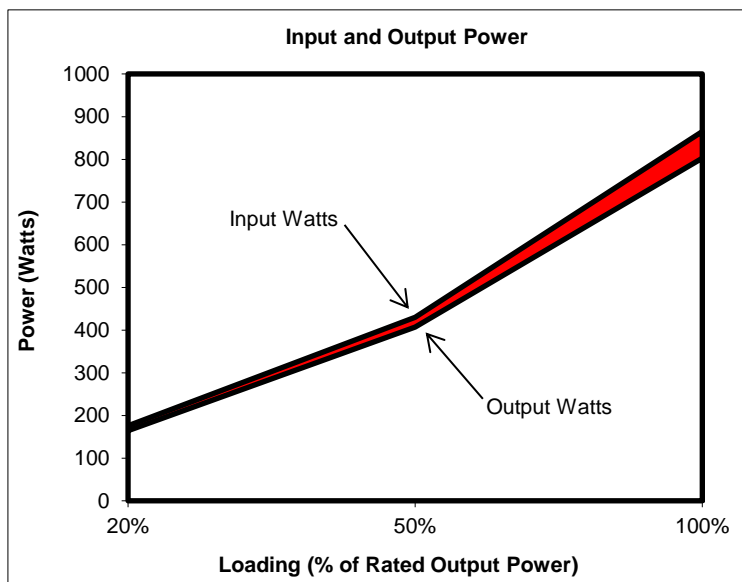
Input AC Current Waveform (ITHD = 3.45%, 50% Load)

Rated Specifications	Value	Units
Input Voltage	100-240	Volts
Input Current	9.4-4.5	Amps
Input Frequency	50-60	Hz
Rated Output Power	800	Watts

Note: All measurements were taken with input voltage at 230 V nominal and 60 Hz.

I _{RMS} A	PF	I _{THD} (%)	Load (%)	Fraction of Load	Input Watts	External Fan (W)*	DC Terminal Voltage (V)/ DC Load Current (A)		Output Watts	Efficiency %
							12V			
0.41	0.96	14.08	10%	Low	91	0.48	12.29/6.69		82	90.77%
0.78	0.98	5.59	20%	Light	176	0.48	12.27/13.37		164	93.24%
1.88	1.00	3.45	50%	Typical	430	0.60	12.18/33.41		407	94.60%
3.77	1.00	1.59	100%	Full	865	1.20	12.01/66.83		803	92.78%

* Fan power is not included in the efficiency calculations



These tests were conducted by a third party independent testing firm on behalf of the 80 PLUS® Program. 80 PLUS is a certification program to promote highly-efficient power supplies (greater than 80% efficiency in the active mode) in technology applications. <http://www.80plus.org/>

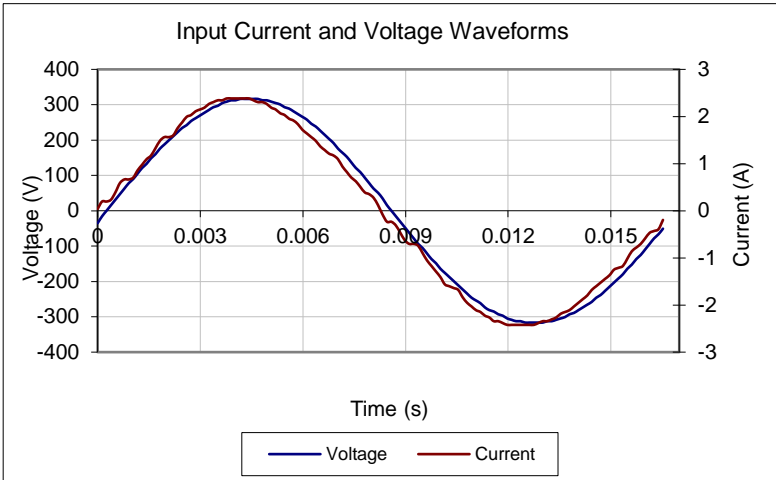


80 PLUS Verification and Testing Report

TYPICAL EFFICIENCY (50% Load):	94.43%
AVERAGE EFFICIENCY :	93.42%
80 PLUS COMPLIANT:	YES



ID Number	SO-1229
Manufacturer	Hewlett Packard Enterprise
Model Number	865412-501
Serial Number	CT:5WEBPX28J4909V
Year	2017
Type	1U
Test Date	01/27/17



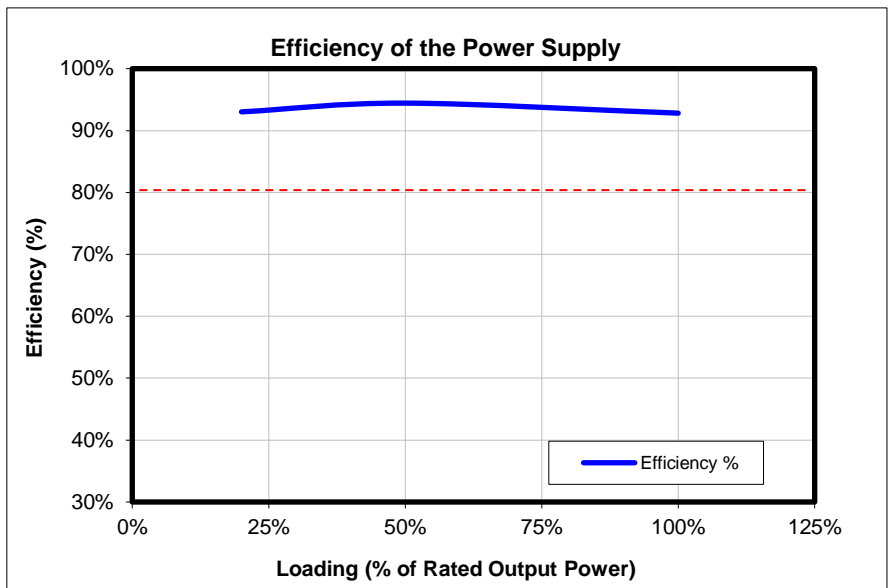
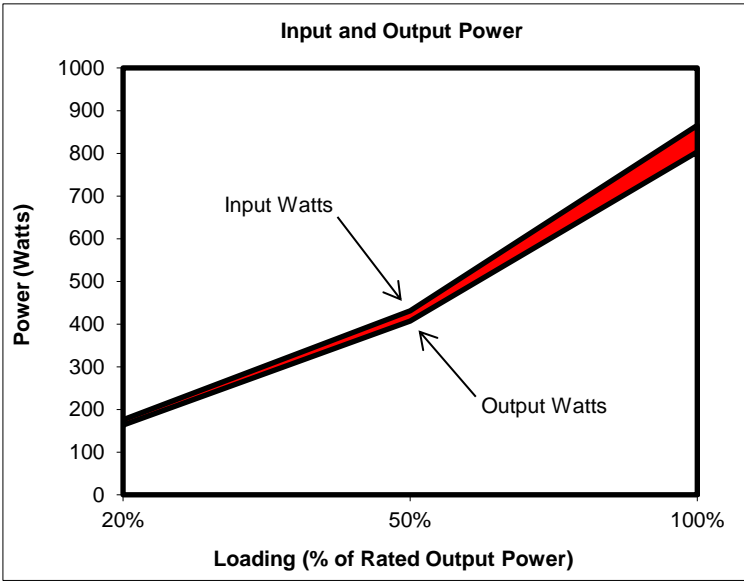
Input AC Current Waveform (ITHD = 3.98%, 50% Load)

Rated Specifications	Value	Units
Input Voltage	100-240	Volts
Input Current	9.4-4.5	Amps
Input Frequency	50-60	Hz
Rated Output Power	800	Watts

Note: All measurements were taken with input voltage at 230 V nominal and 60 Hz.

I _{RMS} A	PF	I _{THD} (%)	Load (%)	Fraction of Load	Input Watts	External Fan (W)*	DC Terminal Voltage (V)/ DC Load Current (A)		Output Watts	Efficiency %
							12V			
0.43	0.92	8.65	10%	Low	92	0.48	12.27/6.68		82	89.33%
0.79	0.96	5.62	20%	Light	176	0.48	12.25/13.37		164	93.02%
1.89	0.99	3.98	50%	Typical	431	0.48	12.17/33.42		407	94.43%
3.78	1.00	1.89	100%	Full	866	1.94	12.02/66.83		803	92.81%

* Fan power is not included in the efficiency calculations



These tests were conducted by a third party independent testing firm on behalf of the 80 PLUS® Program. 80 PLUS is a certification program to promote highly-efficient power supplies (greater than 80% efficiency in the active mode) in technology applications. <http://www.80plus.org/>





Hewlett Packard
Enterprise

HPE ACTIVE HEALTH SYSTEM

Server iLO Management



WHAT'S NEW

- New Capabilities enabled via Active Health System Viewer
- Read AHS logs
- Self-repair some server errors
- Firmware analysis, ability to read release notes and download firmware
- Raise Support cases

OVERVIEW

Troubleshooting server hardware issues taking too much time and information that could assist you in troubleshooting not captured? Myriad of tools and log files driving you crazy? HPE Active Health System is an essential component of the iLO Management Engine portfolio. It is an industry-first technology that provides continuous, proactive health monitoring of over 1600 system parameters. 100% of configuration changes are logged for more accurate problem resolution. SmartMemory and SmartDrive devices log failure information to accurately

document events and avoid inadvertent re-use of failed components. This enables customers to start problem analysis faster and spend less time reproducing or describing errors. For support, hand off the Active Health System log file to HPE support and get your issue resolution. You can also view the error information contained in the Active Health System Viewer by uploading your Active Health System file to <https://infosight.hpe.com/app/login>

FEATURES

Rich Configuration History, Health and Service Alerts

HPE Active Health System is raising the bar on quality and customer experience

Faster and accurate problem resolution

Consolidated diagnostic mechanism

Always-on proactive diagnostics rather than reactive

Enhanced Customer Support with Active Health System Viewer

HPE Active Health System Viewer has the ability to read and troubleshoot Active Health System Data

HPE recommended actions based on experience and best practice within the tool



For additional technical information, available models and options, please reference the [QuickSpecs](#)

HPE POINTNEXT

Access expertise at every step of your IT journey with [HPE Pointnext Services](#). [Advisory Services](#) focuses on your business outcomes and goals, to design your transformation and build a roadmap tuned to your unique challenges. Our [Professional](#) and [Operational Services](#) help speed up time-to-production and keep your IT stable and reliable.

Operational Services from HPE Pointnext Services

- [HPE Datacenter Care](#) helps modernize and simplify IT operations. Partner with an assigned account team, access technical expertise, an enhanced call experience gives you priority access, choose hardware and software support, implement proactive monitoring to help stay ahead of issues, and access HPE IT best practices and IP.
- [HPE Proactive Care](#) offers an enhanced call experience and helps reduce problems with personalized proactive reports and advice. This also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.). [Read more](#)
- [HPE Foundation Care](#) helps when there is a problem and has a choice of response levels. Collaborative software support is included and provides troubleshooting help for ISVs running on your server. [Read more.](#)

Other related services

[Defective Media Retention](#) is optional and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

[HPE Service Credits](#) offers a menu of technical services, access additional resources, and specialist skills.

[HPE Education Services](#) delivers a comprehensive range of services to support your people as they expand their skills required for a digital transformation.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and support options.

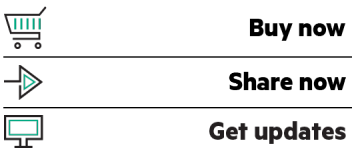
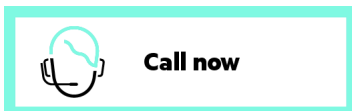
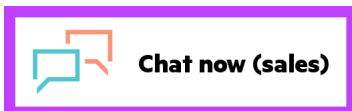
HPE GREENLAKE

[HPE Greenlake](#) is HPE's market-leading IT as-a-Service offering that brings the cloud experience to apps and data everywhere – data centers, multi-clouds, and edges – with one unified operating model. HPE GreenLake delivers public cloud services and infrastructure for workloads on premises, fully managed in a pay per use model.

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Contact our presales specialists.

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**Hewlett Packard
Enterprise**

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Parts and Materials: HPE will provide HPE-supported replacement parts and materials required to maintain the covered hardware.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

Image may differ from the actual product
[PSN5219983USEN](#), April, 2021.

Barueri, 09 de Abril de 2021.

**Ao
TRIBUNAL DE JUSTIÇA DO ESTADO DO AMAZONAS
BDE 3020
Pregão Eletrônico: 016-2021**

**Fabiana de Brito Santos
Representante Legal
fabiana.brito@hpe.com
+55 11 2657-8491 Office**

Declaramos para os devidos fins, que a empresa **Ingram Micro Brasil**, inscrita no CNPJ 01.771.935/0002-15, sediada na **Av Piracema,1341 – Tamboré – Barueri – São Paulo - SP - CEP 06460-030**, é uma revenda Participante do Programa de Canais da Hewlett-Packard Enterprise estando apta a comercializar os Produtos de nossa fabricação, juntamente com a empresa **Futura Dis Com E S De Inf Ltda ME**, inscrita no CNPJ 12.713.709/0001-13.

Produto	Part Number (Hardware)	Part Number (Serviço)
HPE DL360 Gen10 4LFF NC CTO Svr	P19765-B21	60 (sessenta) meses de garantia H7J32A5 HPE 5Y Foundation Care NBD Service
HPE 8TB SAS 7.2K LFF SC 512e DS HDD	819201-B21	-
HPE 12TB SAS 7.2K LFF SC He 512e DS HDD	881779-B21	-
HPE 16GB 2Rx8 PC4-2933Y-R Smart Kit	P00922-B21	-
HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	-

"Esta declaração tem caráter estritamente informativo e com o objetivo de atribuir e determinar o escopo e função dos produtos aqui listados e comercializados pela HPE.

Esta declaração não está revestida de nenhuma forma de função validadora ou verificadora do tanto quanto exposto nos requerimentos / formatos pelos clientes dos canais, parceiros e distribuidores HPE, sendo certo que é de responsabilidade exclusiva do referido parceiro de negócio, a devida validação e avaliação dos itens ou soluções que compõem as RFPs, editais, ou quaisquer demais formatos relativos a pedido ou cotação de compra de produtos HPE.

Todas as informações fornecidas por meio deste instrumento serão válidas desde que o solicitante tenha fornecido corretamente as informações dos produtos e serviços necessários para atender as especificações técnicas dos procedimentos de compra ora informados, eximindo dessa forma, a HPE de quaisquer responsabilidades futuras advindas de equívocos provocados na formatação da solução a ser ofertada e/ou atribuição do produto ou serviço HPE."

Alameda Rio Negro, 750
Alphaville - Barueri
CEP: 06454-000
Brasil

Durante o período de garantia, responsabilizamo-nos pela garantia dentro das condições padrão Hewlett Packard Enterprise, conforme especificado em nossos manuais técnicos. Serviços adicionais ao especificado pela garantia, podem ser adquiridos através da compra do Care Pack pela **Ingram Micro Brasil**.

Declaramos ainda, que a HPE possui **site na internet** - www.hpe.com.br - onde pode ser efetuado download de drivers para os equipamentos ofertados e número de telefone para Grande São Paulo – (011) 4004-7751 e demais regiões – **0800 55 64 05** - para informações e aberturas de chamados técnicos.

Fabiana de Brito Sant
Representante Legal
fabiana.brito@hpe.co
+55 11 2657-8491 Offi

Recomendamos que o primeiro contato com a assistência técnica seja feito através da HPE nos telefones acima, a fim de agilizar o procedimento de atendimento.

LISTA DE ASSISTÊNCIA TÉCNICA

MANAUS:

DIGITAL PROCESSAMENTO DE DADOS LTDA

Rua Clarindo de Queiroz, nº101. São Francisco

Manaus - AM CEP:69079-080

E-MAIL: michel.fussi@ativats.com.br – Michel Fussi

TELEFONES: 55 19 3272-2280 / 55 19 99666-5156.

Atenciosamente,



Fabiana de Brito Santos
Representante Legal

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Overview

HPE Integrated Lights-Out (iLO)

Integrated Lights-Out (iLO) is an embedded technology that ships in HPE Servers. It is the core foundation for the intelligence of the HPE Servers. This technology is combination of the iLO ASIC that is part of the server-board and the firmware that powers the ASIC. Different generations of ProLiant Servers carry different versions of the iLO ASIC.

SI No	ProLiant Generation	iLO ASIC version
1	Gen10	iLO 5
2	Gen9 and Gen8	iLO 4
3	Gen7	iLO 3

iLO is key to make the server operational and boot. It helps simplify server set up, engage health monitoring as well as power and thermal control.

These capabilities are included with the Server at no extra cost (iLO Standard). No installation needed and minimal setup is required.

Industry leading features that enhance server administrator productivity are available through optional licenses. With iLO 5 Firmware version v1.40, the iLO Advanced license will include all licensed features. This new, simplified approach allows customers to have either standard, included features, or upgrade to licensed features that are all available with iLO Advanced.

What's New

Currently, when a customer orders a server, the server is shipped with the default iLO password being a randomized string. The randomized string which is the initial password for the iLO is printed on the iLO Default Network Settings Tag. The default password is used for the initial login and is restored when iLO is Reset to Defaults.

Using the randomized password is a security best practice. However, some customers that onboard large numbers of servers view this as an impediment to automation.

Customers who prefer to get their servers with a well-defined or common default iLO password, may now order SKU P08040-B21 along with their servers. Ordering this SKU with the server will instruct the factory NOT to randomize the password and set a HPE defined common password. All customers using this SKU will receive their systems with the same password. Server orders that do not include the SKU P08040-B21 will continue to receive their servers with randomized passwords. This common password will be printed on the iLO Default Network Settings Tag and will be the default password if iLO is Reset to Defaults.

HPE highly recommends changing of this password immediately after the initial onboarding process.

Customers who want to choose their own custom default password should use the HPE Factory Express Integration Services.

Standard Features

iLO 5 Firmware version v1.40

- Features previously requiring an iLO Advanced Premium Security Edition now enabled with an iLO Advanced license
 - Security Dashboard – Displays the status of important security features, the Overall Security Status for the system, and the current configuration for the Security State and Server Configuration Lock features
 - One-button Secure Erase via Intelligent Provisioning, designed to decommission/repurpose servers
 - Support for Gemalto SafeNet and SafeNet AT key managers
 - Virtual NIC functionality, allowing secure authenticated iLO access from the Operating System
 - LDAP/Directory settings configurable via Redfish
 - Firmware Downgrade Policy – Specifies how iLO handles requests to downgrade firmware that you can update through iLO
 - NVMe wear level display
 - Ability to edit Maintenance Windows in Firmware & OS Software section
 - Password complexity rules feature
 - Enable/disable for overlay video showing Server Health Summary
 - Server configuration lock enabled via the BIOS
 - Workload Performance Advisor – Provides server tuning recommendations to improve server performance
-

iLO 5 Firmware version v1.30

- Support for scheduled firmware updates
 - Support for Intelligent System Tuning features via iLO UI
 - Enhancements to AlertMail features including secure email and the ability to use an external SMTP mail server, eliminating the need for users to have their own SMTP server
 - HTML5 IRC enhancements
 - Support for local files to be mounted via Virtual Media in HTML5 Remote Console
 - Improved performance of HTML5 Remote Console
 - Fixed keyboard bugs in HTML5 Remote Console
 - Forensics capture of defective FW images to NAND, and ability to download bad image for external analysis
 - Automatic Save/Restore of iLO configuration to/from NAND at iLO startup
 - Enhancements to prevent NAND wear out
-

iLO 5 Firmware version v1.20

- HTML5 Remote Console
 - No dependency on JAVA or .NET
 - Native browser support for Chrome, Firefox, Edge, Internet Explorer, Safari
 - Support for Windows, Linux, Mac clients
 - Keyboard, Video, Mouse redirection
 - Virtual Media Support (via URLs)
 - GUI and REST API to configure power settings for Apollo servers
 - GUI and REST API to configure drive zoning for Apollo servers
 - Support for IPv6 on share network port
 - Support for Online Certificate Status Protocol (OCSP) for CAC/SmartCard/certificate based authentication
 - Support for RSA-PSS certificate signatures
 - RSA cipher support in CNSA mode
 - Added NVMe drive properties to Redfish
-

Standard Features

iLO 4 Firmware version v2.70

- HTML5 Remote Console
- Support for Gemalto SafeNet and SafeNet AT key managers
- "All Host Links Down" SNMP trap
- Infosight skinny AHS download
- Integrated Remote Console power button confirmations.
- OpenSSL 1.0.1 -> 1.0.2o
- Added logging of Non-volatile flash memory wear data to Active Health System.

iLO 4 Firmware version v2.62

- Bug Fixes

Refer to the [HPE iLO User Guide \(iLO 5 iLO 4\)](#) and [release notes \(iLO 5 iLO 4\)](#) for a complete list of fixes/enhancements and also additional information on new features/enhancements/fixes.

RELATED FAQs for HPE iLO Licensing

Q: Can the iLO Advanced license key of the new electronic SKU's be installed via normal HPE factory CTO process?

A: No, this has been discontinued, in case you need factory integration of iLO licenses please order the physical SKU with the #0D1 option.

Q: Can one still get iLO Advanced electronic licenses (E-LTU SKU)?

A: YES, electronic licenses are still available and can be ordered. Only the #0D1 option i.e. factory integration has been discontinued.

Q: Can the **FLEX or TRACKING license SKU's** be HPE Factory Integrated?

A: NO, the FLEX and TRACKING license SKU's cannot be installed in the Hewlett Packard Enterprise Factory. However, these licenses can be installed in the factory as part of the Factory Express service which is chargeable.

Q: What is the difference between one (1) and three (3) year support?

A: You are entitled to a one (1) or a three (3) year support contract on licensed features. After your one (1) or three (3) year support contract expires, your iLO licensed features still work, and are enabled. However, you will not have HPE support for those licensed features; standard iLO non licensed features are still supported. Your licenses do not expire. They are valid for the life of the server on which they are applied.

Q: How are iLO standard features (included with every ProLiant server at no additional cost) supported?

A: iLO standard features and firmware updates are supported under the Server Hardware Warranty Contract.

iLO firmware updates are available at

<http://www.hpe.com/support/iLO4> - for iLO 4

<http://www.hpe.com/support/iLO5> - for iLO 5

For more information on HPE iLO licensing, please refer to the [HPE iLO Licensing Guide](#) at <http://www.hpe.com/support/iLOLicenseGuide-en>.

Licensing Redemption

HPE has a new licensing portal, visit us at <https://myenterpriselicense.hpe.com>.

Q: What does the customer receive when the electronic version is ordered?

A: The customer will still receive an email that contains a link to the licensing portal and the license key will be printed on the electronic email.

Standard Features

Customers are HIGHLY encouraged to register the product on the licensing portal.

Registration is important because:

If you lose your license key, you can obtain it through the My License Portal (<https://myenterpriselicense.hpe.com>).

You receive your support contract that is included in the price of your iLO license.

For e-delivery products, the entitlement order number (EON) used to register the product on the licensing portal will be the same as the Hewlett Packard Enterprise sales order number.

NOTE: This document is a consolidation of previous QuickSpecs and covers HPE iLO 5, HPE iLO 4, HPE iLO 3 and HPE iLO 2 for HPE ProLiant servers. Please visit: <http://www.hpe.com/info/iLO>

Alert Administration for HPE ProLiant	HPE Integrated Lights-Out (iLO) for ProLiant support delivery of SNMP server agent alerts as well as internally generated management processor alerts (e.g. unsuccessful login attempt), to a management console such as HPE Systems Insight Manager, Insight Control, OneView. Traps forwarded by the processor can be configured in Insight Manager for delivery to an administrator's pager or e-mail.
Always On Intelligent Provisioning	Intelligent Provisioning is now Always On. Intelligent Provisioning is accessible from the iLO browser user interface anytime without having to reboot your server. Clicking Always On to access Intelligent Provisioning has the same capabilities as accessing Intelligent Provisioning by pressing F10 from the POST screen.
Auto-Configuration of IP Address using DNS/DHCP for HPE ProLiant	HPE Integrated Lights-Out (iLO) for ProLiant provides automatic network configuration. A default name and Dynamic Host Configuration Protocol (DHCP) client that leases an IP address from the DHCP server on the network are standard with HPE iLO for ProLiant. This allows the management processor to register its device name with Domain Name Services (DNS) and Windows® Internet Naming Service (WINS). For systems that do not use DNS/DHCP, static IP configuration is also supported.
Automated Group Administration & Actions for HPE ProLiant	HPE Integrated Lights-Out (iLO) for ProLiant group administration automates configuring and managing large deployments of Integrated Lights-Out processors. Using iLO's extensive scripting language with HPE Lights-Out Configuration Utility, the HPE Lights-Out Online Configuration Utility or RESTful Interface Tool, an administrator can easily configure all settings for mass deployments, control all functions and activate the HPE Integrated Lights-Out (iLO) for ProLiant Advanced license keys simultaneously on multiple HPE ProLiant iLO processors. With a batch process or HPE System Insight Manager's powerful device query mechanism, these utilities enable scalable use and management of HPE ProLiant iLO's. Sample scripts are available at: http://www.hpe.com/info/iLO .
Auxiliary Power for HPE ProLiant	Because the HPE Integrated Lights-Out (iLO) for ProLiant management processor obtains its power from the auxiliary power plane of the server, it is always on when the server is plugged into a power source. If the server provides Redundant Power Supplies (RPS) then the HPE iLO for ProLiant will use redundant power and will continue operation in the event of a power supply failure.

Standard Features

POST LED Indicator for HPE ProLiant

The Integrated Lights-Out (iLO) has been designed to provide feedback during the POST process as a blade system does not include a directly attached monitor. The Integrated Lights-Out (iLO) blinks the Server Health LED during the boot process to enable the onsite administrator the results of the POST process.

Embedded System Health for HPE ProLiant

On supported server models, the HPE iLO for ProLiant management processor monitors fans, temperature sensors, power supply sensors and VRMs without having the System Management Driver loaded. The status of these is accessible from all HPE iLO for ProLiant user interfaces (browser, SMASH command line Redfish API, XML scripts and IPMI) independent of the host operating system. The intelligence of iLO manages the Sea of Sensors thermal control, directs the Dynamic Power Capping technology and monitors the health of server components.

Flexible Interfaces for HPE ProLiant

Using any of the HPE iLO for ProLiant interfaces, customers can configure, update and control all HPE iLO for ProLiant Standard functions regardless of the state of the host server or operating system

- **Browser** - HPE iLO for ProLiant is fully accessible by means of Microsoft® Internet Explorer®, and Mozilla Firefox® (Linux® and Windows® only).
 - **Redfish API** - HPE iLO for ProLiant conforms to industry-standard specification and schema for data center infrastructure management sponsored and controlled by the Distributed Management Task Force, Inc. (DMTF), Redfish establishes a new management standard for system control that is scalable, easy to use, and secure with the effort to modernize heterogeneous data centers. In addition, HPE ProLiant servers expose iLO RESTful API extensions, allowing customers to experience the full range of value-add features available from a programmable interface.
 - **Command line** - HPE iLO for ProLiant supports the new industry standard command line, DMTF System Management Architecture for Server Hardware, Server Management Command Line Protocol (SM CLP) specification. These commands can be used on other SM CLP compliant Hewlett Packard Enterprise products, such as the first generation iLO, Lights-Out 100 Management Processors, HPE Integrity iLO, and other non-Hewlett Packard Enterprise products.
 - **Scripting** - HPE iLO for ProLiant supports a scalable scripting interface using either programmable JSON, XML or PERL scripting. This enables scalable, simultaneous configuration, update and operation large groups of HPE iLO for ProLiant servers as well as iLO and RILOE II management processors.
 - **Intelligent Platform Management Interface (IPMI)** is a standardized computer system interface used by system administrators for out-of-band management of computer systems and monitoring of their operation. System administrators can use IPMI messaging to monitor platform status (e.g. system temperatures, voltages, fans, power supplies and chassis intrusion); to query inventory information; to review hardware logs of out-of-range conditions; or to perform recovery procedures such as issuing requests from a remote console through the same connections e.g. system power-down and rebooting, or configuring watchdog timers. The standard also defines an alerting mechanism for the system to send a simple network management protocol (SNMP) platform event trap (PET).
-

Standard Features

Flexible Network Connectivity for HPE ProLiant	<p>HPE Integrated Lights-Out (iLO) for ProLiant provides a choice between two network connection methods to access all functionality:</p> <ul style="list-style-type: none"> • Dedicated connection - Access HPE iLO for ProLiant via an embedded 10/100-MB (10/100/1000-MB on iLO 4) dedicated Ethernet NIC. This enables remote management over a dedicated, out-of-band management network. In-band SNMP notification of server problems on a real-time basis is also supported without separate telephone connections or modem sharing devices. The dedicated NIC can auto-negotiate speed and duplex options. The iLO Dedicated NIC provides the highest levels of reliability and security. • Shared Network Port - On selected ProLiant server models, HPE iLO for ProLiant supports network connectivity through a new high-speed shared connection via one of the embedded system NICs. The latest version of iLO also supports Shared network port over the Flexible -LOM providing full accessibility to all HPE iLO for ProLiant functions including browser, Virtual Media and Virtual Keyboard Video and Mouse in graphics mode. The management processor maintains a unique IP address and MAC allowing the network controller to route HPE iLO for ProLiant and host data correctly. With the Shared Network Port, out-of-band management and production data can share the same wire eliminating the separate network connection for each server.
Flexible Setup Options for HPE ProLiant	<p>An onboard ROM-based configuration utility allows fast and easy setup without additional software. HPE iLO for ProLiant can also be setup via the browser or command line interface over the network. Integration with SmartStart Scripting Toolkit allows configuration of the card as part of the initial server deployment. For large deployments, the HPE Lights-Out Configuration Utility or the iLO REST tool can be used to configure groups of HPE iLO for ProLiant processors, saving time and resources.</p>
iLO Access Options and Services Control (iLO 5 and above only)	<p>Ability to turn enable/disable iLO access options and services.</p>
iLO Repository (iLO 5 and above only)	<p>Storage space earmarked in the iLO which can be used as a repository for firmware, drivers and software components. The components can be organized in to install sets and can be used to rollback/patch faulty firmware.</p>
iLO Security Dashboard	<p>Helps detect and address possible security vulnerabilities in current server setup</p>
iLO Security Modes (iLO 5 and above only)	<p>Ability to put harden iLO for specific security requirements.</p>
iLO Service Port (Gen10 servers and above only)	<p>The iLO Service port is a USB port connected to the iLO and is located on the front panel of the server. Users can connect their laptops to this port via a USB-Ethernet adapter (HPE recommends using the following HPE part Q7Y55A) and get the full access to the Integrate remote console. Users can also connect a USB drive to this port and download service logs to it.</p> <p>All servers may not have an iLO Service Port please refer server QuickSpecs to confirm.</p>
Immutable Root of Trust (iLO 5 and later only)	<p>Signatures for validation of integrity of iLO and UEFI/BIOS are built into the iLO ASIC. This prevents any possibility of tampering of security signatures throughout the supply-chain.</p>

Standard Features

Integrated Lights-Out (iLO) Management for HPE ProLiant

HPE Agentless Management 2.0: The base hardware monitoring and alerting capability is built into the system (running on the HPE iLO chipset) and starts working the moment that a power cord and an Ethernet cable is connected to the server. This means that:

- All core management is out-of-band for increased security and stability: no OS software required, no open SNMP port on the OS and zero downtime updates.
- Monitor and Alerting on key internal server components: CPUs, memory, temperatures, fans, SmartArray controllers, hard drives (including cache modules) and power supplies.
- HPE Systems Insight Manager (HPE SIM) can see the system and will give customers preview of the System Health Summary and Sub-System Details.
- iLO integrates with HPE OneView.

NOTE: On Gen10 servers, server monitoring is only via Agentless Management, HPE does not provide HPE Insight Management Agents or HPE WBEM providers for Gen10 servers.

HPE Active Health System: HPE Active Health System is an essential component of the HPE iLO Management. It provides customers with: Diagnostics tools/scanners wrapped into one; Always on, continuous monitoring for increased stability and shorter downtimes; Rich configuration history; Health and service alerts; Easy export and upload to Service and Support.

HPE Active Healthy System Viewer Tool: Enables you to read the Active Health System log files. It will provide errors messages and advises on a resolution. Use can create a support file, simply by uploading your AHS log file from within this tool.

Visit <http://www.hpe.com/servers/AHSV> for the **FREE** online version.

HPE Intelligent Provisioning: Lets customers provision and configure a single server without any separate media. No more SmartStart CDs or Smart Update Firmware DVDs are needed. For more information regarding Intelligent Provisioning please go to website at <http://www.hpe.com/info/intelligentprovisioning>

HPE Embedded Remote Support: Hewlett Packard Enterprise offers embedded remote support that allows a customer to enable remote support directly from iLO (also OA and IP) without installing OS agents on the device, greatly reducing the time to activate remote monitoring. Through Insight Remote Support 7.0.5 and later versions and Insight Online direct connect capability, customers now benefit from 24x7 remote monitoring, auto-generated service events, support cases and anywhere, anytime monitoring with HPE Insight Online, a personalized cloud-based IT dashboard. Through the HPE Support Center portal, Insight Online displays devices remotely monitored by Hewlett Packard Enterprise and lets you easily track your auto-generated service events and support cases, view device configurations, and proactively monitor your Hewlett Packard Enterprise contracts and warranties as well as HPE Proactive service credit balances. The Insight Online dashboard is also available in the HPE Support Center Mobile App.

Integrated Lights-Out (iLO) Event Log for HPE ProLiant

The HPE iLO for ProLiant Event Log stores detailed management processor events and data independent of the host operating system. Actions like server power on/off, reset, changes in user configuration, clear event log, successful and unsuccessful login attempts are logged along with the user's access machine name in the iLO Event Log enabling audits for security or troubleshooting purposes. The iLO Event Log is easily accessible through the browser, command line, script or Insight Manager.

Integrated Lights-Out (iLO) Standard Blade Edition Features for HPE ProLiant

HPE iLO for ProLiant Standard Blade Edition is enhanced to include several features that are essential for blade operation. The following additional features are supported as standard features on HPE ProLiant BL c-Class and HPE Integrated Lights-Out (iLO) supported c-Class BladeSystem servers:

- Virtual Keyboard Video and Mouse remote graphic console.
- Terminal Services Pass-Through supported in iLO2. Improvements in the iLO 3. Integrated Remote Console displaces the need for this feature. Virtual Media (browser access only to floppy disk, CD-ROM, DVD-ROM and USB-Drive based virtual media).

Standard Features

Integrated Management Log for HPE ProLiant HPE Integrated Lights-Out (iLO) for ProLiant captures and stores the server's Integrated Management Log (IML) for access via browser or command line even when the server is not operational. This capability can be helpful when troubleshooting remote host server problems. The IML contains a history of events that impact server health and management.

Integration with HPE Systems Insight Manager and other management applications for HPE ProLiant HPE Integrated Lights-Out (iLO) for ProLiant is integrated with Hewlett Packard Enterprise and other leading management applications to allow seamless use in lifecycle tasks and processes from deployment to fault management and administration. HPE OneView and HPE Systems Insight Manager (SIM) intelligently discovers HPE iLO for ProLiant devices and associates them with their host servers for fast access during fault management activities. HPE Insight Control Server Provisioning integrates tightly with HPE iLO when provisioning HPE ProLiant servers, including the Intelligent Provisioning capabilities of HPE ProLiant Gen8 servers. Intelligent discovery and launch of HPE iLO for ProLiant browser is also supported in HPE Openview Operations for Windows® and Network Node Manager®, Microsoft Operations Manager® and CA Unicenter®.

Standard Features

Integrated Remote Console for HPE ProLiant	<p>The HPE iLO .NET Integrated Remote Console is launched from the iLO web browser interface, utilizes Microsoft .NET Framework® 3.5 (on the client PC) and takes advantage of Microsoft DirectX® based hardware acceleration to provide high performance and outstanding user graphics. HPE iLO has an enriched viewing experience with maximum resolution of 1600 x 1200 and maximum color depth of 32k colors. With HPE iLO, remote screen fits within one window and the screen can be scaled to any size, avoiding the use of scroll bars.</p> <p>HPE iLO for ProLiant has a Java-free Integrated Remote Console for environments with Microsoft Windows® host and client operating systems. With HPE iLO Standard and HPE iLO Standard Blade Edition, Integrated Remote Console provides access to Virtual Keyboard Video and Mouse in pre-OS text mode and Virtual power from a single screen. ProLiant OA/iLO Standard Blade Edition also allows virtual media to be controlled from the IRC.</p> <p>Starting with iLO 5 v1.20 onwards a HTML5 remote console is supported.</p>
Local User Accounts And Logon Records for HPE ProLiant	<p>HPE Integrated Lights-Out (iLO) for ProLiant Standard supports up to 12 local user accounts with customizable access rights, individual logins and passwords. HPE iLO for ProLiant also provides logging of user actions in the event log, progressive delays for failed login attempts, and login legal warning.</p>
Microsoft Emergency Management Service Console Integration for HPE ProLiant	<p>The Microsoft Emergency Management Service® console provides a text-based screen to access the host server. HPE Integrated Lights-Out (iLO) for ProLiant provides the option to access the EMS console from the Integrated Lights-Out (iLO) browser interface. The Emergency Management Service console option is available on all HPE ProLiant servers using Windows Server 2003® or later.</p>
Mobile App for HPE iLO	<p>HPE iLO brings additional efficiency and effective remote management at the touch of your fingertips with the HPE iLO Mobile App. The HPE iLO Mobile App gives you immediate secured access to your server from the touch of your Smartphone or Tablet devices. Today we support Apple's iOS and Android devices (Phone and Tablet). This feature is supported on HPE iLO 3 and HPE iLO 4. To learn more visit: http://www.hpe.com/info/ilo/mobileapp.</p>
Multi-Language Support	<p>We provide our customers with the ability to read the HPE iLO GUI in the following languages: English, Japanese and simplified Chinese. Multi-Language support is only available on servers which carry a version of iLO with NAND.</p>
Power Consumption Reporting for HPE ProLiant	<p>On supported server models, the HPE iLO for ProLiant management processor displays the present power consumption in Watts and BTU. The present power is a five minute average that is calculated and displayed via all HPE iLO interfaces (browser, CLI, script).</p>
Power Regulator for HPE ProLiant	<p>Power Regulator for ProLiant can be enabled on supported server models from HPE iLO for ProLiant Standard browser, CLP and script interfaces. Power Regulator Static Low Power and Dynamic Power Savings Modes as well as Operating System based modes (AMD PowerNow or Intel Demand Based Switching) can be enabled to save on server power and cooling costs. On supported ProLiant servers, Power Regulator allows CPU's to operate at lower frequency and voltage during periods of reduced application activity.</p>

Standard Features

Power Supply High-Efficiency Mode for HPE ProLiant	Beginning with the HPE ProLiant G6 servers, power supply high efficiency mode enables servers to run at maximum power efficiency even at low loads. When operating in this mode, the ProLiant OA will channel load through a single primary supply, as opposed to balancing power load equally across both supplies. In the event of a power supply outage, the secondary supply will immediately assume the load for the server. Power supply high-efficiency mode is not enabled automatically and must be configured through the iLO user interface.
Remote Firmware Update for HPE ProLiant	This feature ensures that HPE Integrated Lights-Out (iLO) for ProLiant is always up-to-date with the latest firmware available from Hewlett Packard Enterprise. Updates to the ROM code on HPE iLO for ProLiant are accomplished through the browser interface, command line, REST API, XML script, or using online flash components for Windows®, Linux® and VMware®.
Remote Serial Console (Virtual Serial Port) for HPE ProLiant	Access to the host server's serial, text-based (Virtual Serial Port) during all server states over an Ethernet network is a standard feature on all HPE Integrated Lights-Out for ProLiant management processors. From the operating system-independent console you can monitor and control the BIOS and the server during Power-On System start-up testing (POST), as well as Microsoft Emergency Management Services® and serial tty sessions on systems running Linux operating systems. After OS is installed access can be set up to be re-directed to the Virtual Serial Port. Also in the event of a crash you can configure the OS to send the core data dumps to the Virtual Serial port.
ROM-base Setup Utility (RBSU) for HPE ProLiant	Embedded configuration utility within the system ROM and accessible through the HPE Integrated Lights-Out (iLO) for ProLiant interface that facilitates pre-OS display of server resources, configuration of primary boot controller and boot order, and configuration of system devices and installed options.
Security for HPE ProLiant	<p>HPE Integrated Lights-Out (iLO) for ProLiant provides strong security for remote management in distributed IT environments by using industry-standard Secure Sockets Layer (SSL) and Transport Layer Security (TLS) encryption of HTTP data transmitted across the network. SSL or TLS encryption (up to 256-bit) ensures that the HTTP information is secure as it travels across the network.</p> <p>HPE Integrated Lights-Out (iLO) for ProLiant also uses Secure Shell version 2 to provide strong authentication and encryption of commands executed on iLO management processors over a network. PuTTY and OpenSSH clients may be used to access HPE iLO for ProLiant over a Secure Shell connection.</p> <p>In addition, HPE iLO for ProLiant provides a configurable option to enable strong encryption Advanced Encryption Standard (AES) on browser, REST API, CLP and XML scripting interfaces.</p>
Single Sign-on for HPE ProLiant	When using local user accounts on HPE Integrated Lights-Out and BladeSystem Onboard Administrator, single-sign on is supported. This allows users to access automatically, login to HPE ProLiant iLO from the BladeSystem OA user interface.
Static IP Bay Configuration for HPE ProLiant	The Static IP Bay Configuration feature simplifies deployment by automatically assigning IP addresses to individual blades from a reserved static pool as they're powered on even if DHCP is present.
System Diagnostics for HPE ProLiant	HPE Integrated Lights-Out (iLO) for ProLiant may be used to diagnose systems. The Remote Console, Integrated Remote Console and Remote Serial Console may be used to monitor the system for POST error messages. The Integrated Management Log and HPE iLO for ProLiant Event Log record events useful for diagnostics. HPE Integrated Lights-Out (iLO) for ProLiant Virtual Media (if activated by an iLO Advanced key) may be used to boot and run System Diagnostics.

Standard Features

Virtual Indicators for HPE ProLiant

HPE Integrated Lights-Out (iLO) for ProLiant provides the ability to control server Unit ID LEDs from the HPE iLO browser, REST API command line (SM CLP), XML scripting. The server Unit ID LED is the blue LED on the ProLiant server that is used for identifying systems in a rack full of servers.

Virtual Key Video Mouse remote text console for HPE ProLiant

Embedded hardware remote console capabilities in a text mode screen prior to loading of the operating system; is provided as a standard feature on all ProLiant Integrated Lights-Out (iLO) management processors. This provides access to system BIOS and during Power-On System start-up testing using Virtual KVM technology. Remote text in "pre-OS" mode is accessible from the Integrated Remote Console and the Java applet Remote Console. The Java applet supports both Microsoft® and Sun Java® software.

Virtual Power Button for HPE ProLiant

Using a supported browser, command line or script interface, HPE Integrated Lights-Out (iLO) for ProLiant can be used to remotely operate the power button of a host. For example, if the host server is off, you can turn it on from the HPE ProLiant iLO browser, REST API, command line (SM CLP), XML. You can also power off and on the server in one step. A "press and hold" option is available for the Virtual Power Button in the event a momentary press is insufficient to power off a server experiencing an operating system failure.

Virtual Private Network (VPN) support for HPE ProLiant

HPE iLO for ProLiant functionality is available securely over the Internet around the world when used in conjunction with VPN technology. VPN is supported on both HPE iLO for ProLiant network connection methods, dedicated and shared network ports.

Simple Network Management Protocol Version 3 (SNMPv3)

SNMP is the protocol developed to manage nodes (servers, workstations, routers, switches and hubs etc.) on an IP network. HPE iLO now has SNMP Version 3 (SNMPv3) which has added security and remote configuration capabilities over the previous versions. The SNMPv3 architecture introduces the User-based Security Model (USM) for message security and the View-based Access Control Model (VACM) for access control. The architecture supports the concurrent use of different security, access control, and message processing models. More specifically: Security, authentication and privacy, authorization and access control, Administrative Framework, naming of entities, people and policies, usernames and key management, notification destinations, proxy relationships, and remotely configurable via SNMP operations.

IPv6 on Dedicated NIC

The HPE iLO 4 dedicated NIC supports IPv6 addressing, DHCPv6, SLAAC/router assigned addresses and static IPv6 addresses are supported.

iLO Federation Discovery

Built in standard uniquely recognizes numerous servers at once via multicast discovery methods supporting both IPv4 and IPv6 environment providing the following information:

- Queries and displays group health status
- Displays group configuration
- Provides registered server name
- Discovers and identifies what servers have licenses installed
-

See the section below for additional iLO Federation Management features that are supported with the iLO Advanced license.

To learn more see the iLO Federation User Guide:

<http://www.hpe.com/support/ilo5-federation-ug-en>

Standard Features

iLO RESTful Application Program Interface (API)	<p>The iLO RESTful API management interface functionality is available for iLO 4, iLO 5 and Moonshot iLO Chassis Management Module-based. Hewlett Packard Enterprise servers uses the basic HTTP operations (GET, PUT, POST, DELETE, and PATCH) to either submit or return a JSON formatted “resource” to or from a URI. The API enables users to manage one or multiple servers to:</p> <ul style="list-style-type: none"> • Get full inventory • Control Power and reset • Configure BIOS, iLO 4, iLO 5 and Smart Array (supported only on iLO 5/Gen10 controllers and above) settings • Status of server health • Fetch event logs and SSH Serial Console • And more <p>iLO RESTful API Redfish conformant. To learn more see the https://hewlettpackard.github.io/ilo-rest-api-docs/ilo5 or http://www.hpe.com/info/restfulapi.</p> <p>NOTE: For more information on supported servers and licensed features see the iLO license matrix.</p> <p>Advanced functionality, through the HPE iLO Advanced license such as graphical remote console, multi-user collaboration, and video record/playback can be activated with the optional HPE iLO Advanced or HPE iLO Advanced for BladeSystem licenses. These HPE iLO Advanced licenses can be purchased stand-alone or as part of HPE Insight Control or HPE OneView. The Advanced licensed features offer sophisticated remote administration of servers in dynamic data center and remote locations and can help significantly reduce cost associated with IT-related travel and unplanned downtime. For more specific license information, visit our iLO Family Datasheet.</p>
3rd Party Key Manager Support	<p>Facilitates key exchange for disk connect to a smart array controller, encrypted by Utimaco ESKM, Gemalto Safenet or SafenetAT key managers – providing easy integration of ProLiant servers in environments where the encryption key management is done by Utimaco ESKM, Gemalto Safenet or SafenetAT.</p>
Automatic and On-Demand Video Record and Playback for HPE ProLiant	<p>HPE ProLiant iLO Console Replay captures and stores for replay the console video during a server's last major fault or boot sequence. Server faults include an ASR, server boot sequence, Linux panic, or Windows® blue screen. Additionally users are able to manually record and save any console video sequence to their client hard drive for replay from the HPE iLO Integrated Remote Console.</p>
Automatic Firmware Recovery (iLO 5 and above only)	<p>Recover iLO, UEFI/BIOS and other essential firmware automatically to a known good version (either factory default or a known good firmware recipe resident in the iLO Repository) on detection of a compromised iLO, UEFI/BIOS and other essential firmware.</p>
Commercial National Security Algorithms mode (CNSA) support (iLO 5 and above only)	<p>Support for CNSA compliant cryptography preventing the use of insecure algorithms.</p>
Directory Services Integration for HPE ProLiant	<p>HPE Integrated Lights-Out (iLO) for ProLiant integrates with enterprise-class directory services to provide secure, scalable, and cost effective user management. Directory services, such as Microsoft® Active Directory Novell eDirectory and OpenLDAP (iLO 4 v2.53), can be used to authorize directory users with assigned user roles to Integrated Lights-Out processors. With Active Directory, customers have the flexibility to integrate with or without a schema extension. An easy and reliable installation program is available to install a management console snap-in and extend customer's existing directory schema to enable directory support for the HPE lights-out management products. A directory migration tool is available to automate setup for both methods of integration. In addition, current versions of HPE iLO firmware will support directory nested groups.</p>

Standard Features

Global Team Collaboration for HPE ProLiant

Up to six (via iLO 3 and above) and four (via iLO 2) HPE ProLiant iLO users with remote console privileges in different locations can collaborate using the shared remote console to troubleshoot, maintain and administer remote servers. In iLO2, the session leader can allow either view only or full console control by individual participants. In iLO3 and iLO4 the session leader can allow full console control by individual participants. Shared remote console mode is supported from the Integrated Remote Console on clients using Microsoft® Internet Explorer browsers as well as Firefox via iLO 3.

iLO Federation Management

The next generation enabling technology delivering unprecedented scale, speed and simplicity. iLO Federation Management, requires an iLO Advanced, iLO Advanced for BladeSystem or iLO Scale-Out license, and enables users to manage multiple servers as one via:

- Group Power Control
- Group Power Capping
- Group Firmware Update
- Group Configuration
- Group Virtual Media
- Group License Activation

To learn more see the iLO Federation User

Guide: <http://h20564.www2.hp.com/hpsc/doc/public/display?docId=c04149067>

iLO FREE Trial 60 Day License

A FREE license key is available to temporarily activate iLO licensed features for evaluation purposes. The evaluation key unlocks all of the industry leading remote management on supported HPE ProLiant servers up to 60 days. Evaluation keys are available at: <http://www.hp.com/info/TryiLO>.

iLO Serial Port Record\ Playback for HPE ProLiant

HPE iLO takes the output data from the Remote Virtual Serial Console (VSP) and saves it to iLO memory for so data can be later accessed. Very similar to "video console replay ", but is text based data only from the serial port. This would be used to store logs of data and/or history of activity to be retrieved later to see exactly what activity was done - or actions occurred (Play back) but all text based.

Intelligent System Tuning (Jitter Smoothing) (iLO 5 and above only)

Improve workload throughput, start by leveling and balancing frequency fluctuation with HPE's patented Jitter Smoothing technology. Engaging processor turbo boost can cause frequency fluctuations or "jitter" which results in a constant struggle between maximum output and deterministic performance needs. Now available on all ProLiant Gen10 servers, Jitter Smoothing mitigates processor frequency fluctuation to improve overall workload throughput above turbo mode. Beneficial for high frequency trading applications. To enable this capability an iLO Advanced license is needed.

Intelligent System Tuning (Core Boosting) (iLO 5 and above only)

When enabling Intel Turbo Boost mode, Core Boosting will maintain higher frequencies across more active cores on select servers and Intel processors; This is accomplished while maintaining Intel specs, warranty, and reliability. To enable this capability iLO Advanced license is needed

One-Button Secure Erase

Easily erase all user data on the server, secondary storage and NVRAM, per NIST Standards 800-88r1 with the click of a button in the UI/one call via RESTful API. Allowing easy repurpose and redeployment of servers with confidence that servers have been reset back to factory settings.

Power Regulator Reporting for HPE ProLiant

iLO Advanced iLO Advanced for BladeSystem and iLO Scale-Out enable access to power related data from any of the three iLO interfaces (browser, script or command line) on supported server models. Available information includes time spent in Power Regulator Dynamic Savings mode and average, peak and minimum power consumption over 24 hour intervals. Check the server QuickSpecs to verify specific system support for Power Regulator and power monitoring.

Standard Features

Remote Kernel Debugger for Windows® for HPE ProLiant	Integrated Lights-Out allows you to connect a Microsoft® Windows® debugger running on a remote PC to the iLO Virtual Serial Port (VSP) to diagnose and repair operating system kernel errors.
Remote System logs	HPE iLO keeps a log of everything being done, so it can later be used for troubleshooting or simply has a record. Syslog can be configured to receive logging from a remote client, or to send logging to a remote syslog server. Remote logging is sending a duplicate record of those events not only to the local machine but to a remote machine as well.
Runtime Firmware Validation (iLO 5 and above only)	Validation of iLO and UEFI/BIOS firmware at runtime. Notification and automated recovery on detection of compromised firmware.
Server Configuration Lock	Ensures secure transit and locks server hardware configuration using a password
Server System Restore	Improvement of server system restore – extending the number of components that can be restored
Single Sign-On for HPE ProLiant	ProLiant users can automatically login to iLO from HPE OneView, HPE System Insight Manager (version 5.1 or greater) and the HPE BladeSystem Onboard Administrator. In addition, to direct access and authentication using iLO Active Directory integration, the role based authentication in HPE OneView, SIM and Onboard Administrator can be used to simplify user access and user account administration.
Two-factor authentication via Kerberos for HPE ProLiant	HPE ProLiant Integrated Lights-Out (iLO) provides strong user authentication with two-factor authentication via Kerberos or smart cards such as Common Access Card (CAC) and Personal Identity Verification (PIV) cards using digital certificates embedded on smartcards or USB -security tokens. Using this form of strong authentication, iLO access can be restricted only to IT individuals possessing a certificate bearing smartcard or USB security token and a PIN.
Video Player for HPE ProLiant	HPE iLO allows you to view automatically captured server video footage or on-demand captured footage within an iLO session or separately through the new iLO Video Player.
Virtual Keyboard Video and Mouse graphic console for HPE ProLiant	HPE iLO graphical consoles provide Virtual KVM capabilities with KVM over IP performance. This gives system administrators a single console that is responsive and agile for routine administration and emergency situations. iLO Virtual KVM works with a standard browser and no additional software is required on the remote server or client system for iLO 2. HPE iLO 3 and iLO 4 require the .NET Framework 3.5, which is already provided with Windows® 7.
Virtual Media for HPE ProLiant	The USB-based Virtual Media feature allows an IT administrator to boot the remote server using a standard 1.44-MB diskette, CD ROM, DVD+R or USB flash drive on a client PC or from a floppy diskette, CD or DVD image stored on a virtual media server on the network. Virtual Media saves time and increases efficiency by eliminating the need to visit servers in datacenters and remote sites just to insert a diskette, CD-ROM, DVD-ROM or USB key.
Warranty	Hewlett Packard Enterprise will replace defective delivery media replacement for a period of 90 days following the date of purchase.

Standard Features

Workload Performance Advisor Provides server tuning recommendations to improve server performance

Service and Support

HPE Software Support Hewlett Packard Enterprise offers a number of software support services, many of which are provided to customers at no additional charge.

Software Technical Support and Update Service

All HPE iLO licenses include one or three years of 24 x 7 HPE Software Technical Support and Update Service. 24x7 HPE Software Technical Support and Update Service Care can also be purchased on a standalone basis. This service provides access to Hewlett Packard Enterprise technical resources for help in resolving software implementation or operational problems. With the Software Technical Support and Update Services, HPE iLO licensed customers will benefit from expedited problem resolution and proactive notification and delivery of iLO software updates. For more information about this service, see: <https://www.hpe.com/us/en/services/foundation-care-services.html>

If you received a license entitlement certificate, registration for this service will automatically take place upon redemption of the license certificate/key online and a service contract will be created for you.

If the license information you received for your product instructs you to register for Software Technical Support and Update Service, please follow the instructions or you will not be eligible for telephone support or product updates.

Once registered for this service, you will receive a letter in the mail containing the Customer Service Phone number for your reference and your Service Agreement Identifier (SAID). After you have received your SAID, you can go to the Software Update Manager (SUM) web page to view your contract online and elect electronic delivery for your updates.

HPE Support Center Personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more [HPE Support Center](#)

HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Support Services or HPE contractual support agreement.

NOTE: HPE Support Center Mobile App above is subject to local availability.

Parts and Materials Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

HPE Services iLO Care Pack options can be found at <https://ssc.hpe.com/portal/site/ssc?action=determineNodeContents&nodeId=28814>

Configuration Information

In order to assist with your buying decisions on iLO Licensing, Hewlett Packard Enterprise provides the following reference material.

- HPE iLO Standard – FREE – no license required
- HPE Factory Installed Licenses – No extra cost
- **Selecting the right iLO license**
- **HPE iLO Licensing Guide**
- **Supported Servers and Features**

NOTE: HPE iLO licenses can be purchased regardless of the version of iLO you are using, however some of the licensed features may require a specific iLO ASIC version to function.

HPE iLO Scale-Out, Essentials, Advanced for BladeSystem, and Advanced Premium Security Edition licenses have been discontinued with the release of iLO 5 v1.40.

With iLO 5 v1.40, the security features from the Advanced Premium Security Edition license will now be included with the purchase of an iLO Advanced license.

For more information on license tiers, please visit our [HPE iLO Licensing Guide](#)

HPE Integrated Lights-Out (iLO) Advanced for ProLiant Servers (supported on ALL Servers)

HPE iLO Advanced Electronic License with 1yr Support on iLO Licensed Features	E6U59ABE
HPE iLO Advanced Electronic License with 3yr Support on iLO Licensed Features	E6U64ABE
HPE iLO Advanced 1-server License with 1yr Support on iLO Licensed Features	512485-B21
HPE iLO Advanced Flexible Quantity License with 1yr Support on iLO Licensed Features	512486-B21
HPE iLO Advanced AKA Tracking License with 1yr Support on iLO Licensed Features	512487-B21
HPE iLO Advanced 1-server License with 3yr Support on iLO Licensed Features	BD505A
HPE iLO Advanced Flexible Quantity License with 3yr Support on iLO Licensed Features	BD506A
HPE iLO Advanced AKA Tracking License with 3yr Support on iLO Licensed Features	BD507A
HPE iLO Common Password FIO Setting	P08040-B21

NOTE: Supported on ALL Servers

NOTE: HPE highly recommends changing of this password immediately after the initial onboarding process.

NOTE: Tracking and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.

NOTE: Tracking licenses may only be purchased by customers that have implemented an activation key agreement (AKA) with Hewlett Packard Enterprise. You can request an AKA

at <http://www.hpe.com/info/aka>

NOTE: When purchasing an iLO electronic license, regardless of the number of licenses purchased, customers will obtain only ONE (1) License Entitlement Certificate. This ONE (1) License Entitlement Certificate will be used for all licenses purchased.

NOTE: An iLO Advanced license is automatically included with Synergy compute modules. Use the licensing page to view the license. You cannot add or remove a license on Synergy compute modules.

HPE recommended USB to Ethernet Adapter to connect iLO Service Port to laptops

HPE Serial Special Cable Kits

Q7Y55A

NOTE: For more information, visit: <http://www.hpe.com/info/ilo/licensing>

Configuration Information

Discontinued iLO Licenses and Replacement Part Numbers

HPE is simplifying iLO licensing. All features would either be standard or enable via iLO Advanced license. All other iLO iLO licenses are being discontinued.

Please see our [HPE iLO Licensing Guide](#) documentation for more details surrounding this transition.

Summary:

- Customers who have iLO Advanced and upgrade to v1.40 will get the security features at no additional cost.
- Customers that already have iLO Advanced Premium Security Edition will continue to get the security features as before.
- The iLO Essentials and iLO Advanced for BladeSystem licenses can no longer be purchased after January 31, 2019.
- The iLO Advanced Premium Security Edition license can no longer be purchased after the release of iLO 5 v1.40
- All the above changes will not impact our customers support and support agreements.
- Customers who have licenses which are discontinued will continue to use the features and get support as long as they have a valid support contract
- Customer who have licenses which are discontinued but have not be applied to a server, can use these licenses at a time of their choosing.
- Previously purchased licenses that are unused can still be utilized

Table 1: Discontinued iLO Essentials Licenses and Replacement Part Numbers:

Description	SKU	Replacement SKU Description	Replacement SKU
HPE iLO Essentials License with 1yr Support on iLO Licensed Features	BD775A	HPE iLO Advanced 1-server License with 1yr Support on iLO Licensed Features	512485-B21
HPE iLO Essentials License with 3yr Support on iLO Licensed Features	BD774A	HPE iLO Advanced 1-server License with 3yr Support on iLO Licensed Features	BD505A
HPE iLO Essentials Electronic License with 1yr Support on iLO Licensed Features	E6U62ABE	HPE iLO Advanced Electronic License with 1yr Support on iLO Licensed Features	E6U59ABE
HPE iLO Essentials Electronic License with 3yr Support on iLO Licensed Features	E6U61ABE	HPE iLO Advanced Electronic License with 3yr Support on iLO Licensed Features	E6U64ABE

Configuration Information

Table 2: Discontinued iLO Advanced for BladeSystem Licenses and Replacement Part Numbers:

Description	SKU	Replacement SKU Description	Replacement SKU
HPE iLO Advanced for BladeSystem 8-server License with 1yr Support on iLO Licensed Features	512489-B21	None	None
HPE iLO Advanced for BladeSystem 1-server License with 1yr Support on iLO Licensed Features	512488-B21	HPE iLO Advanced 1-server License with 1yr Support on iLO Licensed Features	512485-B21
HPE iLO Advanced for BladeSystem 1-server License with 3yr Support on iLO Licensed Features	BD502A	HPE iLO Advanced 1-server License with 3yr Support on iLO Licensed Features	BD505A
HPE iLO Advanced for BladeSystem Electronic License with 1yr Support on iLO Licensed Features	E6U60ABE	HPE iLO Advanced Electronic License with 1yr Support on iLO Licensed Features	E6U59ABE
HPE iLO Advanced for BladeSystem Electronic License with 3yr Support on iLO Licensed Features	E6U63ABE	HPE iLO Advanced Electronic License with 3yr Support on iLO Licensed Features	E6U64ABE
HPE iLO Advanced for BladeSystem Flexible Quantity License with 1yr Support on iLO Licensed Feature	512490-B21	HPE iLO Advanced Flexible Quantity License with 1yr Support on iLO Licensed Features	512486-B21
HPE iLO Advanced for BladeSystem Flexible Quantity License with 3yr Support on iLO Licensed Features	BD503A	HPE iLO Advanced Flexible Quantity License with 3yr Support on iLO Licensed Features	BD506A
HPE iLO Advanced for BladeSystem AKA Tracking License with 1yr Support on iLO Licensed Features	512491-B21	HPE iLO Advanced AKA Tracking License with 1yr Support on iLO Licensed Features	512487-B21

Table 2: Discontinued iLO Advanced for BladeSystem Licenses and Replacement Part Numbers:

Description	SKU	Replacement SKU Description	Replacement SKU
HPE iLO Advanced for BladeSystem AKA Tracking License with 3yr Support on iLO Licensed Features	BD504A	HPE iLO Advanced AKA Tracking License with 3yr Support on iLO Licensed Features	BD507A
HPE iLO Advanced Blade Electronic License with 3yr 24x7 Tech Support and Updates	BD503AAE	HPE iLO Advanced Electronic License with 3yr Support on iLO Licensed Features	E6U64ABE

Configuration Information

Table 3: Discontinued iLO Advanced Premium Security Edition Licenses and Replacement Part Numbers:

Description	SKU	Replacement SKU Description	Replacement SKU
HPE iLO Advanced Premium Security Upgrade Electronic License with 3yr Support on Licensed Features	Q7E12AAE	None	None
HPE iLO Advanced Premium Security Edition License with 1yr Support on Licensed Features	Q7E31A	HPE iLO Advanced 1-server License with 1yr Support on iLO Licensed Features	512485-B21
HPE iLO Advanced Premium Security Edition License with 3yr Support on Licensed Features	Q7E33A	HPE iLO Advanced 1-server License with 3yr Support on iLO Licensed Features	BD505A
HPE iLO Advanced Premium Security Edition Electronic License with 1yr Support on Licensed Features	Q7E32AAE	HPE iLO Advanced Electronic License with 1yr Support on iLO Licensed Features	E6U59ABE
HPE iLO Advanced Premium Security Edition Electronic License with 3yr Support on Licensed Features	Q7E34AAE	HPE iLO Advanced Electronic License with 3yr Support on iLO Licensed Features	E6U64ABE
HPE iLO Advanced Premium Security Flex Qty License with 1yr Support on Licensed Features	Q7E32A	HPE iLO Advanced Flexible Quantity License with 1yr Support on iLO Licensed Features	512486-B21
HPE iLO Advanced Premium Security Flex Qty License with 3yr Support on Licensed Features	Q7E34A	HPE iLO Advanced Flexible Quantity License with 3yr Support on iLO Licensed Features	BD506A
HPE iLO Advanced Premium Security AKA Tracking License with 1yr Support on Licensed Features	Q7E35A	HPE iLO Advanced AKA Tracking License with 1yr Support on iLO Licensed Features	512487-B21
HPE iLO Advanced Premium Security AKA Tracking License with 3yr Support on Licensed Features	Q7E36A	HPE iLO Advanced AKA Tracking License with 3yr Support on iLO Licensed Features	BD507A

Factory Integration Rules:

Factory integration of iLO electronic licenses (E-LTU) has been discontinued. If you need factory integration of iLO licenses please order the physical license along with the #0D1 option. This will ensure factory integration of the iLO license at no extra cost.

NOTE: When a user purchases an iLO license they get the right to use the licensed features perpetually, the time duration in the license refers to the duration for which they are entitled to support and updates. An iLO license is tied to the life of the server that it has been applied on, it cannot be transferred from that server to any other server.

NOTE: When purchasing an iLO electronic license, regardless of the number of licenses purchased, customers will obtain only ONE (1) License Entitlement Certificate. This ONE (1) License Entitlement Certificate will be used for all licenses purchased.

Technical Specifications

HPE iLO On System Management	Architecture	PCI Express based health and remote management ASIC
	Processor	iLO 5 Embedded ARM processor core operating at 800MHz iLO 4 Embedded ARM processor core operating at 400MHz
	Upgradeability	Firmware upgradeable via Flash ROM
	Video Support	iLO 5 1920 x 1200 (32 bpp) iLO 4 1920 x 1200 (16 bpp)
	Interfaces	HPE iLO Dedicated* Network connection (10/100/1000 Mb/s) on rack, tower and SL systems NOTE: *Optional Module on some servers. HPE iLO Shared Network connection (10/100/1000 Mb/s) on rack, tower and SL systems HPE iLO network connection on blades (100 Mb/s) to Onboard Administrator (with 10/100/1000 Mb/s uplink) on blade systems HPE iLO network connection on Synergy compute modules (1000 Mb/s) to the Enclosure Manager
	Operating System Support	For information on the Hewlett Packard Enterprise Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase from Hewlett Packard Enterprise, please visit our OS Support Site at: http://www.hpe.com/info/ossupport .
	Client System Support	For information on Client System Support, please visit the HPE iLO Release notes
	Client Browser Support	Microsoft Internet Explorer Firefox Extended Support Release (ESR) Google Chrome NOTE: Please refer to the iLO GUI login help page for latest list of supported browser versions.
	Command Line Support	Secure Shell and serial port access Secure Shell version 2 CLP and XML scripting interface RESTful Interface tool
	Security	FIPS 140-2 validation Common Criteria certification Secure Socket Layer Transport Layer Security Configurable for PCI DSS compliance Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser AES encryption of video iLO 5 Immutable silicon root of trust

Technical Specifications

Runtime firmware validation
 CNSA support
 Common Access Card support
 Security Modes
 Granular Control over iLO services and access options
 Encrypted virtual media

Directory Support Services	Active Directory, OpenLDAP, Novell eDirectory
Driver Support	HPE ProLiant iLO Management Controller Driver Package
Management protocols supported	SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HPE RIBCL XML, and iLO RESTful API (Redfish Spec conformance)

Environment friendly Products and Approach End-of life Management and Recycling

Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs** in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **Hewlett Packard Enterprise web site**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
02-Dec-2019	Version 29	Changed	Service and Support Section was updated Overview and Configuration Information sections were updated.
02-Apr-2019	Version 28	Changed	Overview section updated. Added new features in Standard Features section.
04-Jun-2018	Version 27	Changed	Overview section was updated.
05-Mar-2018	Version 26	Changed	SKU Descriptions were updated
05-Feb-2018	Version 25	Changed	Overview –What’s New section was updated
04-Dec-2017	Version 24	Changed	Overview and Standard Features sections were updated
23-Oct-2017	Version 23	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
25-Sep-2017	Version 22	Added	Added Information for iLO 5 v1.15 and iLO 4 v2.54 and v2.55
17-Jul-2017	Version 21	Changed	The SKU Q7E36A changed from 1yr support to 3yr support.
11-Jul-2017	Version 20	Added	Added iLO 5/Gen10 information.
05-Jun-2017	Version 19	Added	Added information on version 2.53. Added information on changes to #OD1 option for Electronic SKUs and the fact that it would discontinued. Added a pointer to iLO licensing guide for detailed information on licensing. Added RESTful API information under scripting.
		Changed	RESTful API branding changes.
		Removed	Removed information on feature of 2.40 related to critical temperature cutoff as it applied to a small subset of servers.
18-Nov-2016	Version 18	Added	Added a note on licensing for Synergy compute modules and note on 2.50
26-Sep-2016	Version 17	Changed	Overview sections was revised.
06-Jun-2016	Version 16	Changed	Overview section was updated.
18-Mar-2016	Version 15	Changed	Removed Care Pack SKU numbers and replaced with link to site with Care Pack information, this will ensure customers get the latest SKU information.
19-Feb-2016	Version 14	Added	Added new HPE Pointnext operational and licenses information.
		Changed	Overview, and Standard Features were revised.
28-Sep-2015	Version 13	Added	HPE RESTful Application Program Interface (API) section was added to Standard Features. Redfish 1.0 Spec conformance was added to the management protocols supported in Technical Specifications.
		Changed	HPE RESTful API was revised in the Overview section.
03-Mar-2015	Version 12	Changed	Overview section was revised.
10-Oct-2014	Version 11	Changed	Overview section was revised.
09-Sep-2014	Version 10	Changed	Changes made throughout the QuickSpecs.
18-Feb-2014	Version 9	Changed	Changes made in Step 2.
14-Feb-2014	Version 8	Changed	Changes made throughout the QuickSpecs.
08-Nov-2013	Version 7	Changed	Models and HPE Pointnext operational services were revised.
10-Sep-2013	Version 6	Changed	Models and HPE Pointnext operational services were revised.
19-Aug-2013	Version 5	Changed	Overview: change was made in HPE Embedded Remote Support (iLO 4) section only.
29-Mar-2013	Version 4	Changed	Overview: Updated Product description at the beginning of the section and updated hyperlink Models section. Standard Features: Completely updated Remote Serial Console (Virtual Serial Port) for HPE ProLiant section. Additional Features: Completely updated Text Console via SSH for HPE ProLiant section.

Summary of Changes

19-Feb-2013	Version 3	Changed	Overview and Models sections completely revised. The HPE Pointnext operational descriptions were updated in the Related Options section.
		Added	Added iLO Serial Port Record\ Playback for HPE ProLiant, and Remote System logs to the Additional Options section. HPE iLO 4 On System Management was added to the Technical Specifications section.
31-Aug-2012	Version 2	Changed	Changes made throughout the QuickSpecs.
06-Mar-2012	Version 1	New	Initial version.



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c04154343 - 14276 - Worldwide - V29 - 02-December-2019



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HPE ProLiant DL360 Gen10

by Hewlett Packard Enterprise

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Products	Version	Arch	Level	Notes	Additional Information
Red Hat Enterprise Linux	8.0 - 8.x	x86_64	Certified		Details
Red Hat Enterprise Linux	7.3 - 7.x	x86_64	Certified	▶ Notes	
Red Hat Enterprise Linux	6.9 - 6.x	x86_64	Certified	▶ Notes	
Red Hat Gluster Storage	3.2 - 3.x	x86_64	Certified	▶ Notes	
Red Hat Gluster Storage	3.1 - 3.x	x86_64	Certified	▶ Notes	
Red Hat OpenStack Platform for Bare Metal	16.1 - 16.x	x86_64	Certified		Details
Red Hat OpenStack Platform for Compute	16.1 - 16.x	x86_64	Certified		Details
Red Hat OpenStack Platform for Compute	16.0 - 16.x	x86_64	Certified		Details
Red Hat OpenStack Platform for Bare Metal	13.0 - 13.x	x86_64	Certified		
Red Hat OpenStack Platform for Compute	13.0	x86_64	Certified		
Red Hat OpenStack Platform for Compute	10.0	x86_64	Certified	▶ Notes	
Red Hat Enterprise Linux for Real Time	7.5	x86_64	Certified	▶ Notes	
Red Hat Virtualization	4.4 - 4.x	x86_64	Certified	▶ Notes	Details
Red Hat Virtualization	4.2 - 4.3	x86_64	Certified	▶ Notes	

Nome do fabricante: Hewlett Packard Enterprise Company
Endereço do fabricante: 11445 Compaq Center Drive West, Houston, TX 77070, USA

declara sob sua exclusiva responsabilidade que o produto:

Nome e/ou Modelo do Produto: Por favor, consulte ANEXO I
Número de Modelo Regulamentar: HSTNS-2154
Opções de produto: Todo

Em conformidade com as seguintes especificações de produto e diretivas:

Segurança	Compatibilidade Electromagnética
EN 60950-1:2006 + A11:2009 +A1:2010 +A12:2011 +A2:2013	EN 55024:2010
EN 62368-1:2014	EN 55032:2015 Class A
EN 62479:2010	EN 61000-3-2:2014
	EN 61000-3-3:2013

Concepção ecológica

Regulamento (CE) Nº. 617/2013

Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies
Revision 6.6 (April, 2012)

Restrição do uso de determinadas substâncias perigosas

EN 50581:2012

O produto está em conformidade com os requisitos da Directiva 2014/35/UE no domínio do material eléctrico destinado a ser utilizado dentro de certos limites de tensão, Directiva 2014/30/UE respeitantes à compatibilidade electromagnética, Directiva 2009/125/CE relativa à criação de um quadro para definir os requisitos de concepção ecológica dos produtos relacionados com o consumo de energia, Directiva 2011/65/UE na versão actual relativa à restrição do uso de determinadas substâncias perigosas em equipamentos eléctricos e electrónicos, , bem como detém a respetiva marcação CE.

Informação adicional

O presente produto detém um Número de Modelo Regulamentar, correspondente aos aspetos regulamentares do design. O Número de Modelo regulamentar é o principal identificador do produto presente na documentação regulamentar e nos relatórios de teste; este número não deve ser confundido com o nome de marketing ou os números do produto. Qualquer produto que possua este Número de modelo regulamentar que não possua a marcação CE não cumprirá todos os requisitos listados acima e não poderá ser colocado no mercado da UE.

O presente produto foi testado num ambiente tipicamente HPE.



Bryan Vanalstyne, Gerente de regulamentação
HPE, Houston Product Compliance Center

Houston, TX
20.01.2021

Contato apenas para assuntos regulamentares

UE: HPE, Postfach 0001, 1122 Wien, Austria

EUA: Hewlett Packard Enterprise, 6280 America Center Drive, San Jose, CA 95002, U.S.A. 844-806-3425

<http://www.hpe.com/eu/certificates>

ANEXO I
Número de Modelo Regulamentar: HSTNS-2154

Nome e/ou Modelo do Produto

HPE DL360 Gen10 4LFF CTO Server

HPE DL360 Gen10 8SFF CTO Server

HPE ProLiant DL360 Gen10 Server NEC EXP804

HA8000V DL360 Gen10

HPE DL360 Gen10 Premium 10NVMe CTO Svr

HPE DL360 Gen10 3106 1P 16G 8SFF JP Svr

HPE DL360 Gen10 3106 1P 16G 8SFF Svr

HPE DL360 Gen10 4114 1P 16G 8SFF JP Svr

HPE DL360 Gen10 4114 1P 16G 8SFF Svr

HPE DL360 Gen10 5118 2P 32G 8SFF JP Svr

HPE DL360 Gen10 5118 2P 32G 8SFF Svr

HPE DL360 Gen10 6130 2P 64G 10NVMe Svr

HPE OEM DL360 Gen10 8-SFF CTO Server

HPE DL360 Gen10 4110 1P 16G 8SFF Svr

HPE DL360 Gen10 4114 1P 32G 8SFF Svr

HPE DL360 Gen10 4116 1P 16G 8SFF Svr

HPE DL360 Gen10 5120 1P 16G 8SFF Svr

HPE DL360 Gen10 3104 1P 16G 8SFF Svr

HT DL360 G10 4LFF CTO Server

HT DL360 G10 8SFF CTO Server

HT DL360 G10 10SFF CTO Server

OEM Siegy DL360G10 Non ft 2018 Svr

OEM Siegy DL360G10 DR 2018 Svr

Nome e/ou Modelo do Produto

HPE DL360 Gen10 3104 1P 8GB 4LFF JP Svr

HPE CL2600 Gen10 8SFF CTO Server

HPE DL360 Gen10 4110 1P 16G 8SFF JP Svr

HPE DL360 Gen10 4110 1P 16G 8SFF WW Svr

HPE DL360 Gen10 5118 1P 32G 8SFF JP Svr

HPE DL360 Gen10 5118 1P 32G 8SFF WW Svr

HPE DL360 Gen10 3104 1P8GB4LFF JP WW Svr

HPE DL360 Gen10 3104 1P 8GB 4LFF WW Svr

HPE DL360 Gen10 6130 1P 64G 8SFF JP Svr

HPE DL360 Gen10 6130 1P 64G 8SFF WW Svr

HPE DL360 Gen10 3104 1P 4LFF IN Svr

HPE DL360 Gen10 3106 1P 8SFF IN Svr

HPE DL360 Gen10 4110 1P 8SFF IN Svr

HPE DL360 Gen10 4114 1P 8SFF IN Svr

HPE OEM DL360G10 4110 GEHC Svr

HPE OEM DL360G10 5120 GEHC Svr

HPE OEM DL360G10 6130 GEHC Svr

HPE OEM DL360G10 4112 GEHC Svr

HPE OEM DL360G10 3104 GEHC Svr

HPE OEM INE10546060358 DL360G10 4110 Svr

HPE OEM INE10546060367 DL360G10 5118 Svr

HPE OEM INE10546060368 DL360G10 5118 Svr

HPE OEM INE10546060370 DL360G10 4112 Svr

HPE Cloudline CL2600 Gen10

HPE OEM Vital DL360G10 VIMS Svr

HPE OEM Vital DL360G10 WS16 VIMS Svr

Nome e/ou Modelo do Produto

HPE OEM Vital DL360G10 SUR 1GPU Svr

HPE OEM Vital DL360G10 WS16 SUR Svr

HPE OEM Vital DL360G10 MUR 2GPU Svr

HPE OEM Vital DL360G10 WS16 MUR Svr

HPE OEM DL360G10 100U 8SFF Svr

HPE 3PAR StoreServ AC RPS Svc Processor

HPE DX360 Gen10 4LFF CTO Svr

HPE DX360 Gen10 8SFF CTO Svr

HPE DX360 Gen10 10NVMe CTO Svr

Aruba ClearPass C3010DL360 G10 HW Appl

ARST C6700 Gen10 Appliance Server

ARST L7700 Gen10 Appliance Server

HITACHI / VANTARA HA810

HPE ProLiant DX360 Gen10 4LFF OEM1 Svr



Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

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1217 Meyrin 2
Switzerland

Holds Certificate Number:

FS 70484

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For and on behalf of BSI:

Andrew Launn, EMEA Systems Certification Director

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Latest Revision Date: 2019-02-25

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Hewlett-Packard GmbH Herrenberger Strasse 140 D-71034 Boeblingen Germany	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Germany.
Hewlett-Packard Hellas E.P.E 1-3 Tzavella str. 152 31 Halandri Athens Greece	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Greece.
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Hydrus Holding S.C.A. 75 Parc d'Activités L-8308 Capellen Luxembourg	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Luxembourg.
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Global E-Business Operations Centre SRL 5 Fabrica de Glucoza Stree Novo Park, F Building 11th and 12th Floors -Space A Second District, Bucharest 020331 Romania	Global Solution Centre Support to EMEA customers.

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Hewlett Packard Enterprise Slovakia s.r.o Galvaniho 7 Bratislava 82104 Slovakia	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Slovakia.
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Effective Date: 2016-03-02

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Hewlett-Packard Sverige AB S-16985 Stockholm Sweden	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Sweden.
Hewlett-Packard International Sàrl 1217 Meyrin 2 Switzerland	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Switzerland.
Hewlett-Packard (Schweiz) GmbH Ueberlandstrasse 1 1st Floor 8600 Dübendorf Switzerland	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Switzerland.
Hewlett Packard Nederland B.V. Startbaan 16 1187 XR Amstelveen The Netherlands	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within The Netherlands.
Hewlett-Packard CDS (Netherlands) BV Pascallaan 70 8218 NJ Lelystad The Netherlands	The service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within The Netherlands.
Hewlett-Packard Global Delivery Tunisia Center, S.A.R.L. Technopole El Gazala Ariana 2088 Tunisia	Global Solution Centre Support to EMEA customers.
Hewlett-Packard Teknoloji Çözümleri Ltd. Sirketi Akkom Plaza, Saray Mahallesi Dr. Adnan Büyükdenez Cad. No:4 Kat:7-8 Ümraniye Istanbul 34768 Turkey	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within Turkey.

Original Registration Date: 2002-10-23

Effective Date: 2016-03-02

Latest Revision Date: 2019-02-25

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Hewlett-Packard Ltd Cain Road Amen Road, (BLDG BRA02) Bracknell RG12 1HN United Kingdom	The sales, supply chain management, delivery, service and support of servers, storage, and networking products, IT converged solutions and datacentre solutions within The United Kingdom.
Hewlett-Packard CDS Ltd Building AC1.G Cain Road Amen Corner Bracknell RG12 1HN United Kingdom	The service and support of printers, personal systems, servers, storage, and networking products, IT converged solutions and datacentre solutions within The United Kingdom.



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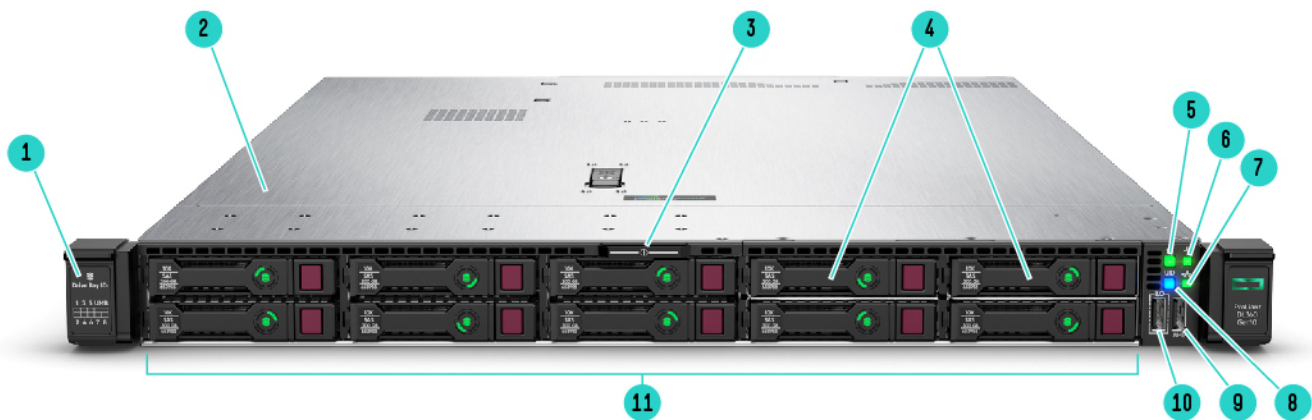
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Overview

HPE ProLiant DL360 Gen10 Server

Does your data center need a secure, performance driven dense server that you can confidently deploy for virtualization, database, or high-performance computing? The HPE ProLiant DL360 Gen10 server delivers security, agility and flexibility without compromise.

The HPE ProLiant DL360 Gen10 Server supports the Intel® Xeon® Scalable Processor Family with up to 28 cores, plus 2933 MT/s HPE DDR4 SmartMemory supporting up to 3.0 TB max. With the added performance that HPE Persistent Memory and 10 NVMe bring, the HPE ProLiant DL360 Gen10 means business. Deploy this dense platform for diverse workloads in space constrained environments and maintain it with ease by automating the most essential server lifecycle management tasks with HPE OneView and HPE iLO 5.



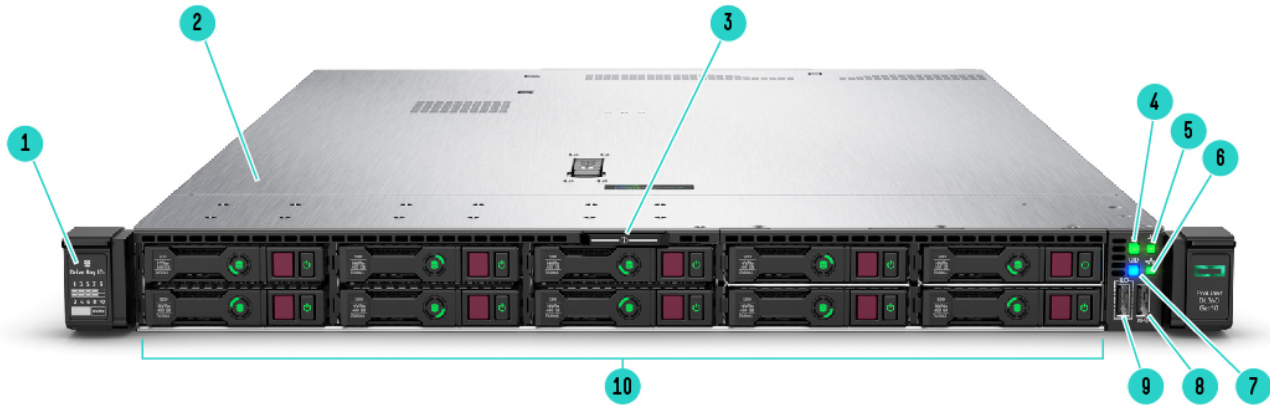
8 SFF Front View – 8 SFF + 2 SFF- Universal Media Bay option shown

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 1. Drive support label | 5. Power On/Standby button and system power LED |
| 2. Quick removal access panel | 6. Health LED |
| 3. Serial no. label pull tab | 7. NIC status LED |
| 4. Universal Media Bay: +2 SFF SAS/SATA shown
Option: +2 SFF NVMe drives
Option: DVD-RW or DVD-ROM + Display port & USB 2.0 port Kit
Option: +2 Dual uFF (4x M.2 cartridges)
Option: Display port + USB 2.0 port Kit + Blank | 8. UID button/LED |
| | 9. USB 3.0 port |
| | 10. iLO Service Port |
| | 11. Standard 8 SAS/SATA drive bays |

Notes:

- Rear drive option allows for an additional + 1 SFF or +1 Dual uFF (2x M.2 cartridges).
- System Insight Display (SID) module will include #5-9 above (will not include #10 - iLO Service Port).

Overview

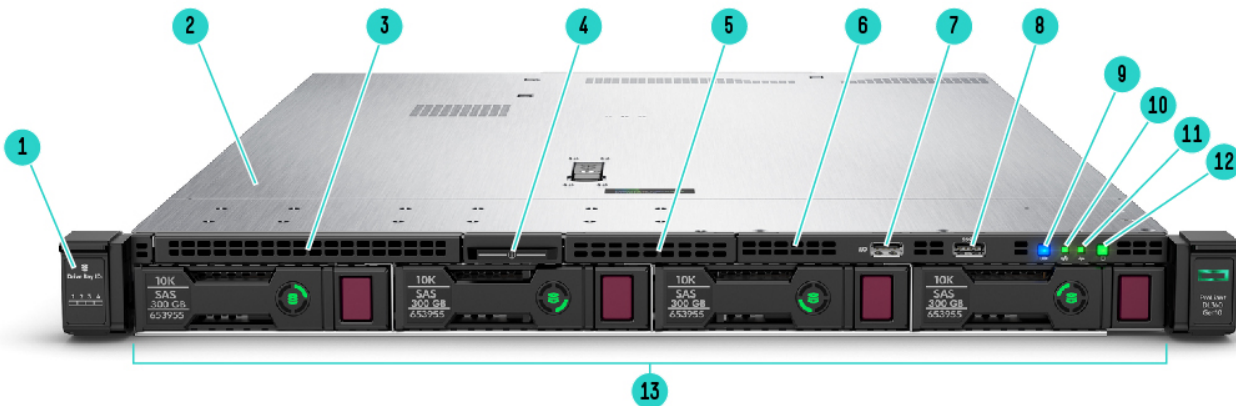


Premium 10SFF NVMe Front View

- | | |
|-------------------------------------------------|---------------------------------------------------------------------------------|
| 1. Drive support label | 6. NIC status LED |
| 2. Quick removal access panel | 7. UID button/LED |
| 3. Serial no. label pull tab | 8. USB 3.0 port |
| 4. Power On/Standby button and system power LED | 9. iLO Service Port |
| 5. Health LED | 10. Max up to 10 NVMe drives (PCIe direct attached) or 8 SAS/SATA/NVMe + 2 NVMe |

Notes:

- Rear drive option allows for an additional + 1 SFF or +1 Dual uFF (2x M.2 cartridges).
- System Insight Display (SID) module will include #4-8 above (will not include #9 - iLO Service Port).
- Does not support the Xeon-Gold 6250L or Gold 6250 processors.



4 LFF Front View - Standard 4 LFF shown

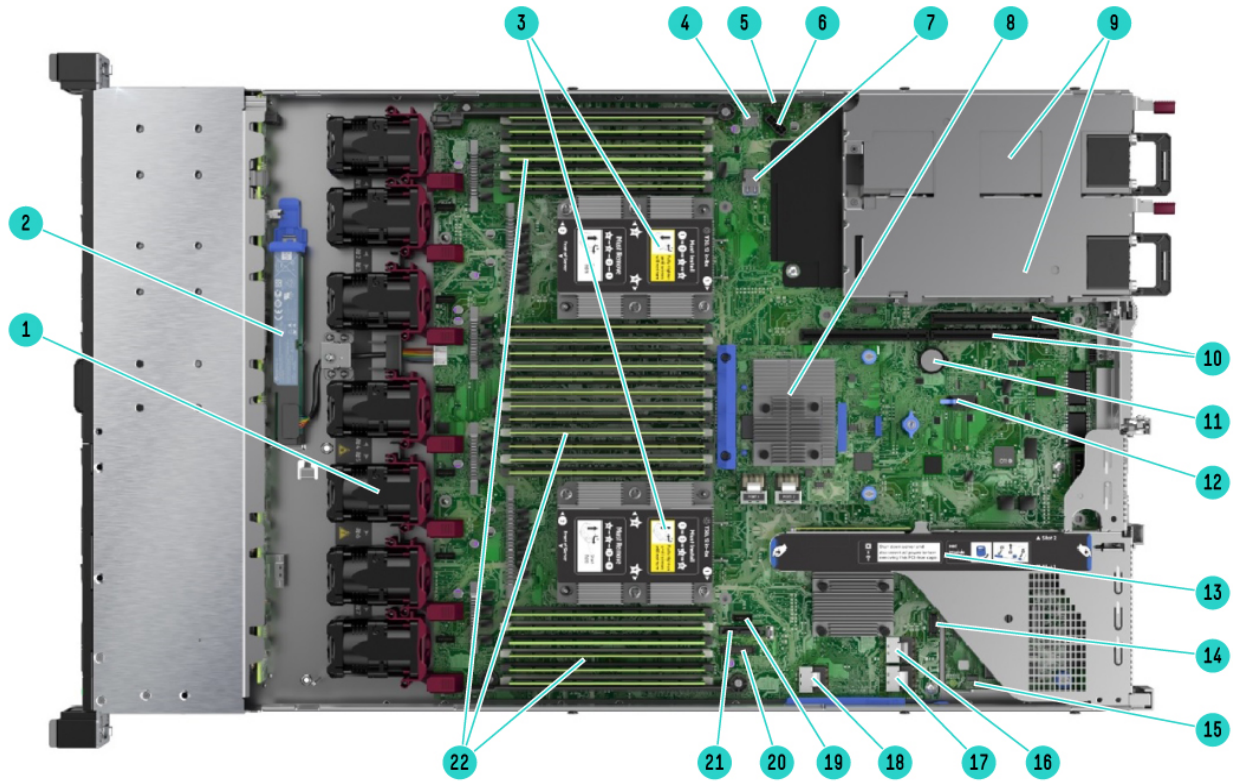
- | | |
|-----------------------------------------------------------------------|--------------------------------------------------|
| 1. Drive support label | 8. USB 3.0 Port |
| 2. Quick removal access panel | 9. UID button/LED |
| 3. Option: DVD-RW or DVD-ROM (blank shown) | 10. Power On/Standby button and system power LED |
| 4. Serial no. label pull tab | 11. Health LED |
| 5. Option: Display port & USB 2.0 port Kit (blank shown) | 12. NIC status LED |
| 6. Option: System insight Display (SID) - standard shown ⁶ | 13. SAS/SATA drive bays |
| 7. iLO Service Port | |

Notes:

- ⁶ This option will lose #7 iLO Service Port.
- Rear drive option allows for additional + 1 SFF or +1 Dual uFF (2x M.2 cartridges), will lose one FH PCIe slot.



Overview



Internal View - Standard for all DL360 Gen10

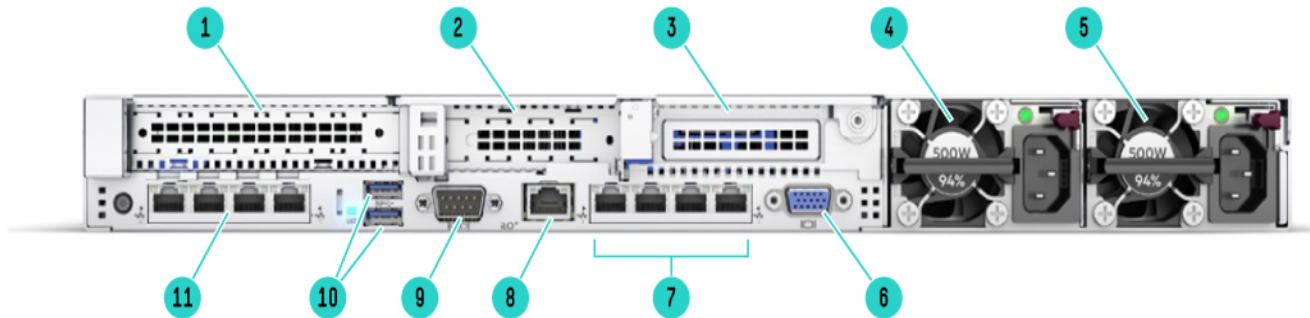
- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. For 8 SFF or 4 LFF - Standard single rotor hot plug fans¹
1 CPU – 5 standard fans
2 CPUs – 7 standard fans
Option: High Performance fans 2. Option: HPE Smart Hybrid Capacitor or HPE Smart Storage Battery 3. Up to 2 processors (shown with standard heat sinks) 4. MicroSD card slot 5. Option: Chassis Intrusion Detection 6. Hard Drive backplane power connector 7. Dual internal USB 3.0 connector 8. Smart Array Controller (Type -a shown) 9. Up to 2 Power Supplies for redundant power 10. Secondary (CPU2) PCIe 3.0 riser
Option: Full Height x16 (Lose slot 2 on Primary riser)¹⁰ 11. System Battery 12. Optional: TPM 2.0 | <ol style="list-style-type: none"> 13. Primary (CPU1) PCIe 3.0 riser (Standard: GPU power connector + 1x 16 and 1x 8)
Option: 2 SATA M.2 + 2x 16
Option: (8 SFF only): 2x 4 NVMe + 1x 16 and 1x 8 14. Option: Front Display port / USB 2.0 15. FlexibleLOM (supports various NICs up to 25GbE) 16. x4 SATA port 1 17. x4 SATA port 2 18. x2 SATA port 3 19. x1 SATA port 4 20. Front Power USB 3.0 connector 21. Optical/SATA port 5 22. DDR4 DIMM slots (Fully populated 24 DIMMs shown) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Notes:

- ¹For 10 NVMe chassis - 7 High Performance fans
- ¹⁰For 10 NVMe chassis – Secondary Riser is not available due to 10 x4 NVMe riser for PCIe direct attached



Overview



Rear View – Standard for all DL360 Gen10

- | | |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 1. Slot 1 PCIe 3.0
Option: Rear Drive +1 SFF or 1 uFF SSD (2x M.2 cartridges) ¹ | 7. Embedded 4x 1GbE Adapter (if equipped) ⁷ |
| 2. Slot 2 PCIe 3.0 | 8. iLO Management Port |
| 3. Option: Slot 3 PCIe 3.0 (Requires 2 nd processor) | 9. Option: Serial Port |
| 4. Power Supply 2 | 10. USB 3.0 Ports |
| 5. Power Supply 1 | 11. Option: FlexibleLOM (Shown: 4x 1GbE) ¹¹ |
| 6. VGA port | |

Notes:

- ¹Will lose FH x16 PCIe slot1 with this option.
- ⁷ Network Choice (NC) models do not include embedded LOM. Customer choice of FlexibleLOM for networking capability.
- ¹¹Supports Various NICs up to 25GbE.

What's New

- HPE SAS 12G Read Intensive SAS SSDs (960GB/1.92TB/3.84TB/7.68TB/15.3TB)
- HPE SAS 12G Mixed Use SAS SSDs (800GB/1.6TB/3.2TB/6.4TB)
- HPE SAS 12G Write Intensive SAS SSDs (400GB/800GB/1.6TB)
- HPE 18TB SAS 7.2K LFF HDD
- HPE 18TB SATA 7.2K LFF HDD
- Four additional Pre-Configured models (P40637-xx1, P40638-xx1, P36183-xx1 and P40636-xx1)
- Support for 32GB Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory

Platform Information

Form Factor

- 1U rack

Chassis Types

- 8 SFF with options supporting: +2 SFF or 2 NVMe or 2 Dual uFF (4x M.2 cartridges)
- 10 SFF NVMe Premium
- 4 LFF

Notes: Rear drive option available on all DL360 Gen10 chassis types for additional boot/storage: +1SFF or 1 Dual uFF (2x M.2 cartridges).



Overview

System Fans

- Single rotor hot plug fans will be included

For 4 LFF and 8 SFF chassis:

- 1 CPU – Includes 5 standard fans
- 2 CPUs – Includes 7 standard fans

Notes:

- Optional High Performance Fan Kit available (includes 7 fans).
- The DL360 Gen10 will support up to 7 fans with fan redundancy built in. One fan rotor failure will place server in degraded mode but fully functional. Two fan rotor failures could provide warning and imminent server shutdown.

For 10 NVMe Premium chassis:

- 2 CPUs – Includes 7 high performance fans as standard
-



Standard Features

Processors – Up to 2 of the following depending on model.

Notes:

- The 2nd digit of the processor model number “x1xx” and “x2xx” is used to denote the processor generation (i.e. 1=1st generation and 2=2nd generation)
- Field upgrades from 1st generation processors (x1xx) to 2nd generation processors (x2xx) not supported.
- “U” processors (i.e. 6212U) only supported in single socket configurations
- This table covers the public Intel offering only.
- For more information regarding Intel Xeon processors, please see the following <http://www.intel.com/xeon>.

Intel Xeon Processor		
Processor Suffix	Description	Offering
L	Large memory tier	Up to 4.5 TB addressable memory per socket
M	Medium memory tier	Up to 2.0 TB addressable memory per socket
N	NFV Optimized	Targeted at Network Function Virtualization (NFV) workloads. Intel® SST-BF improves performance by directing base frequency to high priority/bottleneck cores, other workloads may see throttling.
R	Refresh	Improved price/performance over equivalent “non-R” 2 nd generation processors
S	Search Optimized	Optimized base frequency to address ‘search’ workloads, other workloads may see throttling.
U	1 Socket Optimized	Focused on single socket (1P) configurations deliver performance at competitive price points. Does not support two socket (2P) arrangements.
V	VM Density Optimized	Fosters enhanced VM density, allowing to support more/larger virtual machines per host.
Y	Speed Select	Intel® SST-PP increases base frequency when fewer cores are enabled. Allows greater flexibility, deployment options and platform longevity.

Notes: More than 1.5 TB memory per socket requires HPE Persistent Memory

2 nd Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Platinum 8280 Processor	2.7 GHz	28	38.50 MB	205W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8280L Processor	2.7 GHz	28	38.50 MB	205W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Platinum 8280M Processor	2.7 GHz	28	38.50 MB	205W	3 @ 10.4 GT/s	2933 MT/s	2TB
Platinum 8276 Processor	2.2 GHz	28	38.50 MB	165W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8276L Processor	2.2 GHz	28	38.50 MB	165W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Platinum 8276M Processor	2.2 GHz	28	38.50 MB	165W	3 @ 10.4 GT/s	2933 MT/s	2TB
Platinum 8270 Processor	2.7 GHz	26	35.75 MB	205W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8268 Processor	2.9 GHz	24	35.75 MB	205W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8260 Processor	2.4 GHz	24	35.75 MB	165W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8260L Processor	2.4 GHz	24	35.75 MB	165W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Platinum 8260M Processor	2.4 GHz	24	35.75 MB	165W	3 @ 10.4 GT/s	2933 MT/s	2TB
Platinum 8260Y Processor	2.4 GHz	24	35.75 MB	165W	3 @ 10.4 GT/s	2933 MT/s	1TB
	2.5 GHz	20					
Platinum 8260Y Processor	2.7 GHz	16	35.75 MB	165W	3 @ 10.4 GT/s	2933 MT/s	1TB
	2.5 GHz	20					
Platinum 8256 Processor	3.8 GHz	4	16.50 MB	105W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8253 Processor	2.2 GHz	16	22.00 MB	125W	3 @ 10.4 GT/s	2933 MT/s	1TB

Notes:

- 6-Channel DDR4 @ 2933 MT/s.
- 6TB max RAM (larger than 2TB memory per socket on select SKUs)
- Support for: HPE Persistent Memory, Vector Neural Network Instructions (VNNI) for inference acceleration.
- 2 and 4 socket capable, 2S - 2UPI, 2S - 3UPI, 4S - 3UPI @ 10.4 GT/s.
- Intel Turbo Boost Technology, Intel Hyper-Threading Technology Intel AVX-512 (2x 512-bit FMA).
- 48 lanes PCIe 3.0, advanced RAS



Standard Features

1st Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Platinum 8180M Processor	2.5 GHz	28	38.50 MB	205W	3 @ 10.4 GT/s	2666 MT/s	1.5TB
Platinum 8180 Processor	2.5 GHz	28	38.50 MB	205W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8176 Processor	2.1 GHz	28	38.50 MB	165W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8170 Processor	2.1 GHz	26	35.75 MB	165W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8168 Processor	2.7 GHz	24	33.00 MB	205W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8165 Processor	2.3 GHz	24	33.00 MB	205W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8164 Processor	2.0 GHz	26	35.75 MB	150W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8160M Processor	2.1 GHz	24	33.00 MB	150W	3 @ 10.4 GT/s	2666 MT/s	1.5TB
Platinum 8160 Processor	2.1 GHz	24	33.00 MB	150W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8158 Processor	3.0 GHz	12	24.75 MB	150W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8156 Processor	3.6 GHz	4	16.50 MB	105W	3 @ 10.4 GT/s	2666 MT/s	768GB
Platinum 8153 Processor	2.0 GHz	16	22.00 MB	125W	3 @ 10.4 GT/s	2666 MT/s	768GB

Notes:

- 6-Channel 1DPC DDR4 @ 2666 MT/s.
- 768 GB max memory capacity (1.5 TB on select skus)
- 2 and 4 socket capable, 2S - 2UPI, 4S - 3UPI, 8S - 3UPI @ 10.4 GT/s.
- Intel Turbo Boost Technology, Intel Hyper-Threading Technology Intel AVX-512 (2x 512-bit FMA).
- 48 lanes PCIe 3.0, advanced RAS.



Standard Features

2 nd Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Gold 6262V Processor	1.9 GHz	24	33.00 MB	135W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6258R Processor	2.7 GHz	28	38.50 MB	205W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6256 Processor	3.6 GHz	12	33.00 MB	205W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6254 Processor	3.1 GHz	18	24.75 MB	200W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6252 Processor	2.1 GHz	24	35.75 MB	150W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6252N Processor	2.3 GHz	24	35.75MB	150W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6250L Processor	3.9 GHz	8	35.75MB	185W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Gold 6250 Processor	3.9 GHz	8	35.75MB	185W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6248R Processor	3.0 GHz	24	35.75 MB	205W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6248 Processor	2.5 GHz	20	27.5 MB	150W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6246R Processor	3.4 GHz	16	35.75 MB	205W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6246 Processor	3.3 GHz	12	24.75 MB	165W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6244 Processor	3.6 GHz	8	24.75 MB	150W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6242R Processor	3.1 GHz	20	35.75 MB	205W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6242 Processor	2.8 GHz	16	22 MB	150W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6240R Processor	2.4 GHz	24	35.75 MB	165W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6240 Processor	2.6 GHz	18	24.75 MB	150W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6240Y Processor	2.6 GHz	18	24.75 MB	150W	3 @ 10.4 GT/s	2933 MT/s	1TB
	2.8 GHz	14					
	3.1 GHz	8					
Gold 6240L Processor	2.6 GHz	18	24.75 MB	150W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Gold 6240M Processor	2.6 GHz	18	24.75 MB	150W	3 @ 10.4 GT/s	2933 MT/s	2TB
Gold 6238R Processor	2.2 GHz	28	38.50 MB	165W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6238 Processor	2.1 GHz	22	30.25 MB	140W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6238L Processor	2.1 GHz	22	30.25 MB	140W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Gold 6238M Processor	2.1 GHz	22	30.25 MB	140W	3 @ 10.4 GT/s	2933 MT/s	2TB
Gold 6234 Processor	3.3 GHz	8	24.75 MB	130W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6230R Processor	2.1 GHz	26	35.75 MB	150W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6230 Processor	2.1 GHz	20	27.5 MB	125W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6230N Processor	2.3 GHz	20	27.50 MB	125W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6226R Processor	2.9 GHz	16	22 MB	150W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6226 Processor	2.7 GHz	12	19.25 MB	125W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6222V Processor	1.8 GHz	20	27.50 MB	115W	3 @ 10.4 GT/s	2933 MT/s	1TB
Gold 6212U Processor	2.4 GHz	24	35.75 MB	165W	N/A	2933 MT/s	1TB
Gold 6210U Processor	2.5 GHz	20	27.50 MB	150W	N/A	2933 MT/s	1TB
Gold 6209U Processor	2.1 GHz	20	27.50 MB	125W	N/A	2933 MT/s	1TB
Gold 6208U Processor	2.9 GHz	16	22 MB	150W	N/A	2933 MT/s	1TB
Gold 5222 Processor	3.8 GHz	4	16.5 MB	105W	2 @ 10.4 GT/s	2933 MT/s	1TB
Gold 5220R Processor	2.2 GHz	24	35.75 MB	150W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5220 Processor	2.2 GHz	18	24.75 MB	125W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5220S Processor	2.7 GHz	18	24.75 MB	125W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5218R Processor	2.1 GHz	20	27.50 MB	125W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5218 Processor	2.3 GHz	16	22 MB	125W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5218N Processor *	2.3 GHz	16	22 MB	110W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5218B Processor *	2.3 GHz	16	22 MB	125W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5217 Processor	3.0 GHz	8	11 MB	115W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5215 Processor	2.5 GHz	10	13.75 MB	85W	2 @ 10.4 GT/s	2666 MT/s	1TB
Gold 5215L Processor	2.5 GHz	10	13.75 MB	85W	2 @ 10.4 GT/s	2666 MT/s	4.5TB
Gold 5215M Processor	2.5 GHz	10	13.75 MB	85W	2 @ 10.4 GT/s	2666 MT/s	2TB

Standard Features

Notes:

- * 5218B has consistent features with the 5218 processor but from a different die. Mixing both 5218B & 5218 in a system is not supported
- 6-Channel DDR4 @ 2933 MT/s (Gold 6200 & 5222 skus only), 2666 MT/s on all Gold 5200 skus (except 5222 @ 2933 MT/s).
- 6TB max RAM (larger than 2TB memory per socket on select SKUs)
- Support for: HPE Persistent Memory, Vector Neural Network Instructions (VNNI) for inference acceleration.
- 2 and 4 socket capable, 2S - 2UPI, 2S - 3UPI, 4S - 3UPI @ 10.4 GT/s.
- Intel Turbo Boost Technology, Intel Hyper-Threading Technology Intel AVX-512 (2x 512-bit FMA).
- 48 lanes PCIe 3.0, advanced RAS

1st Generation Intel® Xeon® Scalable Processor Family

Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Gold 6154 Processor	3.0 GHz	18	24.75 MB	200W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6152 Processor	2.1 GHz	22	30.25 MB	140W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6150 Processor	2.7 GHz	18	24.75 MB	165W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6148 Processor	2.4 GHz	20	27.50 MB	150W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6146 Processor	3.2 GHz	12	24.75 MB	165W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6144 Processor	3.5 GHz	8	24.75 MB	150W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6143 Processor	2.8 GHz	16	22.00 MB	205W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6142 Processor	2.6 GHz	16	22.00 MB	150W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6140 Processor	2.3 GHz	18	24.75 MB	140W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6138 Processor	2.0 GHz	20	27.50 MB	125W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6136 Processor	3.0 GHz	12	24.75 MB	150W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6134M Processor	3.2 GHz	8	24.75 MB	130W	3 @ 10.4 GT/s	2666 MT/s	1.5TB
Gold 6134 Processor	3.2 GHz	8	24.75 MB	130W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6132 Processor	2.6 GHz	14	19.25 MB	140W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6130 Processor	2.1 GHz	16	22.00 MB	125W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6128 Processor	3.4 GHz	6	19.25 MB	115W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6126 Processor	2.6 GHz	12	19.25 MB	125W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 5122 Processor	3.6 GHz	4	16.50 MB	105W	2 @ 10.4 GT/s	2666 MT/s	768GB
Gold 5120 Processor	2.2 GHz	14	19.25 MB	105W	2 @ 10.4 GT/s	2400 MT/s	768GB
Gold 5118 Processor	2.3 GHz	12	16.50 MB	105W	2 @ 10.4 GT/s	2400 MT/s	768GB
Gold 5117 processor	2.0GHz	14	19.25 MB	105W	2 @ 10.4 GT/s	2400 MT/s	768GB
Gold 5115 Processor	2.4 GHz	10	13.75 MB	85W	2 @ 10.4 GT/s	2400 MT/s	768GB

Notes:

- 6-Channel 1DPC DDR4 @ 2400 MT/s (SKU 5122 - supports 2666 MT/s).
- 768 GB max memory capacity (1.5 TB on select skus).
- 2 and 4 socket capable, 2S - 2UPI, 4S - 3UPI @ 10.4 GT/s.
- Intel Turbo Boost Technology, Intel Hyper-Threading Technology, Intel AVX-512 (1x 512-bit FMA) (SKU 5122 - supports 2x 512 bit FMA).
- 48 lanes PCIe 3.0, advanced RAS.



Standard Features

2 nd Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Silver 4216 Processor	2.1 GHz	16	22 MB	100W	2 @ 9.6 GT/s	2400 MT/s	1TB
Silver 4215R Processor	3.2 GHz	8	11 MB	130W	2 @ 9.6 GT/s	2400 MT/s	1TB
Silver 4215 Processor	2.5 GHz	8	11 MB	85W	2 @ 9.6 GT/s	2400 MT/s	1TB
Silver 4214R Processor	2.4 GHz	12	16.5 MB	100W	2 @ 9.6 GT/s	2400 MT/s	1TB
Silver 4214Y Processor	2.2 GHz	12	16.5 MB	85W	2 @ 9.6 GT/s	2400 MT/s	1TB
	2.3 GHz	10					
	2.4 GHz	8					
Silver 4214 Processor	2.2 GHz	12	16.5 MB	85W	2 @ 9.6 GT/s	2400 MT/s	1TB
Silver 4210R Processor	2.4 GHz	10	13.75 MB	100W	2 @ 9.6 GT/s	2400 MT/s	1TB
Silver 4210 Processor	2.2 GHz	10	13.75 MB	85W	2 @ 9.6 GT/s	2400 MT/s	1TB
Silver 4208 Processor	2.1 GHz	8	11 MB	85W	2 @ 9.6 GT/s	2400 MT/s	1TB

Notes:

- 6-Channel DDR4 @ 2400 MT/s.
- 2TB max RAM
- Support for: HPE Persistent Memory (Silver 4215 and 4215R only), Intel® Vector Neural Network Instructions (VNNI) for inference acceleration.
- 2 and 4 socket capable, 2S - 2UPI, 2S - 3UPI, 4S - 3UPI @ 9.6 GT/s.
- Intel Turbo Boost Technology, Intel Hyper-Threading Technology Intel AVX-512 (2x 512-bit FMA).
- 48 lanes PCIe 3.0, standard RAS

1 st Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Silver 4116 Processor	2.1 GHz	12	16.50 MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB
Silver 4114 Processor	2.2 GHz	10	13.75 MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB
Silver 4112 Processor	2.6 GHz	4	8.25 MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB
Silver 4110 Processor	2.1 GHz	8	11.00 MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB
Silver 4108 Processor	1.8 GHz	8	11.00 MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB

Notes:

- 6-Channel DDR4 @ 2400 MT/s, 768 GB max memory capacity.
- 2 socket capable, 2S - 2UPI @ 9.6 GT/s.
- Intel Turbo Boost Technology, Intel Hyper-Threading Technology, Intel AVX-512 (1x 512-bit FMA).
- 48 lanes PCIe 3.0, standard RAS.

2 nd Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Bronze 3204 Processor	1.9 GHz	6	8.25 MB	85W	2 @ 9.6 GT/s	2133 MT/s	1 TB
Bronze 3206R Processor	1.9 GHz	8	11 MB	85W	2 @ 9.6 GT/s	2133 MT/s	1 TB

Notes:

- 6-Channel DDR4 @ 2133 MT/s.
- 2TB max RAM
- Support for: Intel® Vector Neural Network Instructions (VNNI) for inference acceleration..
- 2 and 4 socket capable, 2S - 2UPI, 2S - 3UPI, 4S - 3UPI @ 9.6 GT/s.
- Intel AVX-512 (2x 512-bit FMA).
- 48 lanes PCIe 3.0, standard RAS



Standard Features

1st Generation Intel® Xeon® Scalable Processor Family

Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Bronze 3106 Processor	1.7 GHz	8	11.00 MB	85W	2 @ 9.6 GT/s	2133 MT/s	768GB
Bronze 3104 Processor	1.7 GHz	6	8.25 MB	85W	2 @ 9.6 GT/s	2133 MT/s	768GB

Notes:

- 6-Channel DDR4 @ 2133 MT/s, 768 GB max memory capacity.
- 2 socket capable, 2S - 2UPI @ 9.6 GT/s.
- Intel AVX-512 (1x 512-bit FMA).
- 48 lanes PCIe 3.0, standard RAS.

Chipset

Intel C621 Chipset

Notes: For more information regarding Intel® chipsets, please see the following

URL: <https://www.intel.com/content/www/us/en/products/chipsets/server-chipsets.html>

System Management Chipset

HPE iLO 5 ASIC

Notes: Read and learn more in the [iLO QuickSpecs](#).

Memory

Type	HPE DDR4 SmartMemory	Registered (RDIMM), Load Reduced (LRDIMM)
DIMM Slots Available	24	12 DIMM slots per processor, 6 channels per processor, 2DIMMs per channel
Maximum capacity (LRDIMM)	3.0 TB	24 x 128 GB LRDIMM @ 2933 MT/s
Maximum capacity (RDIMM)	1.54 TB	24 x 64 GB RDIMM @ 2933 MT/s
Maximum capacity (HPE Persistent Memory)	6.0 TB	12 X 512 GB HPE Persistent Memory Kit @ 2666 MT/s
Maximum capacity (NVDIMM)	192 GB	12 x 16 GB NVDIMM @ 2666 MT/s

Notes:

- NVDIMMs can only be mixed with RDIMMs.
- A maximum of 12 NVDIMMs supported with 1st generation Intel Xeon Scalable processors.
- HPE Persistent Memory only supported on 2nd generation Intel Xeon Scalable Processor series (Platinum 8200, Gold 6200, Gold 5200, Silver 4215 and 4215R)
- Maximum memory per socket is dependent on processor selection. 2nd generation processors supporting 2 TB or 4.5 TB per CPU are indicated by the “M” and “L” in the processor model names (i.e. 8276M and 8276L). 1st generation processors supporting 1.5 TB per CPU are indicated by the “M” in the processor model names (i.e. 8160M)
- Mixing of RDIMM and LRDIMM memory is not supported.
- For General Server Memory and Persistent Memory Population Rules and Guidelines for Gen10 see details here: <http://www.hpe.com/docs/memory-population-rules>

Standard Features

Memory Protection

Advanced ECC

Advanced ECC uses single device data correction to detect and correct single and all multibit error that occurs within a single DRAM chip.

Online Spare

Memory online spare mode detects a rank that is degrading and switches operation to the spare rank.

Notes: For more information see our [Memory RAS feature technical whitepaper](#).

Expansion Slots

Primary GPU Riser

Expansion Slots #	Technology	Bus Width	Connector Width	Processor	Slot Form Factor
1	PCIe 3.0	x16	x16	CPU1	Full-height, 3/4 length (up to 9.5in)
2	PCIe 3.0	x8	x8	CPU1	Low Profile

Primary SATA M.2 Riser

Expansion Slots #	Technology	Bus Width	Connector Width	Processor	Slot Form Factor
1	PCIe 3.0	x16	x16	CPU 1	Full-height; 3/4 length (up to 9.5in)
2	PCIe 3.0	x16	x16	CPU 1	Low Profile

Primary NVMe Riser

Expansion Slots #	Technology	Bus Width	Connector Width	Processor	Slot Form Factor
1	PCIe 3.0	x16	x16	CPU 1	Full-height; 3/4 length (up to 9.5")
2	PCIe 3.0	x8	x8	CPU 1	Low Profile

Secondary Riser*

Expansion Slots #	Technology	Bus Width	Connector Width	Processor	Slot Form Factor
3	PCIe 3.0	x16	x16	CPU 2	Low Profile or Full-height; 3/4 length (up to 9.5")

Notes: If secondary full height kit is installed, then primary PCIe Slot #2 cannot be used. Only 2 full height slots are supported.

Internal Storage Devices

- **Optical Drive**
Available on 8 SFF and 4 LFF CTO Servers as an option (DVD-ROM or DVD-RW)
- **Hard Drives**
None ship standard



Standard Features

Storage Controllers

NVMe Boot Device

- HPE NS204i-p NVMe PCIe3 OS Boot Device

Software RAID

- HPE Smart Array S100i SR Gen10 SW RAID

Notes:

- All models come with the S100i Smart Array Controller with embedded software RAID support for up to 12 bays. The S100i uses 14 embedded SATA ports, but only 12 are available for bays as 2 are leveraged to support the M.2 connectors on the optional SATA M.2 capable primary riser (867978-B21).
- HPE Smart Array S100i SR Gen10 SW RAID will operate in UEFI mode only. For legacy support an additional controller will be needed, and for CTO orders please also select the Legacy mode settings part, 758959-B22.
- HPE Smart Array S100i SR Gen10 SW RAID is off by default and must be enabled.
- The S100i supports Microsoft Windows Server only.
- For Linux users, HPE offers a solution that uses in-distro open-source software to create a two-disk RAID 1 boot volume. For more information visit: <https://downloads.linux.hpe.com/SDR/project/lrrib/>

Essential RAID Controllers

- HPE Smart Array E208i-a SR Gen10 Controller
- HPE Smart Array E208i-a SR G10 LH Controller
- HPE Smart Array E208i-p SR Gen10 Controller
- HPE Smart Array E208e-p SR Gen10 Controller

Performance RAID Controllers

- HPE Smart Array P408i-a SR Gen10 Controller
- HPE Smart Array P408i-a SR G10 LH Controller
- HPE Smart Array P408i-p SR Gen10 Controller
- HPE Smart Array P408e-p SR Gen10 Controller
- HPE Smart Array P816i-a SR Gen10 Controller
- HPE Smart Array P816i-a SR G10 LH Controller

Notes:

- If GPGPU is needed then the LH controller (low profile heatsink) should be ordered to allow GPU to fit in the chassis.
- For additional details, please see [HPE Smart Array Gen10 Controllers Data Sheet](#).

Maximum Storage

Storage	Capacity	Configuration
Hot Plug SFF SAS HDD	26.4 TB	8+2+1 x 2.4 TB (with optional UMB + rear drive option)
Hot Plug SFF SATA HDD	22 TB	8+2+1 x 2.0 TB (with optional UMB + rear drive option)
Hot Plug SFF SAS SSD	168.3 TB	8+2+1 x 15.3 TB (with optional UMB + rear drive option)
Hot Plug SFF SATA SSD	84.48 TB	8+2+1 x 7.68 TB (with optional UMB + rear drive option)
Hot Plug SFF NVMe PCIe SSD	153.6 TB	10 x 15.36 TB NVMe
Hot Plug LFF SAS HDD	72 TB	4 x 18 TB
Hot Plug LFF SATA HDD	72 TB	4 x 18 TB
Hot Plug LFF SAS SSD	7.68 TB	4 x 1.92 TB
Hot Plug LFF SATA SSD	7.68 TB	4 x 1.92 TB



Standard Features

Graphics

- Integrated video standard
- Video modes up to 1920 x 1200 @ 60 Hz (32 bpp)
- 16 MB Video Memory
- HPE iLO 5 on system management memory
- 32 MB Flash
- 4 Gbit DDR3 with ECC protection

Power Supply

- HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
Notes: Available in 94% efficiency.
- HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
Notes:
 - Available in 94% and 96% efficiency.
 - Also available in -48VDC and 227VAC/380VDC power inputs.
- HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
Notes:
 - Available in 94% efficiency.
 - 1600W Power supplies only support high line voltage (200 VAC to 240 VAC).

HPE Flexible Slot (Flex Slot) Power Supplies share a common electrical and physical design that allows for hot plug, tool-less installation into HPE ProLiant Gen10 Performance Servers. Flex Slot power supplies are certified for high-efficiency operation and offer multiple power output options, allowing users to "right-size" a power supply for specific server configurations. This flexibility helps to reduce power waste, lower overall energy costs, and avoid "trapped" power capacity in the data center.

All pre-configured servers ship with a standard 6-foot IEC C-13/C-14 jumper cord (A0K02A). This jumper cord is also included with each standard AC power supply option kit. If a different power cord is required, please check the [ProLiant Power Cables](#) web page.

To review the power requirements for your selected system, please use the [HPE Power Advisor Tool](#).

For information on power specifications and technical content visit [HPE Server power supplies](#).

Interfaces

Serial	1 port - Optional
Video	1 Front - Display port (optional 8 SFF and 4 LFF only) 1 Rear - VGA port (standard on all chassis types) Notes: Both ports are not active simultaneously.
Network Ports	4x 1GbE embedded NIC (if equipped/depending on model) 1 FlexibleLOM slot available on all chassis types (supporting various NICs adapters)
iLO Remote Mgmt Port	1 Gb Dedicated
MicroSD Slot	1 MicroSD slot Notes: The MicroSD slot is not hot-pluggable, server must be powered down before removal.
USB 3.0	Up to 5 total: 1 front, 2 rear, 2 internal (standard on all chassis types) +1 optional USB 2.0 front (on 8 SFF and 4 LFF only)
SID (Systems Insight Display)	Optional for all chassis types Notes: Will lose iLO Service Port if selecting this option.



Standard Features

Operating Systems and Virtualization Software

2nd Generation Intel® Xeon® Scalable Processor Family

- **Windows Server 2019:** Essentials, Standard, Datacenter
- **Windows Server 2016:** Essentials, Standard, Datacenter
- **Windows Server 2012 R2:** Essentials, Standard, Datacenter
- Microsoft Hyper-V Server: 2012 R2, 2016 & 2019
- VMware vSphere: 6.0 U3, 6.5 U2 through U.3 & 6.7 U1 through U3, 7.0
Notes: 6.5 U3, 6.7 U3 & 7.0 minimums for Xeon "R", Gold 6256, Gold 6250L & Gold 6250 processors.
- ClearOS: 7.6; ClearVM: 2.0
- **Red Hat Enterprise Linux (RHEL):** 7.6 w/ Kbase **, 8.0
- **SUSE Linux Enterprise Server (SLES):** 12 SP3, 15 (includes Xen) **
Notes: SLES12 SP4 is the minimum for servers featuring Intel® Optane™ DC Persistent Memory.
- Ubuntu: 18.04 LTS (4.15.0)
- Oracle Linux: Oracle Linux 7.6 UEK Release 5 Update 2; Oracle VM 3.4.6 (UEK Release 4 Update 7)
- Citrix: Hypervisor: 8.0, 8.1, 8.2; XenServer 7.1, 7.4, 7.5, 7.6

1st Generation Intel® Xeon® Scalable Processor Family

- **Windows Server 2019:** Essentials, Standard & Datacenter
- **Windows Server 2016:** Essentials, Standard & Datacenter
- **Windows Server 2012 R2:** Essentials, Standard & Datacenter
- Microsoft Hyper-V Server: 2012 R2, 2016 & 2019
- VMware vSphere: 6.0 U3, 6.5 through U.3 & 6.7 through U3, 7.0
- ClearOS: 7.6; ClearVM: 2.0
- **Red Hat Enterprise Linux (RHEL):** 6.9 & 7.3**
- **SUSE Linux Enterprise Server (SLES):** 11 SP4, 12 SP2 & 15 (includes Xen) **
- Ubuntu: 16.04.3 HWE (4.10), 18.04 LTS (4.15.0)
- Oracle Linux: Oracle Linux/UEK 6.9, 7.4; Oracle VM 3.4.4
- Citrix: Hypervisor: 8.0, 8.1, 8.2; XenServer 7.1, 7.4, 7.5, 7.6
- **ClearOS**
Notes: ClearOS allows you to build a fully functional server that is just right for you at no upfront cost. For more information on ClearOS, please visit <http://www.hpe.com/servers/clearos>.
- **CentOS**

Notes:

- For more information on Hewlett Packard Enterprise Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server. <http://www.hpe.com/info/ossupport>
- **64-bit only; includes KVM

Industry Standard Compliance

- ACPI 6.1 Compliant
- PCIe 3.0 Compliant
- WOL Support
- Microsoft® Logo certifications
- PXE Support
- USB 3.0 Compliant
- USB 2.0 Compliant (only on optional Universal Media Bay)
- **SMBIOS 3.1**
- **UEFI 2.6 (Unified Extensible Firmware Interface Forum)**
- Redfish API

Standard Features

- IPMI 2.0
- Secure Digital 4.0
- TPM 1.2 and 2.0 support
- Advanced Encryption Standard (AES)
- Triple Data Encryption Standard (3DES)
- SNMP v3
- TLS 1.2
- DMTF Systems Management Architecture for Server Hardware Command Line (SMASH CLP)
- Active Directory v1.0
- ASHRAE A3/A4
- Energy Star
- European Union (EU) eco-design regulations for server and storage products, known as Lot 9, go into effect on March 1st, 2020. Among other requirements, for servers this directive establishes power thresholds for idle state, as well as efficiency and performance in active state which vary among configurations. HPE ProLiant Gen10 servers are compliant with Lot 9 requirements. For more information regarding HPE Lot 9 conformance, please visit:
<https://www.hpe.com/us/en/about/environment/msds-specs-more/erp-lot9-servers.html>

Notes: For additional technical thermal details regarding ambient temperatures, humidity and features support please visit: <http://www.hpe.com/servers/ashrae>.

HPE Server UEFI/Legacy ROM

UEFI enables numerous new capabilities specific to HPE ProLiant servers such as:

- Secure Boot and Secure Start enable for enhanced security
- Operating system specific functionality
- Support for > 2.2 TB (using GPT) boot drives
- USB 3.0 Stack
- Embedded UEFI Shell
- Mass Configuration Deployment Tool using iLO RESTful API that is Redfish API Conformant
- PXE boot support for IPv6 networks
- Workload Profiles for simple performance optimization

UEFI Boot Mode only:

- TPM 2.0 Support
- NVMe Boot Support
- Platform Trust Technology (PTT) can be enabled.
- iSCSI Software Initiator Support.
- HTTP/HTTPs Boot support as a PXE alternative.
- Boot support for option cards that only support a UEFI option ROM

Notes:

- For UEFI Boot Mode, boot environment and OS image installations should be configured properly to support UEFI.
 - UEFI FIO Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory for your HPE ProLiant Gen10 Server.
-



Standard Features

Embedded Management

HPE Integrated Lights-Out (HPE iLO)

Monitor your servers for ongoing management, service alerting, reporting and remote management with HPE iLO.

Learn more at <http://www.hpe.com/info/ilo>.

UEFI

Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI).

Learn more at <http://www.hpe.com/servers/uefi>.

Intelligent Provisioning

Hassle free server and OS provisioning for one or more servers with Intelligent Provisioning.

Learn more at <http://www.hpe.com/servers/intelligentprovisioning>.

iLO RESTful API

iLO RESTful API is Redfish API conformance and offers simplified server management automation such as configuration and maintenance tasks based on modern industry standards. Learn more at <http://www.hpe.com/info/restfulapi>.

Server Utilities

Active Health System

The HPE Active Health System (AHS) is an essential component of the iLO management portfolio that provides continuous, proactive health monitoring of HPE servers. Learn more at <http://www.hpe.com/servers/ahs>.

Active Health System Viewer

Use the Active Health System Viewer, a web-based portal, to easily read AHS logs and speed problem resolution with HPE self-repair recommendations, to learn more visit: <http://www.hpe.com/servers/ahsv>.

Smart Update

Keep your servers up to date with the HPE Smart Update solution by using Smart Update Manager (SUM) to optimize the firmware and driver updates of the Service Pack for ProLiant (SPP). Learn more at <https://www.hpe.com/us/en/servers/smart-update.html>.

iLO Amplifier Pack

Designed for large enterprise and service provider environments with hundreds of HPE servers, the iLO Amplifier Pack is a free, downloadable open virtual application (OVA) that delivers the power to discover, inventory and update Gen8, Gen9 and Gen10 HPE servers at unmatched speed and scale. Use with an iLO Advanced License to unlock full capabilities.

Learn more at <http://www.hpe.com/servers/iLOamplifierpack>.

HPE iLO Mobile Application

Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: <http://www.hpe.com/info/ilo/mobileapp>.

RESTful Interface Tool

RESTful Interface tool (iLOREST) is a single scripting tool to provision using iLO RESTful API to discover and deploy servers at scale. Learn more at <http://www.hpe.com/info/resttool>.

Scripting Tools

Provision one to many servers using your own scripts to discover and deploy with Scripting Tool (STK) for Windows and Linux or Scripting Tools for Windows PowerShell.

Learn more at <http://www.hpe.com/servers/stk> and <http://www.hpe.com/servers/powershell>.



Standard Features

HPE OneView Standard

HPE OneView Standard can be used for inventory, health monitoring, alerting, and reporting without additional fees. It can monitor multiple HPE server generations. The user interface is similar to the HPE OneView Advanced version, but the software-defined functionality is not available. Learn more at <http://www.hpe.com/info/oneview>.

HPE Systems Insight Manager (HPE SIM)

Ideal for environments already using HPE SIM, it allows you to monitor the health of your HPE ProLiant Servers and HPE Integrity Servers. Also provides you with basic support for non-HPE servers. HPE SIM also integrates with Smart Update Manager to provide quick and seamless firmware updates. Learn more at <http://www.hpe.com/info/hpesim>.

Warranty

This product is covered by a global limited warranty and supported by HPE Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HPE Pointnext operational services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

Notes: Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:

<http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/>.

Security

- UEFI Secure Boot and Secure Start support
 - Immutable Silicon Root of Trust
 - FIPS 140-2 validation
 - Common Criteria certification
 - Configurable for PCI DSS compliance
 - Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser
 - Support for Commercial National Security Algorithms (CNSA)
 - iLO Security Modes
 - Granular control over iLO interfaces
 - Smart card (PIV/CAC) and Kerberos based 2-factor Authentication
 - Tamper-free updates – components digitally signed and verified
 - Secure Recovery – recover critical firmware to known good state on detection of compromised FW
 - Ability to rollback firmware
 - Secure erase of NAND
 - TPM (Trusted Platform Module) 1.2 option
 - TPM (Trusted Platform Module) 2.0 option
 - Bezel Locking Kit
 - Chassis Intrusion detection option
-



Optional Features

Server Management

HPE iLO Advanced

HPE iLO Advanced licenses offer smart remote functionality without compromise, for all HPE ProLiant servers. The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. You can also activate the enhanced security and power management functionality. Learn more about HPE iLO Advanced at <http://www.hpe.com/servers/iloadvanced>.

HPE OneView Advanced

HPE OneView brings a new level of automation to infrastructure management by taking a template driven approach to provisioning, updating, and integrating compute, storage, and networking infrastructure. It provides full-featured licenses which can be purchased for managing Gen8, Gen9 and Gen10 servers. To learn more visit <http://www.hpe.com/info/oneview>.

HPE InfoSight for Servers

HPE InfoSight for Servers combines the cloud-based machine learning of InfoSight with the health and performance monitoring of Active Health System (AHS) and iLO to optimize performance and predict and prevent problems. The end result is an intelligent environment that modernizes IT operations and enhances the support experience by predicting and preventing the infrastructure issues that lead to application disruptions, wasted IT staff time and missed business opportunities.

Learn more at <https://www.hpe.com/servers/infosight>

HPE Insight Cluster Management Utility (CMU)

HPE Insight Cluster Management Utility is a HyperScale management framework that includes software for the centralized provisioning, management and monitoring of nodes and infrastructure. Learn more at <http://www.hpe.com/info/cmu>.

Accelerator and GPGPU Information

Hewlett Packard Enterprise supports various accelerators on select HPE ProLiant servers to support different workloads. The accelerators enable seamless integration of GPU computing with HPE ProLiant servers for high-performance computing, large data center graphics, deep learning and virtual desktop deployments. These accelerators deliver all of the standard benefits of GPU computing while enabling maximum reliability and tight integration with system monitoring and management tools such as HPE Insight Cluster Management Utility.

Rack and Power Infrastructure

The story may end with servers, but it starts with the foundation that makes compute go – and business grow. We've reinvented our entire portfolio of rack and power products to make IT infrastructure more secure, more practical, and more efficient. In other words, we've created a stronger, smarter, and simpler infrastructure to help you get the most out of your IT equipment. As an industry leader, Hewlett Packard Enterprise is uniquely positioned to address the key concerns of power, cooling, cable management and system access.

HPE G2 Advanced and Enterprise Racks are perfect for the server room or today's modern data center with enhanced airflow and thermal management, flexible cable management, and a 10 year Warranty to support higher density computing.

HPE G2 PDUs offer reliable power in flexible form factors that operate at temperatures up to 60°, include color-coded outlets and load segments and a low-profile design for optimal access to the rack and support for dense rack environments.

HPE Uninterruptible Power Systems are cost-effective power protection for any type workload. Some UPSs include options for remote management and extended runtime modules so your critical dense data center is covered in power outages.

HPE KVM Solutions include a console and switches designed to work with your server and IT equipment reliably. We've got a cost-effective KVM switch for your first rack and multiple connection IP switches with remote management and security capabilities to keep your data center rack up and running.

Learn more about HPE Racks, KVM, PDUs and UPSs at [HPE Rack and Power Infrastructure](#).



Optional Features

One Config Simple (SCE)

SCE is a guided self-service tool to help sales and non-technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact Hewlett Packard Enterprise Customer Business Center or an Authorized Partner for assistance. <https://h22174.www2.hpe.com/SimplifiedConfig/Welcome#>



Service and Support

HPE Pointnext - Service and Support

Protect your business beyond warranty with HPE Pointnext Operational Service

HPE Pointnext provides a comprehensive portfolio including Advisory and Transformational, Professional, and Operational Services to help accelerate your digital transformation. From the onset of your transformation journey, Advisory and Transformational Services focus on designing the transformation and creating a solution roadmap. Professional Services specializes in creative configurations with flawless and on-time implementation, and on-budget execution. Finally, operational services provides innovative new approaches like Flexible Capacity and Datacenter Care, to keep your business at peak performance. HPE is ready to bring together all the pieces of the puzzle for you, with an eye on the future, and make the complex simple.

Connect your devices

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%¹ reduction in down time, near 100%² diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to HPE support.

Notes:

- ¹IDC
- ²HPE CSC reports 2014 – 2015

Learn more about getting connected at <http://www.hpe.com/services/getconnected>

Recommended Services

HPE Proactive Care* with 6 hour call-to-repair commitment, three year Support Service

HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice. This Service combines three years' proactive reporting and advice with our highest level of hardware support - HPE's 24x7, six hour hardware call-to-repair. HPE is the only leading manufacturer who makes this level of coverage available as a standard service offering for your most valuable servers. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your HPE servers. <https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

HPE Proactive Care* with 24x7 coverage, three year Support Service

HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice. This Service combines three years proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your HPE servers. <https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

HPE Proactive Care* - Next Business Day service, three year Support Service

HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice. This service combines three years of Hardware Support where an HPE authorized representative will arrive at the Customer's site during the onsite coverage window to begin hardware maintenance service the next coverage day after the service request has been logged. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your HPE servers. <https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

Notes: *HPE Proactive Care and HPE Proactive Care Advanced require that the customer connect their devices to make the most of these services and receive all the deliverables.



Service and Support

Other related Services

HPE Server Hardware Installation

Provides for the basic hardware installation of HPE branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

<https://h20195.www2.hp.com/v2/Getdocument.aspx?docname=5981-9356enw>

HPE Installation and Startup Service

Provides for the installation of your HPE hardware according to product specifications including options. The HPE service delivery technician will connect the product to a LAN as appropriate and enable remote support to allow for automatic case creation for hardware failures. Installation and start up services also includes the installation of one supported operating system type (Windows® or Linux).

HPE Datacenter Care service

HPE Datacenter Care helps improve IT stability and security, increase the value of IT, and enable agility and innovation. It is a structured framework of repeatable, tested, and globally available services “building blocks.” You can deploy, operate, and evolve your datacenter wherever you are on your IT journey. With HPE Datacenter Care, you benefit from a personalized relationship with HPE via a single point of accountability for HPE and others’ products.

For more information, visit <http://www.hp.com/services/datacentercare>

HPE GreenLake Flex Capacity

With HPE GreenLake Flex Capacity, you get the speed, scalability, and economics of the public cloud in the privacy of your data center. Gain the advantages of the public cloud—consumption-based payment, rapid scalability without worrying about capacity constraints. Reduce the “heavy lifting” needed to operate a data center. And retain the advantages that IT provides the business (i.e., control, security). Deliver the right user experience, choose the right technology for the business, manage privacy and compliance, and manage the cost of IT. And, you have the option to use the public cloud when needed.

DC for Hyperscale

Datacenter Care for Hyperscale is available for Service Providers and HPC customers who use a scale out approach to computing with a high volume homogenous infrastructure and resilient architecture can take advantage of this environment support tailored to their operating model.

HPE Factory Express for Servers and storage

HPE Factory Express offers configuration, customization, integration and deployment services for HPE servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HPE products supported through Factory Express include a wide array of servers and storage: HPE Integrity, HPE ProLiant, HPE Apollo, HPE ProLiant Server Blades, HPE BladeSystem, HPE 9000 servers as well as the MSAxxx3PAR suite, XP, rackable tape libraries and configurable network switches.

HPE Service Credits

HPE Service Credits offers flexible services and technical skills to meet your changing IT demands. With a menu of service that is tailored to suit your needs, you get additional resources and specialist skills to help you maintain peak performance of your IT. Offered as annual credits, you can plan your budgets while proactively responding to your dynamic business.

HPE Education Services

Keep your IT staff trained making sure they have the right skills to deliver on your business outcomes. Book on a class today and learn how to get the most from your technology investment. <http://www.hp.com/ww/learn>



Service and Support

HPE Support Center

The HPE Support Center is a personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more <http://www.hpe.com/support/hpesc>.

The HPE Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Support Service or HPE contractual support agreement.

Notes:*HPE Support Center Mobile App is subject to local availability.

For more information: <http://www.hpe.com/services>.

Notes: HPE ProLiant DL360 Gen10 Server is covered under the HPE Service Contract applied to the HPE ProLiant Server. No separate HPE support services need to be purchased.

Warranty and Support Services will extend to include HPE options configured with your server or storage device. The price of support service is not impacted by configuration details. HPE sourced options that are compatible with your product will be covered under your server support at the same level of coverage allowing you to upgrade freely. Installation for HPE options is available as needed. To keep support costs low for everyone, some high value options will require additional support. Additional support is only required on select high value workload accelerators, fibre switches, InfiniBand and UPS batteries over 12KVA. See the specific high value options that require additional support [here](#).

Parts and Materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.



Pre-Configured Models

- Pre-Configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.
- Hewlett Packard Enterprise does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.
- If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

European Union (EU) eco-design regulations for server and storage products, known as Lot 9, go into effect on March 1st, 2020. Among other requirements, for servers this directive establishes power thresholds for idle state, as well as efficiency and performance in active state which vary among configurations. HPE ProLiant Gen10 servers are compliant with Lot 9 requirements. For more information regarding HPE Lot 9 conformance, please visit:

<https://www.hpe.com/us/en/about/environment/msds-specs-more/erp-lot9-servers.html>

Network Choice (NC) Models

Network Choice models do not include embedded LOM. FlexibleLOM is included in the configuration with customer choice of additional NIC (stand-up card)

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P40637-B21 P40637-291	P23578-B21 P23578-291 P23578-AA1	P23579-B21 P23579-291 P23579-AA1
Model Name	HPE ProLiant DL360 Gen10 4210R 2.4GHz 10-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 4210R 2.4GHz 10-core 1P 16GB-R P408i-a NC 8SFF 500W PS Server	HPE ProLiant DL360 Gen10 4214R 2.4GHz 12-core 1P 32GB-R P408i-a NC 8SFF 500W PS Server
Chassis	8SFF	8SFF	8SFF
Processor	4210R (10-Core, 2.4 GHz, 100W)	4210R (10-Core, 2.4 GHz, 100W)	4214R (12-Core, 2.4 GHz , 100W)
Number of Processors	One processor with standard heatsink	One processor with standard heatsink	One processor with standard heatsink
Memory	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2400 MT/s due to processor limitation.	16 GB RDIMM 2R 2933 MT/s (1x 16 GB) Notes: Runs at 2400 MT/s due to processor limitation.	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2400 MT/s due to processor limitation.
Network Controller	P40637-B21 / -291 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P23578-B21 / -291 / -AA1 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P23579-B21 / -291 / -AA1 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery
Hard Drive	None included	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 800W	1x 500W	1x 500W
Fans	5 - Standard	5 - Standard	5 - Standard
Management	HPE iLO 5	HPE iLO 5	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA		
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Pre-Configured Models

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

- B21 = Worldwide
- 291 = Japan
- AA1 = PRC

Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P40638-B21 P40638-291	P23577-B21 / P40409-B21 P23577-291 / P40409-291	P36183-B21 P36183-291
Model Name	HPE ProLiant DL360 Gen10 4215R 3.2GHz 8-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 4215R 3.2GHz 8-core 1P 32GB- R S100i NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 5218R 2.1GHz 20-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server
Chassis	8SFF	8SFF	8SFF
Processor	4215R (8-Core, 3.2 GHz, 130W)	4215R (8-Core, 3.2 GHz, 130W)	5218R (20-Core, 2.1 GHz, 125W)
Number of Processors	One processor with High Performance heatsink	One processor with High Performance heatsink	One processor with standard heatsink
Memory	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2400 MT/s due to processor limitation.	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2400 MT/s due to processor limitation.	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2666 MT/s due to processor limitation.
Network Controller	P40638-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter Notes: No embedded networking	P23577-B21 / -291 HPE Ethernet 10Gb 2-port FLR- T X550-AT2 (HPE Ethernet 10 GbE 2P 562FLR-T) Notes: No embedded networking P40409-B21 / -291 HPE Ethernet 10Gb 2-port FLR- T BCM57416 Adapter Notes: No embedded networking	P36183-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	Embedded 14-port S100i Notes: SATA only.	P408i-a/2GB with Smart Storage Battery
Hard Drive	None included	None included	None included
Optical Drive	None included	None included	None included
PCIe Slots	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
Power Supply	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP
Fans	1x 800W	1x 800W	1x 800W
Management	HPE iLO 5	HPE iLO 5	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA		
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Pre-Configured Models

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

- B21 = Worldwide
- 291 = Japan
- AA1 = PRC

Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P24740-B21 / P40408-B21 P24740-291 / P40408-291	P24741-B21 / P40407-B21 P24741-291 / P40407-291	P24742-B21 / P40406-B21 P24742-291 / P40406-291
Model Name	HPE ProLiant DL360 Gen10 5218R 2.1GHz 20-core 1P 32GB-R S100i NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 5220R 2.2GHz 24-core 1P 32GB-R S100i NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 6226R 2.9GHz 16-core 1P 32GB-R S100i NC 8SFF 800W PS Server
Chassis	8SFF	8SFF	8SFF
Processor	5218R (20-Core, 2.1 GHz, 125W)	5220R (24 core, 2.2 GHz, 150W)	6226R (16-Core, 2.9 GHz, 150W)
Number of Processors	One processor with standard heatsink	One processor with High Performance heatsink	One processor with High Performance heatsink
Memory	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2666 MT/s due to processor limitation.	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2666 MT/s due to processor limitation.	32 GB RDIMM 2R 2933 MT/s (1x 32 GB)
Network Controller	P24740-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T X550-AT2 (HPE Ethernet 10 GbE 2P 562FLR-T) Notes: No embedded networking	P24741-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T X550-AT2 (HPE Ethernet 10 GbE 2P 562FLR-T) Notes: No embedded networking	P24742-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T X550-AT2 (HPE Ethernet 10 GbE 2P 562FLR-T) Notes: No embedded networking
	P40408-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter Notes: No embedded networking	P40407-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter Notes: No embedded networking	P40406-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter Notes: No embedded networking
Storage Controller	Embedded 14-port S100i Notes: SATA only.	Embedded 14-port S100i Notes: SATA only.	Embedded 14-port S100i Notes: SATA only.
Hard Drive	None included	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 800W	1x 800W	1x 800W
Fans	5 - Standard	5 - Standard	5 - Standard
Management	HPE iLO 5	HPE iLO 5	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA		
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Pre-Configured Models

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

- B21 = Worldwide
- 291 = Japan
- AA1 = PRC

Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.

Powered by 2 nd Generation Intel Xeon Processors	
Network Choice Models	
SKU Number	P24743-B21 / P40405-B21 P24743-291 / P40405-291
Model Name	HPE ProLiant DL360 Gen10 6248R 3.0GHz 24-core 1P 32GB-R S100i NC 8SFF 800W PS Server
Chassis	8SFF
Processor	6248R (24-Core, 3.0 GHz, 205W)
Number of Processors	One processor with High Performance heatsink
Memory	32 GB RDIMM 2R 2933 MT/s (1x 32 GB)
Network Controller	P24743-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T X550-AT2 (HPE Ethernet 10 GbE 2P 562FLR-T) Notes: No embedded networking P40405-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter Notes: No embedded networking
Storage Controller	Embedded 14-port S100i Notes: SATA only.
Hard Drive	None included
Optical Drive	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 800W
Fans	5 - Standard
Management	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA
Energy Star	Energy Star 3.0
Form Factor	1U Rack
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

- B21 = Worldwide
- 291 = Japan
- AA1 = PRC

Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.



Pre-Configured Models

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P40636-B21 P40636-291	P19774-B21 P19774-291 P19774-AA1	P19776-B21 P19776-291
Model Name	HPE ProLiant DL360 Gen10 4208 2.1GHz 8-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 4208 2.1GHz 8-core 1P 16GB-R P408i-a NC 8SFF 500W PS Server	HPE ProLiant DL360 Gen10 4208 2.1GHz 8-core 1P 16GB-R S100i NC 4LFF 500W PS Server
Chassis	8SFF	8SFF	4LFF
Processor	4208 (8 core, 2.1 GHz, 85W)	4208 (8 core, 2.1 GHz, 85W)	4208 (8 core, 2.1 GHz, 85W)
Number of Processors	One processor With standard heatsink	One processor With standard heatsink	One processor With standard heatsink
Memory	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2400 MT/s due to processor limitation.	16 GB RDIMM 2R 2933 MT/s (1x 16 GB) Notes: Runs at 2400 MT/s due to processor limitation.	16 GB RDIMM 2R 2933 MT/s (1x 16 GB) Notes: Runs at 2400 MT/s due to processor limitation.
Network Controller	P40636-B21 / -291 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P19774-B21 / -291 / -AA1 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P19776-B21 / -291 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery	Embedded 14-port S100i Notes: SATA only.
Hard Drive	None included	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 800W	1x 500W	1x 500W
Fans	5 - Standard	5 - Standard	5 - Standard
Management	HPE iLO 5	HPE iLO 5	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA	SFF Easy Install w/o CMA	LFF Easy Install w/o CMA
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

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- AA1 = PRC

Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.



Pre-Configured Models

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P19779-B21 P19779-291 P19779-AA1	P19775-B21 P19775-291 P19775-AA1	P19176-B21 P19176-291
Model Name	HPE ProLiant DL360 Gen10 4210 2.2GHz 10-core 1P 16GB-R P408i-a NC 8SFF 500W PS Server	HPE ProLiant DL360 Gen10 4214 2.2GHz 12-core 1P 16GB-R P408i-a NC 8SFF 500W PS Server	HPE ProLiant DL360 Gen10 5217 3.0GHz 8-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server
Chassis	8SFF	8SFF	8SFF
Processor	4210 (10 core, 2.2 GHz, 85W)	4214 (12 cores, 2.2GHz, 85W)	5217 (8 core, 3.0 GHz, 115W)
Number of Processors	One processor With standard heatsink	One processor With standard heatsink	One processor With standard heatsink
Memory	16 GB RDIMM 2R 2933 MT/s (1x 16 GB) Notes: Runs at 2400 MT/s due to processor limitation.	16GB RDIMM 2R 2933 MT/s (1x 16 GB) Notes: Runs at 2400 MT/s due to processor limitation.	32GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2666 MT/s due to processor limitation.
Network Controller	P19779-B21 / -291 / -AA1 HPE Ethernet 1Gb 4-port FLR- T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P19775-B21 / -291 / -AA1 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P19176-B21 / -291 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery
Hard Drive	None included	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 500W	1x 500W	1x 800W
Fans	5 - Standard	5 - Standard	5 - Standard
Management	HPE iLO 5	HPE iLO 5	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA		
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

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Pre-Configured Models

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P19777-B21 P19777-291	P19771-B21 / P40401-B21 P19771-291 / P40401-291 P19771-AA1 / P40401-AA1	P19177-B21 P19177-291
Model Name	HPE ProLiant DL360 Gen10 5218 2.3GHz 16-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 5220 2.2GHz 18-core 2P 64GB-R P408i-a NC 8SFF 800W RPS Server	HPE ProLiant DL360 Gen10 5220 2.2GHz 18-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server
Chassis	8SFF	8SFF	8SFF
Processor	5218 (16 cores, 2.3 GHz, 125W)	5220 (18-Core, 2.2 GHz, 125W)	5220 (18-Core, 2.2 GHz, 125W)
Number of Processors	One processor With standard heatsink	Two processors with standard heatsink	One processor With standard heatsink
Memory	32GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2666 MT/s due to processor limitation.	64 GB RDIMM 2R 2933 MT/s (2x 32 GB) Notes: Runs at 2666 MT/s due to processor limitation.	32GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2666 MT/s due to processor limitation.
Network Controller	P19777-B21 / -291 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P19771-B21 / -291 / -AA1 HPE Ethernet 10/25Gb 2-port FLR-SFP28 MCX4121A-ACFT (HPE Ethernet 10/25 GbE 2P 640FLR-SFP28) Notes: No embedded networking P40401-B21 / -291 / -AA1 HPE Ethernet 10/25Gb 2-port FLR-SFP28 BCM57414 Adapter Notes: No embedded networking	P19177-B21 / -291 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery
Hard Drive	None included	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	3 PCIe: 1 x16 FH / 1 x8 LP + 1 x 16 FH	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 800W	2x 800W	1x 800W
Fans	5 - Standard	7 - Standard	5 - Standard
Management	HPE iLO 5	HPE iLO Advanced	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA		
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

- B21 = Worldwide
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Pre-Configured Models

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P19178-B21 / P40404-B21 P19178-291 / P40404-291	P19778-B21 P19778-291	P19179-B21 / P40403-B21 P19179-291 / P40403-291
Model Name	HPE ProLiant DL360 Gen10 5222 3.8GHz 4-core 1P 32GB- R P408i-a NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 6230 2.1GHz 20-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 6234 3.3GHz 8-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server
Chassis	8SFF	8SFF	8SFF
Processor	5222 (4-core, 3.8 GHz, 105W)	6230 (20 cores, 2.1 GHz, 125W)	6234 (8-Core, 3.3 GHz, 130W)
Number of Processors	One processor With High Performance heatsink	One processor With standard heatsink	One processor With High Performance heatsink
Memory	32GB RDIMM 2R 2933 MT/s (1x 32 GB)	32GB RDIMM 2R 2933 MT/s (1x 32 GB)	32GB RDIMM 2R 2933 MT/s (1x 32 GB)
Network Controller	P19178-B21 / -291 HPE Ethernet 10/25Gb 2-port FLR-SFP28 MCX4121A-ACFT (HPE Ethernet 10/25 GbE 2P 640FLR-SFP28) Notes: No embedded networking	P19778-B21 / -291 HPE Ethernet 1Gb 4-port FLR- T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P19179-B21 / -291 HPE Ethernet 10/25Gb 2- port FLR-SFP28 MCX4121A- ACFT (HPE Ethernet 10/25 GbE 2P 640FLR-SFP28) Notes: No embedded networking
	P40404-B21 / -291 HPE Ethernet 10/25Gb 2-port FLR-SFP28 BCM57414 Adapter Notes: No embedded networking		P40403-B21 / -291 HPE Ethernet 10/25Gb 2- port FLR-SFP28 BCM57414 Adapter Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery
Hard Drive	None included	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 800W	1x 800W	1x 800W
Fans	5 - Standard	5 - Standard	5 - Standard
Management	HPE iLO 5	HPE iLO 5	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA		
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

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Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.



Pre-Configured Models

Powered by 2 nd Generation Intel Xeon Processors			
Network Choice Models			
SKU Number	P19180-B21 / P40402-B21 P19180-291 / P40402-291	P19772-B21 / P40400-B21 P19772-291 / P40400-291 P19772-AA1 / P40400-AA1	P24744-B21 / P40399-B21 P24744-291 / P40399-291
Model Name	HPE ProLiant DL360 Gen10 6242 2.8GHz 16-core 1P 32GB-R P408i-a NC 8SFF 800W PS Server	HPE ProLiant DL360 Gen10 6248 2.5GHz 20-core 2P 64GB-R P408i-a NC 8SFF 800W RPS Server	HPE ProLiant DL360 Gen10 6250 3.9GHz 8-core 1P 32GB-R S100i NC 8SFF 800W PS Server
Chassis	8SFF	8SFF	8SFF
Processor	6242 (16-Core, 2.8 GHz, 150W)	6248 (20-Core, 2.5 GHz, 150W)	6250 (8-core, 3.9GHz, 185W)
Number of Processors	One processor With High Performance heatsink	Two processors with High Performance heatsink	One processor with High Performance heatsink
Memory	32GB RDIMM 2R 2933 MT/s (1x 32 GB)	64 GB RDIMM 2R 2933 MT/s (2x 32 GB)	32GB RDIMM 2R 2933 MT/s (1x 32 GB)
Network Controller	P19180-B21 / -291 HPE Ethernet 10/25Gb 2-port FLR-SFP28 MCX4121A-ACFT (HPE Ethernet 10/25 GbE 2P 640FLR-SFP28) Notes: No embedded networking	P19772-B21 / -291 / -AA1 HPE Ethernet 10/25Gb 2-port FLR-SFP28 MCX4121A-ACFT (HPE Ethernet 10/25 GbE 2P 640FLR-SFP28) Notes: No embedded networking	P24744-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T X550-AT2 (HPE Ethernet 10 GbE 2P 562FLR- T) Notes: No embedded networking
	P40402-B21 / -291 HPE Ethernet 10/25Gb 2-port FLR-SFP28 BCM57414 Adapter Notes: No embedded networking	P40400-B21 / -291 / -AA1 HPE Ethernet 10/25Gb 2-port FLR-SFP28 BCM57414 Adapter Notes: No embedded networking	P40399-B21 / -291 HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	P408i-a/2GB with Smart Storage Battery	Embedded 14-port S100i Notes: SATA only.
Hard Drive	None included	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	3 PCIe: 1 x16 FH / 1 x8 LP + 1 x 16 FH	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 800W	2x 800W	1x 800W
Fans	5 - Standard	7 - Standard	7 – High Performance
Management	HPE iLO 5	HPE iLO Advanced	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA		
Energy Star	Energy Star 3.0		
Form Factor	1U Rack		
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.		

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

- B21 = Worldwide
- 291 = Japan
- AA1 = PRC

Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.



Pre-Configured Models

Powered by 2 nd Generation Intel Xeon Processors		
China Specific Network Choice Models		
SKU Number	P23575-AA1	P23577-AA1
Model Name	HPE ProLiant DL360 Gen10 3206R 1.9GHz 8-core 1P 16GB-R P408i-a NC 8SFF 500W PS Server	HPE ProLiant DL360 Gen10 4215R 3.2GHz 8-core 1P 32GB-R S100i NC 8SFF 800W PS Server
Chassis	8SFF	8SFF
Processor	3206R (8 core, 1.9 GHz, 85W)	4215R (8-Core, 3.2 GHz, 130W)
Number of Processors	One processor with standard heatsink	One processor with High Performance heatsink
Memory	16 GB RDIMM 2R 2933 MT/s (1x 16 GB) Notes: Runs at 2133 MT/s due to processor limitation.	32 GB RDIMM 2R 2933 MT/s (1x 32 GB) Notes: Runs at 2400 MT/s due to processor limitation.
Network Controller	P23575-AA1 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking	P23577-AA1 HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 (HPE Ethernet 1Gb 4-port 366FLR Adapter) Notes: No embedded networking
Storage Controller	P408i-a/2GB with Smart Storage Battery	Embedded 14-port S100i Notes: SATA only.
Hard Drive	None included	None included
Optical Drive	Not included (Optical Drive options available)	Not included (Optical Drive options available)
PCIe Slots	2 PCIe: 1 x16 FH, 1 x8 LP	2 PCIe: 1 x16 FH, 1 x8 LP
Power Supply	1x 500W	1x 800W
Fans	5 - Standard	5 - Standard
Management	HPE iLO 5	HPE iLO 5
Rail Kit	SFF Easy Install w/o CMA	
Energy Star	Energy Star 3.0	
Form Factor	1U Rack	
Warranty	3-year parts, 3-year labor, 3-year onsite support with next business day response.	

Notes: UEFI is the standard default for all Pre-configured models.

Country Code Key

- B21 = Worldwide
- 291 = Japan
- AA1 = PRC

Notes: The -B21 WW SKU is to be ordered in all countries other than Japan or PRC.



Configuration Information

This section lists some of the steps required to configure a Factory Integrated Model.

To ensure valid configurations are ordered, Hewlett Packard Enterprise recommends the use of an HPE approved configurator.

Contact your local sales representative for information on configurable product offerings and requirements.

- Factory Integrated Models must start with a CTO Server.
- FIO indicates that this option is only available as a factory installable option.
- All Factory Integrated Models will be populated with sufficient hard drive blanks based on number of drives ordered with server.
- Some options may not be integrated at the factory. Contact your local sales representative for additional information

European Union (EU) eco-design regulations for server and storage products, known as Lot 9, go into effect on March 1st, 2020. Among other requirements, for servers this directive establishes power thresholds for idle state, as well as efficiency and performance in active state which vary among configurations. HPE ProLiant Gen10 servers are compliant with Lot 9 requirements. For more information regarding HPE Lot 9 conformance, please visit:

<https://www.hpe.com/us/en/about/environment/msds-specs-more/erp-lot9-servers.html>

Step 1: Base Configuration (choose one of the following configurable models)

Network Choice (NC) Models

Network Choice models do not include embedded LOM. To enable networking capability please select either a FlexibleLOM NIC or a validated alternative from the Core Options section.

CTO Server	HPE DL360 Gen10 4LFF NC CTO Server	HPE DL360 Gen10 8SFF NC CTO Server	HPE DL360 Gen10 Premium 10NVMe NC CTO Svr
SKU Number	P19765-B21	P19766-B21	P19767-B21
TAA SKU*	P19768-B21	P19769-B21	P19770-B21
Processor	Not included as standard		
DIMM Slots	24-DIMM slots (12 can be used for NVDIMMs or 12 can be used for HPE Persistent Memory)		
Storage Controller	Embedded SW RAID (S100i) with 14 SATA ports Optional: Choice of HPE modular Smart Array and PCIe plug-in controller		
PCIe	2 PCIe slots (1 x16 FH / 1 x8 LP) Optional: 1 x16 FH or LP		2 PCIe slots (1 x16 FH / 1 x8 LP)
Drive Cage - included	4 LFF - SAS/SATA	8 SFF - SAS/SATA Optional: up to 2 NVMe or 2 Dual uFF (4x M.2 cartridges)	10 NVMe - SAS/SATA/NVMe Optional: 1 Dual uFF (2x M.2 cartridges)
Network Controller	Choice of HPE FlexibleLOM for primary NIC and stand up card for additional NICs. Notes: No embedded networking		
Fans	1 CPU – 5 Standard Fans 2 CPU – 7 Standard Fans Optional: High Performance Fans		2 CPU – 7 High Performance Fans
Management	HPE iLO with Intelligent Provisioning (standard) Optional: iLO Advance and OneView		
USB	Front: 1 USB 3.0 + iLO service port Rear: 2 USB 3.0 Internal: 2 USB 3.0 Optional: 1 USB 2.0 (lose iLO serv. Port)		Front: 1 USB 3.0 + iLO service port Rear: 2 USB 3.0 Internal: 2 USB 3.0

Notes:

- *HPE offers multiple Trade Agreement Act (TAA) compliant configurations to meet the needs of US Federal Government customers. These products are either manufactured or substantially transformed in a designated country.
- HPE Persistent Memory is only supported on 2nd generation Intel Xeon Scalable processor series (Platinum 8200, Gold 6200, Gold 5200, Silver 4215 and 4215R).
- SKUs P19767-B21 & P19770-B21 do not support the Xeon-Gold 6250L or Gold 6250 processors.



Configuration Information

CTO Models with embedded LOM

CTO Server	HPE DL360 Gen10 4LFF CTO Server	HPE DL360 Gen10 8SFF CTO Server
SKU Number	867958-B21	867959-B21
TAA SKU*	875965-B21	875966-B21
Processor	Not included as standard	
DIMM Slots	24-DIMM slots (12 can be used for NVDIMMs or 12 can be used for HPE Persistent Memory)	
Storage Controller	Embedded SW RAID (S100i) with 14 SATA ports Optional: Choice of HPE modular Smart Array and PCIe plug-in controller	
PCIe	2 PCIe slots (1 x16 FH / 1 x8 LP) Optional: 1 x16 FH or LP	
Drive Cage - included	4 LFF - SAS/SATA	8 SFF - SAS/SATA Optional: up to 2 NVMe or 2 Dual uFF (4x M.2 cartridges)
Network Controller	HPE 1Gb Ethernet 4-Port 331i Adapter plus optional HPE FlexibleLOM or stand up card	
Fans	1 CPU – 5 Standard Fans 2 CPU – 7 Standard Fans Optional: High Performance Fans	
Management	HPE iLO with Intelligent Provisioning (standard) Optional: iLO Advance and OneView	
USB	Front: 1 USB 3.0 + iLO service port Rear: 2 USB 3.0 Internal: 2 USB 3.0 Optional: 1 USB 2.0 (lose iLO serv. Port)	

Notes:

- HPE offers multiple Trade Agreement Act (TAA) compliant configurations to meet the needs of US Federal Government customers. These products are either manufactured or substantially transformed in a designated country.
- *TAA chassis are only orderable in North America and Canada.
- HPE Persistent Memory is only supported on 2nd generation Intel Xeon Scalable processor series (Platinum 8200, Gold 6200, Gold 5200, Silver 4215 and 4215R).

Step 2: Choose Options

Please select one –L21 processor required below.

For second processor, please select the same processor model with –B21 from Core Options – HPE Processors section.

For example: first processor, select P02679-L21 then for second processor, select P02679-B21.

Notes:

- Mixing of 2 different processor models is not supported.
- For first processor, -L21 kit will include 5 fans. With the exception of Xeon-Gold 6256, Gold 6250L, Gold 6250, Gold 6212U, Gold 6210U, Gold 6209U & Gold 6208U processors, -B21 kits include 2 fans (for 4 LFF and 8 SFF CTO Server, 10 NVMe CTO Server always includes 7 High Performance fans).
- Processors with 130W or higher will ship with the High Performance heat sink plus SKUs 8256, 5222, 8156, 6128, 5122 as noted below. All other processors will ship with the Standard heat sink.
- When 2nd Generation Intel Xeon Scalable Processor is selected, then only DDR4-2933 Memory Kit can be selected; When 1st Generation Intel Xeon Scalable Processor is selected, then only DDR4-2666 Memory Kit can be selected.

Step 2a: Choose Processor Options

Processor Option Kits (Required Processor)

SKU

2nd Generation Intel Xeon- Platinum

Intel Xeon-Platinum 8280 (2.7GHz/28-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10

P02679-L21

Notes: Ships with High Performance Heatsink.



Configuration Information

Intel Xeon-Platinum 8280L (2.7GHz/28-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02718-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8276 (2.2GHz/28-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02676-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8276L (2.2GHz/28-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02715-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8270 (2.7GHz/26-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02673-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8268 (2.9GHz/24-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02670-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8260 (2.4GHz/24-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02661-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8260L (2.4GHz/24-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02712-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8260Y (2.4GHz/24-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02682-L21
Notes:	
– 24/20/16 cores would result in 2.4/2.5/2.7 GHz operating points	
– Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8256 (3.8GHz/4-core/105W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02655-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8253 (2.2GHz/16-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02652-L21
1st Generation Intel Xeon-Platinum	
Intel Xeon-Platinum 8180M (2.5GHz/28-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	876099-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8180 (2.5GHz/28-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	867988-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8176 (2.1GHz/28-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870982-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8170 (2.1GHz/26-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870980-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8168 (2.7GHz/24-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870978-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8165 (2.3GHz/24-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	879121-L21
Notes:	
– Ships with Performance Heatsink.	
– Requires the High Performance Fan Kit (871244-B21)	
– Supports “Core boosting” Learn more http://www.hpe.com/info/ist .	
– To enable this feature an iLO Advanced, or iLO Advanced Premium Security edition License are required.	
Intel Xeon-Platinum 8164 (2.0GHz/26-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870976-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8160M (2.1GHz/24-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	876093-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8160 (2.1GHz/24-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870974-L21
Notes: Ships with High Performance Heatsink.	



Configuration Information

Intel Xeon-Platinum 8158 (3.0GHz/12-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	874455-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Platinum 8153 (2.0GHz/16-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870972-L21
2nd Generation Intel Xeon-Gold	
Intel Xeon-Gold 6262V (1.9GHz/24-core/135W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P11842-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6258R (2.7GHz/28-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24488-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6256 (3.6GHz/12-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P23744-L21
Notes:	
– Ships with High Performance Heatsink.	
– Ambient temperature support up to 30C.	
– High performance fans are required.	
Intel Xeon-Gold 6254 (3.1GHz/18-core/200W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02649-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6252 (2.1GHz/24-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02646-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6252N (2.3GHz/24-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P11851-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6250L (3.9GHz/8-core/185W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P28257-L21
Notes:	
– Ships with High Performance Heatsink.	
– NVMe SSDs not supported with this processor.	
– Not supported on Premium 10SFF NVMe chassis.	
– Ambient temperature support up to 25C on 4LFF and 8SFF configurations. 2SFF cages not supported.	
– High performance fans are required.	
Intel Xeon-Gold 6250 (3.9GHz/8-core/185W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P23741-L21
Notes:	
– Ships with High Performance Heatsink.	
– NVMe SSDs not supported with this processor.	
– Not supported on Premium 10SFF NVMe chassis.	
– Ambient temperature support up to 25C on 4LFF and 8SFF configurations. 2SFF cages not supported.	
– High performance fans are required.	
Intel Xeon-Gold 6248R (3.0GHz/24-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24487-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6248 (2.5GHz/20-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02640-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6246R (3.4GHz/16-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24486-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6246 (3.3GHz/12-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P15443-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6244 (3.6GHz/8-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02634-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6242R (3.1GHz/20-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24485-L21
Notes: Ships with High Performance Heatsink.	



Configuration Information

Intel Xeon-Gold 6242 (2.8GHz/16-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02628-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240R (2.4GHz/24-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24484-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240 (2.6GHz/18-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02625-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240Y (2.6GHz/18-14-8-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02613-L21
Notes:	
– 18/14/8 cores would result in 2.6/2.8/3.1 GHz operating points	
– Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240L (2.6GHz/18-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02643-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6238R (2.2GHz/28-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24483-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6238 (2.1GHz/22-core/140W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02637-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6238L (2.1GHz/22-core/140W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02658-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6234 (3.3GHz/8-core/130W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02604-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6230R (2.1GHz/26-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24482-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6230 (2.1GHz/20-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02607-L21
Intel Xeon-Gold 6230N (2.3GHz/20-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P11848-L21
Intel Xeon-Gold 6226R (2.9GHz/16-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24481-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6226 (2.7GHz/12-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02601-L21
Intel Xeon-Gold 6222V (1.8GHz/20-core/115W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P11839-L21
Intel Xeon-Gold 6212U (2.4GHz/24-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02667-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6210U (2.5GHz/20-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02631-L21
Notes:	
– Ships with High Performance Heatsink.	
– Only supported in single socket configurations	
Intel Xeon-Gold 6209U (2.1GHz/20-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02622-L21
Notes: Only supported in single socket configurations	
Intel Xeon-Gold 6208U (2.9GHz/16-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24489-L21
Notes:	
– Ships with High Performance Heatsink.	
– Only supported in single socket configurations	
Intel Xeon-Gold 5222 (3.8GHz/4-core/105W) FIO Processor Kit for HPE ProLiant DL360 Gen10.	P02709-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 5220R (2.2GHz/24-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P15995-L21
Notes: Ships with High Performance Heatsink.	



Configuration Information

Intel Xeon-Gold 5220 (2.2GHz/18-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10.	P02595-L21
Intel Xeon-Gold 5220S (2.7GHz/18-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02577-L21
Intel Xeon-Gold 5218R (2.1GHz/20-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24480-L21
Intel Xeon-Gold 5218 (2.3GHz/16-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02592-L21
Intel Xeon-Gold 5218N (2.3GHz/16-core/110W) FIO Processor Kit for HPE ProLiant DL360 Gen10.	P11845-L21
Intel Xeon-Gold 5218B (2.3GHz/16-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10.	P12516-L21
Notes: Consistent features with the 5218 processor but from a different die. Mixing both 5218B & 5218 processors in a system is not supported	
Intel Xeon-Gold 5217 (3.0GHz/8-core/115W) FIO Processor Kit for HPE ProLiant DL360 Gen10.	P02589-L21
Intel Xeon-Gold 5215 (2.5GHz/10-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02586-L21
Intel Xeon-Gold 5215L (2.5GHz/10-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10.	P02706-L21
1st Generation Intel Xeon-Gold	
Intel Xeon-Gold 6154 (3.0GHz/18-core/200W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870970-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6152 (2.1GHz/22-core/140W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860677-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6150 (2.7GHz/18-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860675-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6148 (2.4GHz/20-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860673-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6146 (3.2GHz/12-core/165W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860671-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6144 (3.5GHz/8-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870966-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6143 (2.8GHz/16-core/205W) FIO Processor Kit for HPE ProLiant DL360 Gen10	879118-L21
Notes:	
– Ships with Performance Heatsink.	
– Requires the High Performance Fan Kit (871244-B21)	
– Supports “Core boosting” Learn more http://www.hpe.com/info/ist .	
– To enable this feature an iLO Advanced, or iLO Advanced Premium Security edition License are required.	
Intel Xeon-Gold 6142 (2.6GHz/16-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860669-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6140 (2.3GHz/18-core/140W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860667-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6138 (2.0GHz/20-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	870968-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6136 (3.0GHz/12-core/150W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860691-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6134M (3.2GHz/8-core/130W) FIO Processor Kit for HPE ProLiant DL360 Gen10	876087-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6134 (3.2GHz/8-core/130W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860689-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6132 (2.6GHz/14-core/140W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860681-L21
Notes: Ships with Performance Heatsink.	



Configuration Information

Intel Xeon-Gold 6130 (2.1GHz/16-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860687-L21
Intel Xeon-Gold 6128 (3.4GHz/6-core/115W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860685-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6126 (2.6GHz/12-core/125W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860683-L21
Intel Xeon-Gold 5122 (3.6GHz/4-core/105W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860679-L21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 5120 (2.2GHz/14-core/105W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860665-L21
Intel Xeon-Gold 5118 (2.3GHz/12-core/105W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860663-L21
Intel Xeon-Gold 5117 (2.0GHz/14-core/105W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P00793-L21
Intel Xeon-Gold 5115 (2.4GHz/10-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860661-L21
2nd Generation Intel Xeon- Silver	
Intel Xeon-Silver 4216 (2.1GHz/16-core/100W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02583-L21
Intel Xeon-Silver 4215R (3.2GHz/8-core/130W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P24479-L21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Silver 4215 (2.5GHz/8-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02598-L21
Intel Xeon-Silver 4214Y (2.2GHz/12-10-8-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02610-L21
Notes: 12/10/8 cores would result in 2.2/2.3/2.4 GHz operating points	
Intel Xeon-Silver 4214R (2.4GHz/12-core/100W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P15977-L21
Intel Xeon-Silver 4214 (2.2GHz/12-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02580-L21
Intel Xeon-Silver 4210R (2.4GHz/10-core/100W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P15974-L21
Intel Xeon-Silver 4210 (2.2GHz/10-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02574-L21
Intel Xeon-Silver 4208 (2.1GHz/8-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02571-L21
1st Generation Intel Xeon-Silver	
Intel Xeon-Silver 4116 (2.1GHz/12-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	874449-L21
Intel Xeon-Silver 4114 (2.2GHz/10-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860657-L21
Intel Xeon-Silver 4112 (2.6GHz/4-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860659-L21
Intel Xeon-Silver 4110 (2.1GHz/8-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860653-L21
Intel Xeon-Silver 4108 (1.8GHz/8-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860655-L21
2nd Generation Intel Xeon- Bronze	
Intel Xeon-Bronze 3206R (1.9GHz/8-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P15968-L21
Intel Xeon-Bronze 3204 (1.9GHz/6-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	P02565-L21
1st Generation Intel Xeon-Bronze	
Intel Xeon-Bronze 3106 (1.7GHz/8-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860651-L21
Intel Xeon-Bronze 3104 (1.7GHz/6-core/85W) FIO Processor Kit for HPE ProLiant DL360 Gen10	860649-L21

Step 2b: Choose Memory Options

Please select one or more memory from below.

For new Gen10 memory population rule whitepaper and optimal memory performance guidelines, please go to:

<https://www.hpe.com/docs/memory-population-rules>

For Gen10 memory speed table, please go to: <https://www.hpe.com/docs/memory-speed-table>

For memory Reliability, Accessibility, Serviceability (RAS) features whitepaper like Gen10 Fast Fault Tolerance and legacy mirrored memory feature etc. please go to: <http://www.hpe.com/docs/memory-ras-feature>.

Notes:

- Maximum memory capacity and speed per processor is dependent on processor model selection or limitation.
- DDR4-2933 Memory Kits are only supported with 2nd Generation Intel Xeon Scalable Series Processors and DDR4-2666 Memory Kits are only supported with 1st Generation Intel Xeon Scalable Series Processors.



Configuration Information

Registered DIMMs (RDIMMs) for 2nd Generation Intel Xeon Scalable Series

HPE 64GB (1x64GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00930-B21
HPE 32GB (1x32GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Memory Kit	P38446-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00924-B21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00922-B21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00920-B21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00918-B21

Registered DIMMs (RDIMMs) for 1st Generation Intel Xeon Scalable Series

HPE 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815100-B21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815098-B21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	835955-B21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815097-B21

Load Reduced DIMMs (LRDIMMs) for 2nd Generation Intel Xeon Scalable Series

HPE 128GB (1x128GB) Octal Rank x4 DDR4-2933 CAS-24-21-21 Load Reduced 3DS Smart Memory Kit	P00928-B21
HPE 128GB (1x128GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced Smart Memory Kit	P11040-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced Smart Memory Kit	P00926-B21

Load Reduced DIMMs (LRDIMMs) for 1st Generation Intel Xeon Scalable Series

HPE 128GB (1x128GB) Octal Rank x4 DDR4-2666 CAS-22-19-19 3DS Load Reduced Memory Kit	815102-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2666 CAS-19-19-19 Load Reduced Smart Memory Kit	815101-B21

HPE Persistent Memory

Intel Optane 512GB persistent memory 100 Series for HPE	835810-B21
Intel Optane 256GB persistent memory 100 Series for HPE	835807-B21
Intel Optane 128GB persistent memory 100 Series for HPE	835804-B21

Notes:

- A maximum of 12 HPE Persistent Memory Kits supported on the following 2nd Generation Intel Xeon Scalable Processor series (Platinum 8200, Gold 6200, Gold 5200, Silver 4215 and 4215R)
- For additional information regarding HPE Persistent Memory Population Rules and Guidelines for Gen10 visit: <http://www.hpe.com/docs/memory-population-rules>

HPE Persistent Memory (NVDIMM)

HPE 16GB NVDIMM Single Rank x4 DDR4-2666 Module Kit	845264-B21
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Notes:

- Can only be mixed with RDIMMs.
- A maximum of 12 NVDIMMs supported with 1st generation Intel Xeon Scalable processors.
- For General Server Memory and NVDIMM Population Rules and Guidelines for Gen10 see details here: <http://www.hpe.com/docs/memory-population-rules>

Step 2c: Choose Power Supplies

Please select one or two power supplies from below.

Notes: Mixing of 2 different power supplies is NOT supported.

HPE Flex Slot Power Supplies

HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	865408-B21
HPE 800W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit	865438-B21
HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	865414-B21
HPE 800W Flex Slot -48VDC Hot Plug Low Halogen Power Supply Kit	865434-B21
HPE 800W Flex Slot Universal Hot Plug Low Halogen Power Supply Kit	865428-B21

Configuration Information

HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit 830272-B21

Notes: 1600W Power supplies only support high line voltage (200 VAC to 240 VAC).

Step 3: Choose Additional (FIO) Factory Integratable Options

Each of the following may be selected if desired at time of factory integration

HPE Trusted Platform Module 2.0 Gen10 Option 864279-B21

Notes:

- HPE Trusted Platform Module 2.0 option works with Gen10 servers with UEFI Mode not Legacy Mode. It is not compatible with HPE ProLiant Gen8 servers or earlier generation variants.
- HPE server systems can have a TPM module (of any type) installed only once. It cannot be replaced with any other TPM module.

HPE Gen10 TPM 1.2 FIO Setting 872108-B21

Notes: TPM 2.0 is set as default, for 1.2 TPM setting instead, please select this option.

HPE Legacy FIO Mode Setting 758959-B22

Notes: UEFI is the default, this FIO part can be used for CTO to enable Legacy mode.

Step 4: Choose Additional Options for Factory Integration from Core and Additional Option sections below

HPE OneView for ProLiant DL Server including 3yr 24x7 Support FIO Bundle Physical 1-server LTU E5Y43A

HPE OneView w/o iLO including 3yr 24x7 Support 1-server FIO LTU P8B31A



Core Options

Some options may not be integrated at the factory. To ensure only valid configurations are ordered, Hewlett Packard Enterprise recommends the use of a Hewlett Packard Enterprise approved configurator. Contact your local sales representative for additional information.

HPE Unique Options

Risers

HPE DL360 Gen10 Low Profile Riser Kit	867982-B21
HPE DL360 Gen10 SATA M.2 2280 Riser Kit	867978-B21
HPE DL360 Gen10 2P FH GPU Enablement v2 Kit	P23271-B21

Notes:

- Replaces 867980-B21. Enhanced to support additional GPUs and compatible with all GPUs qualified on DL360 Gen10.
- This kit is not available on the 10 NVMe model.

Riser Information**									
Part number	Description	Riser position		Slot Bus width (Gen3 lanes)			NVMe Direct Connect		
		Primary	Secondary	#1	#2	#3	Connectors	Max SSDs	
N/A	HPE DL360 Gen10 x16/x8 Primary GPU Riser	D	N	x1 6	x8	O	N/A	N/A	
867978-B21	HPE DL360 Gen10 x16/x16 SATA M.2 2280 Riser Kit	O	N	x1 6	x16	O	N/A	N/A	
P23271-B21	HPE DL360 Gen10 x16 FH GPU v2 Riser Kit	N	O	O	N/A ⁴	x16	N/A	N/A	
867982-B21	HPE DL360 Gen10 x16 LP Riser Kit	N	O	O	O	x16	N/A	N/A	
N/A	HPE DL360 Gen10 x16/x8 1-port 2SFF NVMe Riser ¹	O	N	x1 6	x8	O	1	2	
N/A	HPE DL360 Gen10 5-port 10SFF NVMe Riser Kit ²	N	D ³	O	O	O	5	10	
867972-B21	HPE DL360 Gen10 1SFF SAS/SATA Rear Backplane Kit	O	N	O	x8	O	N/A	N/A	

Notes:

- D = Default on chassis; O = Optional; N = not supported or slot/connector not present.
- ¹Included on 2SFF NVMe Backplane Kit (871242-B21)
- ²Included on 10SFF chassis (867960-B21, 875967-B21, P19767-B21 & P19770-B21) or 10SFF Premium backplane kit (867974-B21)
- ³Included on 10SFF chassis (867960-B21, 875967-B21, P19767-B21 & P19770-B21)
- ⁴When secondary full height kit is installed, then primary PCIe Slot #2 cannot be used. Only 2 full height slots are supported.
- *For additional details on ProLiant DL Gen10 server risers, please visit: <https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=a00043229enw>
- **For information on obsolete x16 FH GPU riser please consult **HPE DL360 Gen10 QuickSpecs version 37**

Performance Cooling Options

HPE DL360 Gen10 High Performance Heat Sink Kit	871246-B21
HPE DL360 Gen10 High Performance Fan Kit	871244-B21

Universal Media Bay Options

HPE DL360 Gen10 2SFF SAS/SATA Backplane Kit	867966-B21
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Notes: Not supported on Xeon-Gold 6250L or Gold 6250 processor based configurations.



Core Options

HPE DL360 Gen10 2SFF NVMe Backplane Kit	871242-B21
Notes: Not supported on Xeon-Gold 6250L or Gold 6250 processor based configurations.	
HPE DL360 Gen10 2SFF SATA UFF Backplane Kit	867970-B21
Notes: Not supported on Xeon-Gold 6250L or Gold 6250 processor based configurations.	
HPE DL360 Gen10 8SFF Display Port/USB/Optical Drive Blank Kit	868000-B21
Notes: This kit is required for Optical Drive option (8SFF model only).	
HPE DL360 Gen10 LFF Display Port and USB Kit	868004-B21

Optical Drive Options

HPE Mobile USB DVD-RW Optical Drive	701498-B21
Notes: This kit is supported on USB 3.0 ports only.	
HPE 9.5mm SATA DVD-ROM Optical Drive	726536-B21
HPE 9.5mm SATA DVD-RW Optical Drive	726537-B21

System Insight Display Options

HPE DL360 Gen10 SFF System Insight Display Power Module Kit	867996-B21
HPE DL360 Gen10 LFF System Insight Display Power Module Kit	867994-B21

Rear Drive Option Kit

HPE DL360 Gen10 1SFF Rear SAS/SATA/UFF Backplane Kit	867972-B21
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10 NVMe chassis Upgrade Kit

HPE DL360 Gen10 10SFF Premium Backplane Kit	867974-B21
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Notes:

- This kit is supported on the 8SFF model only.
- This kit requires two processors, not supported on single processor configurations.
- Requires High Performance Fan Kit (871244-B21).

Security

HPE Trusted Platform Module 2.0 Gen10 Option	864279-B21
HPE DL360 Gen10 Chassis Intrusion Detection Kit	867984-B21
HPE 1U Gen10 Bezel Kit	867998-B21
HPE Bezel Lock Kit	875519-B21

HPE Processors

Please select one –L21 processor required above.

For second processor, please select the same processor model with –B21 from Core Options – HPE Processors section below.

For example: first processor, select P02679-L21 then for second processor, select P02679-B21.

Notes:

- Field upgrades from 1st generation processors (x1xx) to 2nd generation processors (x2xx) not supported.
- Upgrades to two processors must be performed by HPE Pointnext or an approved Service Delivery Partner.
- Mixing of 2 different processor models is not supported.
- For first processor, -L21 kit will include 5 fans. With the exception of Xeon-Gold 6256, Gold 6250L, Gold 6250, Gold 6212U, Gold 6210U, Gold 6209U & Gold 6208U processors, -B21 kits include 2 fans (for 4 LFF and 8 SFF CTO Server, 10 NVMe CTO Server always includes 7 High Performance fans).
- Processors with 130W or higher will ship with the High Performance heat sink plus SKUs 8256, 5222, 8156, 6128, 5122 as noted below. All other processors will ship with the Standard heat sink.



Core Options

- When 2nd Generation Intel Xeon Scalable Processor is selected, then only DDR4-2933 Memory Kit can be selected; When 1st Generation Intel Xeon Scalable Processor is selected, then only DDR4-2666 Memory Kit can be selected

2nd Generation Intel Xeon-Platinum

Intel Xeon-Platinum 8280 (2.7GHz/28-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 P02679-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8280L (2.7GHz/28-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 P02718-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8276 (2.2GHz/28-core/165W) Processor Kit for HPE ProLiant DL360 Gen10 P02676-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8276L (2.2GHz/28-core/165W) Processor Kit for HPE ProLiant DL360 Gen10 P02715-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8270 (2.7GHz/26-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 P02673-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8268 (2.9GHz/24-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 P02670-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8260 (2.4GHz/24-core/165W) Processor Kit for HPE ProLiant DL360 Gen10 P02661-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8260L (2.4GHz/24-core/165W) Processor Kit for HPE ProLiant DL360 Gen10 P02712-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8260Y (2.4GHz/24-core/165W) Processor Kit for HPE ProLiant DL360 Gen10 P02682-B21

Notes:

- 24/20/16 cores would result in 2.4/2.5/2.7 GHz operating points
- Ships with High Performance Heatsink.

Intel Xeon-Platinum 8256 (3.8GHz/4-core/105W) Processor Kit for HPE ProLiant DL360 Gen10 P02655-B21

Notes: Ships with High Performance Heatsink.

Intel Xeon-Platinum 8253 (2.2GHz/16-core/125W) Processor Kit for HPE ProLiant DL360 Gen10 P02652-B21

1st Generation Intel Xeon-Platinum

Intel Xeon-Platinum 8180M (2.5GHz/28-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 876099-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8180 (2.5GHz/28-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 867988-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8176 (2.1GHz/28-core/165W) Processor Kit for HPE ProLiant DL360 Gen10 870982-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8170 (2.1GHz/26-core/165W) Processor Kit for HPE ProLiant DL360 Gen10 870980-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8168 (2.7GHz/24-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 870978-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8165 (2.3GHz/24-core/205W) Processor Kit for HPE ProLiant DL360 Gen10 879121-B21

Notes:

- Ships with Performance Heatsink.
- Requires the High Performance Fan Kit (871244-B21) **Notes:** Supports “Core boosting”
- Learn more <http://www.hpe.com/info/ist>.
- To enable this feature an iLO Advanced, or iLO Advanced Premium Security edition License are required.



Core Options

Intel Xeon-Platinum 8164 (2.0GHz/26-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	870976-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Platinum 8160M (2.1GHz/24-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	876093-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Platinum 8160 (2.1GHz/24-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	870974-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Platinum 8158 (3.0GHz/12-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	874455-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Platinum 8153 (2.0GHz/16-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	870972-B21
2nd Generation Intel Xeon-Gold	
Intel Xeon-Gold 6262V (1.9GHz/24-core/135W) Processor Kit for HPE ProLiant DL360 Gen10	P11842-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6258R (2.7GHz/28-core/205W) Processor Kit for HPE ProLiant DL360 Gen10	P24488-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6256 (3.6GHz/12-core/205W) Processor Kit for HPE ProLiant DL360 Gen10	P23744-B21
Notes:	
– Ships with High Performance Heatsink.	
– Ambient temperature support up to 30C.	
– High performance fans are required.	
Intel Xeon-Gold 6254 (3.1GHz/18-core/200W) Processor Kit for HPE ProLiant DL360 Gen10	P02649-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6252 (2.1GHz/24-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02646-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6252N (2.3GHz/24-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P11851-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6250L (3.9GHz/8-core/185W) Processor Kit for HPE ProLiant DL360 Gen10	P28257-B21
Notes:	
– Ships with High Performance Heatsink.	
– NVMe SSDs not supported with this processor.	
– Not supported on Premium 10SFF NVMe chassis.	
– Ambient temperature support up to 25C on 4LFF and 8SFF configurations. 2SFF cages not supported.	
– High performance fans are required.	
Intel Xeon-Gold 6250 (3.9GHz/8-core/185W) Processor Kit for HPE ProLiant DL360 Gen10	P23741-B21
Notes:	
– Ships with High Performance Heatsink.	
– NVMe SSDs not supported with this processor.	
– Not supported on Premium 10SFF NVMe chassis.	
– Ambient temperature support up to 25C on 4LFF and 8SFF configurations. 2SFF cages not supported.	
– High performance fans are required.	
Intel Xeon-Gold 6248R (3.0GHz/24-core/205W) Processor Kit for HPE ProLiant DL360 Gen10	P24487-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6248 (2.5GHz/20-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02640-B21
Notes: Ships with High Performance Heatsink.	



Core Options

Intel Xeon-Gold 6246R (3.4GHz/16-core/205W) Processor Kit for HPE ProLiant DL360 Gen10	P24486-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6246 (3.3GHz/12-core/165W) Processor Kit for HPE ProLiant DL360 Gen10	P15443-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6244 (3.6GHz/8-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02634-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6242R (3.1GHz/20-core/205W) Processor Kit for HPE ProLiant DL360 Gen10	P24485-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6242 (2.8GHz/16-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02628-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240R (2.4GHz/24-core/165W) Processor Kit for HPE ProLiant DL360 Gen10	P24484-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240 (2.6GHz/18-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02625-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240Y (2.6GHz/18-14-8-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02613-B21
Notes:	
– 18/14/8 cores would result in 2.6/2.8/3.1 GHz operating points	
– Ships with High Performance Heatsink.	
Intel Xeon-Gold 6240L (2.6GHz/18-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02643-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6238R (2.2GHz/28-core/165W) Processor Kit for HPE ProLiant DL360 Gen10	P24483-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6238 (2.1GHz/22-core/140W) Processor Kit for HPE ProLiant DL360 Gen10	P02637-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6238L (2.1GHz/22-core/140W) Processor Kit for HPE ProLiant DL360 Gen10	P02658-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6234 (3.3GHz/8-core/130W) Processor Kit for HPE ProLiant DL360 Gen10	P02604-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6230R (2.1GHz/26-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P24482-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6230 (2.1GHz/20-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P02607-B21
Intel Xeon-Gold 6230N (2.3GHz/20-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P11848-B21
Intel Xeon-Gold 6226R (2.9GHz/16-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P24481-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 6226 (2.7GHz/12-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P02601-B21
Intel Xeon-Gold 6222V (1.8GHz/20-core/115W) Processor Kit for HPE ProLiant DL360 Gen10	P11839-B21
Intel Xeon-Gold 6212U (2.4GHz/24-core/165W) Processor Kit for HPE ProLiant DL360 Gen10	P02667-B21
Notes:	
– Ships with High Performance Heatsink.	
– Only supported in single socket configurations.	
Intel Xeon-Gold 6210U (2.5GHz/20-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P02631-B21
Notes:	
– Ships with High Performance Heatsink.	
– Only supported in single socket configurations.	



Core Options

Intel Xeon-Gold 6209U (2.1GHz/20-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P02622-B21
Notes: Only supported in single socket configurations.	
Intel Xeon-Gold 6208U (2.9GHz/16-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P24489-B21
Notes:	
– Ships with High Performance Heatsink.	
– Only supported in single socket configurations.	
Intel Xeon-Gold 5222 (3.8GHz/4-core/105W) Processor Kit for HPE ProLiant DL360 Gen10.	P02709-B21
Intel Xeon-Gold 5220R (2.2GHz/24-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	P15995-B21
Notes: Ships with High Performance Heatsink.	
Intel Xeon-Gold 5220 (2.2GHz/18-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P02595-B21
Intel Xeon-Gold 5220S (2.7GHz/18-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P02577-B21
Intel Xeon-Gold 5218R (2.1GHz/20-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P24480-B21
Intel Xeon-Gold 5218 (2.3GHz/16-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P02592-B21
Intel Xeon-Gold 5218N (2.3GHz/16-core/110W) Processor Kit for HPE ProLiant DL360 Gen10	P11845-B21
Intel Xeon-Gold 5218B (2.3GHz/16-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	P12516-B21
Notes: Consistent features with the 5218 processor but from a different die. Mixing both 5218B & 5218 in a system is not supported	
Intel Xeon-Gold 5217 (3.0GHz/8-core/115W) Processor Kit for HPE ProLiant DL360 Gen10	P02589-B21
Intel Xeon-Gold 5215 (2.5GHz/10-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P02586-B21
Intel Xeon-Gold 5215L (2.5GHz/10-core/85W) Processor Kit for HPE ProLiant DL360 Gen10.	P02706-B21
1st Generation Intel Xeon-Gold	
Intel Xeon-Gold 6154 (3.0GHz/18-core/200W) Processor Kit for HPE ProLiant DL360 Gen10	870970-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6152 (2.1GHz/22-core/140W) Processor Kit for HPE ProLiant DL360 Gen10	860677-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6150 (2.7GHz/18-core/165W) Processor Kit for HPE ProLiant DL360 Gen10	860675-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6148 (2.4GHz/20-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	860673-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6146 (3.2GHz/12-core/165W) Processor Kit for HPE ProLiant DL360 Gen10	860671-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6144 (3.5GHz/8-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	870966-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6143 (2.8GHz/16-core/205W) Processor Kit for HPE ProLiant DL360 Gen10	879118-B21
Notes:	
– Ships with Performance Heatsink.	
– Requires the High Performance Fan Kit (871244-B21)	
– Supports “Core boosting” Learn more http://www.hpe.com/info/ist .	
– To enable this feature an iLO Advanced, or iLO Advanced Premium Security edition License are required.	
Intel Xeon-Gold 6142 (2.6GHz/16-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	860669-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6140 (2.3GHz/18-core/140W) Processor Kit for HPE ProLiant DL360 Gen10	860667-B21
Notes: Ships with Performance Heatsink	



Core Options

Intel Xeon-Gold 6138 (2.0GHz/20-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	870968-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6136 (3.0GHz/12-core/150W) Processor Kit for HPE ProLiant DL360 Gen10	860691-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6134M (3.2GHz/8-core/130W) Processor Kit for HPE ProLiant DL360 Gen10	876087-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6134 (3.2GHz/8-core/130W) Processor Kit for HPE ProLiant DL360 Gen10	860689-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6132 (2.6GHz/14-core/140W) Processor Kit for HPE ProLiant DL360 Gen10	860681-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6130 (2.1GHz/16-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	860687-B21
Intel Xeon-Gold 6128 (3.4GHz/6-core/115W) Processor Kit for HPE ProLiant DL360 Gen10	860685-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 6126 (2.6GHz/12-core/125W) Processor Kit for HPE ProLiant DL360 Gen10	860683-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 5122 (3.6GHz/4-core/105W) Processor Kit for HPE ProLiant DL360 Gen10	860679-B21
Notes: Ships with Performance Heatsink	
Intel Xeon-Gold 5120 (2.2GHz/14-core/105W) Processor Kit for HPE ProLiant DL360 Gen10	860665-B21
Intel Xeon-Gold 5118 (2.3GHz/12-core/105W) Processor Kit for HPE ProLiant DL360 Gen10	860663-B21
Intel Xeon-Gold 5117 (2.0GHz/14-core/105W) Processor Kit for HPE ProLiant DL360 Gen10	P00793-B21
Intel Xeon-Gold 5115 (2.4GHz/10-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	860661-B21
2nd Generation Intel Xeon-Silver	
Intel Xeon-Silver 4216 (2.1GHz/16-core/100W) Processor Kit for HPE ProLiant DL360 Gen10	P02583-B21
Intel Xeon-Silver 4215R (3.2GHz/8-core/130W) Processor Kit for HPE ProLiant DL360 Gen10	P24479-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Silver 4215 (2.5GHz/8-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P02598-B21
Intel Xeon-Silver 4214Y (2.2GHz/12-10-8-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P02610-B21
Notes: 12/10/8 cores would result in 2.2/2.3/2.4 GHz operating points	
Intel Xeon-Silver 4214R (2.4GHz/12-core/100W) Processor Kit for HPE ProLiant DL360 Gen10	P15977-B21
Intel Xeon-Silver 4214 (2.2GHz/12-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P02580-B21
Intel Xeon-Silver 4210R (2.4GHz/10-core/100W) Processor Kit for HPE ProLiant DL360 Gen10	P15974-B21
Intel Xeon-Silver 4210 (2.2GHz/10-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P02574-B21
Intel Xeon-Silver 4208 (2.1GHz/8-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P02571-B21
1st Generation Intel Xeon-Silver	
Intel Xeon-Silver 4116 (2.1GHz/12-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	874449-B21
Intel Xeon-Silver 4114 (2.2GHz/10-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	860657-B21
Intel Xeon-Silver 4112 (2.6GHz/4-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	860659-B21
Intel Xeon-Silver 4110 (2.1GHz/8-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	860653-B21
Intel Xeon-Silver 4108 (1.8GHz/8-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	860655-B21
2nd Generation Intel Xeon- Bronze	
Intel Xeon-Bronze 3206R (1.9GHz/8-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P15968-B21
Intel Xeon-Bronze 3204 (1.9GHz/6-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	P02565-B21



Core Options

1st Generation Intel Xeon-Bronze

Intel Xeon-Bronze 3106 (1.7GHz/8-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	860651-B21
Intel Xeon-Bronze 3104 (1.7GHz/6-core/85W) Processor Kit for HPE ProLiant DL360 Gen10	860649-B21

HPE Memory

For new Gen10 memory population rule whitepaper and optimal memory performance guidelines, please go to:

<https://www.hpe.com/docs/memory-population-rules>

For Gen10 memory speed table, please go to: <https://www.hpe.com/docs/memory-speed-table>

For memory Reliability, Accessibility, Serviceability (RAS) features whitepaper like Gen10 Fast Fault Tolerance and legacy mirrored memory feature etc. please go to: <http://www.hpe.com/docs/memory-ras-feature>

Notes:

- Maximum memory capacity and speed per processor is dependent on processor model selection or limitation.
- DDR4-2933 Memory Kits are only supported with 2nd Generation Intel Xeon Scalable Series Processors and DDR4-2666 Memory Kits are only supported with 1st Generation Intel Xeon Scalable Series Processors.

HPE DDR4 Memory

Registered DIMMs (RDIMMs) for 2nd Generation Intel Xeon Scalable Series

HPE 64GB (1x64GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00930-B21
HPE 32GB (1x32GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Memory Kit	P38446-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00924-B21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00922-B21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00920-B21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00918-B21

Registered DIMMs (RDIMMs) for 1st Generation Intel Xeon Scalable Series

HPE 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815100-B21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815098-B21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	835955-B21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815097-B21

Load Reduced DIMMs (LRDIMMs) for 2nd Generation Intel Xeon Scalable Series

HPE 128GB (1x128GB) Octal Rank x4 DDR4-2933 CAS-24-21-21 Load Reduced 3DS Smart Memory Kit	P00928-B21
HPE 128GB (1x128GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced Smart Memory Kit	P11040-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced Smart Memory Kit	P00926-B21

Load Reduced DIMMs (LRDIMMs) for 1st Generation Intel Xeon Scalable Series

HPE 128GB (1x128GB) Octal Rank x4 DDR4-2666 CAS-22-19-19 3DS Load Reduced Memory Kit	815102-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2666 CAS-19-19-19 Load Reduced Smart Memory Kit	815101-B21

HPE Persistent Memory

Intel Optane 512GB persistent memory 100 Series for HPE	835810-B21
Intel Optane 256GB persistent memory 100 Series for HPE	835807-B21
Intel Optane 128GB persistent memory 100 Series for HPE	835804-B21

Notes:

- A maximum of 12 HPE Persistent Memory Kits supported on the following 2nd Generation Intel Xeon Scalable Processor series (Platinum 8200, Gold 6200, Gold 5200, Silver 4215 and 4215R)
- For additional information regarding HPE Persistent Memory Population Rules and Guidelines for Gen10 visit: <http://www.hpe.com/docs/memory-population-rules>

Core Options

HPE Persistent Memory (NVDIMM)

HPE 16GB NVDIMM Single Rank x4 DDR4-2666 Module Kit 845264-B21

Notes:

- Can only be mixed with RDIMMs.
- A maximum of 12 NVDIMMs supported with 1st generation Intel Xeon Scalable processors.
- For General Server Memory and NVDIMM Population Rules and Guidelines for Gen10 see details here: <http://www.hpe.com/docs/memory-population-rules>

HPE Boot Controllers

HPE NS204i-p x2 Lanes NVMe PCIe3 x8 OS Boot Device P12965-B21

HPE Storage Controllers

Notes: For additional details, please see HPE Smart Array Gen10 Controllers Data Sheet at:

<https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=a00017196ENW>

HPE Flexible Smart Array Controllers

HPE Smart Array P816i-a SR Gen10 (16 Internal Lanes/4GB Cache/SmartCache) 12G SAS Modular Controller 804338-B21

HPE Smart Array P408i-a SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS Modular Controller 804331-B21

HPE Smart Array P816i-a SR Gen10 (16 Int Lanes/4GB Cache/SmartCache) 12G SAS Modular LH Controller 869083-B21

HPE Smart Array P408i-a SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS Modular LH Controller 869081-B21

HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular LH Controller 869079-B21

HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular Controller 804326-B21

Notes: The Low Height (LH) controller is required when a PCIe card that exceeds half-length is used in slots 2 or 3.

HPE Smart Array Controllers

HPE Smart Array P408e-p SR Gen10 (8 External Lanes/4GB Cache) 12G SAS PCIe Plug-in Controller 804405-B21

HPE Smart Array P408i-p SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS PCIe Plug-in Controller 830824-B21

Notes: Not supported on slot 3.

HPE Smart Array E208e-p SR Gen10 (8 External Lanes/No Cache) 12G SAS PCIe Plug-in Controller 804398-B21

HPE Smart Array E208i-p SR Gen10 (8 Internal Lanes/No Cache) 12G SAS PCIe Plug-in Controller 804394-B21

Notes: Not supported on slot 3.

HPE 96W Smart Storage Lithium-ion Battery with 145mm Cable Kit P01366-B21

Notes: Supports up to 6 P-class Smart Array controllers

HPE Smart Storage Hybrid Capacitor with 145mm Cable Kit P02377-B21

Notes: Supports up to 3 P-class Smart Array controllers

Cable Kits

HPE DL360 Gen10 SFF Internal Cable Kit 867990-B21

HPE DL3XX Gen10 Rear Serial Cable and Enablement Kit 873770-B21

HPE Hard Disk Drives

For HDDs with optimal product availability, HPE advocates HDDs from the list located here:

Enterprise - 12G SAS - SFF Drives

HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD 881457-B21

HPE 1.8TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD 872481-B21

HPE 1.2TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD 872479-B21



Core Options

HPE 900GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	870759-B21
HPE 600GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	870757-B21
HPE 600GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	872477-B21
HPE 300GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	870753-B21
HPE 300GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	872475-B21

Midline - 12G SAS - SFF Drives

HPE 2TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e HDD	765466-B21
HPE 1TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD	832514-B21

Midline 6G SATA - SFF Drives

HPE 2TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	765455-B21
HPE 1TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD	655710-B21

Enterprise - 12G SAS - LFF Drives

HPE 600GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD	P04695-B21
HPE 300GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD	P04693-B21

Midline - 12G SAS - LFF Drives

HPE 18TB SAS 12G Business Critical 7.2K LFF SC 1-year Warranty 512e ISE HDD	P37664-B21
HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 1yr Wty 512e ISE HDD	P23863-B21
HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09153-B21
HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	881779-B21
HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	857644-B21
HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	819201-B21
HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD	861754-B21
HPE 4TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	872487-B21
HPE 2TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	872485-B21

Midline - 6G SATA - LFF Drives

HPE 18TB SATA 6G Business Critical 7.2K LFF SC 1-year Warranty 512e ISE HDD	P37673-B21
HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) SC 1yr Wty 512e ISE HDD	P23857-B21
HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09163-B21
HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	881785-B21
HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	857648-B21
HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	819203-B21
HPE 6TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD	861750-B21
HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	872491-B21
HPE 2TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	872489-B21
HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty HDD	861691-B21

HPE Solid State Drives

For SSD selection guidance, please visit <https://ssd.hpe.com/>

For SSDs with optimal product availability, HPE advocates SSDs from the list located here:

Read Intensive - 12G SAS - SFF - Solid State Drives

HPE 15.3TB SAS 24G Read Intensive SFF SC PM6 SSD	P26314-B21
HPE 15.3TB SAS 12G Read Intensive SFF SC SS540 SSD	P21147-B21
HPE 15.36TB SAS 12G Read Intensive SFF SC PM1643a SSD	P19911-B21
HPE 7.68TB SAS 24G Read Intensive SFF SC PM6 SSD	P26310-B21



Core Options

HPE 7.68TB SAS 12G Read Intensive SFF SC SS540 SSD	P21145-B21
HPE 7.68TB SAS 12G Read Intensive SFF SC PM1643a SSD	P19909-B21
HPE 7.68TB SAS 12G Read Intensive SFF SC PM5 SSD	P04523-B21
HPE 3.84TB SAS 24G Read Intensive SFF SC PM6 SSD	P26306-B21
HPE 3.84TB SAS 12G Read Intensive SFF SC SS540 SSD	P21143-B21
HPE 3.84TB SAS 12G Read Intensive SFF SC PM1643a SSD	P19907-B21
HPE 3.84TB SAS 12G Read Intensive SFF SC PM5 SSD	P04521-B21
HPE 1.92TB SAS 24G Read Intensive SFF SC PM6 SSD	P26302-B21
HPE 1.92TB SAS 12G Read Intensive SFF SC SS540 SSD	P21141-B21
HPE 1.92TB SAS 12G Read Intensive SFF SC PM1643a SSD	P19905-B21
HPE 1.92TB SAS 12G Read Intensive SFF SC PM5 SSD	P04519-B21
HPE 960GB SAS 24G Read Intensive SFF SC PM6 SSD	P26285-B21
HPE 960GB SAS 12G Read Intensive SFF SC SS540 SSD	P21139-B21
HPE 960GB SAS 12G Read Intensive SFF SC PM1643a SSD	P19903-B21
HPE 960GB SAS 12G Read Intensive SFF SC PM5 SSD	P04517-B21
Mixed Use - 12G SAS - SFF - Solid State Drives	
HPE 6.4TB SAS 24G Mixed Use SFF SC PM6 SSD	P26362-B21
HPE 6.4TB SAS 12G Mixed Use SFF SC SS540 SSD	P21137-B21
HPE 6.4TB SAS 12G Mixed Use SFF SC PM1645a SSD	P19919-B21
HPE 6.4TB SAS 12G Mixed Use SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P09096-B21
HPE 6.4TB SAS 12G Mixed Use SFF SC PM5 SSD	P04539-B21
HPE 3.2TB SAS 24G Mixed Use SFF SC PM6 SSD	P26358-B21
HPE 3.2TB SAS 12G Mixed Use SFF SC SS540 SSD	P21135-B21
HPE 3.2TB SAS 12G Mixed Use SFF SC PM5 SSD	P04537-B21
HPE 3.2TB SAS 12G Mixed Use SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P09094-B21
HPE 1.6TB SAS 24G Mixed Use SFF SC PM6 SSD	P26354-B21
HPE 1.6TB SAS 12G Mixed Use SFF SC SS540 SSD	P21133-B21
HPE 1.6TB SAS 12G Mixed Use SFF SC PM1645a SSD	P19915-B21
HPE 1.6TB SAS 12G Mixed Use SFF SC PM5 SSD	P04533-B21
HPE 1.6TB SAS 12G Mixed Use SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P09092-B21
HPE 960GB SAS 12G Mixed Use SFF SC Value SAS RM5 SSD	P10448-B21
HPE 800GB SAS 24G Mixed Use SFF SC PM6 SSD	P26290-B21
HPE 800GB SAS 12G Mixed Use SFF SC SS540 SSD	P21131-B21
HPE 800GB SAS 12G Mixed Use SFF SC PM1645a SSD	P19913-B21
HPE 800GB SAS 12G Mixed Use SFF SC PM5 SSD	P04527-B21
Write Intensive - 12G SAS - SFF - Solid State Drives	
HPE 1.6TB SAS 24G Write Intensive SFF SC PM6 SSD	P26376-B21
HPE 1.6TB SAS 12G Write Intensive SFF SC SS540 SSD	P21129-B21
HPE 1.6TB SAS 12G Write Intensive SFF SC PM5 SSD	P04545-B21
HPE 800GB SAS 24G Write Intensive SFF SC PM6 SSD	P26372-B21
HPE 800GB SAS 12G Write Intensive SFF SC SS540 SSD	P21127-B21
HPE 800GB SAS 12G Write Intensive SFF SC PM5 SSD	P04543-B21
HPE 400GB SAS 24G Write Intensive SFF SC PM6 SSD	P26295-B21
HPE 400GB SAS 12G Write Intensive SFF SC SS540 SSD	P21125-B21



Core Options

HPE 400GB SAS 12G Write Intensive SFF SC PM5 SSD	P04541-B21
Read Intensive - 12G Value SAS - SFF - Solid State Drives	
HPE 7.68TB SAS 12G Read Intensive SFF SC Value SAS Multi Vendor SSD	P37003-B21
HPE 7.68TB SAS 12G Read Intensive SFF SC Value SAS RM5 SSD	P10446-B21
HPE 3.84TB SAS 12G Read Intensive SFF SC Value SAS Multi Vendor SSD	P37001-B21
HPE 3.84TB SAS 12G Read Intensive SFF SC Value SAS RM5 SSD	P10444-B21
HPE 1.92TB SAS 12G Read Intensive SFF SC Value SAS Multi Vendor SSD	P36999-B21
HPE 1.92TB SAS 12G Read Intensive SFF SC Value SAS RM5 SSD	P10442-B21
HPE 960GB SAS 12G Read Intensive SFF SC Value SAS Multi Vendor SSD	P36997-B21
HPE 960GB SAS 12G Read Intensive SFF SC Value SAS RM5 SSD	P10440-B21
Mixed Use - 12G Value SAS - SFF - Solid State Drives	
HPE 3.84TB SAS 12G Mixed Use SFF SC Value SAS Multi Vendor SSD	P37017-B21
HPE 3.84TB SAS 12G Mixed Use SFF SC Value SAS RM5 SSD	P10460-B21
HPE 1.92TB SAS 12G Mixed Use SFF SC Value SAS Multi Vendor SSD	P37011-B21
HPE 1.92TB SAS 12G Mixed Use SFF SC Value SAS RM5 SSD	P10454-B21
HPE 960GB SAS 12G Mixed Use SFF SC Value SAS Multi Vendor SSD	P37005-B21
Very Read Optimized – 6G SATA - SFF - Solid State Drives	
HPE 7.68TB SATA 6G Very Read Optimized SFF SC 5210 SSD	P23493-B21
HPE 3.84TB SATA 6G Very Read Optimized SFF SC 5210 SSD	P23489-B21
HPE 1.92TB SATA 6G Very Read Optimized SFF SC 5210 SSD	P23487-B21
Read Intensive – 6G SATA - SFF - Solid State Drives	
HPE 7.68TB SATA 6G Read Intensive SFF SC Multi Vendor SSD	P18430-B21
HPE 7.68TB SATA 6G Read Intensive SFF SC 5300P SSD	P19945-B21
HPE 3.84TB SATA 6G Read Intensive SFF SC Multi Vendor SSD	P18428-B21
HPE 3.84TB SATA 6G Read Intensive SFF SC PM883 SSD	P04570-B21
HPE 3.84TB SATA 6G Read Intensive SFF SC S4510 SSD	P05946-B21
HPE 3.84TB SATA 6G Read Intensive SFF SC 5300P SSD	P19943-B21
HPE 3.84TB SATA 6G Read Intensive SFF SC SE4011 SSD	P06200-B21
HPE 1.92TB SATA 6G Read Intensive SFF SC Multi Vendor SSD	P18426-B21
HPE 1.92TB SATA 6G Read Intensive SFF SC PM883 SSD	P04566-B21
HPE 1.92TB SATA 6G Read Intensive SFF SC S4510 SSD	P05938-B21
HPE 1.92TB SATA 6G Read Intensive SFF SC 5300P SSD	P19941-B21
HPE 1.92TB SATA 6G Read Intensive SFF SC SE4011 SSD	P06198-B21
HPE 960GB SATA 6G Read Intensive SFF SC Multi Vendor SSD	P18424-B21
HPE 960GB SATA 6G Read Intensive SFF SC PM883 SSD	P04564-B21
HPE 960GB SATA 6G Read Intensive SFF SC S4510 SSD	P05932-B21
HPE 960GB SATA 6G Read Intensive SFF SC 5300P SSD	P19939-B21
HPE 960GB SATA 6G Read Intensive SFF SC SE4011 SSD	P06196-B21
HPE 480GB SATA 6G Read Intensive SFF SC Multi Vendor SSD	P18422-B21
HPE 480GB SATA 6G Read Intensive SFF SC PM883 SSD	P04560-B21
HPE 480GB SATA 6G Read Intensive SFF SC S4510 SSD	P05928-B21
HPE 480GB SATA 6G Read Intensive SFF SC 5300P SSD	P19937-B21
HPE 480GB SATA 6G Read Intensive SFF SC SE4011 SSD	P06194-B21
HPE 240GB SATA 6G Read Intensive SFF SC Multi Vendor SSD	P18420-B21



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HPE 240GB SATA 6G Read Intensive SFF SC S4510 SSD	P05924-B21
HPE 240GB SATA 6G Read Intensive SFF SC PM883 SSD	P04556-B21
HPE 240GB SATA 6G Read Intensive SFF SC 5300P SSD	P19935-B21
Mixed Use – 6G SATA - SFF - Solid State Drives	
HPE 3.84TB SATA 6G Mixed Use SFF SC 5300M SSD	P19953-B21
HPE 3.84TB SATA 6G Mixed Use SFF SC S4610 SSD	P05994-B21
HPE 3.84TB SATA 6G Mixed Use SFF SC Multi Vendor SSD	P18438-B21
HPE 3.84TB SATA 6G Mixed Use SFF SC SM883 SSD	P21517-B21
HPE 3.84TB SATA 6G Mixed Use SFF RW SE5031 SSD	P13664-B21
HPE 1.92TB SATA 6G Mixed Use SFF SC 5300M SSD	P19951-B21
HPE 1.92TB SATA 6G Mixed Use SFF SC Multi Vendor SSD	P18436-B21
HPE 1.92TB SATA 6G Mixed Use SFF SC SM883 SSD	P09722-B21
HPE 1.92TB SATA 6G Mixed Use SFF SC S4610 SSD	P05986-B21
HPE 1.92TB SATA 6G Mixed Use SFF SC SE5031 SSD	P13662-B21
HPE 960GB SATA 6G Mixed Use SFF SC 5300M SSD	P19949-B21
HPE 960GB SATA 6G Mixed Use SFF SC Multi Vendor SSD	P18434-B21
HPE 960GB SATA 6G Mixed Use SFF SC SM883 SSD	P09716-B21
HPE 960GB SATA 6G Mixed Use SFF SC S4610 SSD	P05980-B21
HPE 960GB SATA 6G Mixed Use SFF SC SE5031 SSD	P13660-B21
HPE 480GB SATA 6G Mixed Use SFF SC 5300M SSD	P19947-B21
HPE 480GB SATA 6G Mixed Use SFF SC Multi Vendor SSD	P18432-B21
HPE 480GB SATA 6G Mixed Use SFF SC SM883 SSD	P09712-B21
HPE 480GB SATA 6G Mixed Use SFF SC S4610 SSD	P05976-B21
HPE 480GB SATA 6G Mixed Use SFF SC SE5031 SSD	P13658-B21
Read Intensive - PCIe/NVMe - SFF - Solid State Drives	
HPE 15.36TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733 SSD	P22282-B21
HPE 15.36TB NVMe Gen3 High Performance Read Intensive SFF SCN U.2 CM5 SSD	P07198-B21
HPE 7.68TB NVMe Gen4 Mainstream Performance Read Intensive SFF SCN U.3 PE8010 SSD	P19821-B21
HPE 7.68TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733 SSD	P22280-B21
HPE 7.68TB NVMe Gen4 Mainstream Performance Read Intensive SFF SCN U.3 CD6 SSD	P20143-B21
HPE 7.68TB NVMe x4 Lanes Read Intensive SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P07196-B21
HPE 4TB NVMe Gen3 High Performance Read Intensive SFF SCN U.2 P4510 SSD	P13697-B21
HPE 3.84TB NVMe Gen4 Mainstream Performance Read Intensive SFF SCN U.3 PE8010 SSD	P19817-B21
HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 CM6 SSD	P20019-B21
HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733 SSD	P22278-B21
HPE 3.84TB NVMe Gen4 Mainstream Performance Read Intensive SFF SCN U.3 CD6 SSD	P20141-B21
HPE 3.84TB NVMe Gen3 Mainstream Performance Read Intensive SFF SCN U.2 PE6011 SSD	P13680-B21
HPE 3.84TB NVMe x4 Lanes Read Intensive SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P10212-B21
HPE 3.84TB NVMe x4 Lanes Read Intensive SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P07194-B21
HPE 2TB NVMe Gen3 High Performance Read Intensive SFF SCN U.2 P4510 SSD	P13695-B21
HPE 1.92TB NVMe Gen4 Mainstream Performance Read Intensive SFF SCN U.3 PE8010 SSD	P19813-B21
HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 CM6 SSD	P20017-B21
HPE 1.92TB NVMe Gen4 Mainstream Performance Read Intensive SFF SCN U.3 CD6 SSD	P20139-B21
HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733 SSD	P22276-B21



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HPE 1.92TB NVMe x4 Lanes Read Intensive SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P10214-B21
HPE 1.92TB NVMe x4 Lanes Read Intensive SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P10210-B21
HPE 1.92TB NVMe x4 Lanes Read Intensive SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P07192-B21
HPE 960GB NVMe Gen4 Mainstream Performance Read Intensive SFF SCN U.3 PE8010 SSD	P19809-B21
HPE 960GB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733 SSD	P22331-B21
HPE 960GB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 CM6 SSD	P20015-B21
HPE 960GB NVMe Gen3 Mainstream Performance Read Intensive SFF SCN U.2 PE6011 SSD	P13676-B21

Notes: NVMe SSDs not supported on Xeon-Gold 6250L or Gold 6250 processor based configurations.

Mixed Use - PCIe/NVMe - SFF - Solid State Drives

HPE 12.8TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 PM1735 SSD	P22274-B21
HPE 6.4TB NVMe Gen4 Mainstream Performance Mixed Use SFF SCN U.3 PE8030 SSD	P19837-B21
HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 CM6 SSD	P20100-B21
HPE 6.4TB NVMe Gen4 Mainstream Performance Mixed Use SFF SCN U.3 CD6 SSD	P20207-B21
HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 PM1735 SSD	P22272-B21
HPE 6.4TB NVMe Gen3 Mainstream Performance Mixed Use SFF SCN U.2 PE6031 SSD	P13674-B21
HPE 6.4TB NVMe x4 Lanes Mixed Use SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P07185-B21
HPE 6.4TB NVMe Gen3 High Performance Mixed Use SFF SCN U.2 P4610 SSD	P13703-B21
HPE 3.2TB NVMe Gen4 Mainstream Performance Mixed Use SFF SC U.3 PE8030 SSD	P19833-B21
HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 CM6 SSD	P20098-B21
HPE 3.2TB NVMe Gen4 Mainstream Performance Mixed Use SFF SCN U.3 CD6 SSD	P20205-B21
HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 PM1735 SSD	P22270-B21
HPE 3.2TB NVMe Gen3 Mainstream Performance Mixed Use SFF SCN U.2 PE6031 SSD	P13672-B21
HPE 3.2TB NVMe x4 Lanes Mixed Use SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P07183-B21
HPE 3.2TB NVMe Gen3 High Performance Mixed Use SFF SCN U.2 P4610 SSD	P13701-B21
HPE 1.6TB NVMe Gen4 Mainstream Performance Mixed Use SFF SCN U.3 PE8030 SSD	P19829-B21
HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 CM6 SSD	P20096-B21
HPE 1.6TB NVMe Gen4 Mainstream Performance Mixed Use SFF SCN U.3 CD6 SSD	P20203-B21
HPE 1.6TB NVMe Gen3 Mainstream Performance Mixed Use SFF SCN U.2 PE6031 SSD	P13670-B21
HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 PM1735 SSD	P22268-B21
HPE 1.6TB NVMe Gen3 High Performance Mixed Use SFF SCN U.2 P4610 SSD	P13699-B21
HPE 800GB NVMe Gen4 Mainstream Performance Mixed Use SFF SCN U.3 PE8030 SSD	P19825-B21
HPE 800GB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 CM6 SSD	P20094-B21
HPE 800GB NVMe Gen4 Mainstream Performance Mixed Use SFF SCN U.3 CD6 SSD	P25953-B21
HPE 800GB NVMe Gen3 Mainstream Performance Mixed Use SFF SCN U.2 PE6031 SSD	P13668-B21
HPE 800GB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 PM1735 SSD	P22329-B21
HPE 800GB NVMe x4 Lanes Mixed Use SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	P07179-B21

Notes: NVMe SSDs not supported on Xeon-Gold 6250L or Gold 6250 processor based configurations.

Write Intensive- PCIe/NVMe - SFF - Solid State Drives

HPE 750GB NVMe Gen3 High Performance Low Latency Write Intensive SFF SCN U.2 P4800X SSD	P06952-B21
HPE 375GB NVMe Gen3 High Performance Low Latency Write Intensive SFF SCN U.2 P4800X SSD	878014-B21

Notes: NVMe SSDs not supported on Xeon-Gold 6250L or Gold 6250 processor based configurations.

Read Intensive – 6G SATA – M.2 UFF to SFF - Solid State Drives

HPE Dual 480GB SATA 6G Read Intensive M.2 to SFF SCM 5300P SSD Kit	P19896-B21
HPE Dual 240GB SATA 6G Read Intensive M.2 to SFF SCM 5300B SSD Kit	P19894-B21



Core Options

Notes: SCM dual drive functionality only supported on HPE DL360 Gen10 1SFF SAS/SATA Rear Backplane (867972-B21) or HPE DL360 Gen10 2SFF SATA UFF Backplane Kit (867970-B21). Installation on any other bay will only show one M.2 drive per bay.

Read Intensive – 6G SATA - M.2 - Solid State Media (2280 type)

HPE 960GB SATA 6G Read Intensive M.2 2280 5300P SSD	P19892-B21
HPE 480GB SATA 6G Read Intensive M.2 2280 5300P SSD	P19890-B21
HPE 240GB SATA 6G Read Intensive M.2 2280 5300B SSD	P19888-B21

Internal - 6G SATA - Dual M.2 Enabling Kits

HPE Universal SATA 6G AIC HHHL M.2 SSD Enablement Kit	878783-B21
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Notes: The Universal SATA M.2 Kit above will require a PCIe slot and support up to two of the same M.2 media cards.

HPE DL360 Gen10 SATA M.2 2280 Riser Kit	867978-B21
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Notes: The DL360 SATA M.2 Riser Kit above is part of the Primary Riser so it will not take up a PCIe slot and will support up to two of the same 2280 M.2 media cards.

Mixed Use - 12G Value SAS - LFF - Solid State Drives

HPE 1.92TB SAS 12G Mixed Use LFF SCC Value SAS Multi Vendor SSD	P37013-B21
HPE 1.92TB SAS 12G Mixed Use LFF SCC Value SAS RM5 SSD	P10456-B21
HPE 800GB SAS 12G Mixed Use LFF SCC PM5 SSD	P04529-B21

Mixed Use – 6G SATA - LFF - Solid State Drives

HPE 1.92TB SATA 6G Mixed Use LFF SCC SM883 SSD	P09724-B21
HPE 960GB SATA 6G Mixed Use LFF SCC SM883 SSD	P09718-B21
HPE 480GB SATA 6G Mixed Use LFF SCC 5300M SSD	P19978-B21

Hard Drive Blank Kits

HPE Large Form Factor Hard Drive Blank Kit	666986-B21
HPE Small Form Factor Hard Drive Blank Kit	666987-B21

HPE Smart IO

Pensando Distributed Services Card (DSC)

Pensando Distributed Services Platform DSC-25 Enterprise 10/25Gb 2-port SFP28 Card	P26966-B21
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Requirements:

- One 3yr/4yr/5yr Silver or 3yr/4yr/5yr Platinum license must be purchased for every DSC-25 card in a server.
- 1yr Silver, 1yr Platinum licenses are reserved for renewals only.

Notes:

- DSC card must be installed in slot 1 when used in combination with ALOM Module for iLO Management.
- Each card instance requires one RTU license of Silver or Platinum software. In case of more than one adapter, RTU licenses doesn't need to be of the same part number.

Pensando Distributed Services Platform for HPE iLO Sideband Management Adaptive LOM Module	P26969-B21
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Pensando DSP Silver Software Licenses

Pensando Distributed Services Platform Enterprise 1-year Renewal Subscription 24x7 Support E-RTU	R6A06AAE
Pensando Distributed Services Platform Enterprise 3-year Subscription 24x7 Support E-RTU	R6A07AAE
Pensando Distributed Services Platform Enterprise 4-year Subscription 24x7 Support E-RTU	R6F68AAE
Pensando Distributed Services Platform Enterprise 5-year Subscription 24x7 Support E-RTU	R6A08AAE



Core Options

Pensando DSP Platinum Software Licenses

Pensando Distributed Services Platform Enterprise Pro 1-year Renewal Subscription 24x7 Support E-RTU	R6A09AAE
Pensando Distributed Services Platform Enterprise Pro 3-year Subscription 24x7 Support E-RTU	R6A10AAE
Pensando Distributed Services Platform Enterprise Pro 4-year Subscription 24x7 Support E-RTU	R6F69AAE
Pensando Distributed Services Platform Enterprise Pro 5-year Subscription 24x7 Support E-RTU	R6A11AAE

HPE Networking

100 Gigabit Ethernet adapters

HPE Ethernet 100Gb 1-port QSFP28 MCX515A-CCAT Adapter	874253-B21
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25 Gigabit Ethernet adapters

HPE Ethernet 10/25Gb 2-port SFP28 MCX4121A-ACUT Adapter	817753-B21
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Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

HPE Ethernet 10/25Gb 2-port SFP28 BCM57414 Adapter	817718-B21
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Notes:

- Alternative to FlexLOM requirement on Network Choice (NC) chassis
- PXE boot not supported on Legacy Mode
- Legacy FIO Mode (758959-B22) not supported with this option on the Network Choice (NC) Configure-to-Order (CTO) chassis. The selection of this networking option and Legacy FIO Mode on an NC chassis requires an additional networking option without the Legacy FIO mode restriction.

HPE Ethernet 10/25Gb 2-port SFP28 QL41401-A2G Adapter	867328-B21
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Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

10 Gigabit Ethernet adapters

HPE Ethernet 10Gb 2-port SFP+ BCM57414 Adapter	P08421-B21
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HPE Ethernet 10Gb 2-port BASE-T X550-AT2 Adapter	817738-B21
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Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

HPE Ethernet 10Gb 2-port 562SFP+ Adapter	727055-B21
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Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

HPE Ethernet 10Gb 2-port 548SFP+ Adapter	P11338-B21
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Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

HPE Ethernet 10Gb 2-port BASE-T BCM57416 Adapter	813661-B21
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Notes:

- Alternative to FlexLOM requirement on Network Choice (NC) chassis
- PXE boot not supported on Legacy Mode
- Legacy FIO Mode (758959-B22) not supported with this option on the Network Choice (NC) Configure-to-Order (CTO) chassis. The selection of this networking option and Legacy FIO Mode on an NC chassis requires an additional networking option without the Legacy FIO mode restriction.

HPE Ethernet 10Gb 2-port SFP+ 57810S Adapter	652503-B21
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Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

HPE Ethernet 10Gb 2-port SFP+ QL41401-A2G Adapter	P08446-B21
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Notes:

- Alternative to FlexLOM requirement on Network Choice (NC) chassis
- PXE boot not supported on Legacy Mode
- Legacy FIO Mode (758959-B22) not supported with this option on the Network Choice (NC) Configure-to-Order (CTO) chassis. The selection of this networking option and Legacy FIO Mode on an NC chassis requires an additional networking option without the Legacy FIO mode restriction.



Core Options

HPE Ethernet 10Gb 2-port BASE-T 57810S Adapter 656596-B21

Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

HPE Ethernet 10Gb 2-port BASE-T QL41401-A2G Adapter 867707-B21

Notes: Alternative to FlexLOM requirement on Network Choice (NC) chassis

1 Gigabit Ethernet adapters

HPE Ethernet 1Gb 4-port BASE-T I350-T4V2 Adapter 811546-B21

HPE Ethernet 1Gb 4-port BASE-T BCM5719 Adapter 647594-B21

HPE Ethernet 1Gb 2-port BASE-T I350-T2V2 Adapter 652497-B21

HPE Ethernet 1Gb 2-port BASE-T BCM5720 Adapter 615732-B21

FlexibleLOM Adapters

HPE Ethernet 10/25Gb 2-port FLR-SFP28 MCX4121A-ACFT Adapter 817749-B21

HPE Ethernet 10/25Gb 2-port FLR-SFP28 BCM57414 Adapter 817709-B21

HPE Ethernet 10/25Gb 2-port FLR-SFP28 QL41401-A2G Converged Network Adapter 867334-B21

HPE Ethernet 10Gb 2-port FLR-SFP+ BCM57414 Adapter P08440-B21

HPE Ethernet 10Gb 2-port FLR-SFP+ X710-DA2 Adapter 727054-B21

HPE Ethernet 10Gb 2-port FLR-T X550-AT2 Adapter 817745-B21

HPE FlexFabric 10Gb 4-port FLR-T 57840S Adapter 764302-B21

HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter 817721-B21

HPE FlexFabric 10Gb 2-port FLR-SFP+ 57810S Adapter 700751-B21

HPE FlexFabric 10Gb 2-port FLR-T 57810S Adapter 700759-B21

HPE Ethernet 1Gb 4-port FLR-T BCM5719 Adapter 629135-B22

HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 Adapter 665240-B21

HPE InfiniBand

HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe3 x16 MCX653105A-HDAT Adapter P06154-B21

Notes: Must be paired with HPE IB HDR PCIe G3 Aux Card W/ Cbl (P06154-B23)

HPE InfiniBand HDR PCIe3 Auxiliary Card with 350mm Cable Kit P06154-B23

HPE InfiniBand EDR/Ethernet 100Gb 2-port 841QSFP28 Adapter 872726-B21

HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe3 x16 MCX653106A-ECAT Adapter P06251-B21

HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe3 x16 MCX653105A-ECAT Adapter P06250-B21

HPE InfiniBand FDR/Ethernet 40/50Gb 2-port 547FLR-QSFP Adapter 879482-B21

HPE InfiniBand EDR 100Gb 1-port 841QSFP28 Adapter 872725-B21

HPE InfiniBand EDR/Ethernet 100Gb 2-port 840QSFP28 Adapter 825111-B21

HPE 100Gb 1-port OP101 QSFP28 x16 PCIe Gen3 with Intel Omni-Path Architecture Adapter 829335-B21

Notes: For additional InfiniBand information: <https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04154440>

HPE Power Supplies

HPE Flexible Slot (Flex Slot) Power Supplies share a common electrical and physical design that allows for hot plug, tool-less installation into HPE ProLiant Gen10 Performance Servers. Flex Slot power supplies are certified for high-efficiency operation and offer multiple power output options, allowing users to "right-size" a power supply for specific server configurations. This flexibility helps to reduce power waste, lower overall energy costs, and avoid "trapped" power capacity in the data center.

All pre-configured servers ship with a standard 6-foot IEC C-13/C-14 jumper cord (A0K02A). This jumper cord is also included with each standard AC power supply option kit. If a different power cord is required, please check the [ProLiant Power Cables](#) web page.



Core Options

To review the power requirements for your selected system, please use the [HPE Power Advisor Tool](#).
For information on power specifications and technical content visit [HPE Server power supplies](#).

HPE Flex Slot Platinum Hot-plug Power supplies

HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	830272-B21
Notes: 1600W Power supplies only support high line voltage (200 VAC to 240 VAC).	
HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	865414-B21
HPE 800W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit	865438-B21
HPE 800W Flex Slot -48VDC Hot Plug Low Halogen Power Supply Kit	865434-B21
HPE 800W Flex Slot Universal Hot Plug Low Halogen Power Supply Kit	865428-B21
HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	865408-B21

HPE Computation and Graphics Accelerators

NVIDIA T4 16GB Computational Accelerator for HPE	ROW29C
Notes: Requires High Performance Fan kit (871244-B21)	
NVIDIA Quadro RTX 4000 Graphics Accelerator for HPE	R1F95C
Notes: v2 GPU cable / enablement kit required	
NVIDIA Quadro P2200 Graphics Accelerator for HPE	R2U55C
Notes: If any of these accelerators is intended for slot 3 and configured with an AROC, the latter needs to have a low profile heatsink	
HPE DL360 Gen10 GPU CPU1 v2 Cable Kit	P23272-B21
Notes: Replaces 871248-B21. Enhanced to support additional GPUs and compatible with all GPUs qualified on DL360 Gen10.	



Core Options

GPGPU Information

HPE DL360 Configuration*										
Part number	Card	Qty supp.	Processor supported	PCIe	4LFF	8SFF	8+2SFF SAS/SATA/Dual M.2 ¹	8+2SFF SAS/SATA/Dual M.2 ²	8+2SFF NVMe ³	10SFF Premium ⁴
Q9B37C	Intel Arria 10GX FPGA Accelerator	2	1 st & 2 nd Gen	Gen3	35C	35C	≤25C	≤30C	≤30C	≤30C
R2U55C	NVIDIA Quadro P2200 GPU Module	2	2 nd Gen	Gen3	35C	35C	35C	35C	35C	35C
R1F95C	NVIDIA Quadro RTX4000 GPU Module	2	2 nd Gen	Gen3	35C	35C	25C/30C*	30C/35C*	25C/30C*	35C ⁵
ROW29C ⁴	NVIDIA Tesla T4 16GB Module	2	1 st & 2 nd Gen	Gen3	30C	30C	Not Supp.	20C	20C	20C

Notes:

- The 2nd digit of the processor model number “x1xx” and “x2xx” is used to denote the processor generation (i.e. 1=1st generation and 2=2nd generation)
- When NVMe drives are installed you will be limited to Slot 1 only for any Accelerator module.
- Requires increased cooling to be selected in BIOS settings
- ¹ - With standard system fans
- ² - With High Performance system fans
- ³ - Requires high performance fans with 2SFF NVMe configuration.
- ⁴ - Requires high performance fans (Note these ship standard on 10SFF models).
- ⁵ - Limited to 1 GPU
- There is no Energy Star certification with Graphic cards.
- *For information on obsolete P2000 & P4000 GPUs please visit [HPE DL360 Gen10 QuickSpecs version 37](#)



Additional Options

Some options may not be integrated at the factory. To ensure only valid configurations are ordered, Hewlett Packard Enterprise recommends the use of an HPE approved configurator. Contact your local sales representative for additional information.

Embedded Management

HPE iLO Advanced

HPE iLO Advanced 1-server License with 1yr Support on iLO Licensed Features	512485-B21
HPE iLO Advanced Flexible Quantity License with 1yr Support on iLO Licensed Features	512486-B21
HPE iLO Advanced AKA Tracking License with 1yr Support on iLO Licensed Features	512487-B21
HPE iLO Advanced 1-server License with 3yr Support on iLO Licensed Features	BD505A
HPE iLO Advanced Flexible Quantity License with 3yr Support on iLO Licensed Features	BD506A
HPE iLO Advanced AKA Tracking License with 3yr Support on iLO Licensed Features	BD507A
HPE iLO Advanced Electronic License with 1yr Support on iLO Licensed Features	E6U59ABE
HPE iLO Advanced Electronic License with 3yr Support on iLO Licensed Features	E6U64ABE

HPE iLO Common Password Setting

HPE iLO Common Password FIO Setting	P08040-B21
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Notes:

- Replaces iLO default randomized password by an HPE defined common password. HPE highly recommends changing this password immediately after the initial onboarding process.
- Customers who want to choose their own custom iLO default password should use the HPE Factory Express Integration Services

HPE Converged Infrastructure Management Software

HPE OneView Advanced (with HPE iLO Advanced)

HPE OneView including 3yr 24x7 Support Physical 1-server LTU	E5Y34A
HPE OneView including 3yr 24x7 Support Flexible Quantity E-LTU	E5Y35AAE

HPE OneView Advanced (without HPE iLO Advanced)

HPE OneView w/o iLO including 3yr 24x7 Support 1-server LTU	P8B24A
HPE OneView w/o iLO including 3yr 24x7 Support Track 1-server LTU	P8B25A
HPE OneView w/o iLO including 3yr 24x7 Support Flexible Quantity E-LTU	P8B26AAE

Notes:

- Licenses ship without media. The HPE OneView Media Kit can be ordered separately, or can be downloaded at: <https://www.hpe.com/us/en/integrated-systems/software.html>
- Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.
- Licenses ship without media. The HPE OneView Media Kit can be ordered separately, or can be downloaded at: <https://www.hpe.com/us/en/integrated-systems/software.html>

HPE PCIe Workload Accelerator Options

HPE 6.4TB NVMe x8 Lanes Mixed Use HHHH 3yr Wty Digitally Signed Firmware Card	P10268-B21
HPE 3.2TB NVMe Gen4 x8 High Performance Mixed Use AIC HHHH PM1735 SSD	P26936-B21
HPE 1.6TB NVMe Gen4 x8 High Performance Mixed Use AIC HHHH PM1735 SSD	P26934-B21
HPE 1.6TB NVMe x8 Lanes Mixed Use HHHH 3yr Wty Digitally Signed Firmware Card	P10264-B21
HPE 750GB NVMe Gen3 x4 High Performance Low Latency Write Intensive AIC HHHH P4800X SSD	878038-B21

Additional Options

Notes: Please see the [HPE PCIe Workload Accelerators for ProLiant Servers QuickSpecs](#) for Technical Specifications and additional information.

HPE Security

HPE 1U Gen10 Bezel Kit	867998-B21
HPE Bezel Lock Kit	875519-B21
HPE DL360 Gen10 Chassis Intrusion Detection Kit	867984-B21

Notes: This provides a physical connection from the chassis board and hood and detects any physical intrusion into the chassis, providing security during the entire supply chain process of shipping, receiving, distribution, and operation.

HPE Trusted Platform Module 2.0 Gen10 Option	864279-B21
----------------------------------------------	------------

Notes:

- HPE Trusted Platform Module 2.0 option works with Gen10 servers with UEFI Mode not Legacy Mode. It is not compatible with HPE ProLiant Gen8 servers or earlier generation variants.
- HPE server systems can have a TPM module (of any type) installed only once. It cannot be replaced with any other TPM module.

HPE Gen10 TPM 1.2 FIO Setting	872108-B21
-------------------------------	------------

Notes: This is a FIO setting to allows the TPM 2.0 module to operate in a TPM 1.2 mode

HPE Storage Options

Emulex Fibre Channel HBAs

HPE SN1200E 16Gb Single Port Fibre Channel Host Bus Adapter	Q0L13A
HPE SN1200E 16Gb Dual Port Fibre Channel Host Bus Adapter	Q0L14A
HPE SN1600E 32Gb Single Port Fibre Channel Host Bus Adapter	Q0L11A
HPE SN1600E 32Gb Dual Port Fibre Channel Host Bus Adapter	Q0L12A

QLogic Fibre Channel HBAs

HPE SN1100Q 16Gb Single Port Fibre Channel Host Bus Adapter	P9D93A
HPE SN1100Q 16Gb Dual Port Fibre Channel Host Bus Adapter	P9D94A
HPE SN1610Q 32Gb 1-port Fibre Channel Host Bus Adapter	R2E08A
HPE SN1600Q 32Gb Single Port Fibre Channel Host Bus Adapter	P9M75A
HPE SN1610Q 32Gb 2-port Fibre Channel Host Bus Adapter	R2E09A
HPE SN1600Q 32Gb Dual Port Fibre Channel Host Bus Adapter	P9M76A
HPE SN1610E 32Gb 1-port Fibre Channel Host Bus Adapter	R2J62A
HPE SN1610E 32Gb 2-port Fibre Channel Host Bus Adapter	R2J63A

Converged Network Adapter

HPE CN1300R 10/25Gb Dual Port Converged Network Adapter	Q0F09A
HPE CN1200R 10GBASE-T Converged Network Adapter	Q0F26A

HPE Rack Options

Rail Kits

HPE 1U Gen10 SFF Easy Install Rail Kit	874543-B21
HPE 1U LFF Gen9 Easy Install Rail Kit	789388-B21
HPE 1U Cable Management Arm for Rail Kit	734811-B21

Notes: Supports both the Easy Install and Ball Bearing Rail Kits.



Additional Options

HPE 1U Gen10 SFF Ball Bearing Rail Kit	872252-B21
HPE 1U Gen10 LFF Ball Bearing Rail Kit	879003-B21

Notes:

- HPE rail kits contain telescoping rails which allow for in-rack serviceability.
- Hewlett Packard Enterprise recommends that a minimum of two people are required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation.

HPE Racks

Please see the [HPE Advanced Series Racks QuickSpecs](#) for information on additional racks options and rack specifications.
Please see the [HPE Enterprise Series Racks QuickSpecs](#) for information on additional racks options and rack specifications.

HPE Power Distribution Units (PDUs)

Please see the [HPE Basic Power Distribution Units \(PDU\) QuickSpecs](#) for information on these products and their specifications.
Please see the [HPE Metered Power Distribution Units \(PDU\) QuickSpecs](#) for information on these products and their specifications. Please see the [HPE Intelligent Power Distribution Unit \(PDU\) QuickSpecs](#) for information on these products and their specifications.
Please see the [HPE Metered and Switched Power Distribution Units \(PDU\) QuickSpecs](#) for information on these products and their specifications.

HPE Uninterruptible Power Systems (UPS)

To learn more, please visit the [HPE Uninterruptible Power Systems \(UPS\)](#) web page.
Please see the [HPE DirectFlow Three Phase Uninterruptible Power System QuickSpecs](#) for information on these products and their specifications.
Please see the [HPE Line Interactive Single Phase UPS QuickSpecs](#) for information on these products and their specifications.

HPE USB and SD Options

HPE Enterprise Mainstream Flash Media Kits for Memory Cards

HPE 32GB microSD RAID 1 USB Boot Drive	P21868-B21
HPE 32GB microSD Flash Memory Card	700139-B21
HPE 8GB microSD Flash Memory Card	726116-B21
HPE 8GB microSD Flash USB Drive	737953-B21
HPE 8GB Dual microSD Flash USB Drive	741279-B21

HPE Support Services

Installation & Start-up Services

HPE Install ProLiant DL3xx Service	U4506E
HPE Installation and Startup DL3xx Service	U4507E

Proactive Care

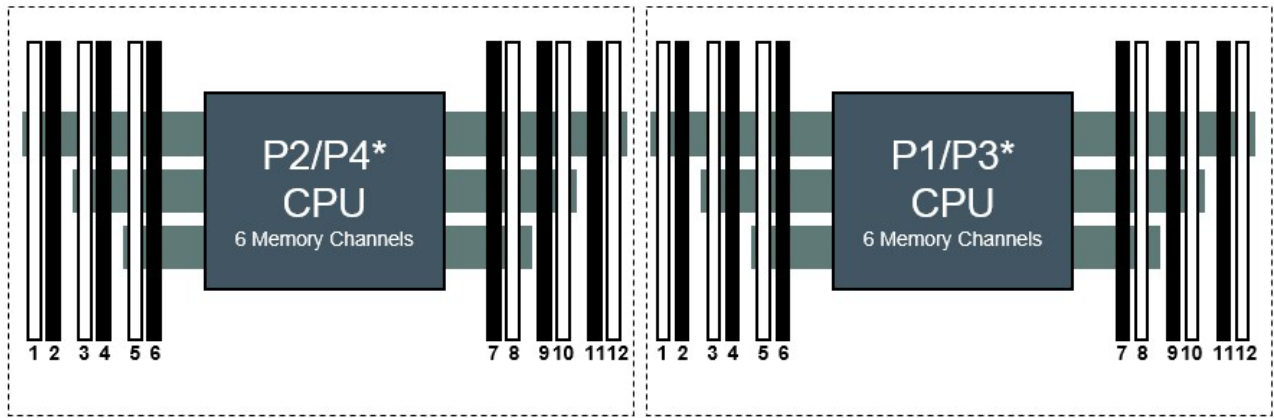
HPE 3 Year Proactive Care 24x7 DL360 Gen10 Service	H8QF3E
HPE 3 Year Proactive Care 24x7 with DMR DL360 Gen10 Service	H8QF4E
HPE 3 Year Proactive Care 24x7 with CDMR DL360 Gen10 Service	H8QF5E
HPE 3 Year Proactive Care Call-To-Repair DL360 Gen10 Service	H8QG2E
HPE 3 Year Proactive Care Call-To-Repair 24x7 with DMR DL360 Gen10 Service	H8QG3E
HPE 3 Year Proactive Care Call-To-Repair with CDMR DL360 Gen10 Service	H8QG4E

Notes: For a full listing of support services available for this server, please visit <https://ssc.hpe.com/>



Memory

Memory Population guidelines



HPE Gen10 DL360 / DL380 / DL560

Notes:* Servers Front Server2 Slots per Channel

HPE ProLiant Gen10 12 slot per CPU DIMM population order											
DIMM population order											
1 DIMM								8			
2 DIMM s								8	10		
3 DIMM s								8	10		12
4 DIMM s			3		5			8	10		
5 DIMM s			3		5			8	10		12
6 DIMM s	1		3		5			8	10		12
7 DIMM s	1		3		5	7		8	10		12
8 DIMM s			3	4	5	6	7	8	9	10	
9 DIMM s	1		3		5	7		8	9	10	11
10 DIMM s	1		3	4	5	6	7	8	9	10	12
11 DIMM s	1		3	4	5	6	7	8	9	10	11
12 DIMM s	1	2	3	4	5	6	7	8	9	10	11

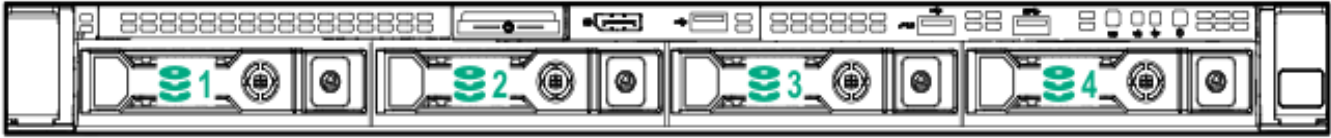
General Memory Population Rules and Guidelines

- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two-processor system, only half of the DIMM slots are available.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors.
- When two processors are installed, balance the DIMMs across the two processors.
- White DIMM slots denote the first slot to be populated in a channel.
- Mixing of DIMM types (UDIMM, RDIMM, and LRDIMM) is not supported.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the number of DIMM slots on the platform, the largest DIMM capacity qualified on the platform, the number and model of installed processors qualified on the platform.
- For details on the HPE Server Memory Options Population Rules, visit: <http://www.hpe.com/docs/memory-population-rules>
- To realize the performance memory capabilities listed in this document, HPE DDR4 SmartMemory is required. For additional information, please see the [HPE DDR4 SmartMemory QuickSpecs](#).

Notes: The maximum memory speed is a function of the memory type, memory configuration, and processor model
 For details on the HPE Server Memory speed, visit: <https://www.hpe.com/docs/memory-speed-table>



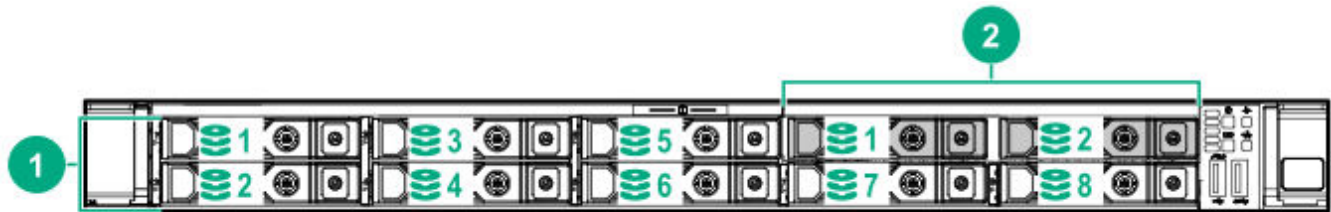
Storage



4 LFF device bay numbering



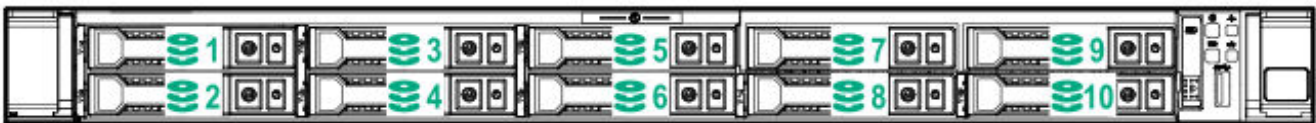
8 SFF + ODD device bay numbering



8 SFF + 2 SFF device bay numbering

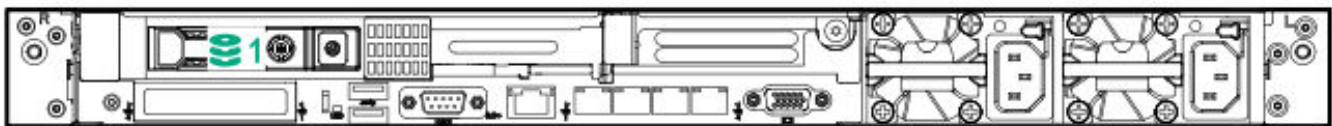
Item Description

- 1 Bays 1-8
- 2 Bays 1 and 2



10 SFF NVMe/SAS backplane option device bay numbering

Notes: When the 10SFF NVMe/SAS backplane option is installed, bays 9 and 10 ONLY support NVMe Drives. The other bays support a mix of NVMe and SAS drives



Optional rear device bay numbering

Notes:

- The optional rear device bay supports either 1 SFF drive or 1 Dual uFF (2x M.2 drives) in an HPE SmartCarrier M.2 (SCM).
- When the Dual uFF is installed, the M.2 drives are recognized as 101 and 102.
- Embedded 1Gb Ethernet 4-Port 331i Adapter shown above is not available on all models



Technical Specifications

System Unit

Dimensions (Height x Width x Depth)

SFF Drives

- 4.29 x 43.46 x 70.7 cm
1.69 x 17.11 x 27.83 in

LFF Drives

- 4.29 x 43.46 x 74.98 cm
1.69 x 17.11 x 29.5 in

Weight (approximate)

- **13.04 kg (28.74 lb)**
 - **SFF minimum:** One drive, one processor, one power supply, two heatsinks, one Smart Array controller, and five fans.
- **16.27 kg (35.86 lb)**
 - **SFF maximum:** 10 drives, two processors, two power supplies, two heatsinks, one Smart Array controller and seven fans.
- **13.77 kg (30.36 lb)**
 - **LFF minimum:** one drive, one processor, one power supply, two heatsinks, one Smart Array controller and five fans.
- **16.78 kg (37 lb)**
 - **LFF maximum:** Four drives, two processors, two power supplies, two heatsinks, one Smart Array controller and seven fans.

Input Requirements (per power supply)

Rated Line Voltage

- For 1600W (Platinum): 200-240 VAC
- For 800W (Titanium) Power Supply: 200-240 VAC
- For 800W (Platinum): 100-240 VAC
- For 800W (Universal) Power Supply: 200-277 VAC
- For 800W (-48VDC): -40 Vdc to -72 Vdc
- 500W (Platinum) Power Supply: 100-240 VAC

BTU Rating

Maximum

- For 1600W Power Supply: 5918 BTU/hr (at 200 VAC), 5888 BTU/hr (at 220 VAC), 5884 BTU/hr (at 240 VAC)
- For 800W (Titanium) Power Supply: 2905 BTU/hr (at 200 VAC), 2899 BTU/hr (at 220 VAC), 2893 BTU/hr (at 240 VAC)
- For 800W (Platinum) Power Supply: 3067 BTU/hr (at 100 VAC), 2958 BTU/hr (at 200 VAC), 2949 BTU/hr (at 240 VAC)
- For 800W (Universal) Power Supply: 2964 BTU/hr (at 200 VAC), 2951 BTU/hr (at 230 VAC), 2936 BTU/hr (at 277 VAC)
- For 800W-(-48Vdc) Power Supply: 2983 BTU/hr (at -40 Vdc), 2951 BTU/hr (at -48Vdc), 2912 BTU/hr (at -72Vdc)
- For 500W (Platinum) Power Supply: 1902 BTU/hr (at 100 VAC), 1840 BTU/hr (at 200 VAC), 1832 BTU/hr (at 240 VAC)



Technical Specifications

Power Supply Output (per power supply)

Rated Steady-State Power

- For 1600W Power Supply: 1600W (at 240 VAC), 1600W (at 240 VDC) for China only
- For 800W (Titanium) Power Supply: 800W (at 200 VAC), 800W (at 240 VAC), 800W (at 240 VDC) for China only
- For 800W (Platinum) Power Supply: 800W (at 100 VAC), 800W (at 240 VAC), 800W (at 240 VDC) input for China only
- For 800W (Universal) Power Supply: 800W (at 200 VAC), 800W (at 277 VAC)
- For 800W (-48VDC) Power Supply: 800W (at -40 Vdc), 800W (at -72Vdc)
- For 500W (Platinum) Power Supply: 500W (at 100 VAC), 500W (at 240 VAC), 500W (at 240 VDC) input for China only

Maximum Peak Power

- For 1600W Power Supply: 1600W (at 240 VAC), 1600W (at 240 VDC) for China only
- For 800W (Titanium) Power Supply: 800W (at 200 VAC), 800W (at 240 VAC), 800W (at 240 VDC) for China only
- For 800W (Platinum) Power Supply: 800W (at 100 VAC), 800W (at 240 VAC), 800W (at 240 VDC) input for China only
- For 800W (Universal) Power Supply: 800W (at 200 VAC), 800W (at 277 VAC)
- For 800W (-48VDC) Power Supply: 800W (at -40 Vdc), 800W (at -72Vdc)
- For 500W (Platinum) Power Supply: 500W (at 100 VAC), 500W (at 240 VAC), 500W (at 240 VDC) input for China only

System Inlet Temperature

- **Standard Operating Support**

10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed. System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F).

For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: <http://www.hpe.com/servers/ashrae>

- **Extended Ambient Operating Support**

For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: <http://www.hpe.com/servers/ashrae>

System performance may be reduced if operating in the extended ambient operating range or with a fan fault.

- **Non-operating**

-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).

Relative Humidity (non-condensing)

- **Operating**

8% to 90% - Relative humidity (Rh), 28°C maximum wet bulb temperature, non-condensing.

- **Non-operating**

5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.

Altitude

- **Operating**

3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

- **Non-operating**

9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).



Technical Specifications

Emissions Classification (EMC)

To view the regulatory information for your product, view the Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products, available at the Hewlett Packard Enterprise Support Center:

<http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts>

HPE Smart Array

For latest information on **HPE Smart Array Gen10 Controllers for HPE ProLiant DL, ML and Apollo Servers**, please refer to their QuickSpecs. (E208i-a,E208i-p,E208e-p,P408i-a,P408i-p,P408e-p,P816i-a)

Acoustic Noise

Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). The listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels. Please have your HPE representative provide information from the HPE EMESC website for further technical details regarding the configurations listed below.

Configuration SKU	Entry	Base	Performance
Idle			
LWAd	5.1 B	5.1 B	5.2 B
LpAm	35 dBA	35 dBA	36 dBA
Operating			
LWAd	5.3 B	5.2 B	5.9 B
LpAm	36 dBA	38 dBA	45 dBA

Notes: Acoustics levels presented here are generated by the test configuration only. Acoustics levels will vary depending on system configuration. Values are subject to change without notification and are for reference only.

Environment-friendly Products and Approach - End-of-life Management and Recycling

Hewlett Packard Enterprise offers **end-of-life product return, trade-in, and recycling programs** in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **Hewlett Packard Enterprise web site**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.



Summary of Changes

Date	Version History	Action	Description of Change
01-Feb-2021	Version 42	Changed	Overview, Pre-Configured Models, Standard Features and Core Options sections were updated. Obsolete SKUs were removed. Added new Read Intensive, Mixed Use & Write Intensive SAS SSDs Added 18TB SAS & SATA drives
04-Jan-2021	Version 41	Changed	Overview and Pre-Configured Models sections were updated. Added four new Pre-Configured Models. Obsolete SKUs were removed.
07-Dec-2020	Version 40	Changed	Overview, Pre-Configured Models and Core Options sections were updated. Obsolete SKUs were removed. Added support for 32GB Single Rank x4 DDR4-2933 Registered Smart Memory Added new NVMe RI & MU Value SAS SSD SKUs
02-Nov-2020	Version 39	Changed	Overview, Pre-Configured Models, Core Options and Additional Options sections were updated. New Pre-Configured Models with 10GbE NICs were added. Full Pre-Configured Models SKUs are now listed. Obsolete SKUs were removed.
05-Oct-2020	Version 38	Changed	Overview, Standard Features, Pre-Configured Models, Configuration Information and Core Options sections were updated. Added HPE NS204i-p NVMe PCIe3 OS Boot Device. Added new NVMe RI & MU SCN SSD SKUs Updated 2nd Gen. Intel® Xeon® Scalable Refresh Processors chassis support. Obsolete SKUs were removed.
08-Sep-2020	Version 37	Changed	Overview, Standard Features, Configuration Information and Core Options sections were updated. Updated Operating Systems and Virtualization Software section Obsolete SKUs were removed
03-Aug-2020	Version 36	Changed	Overview, Pre-Configured Models, Core Options and Additional Options sections were updated. Added Pensando DSP for HPE iLO Management ALOM Module Added new NVMe RI & MU SSD SKUs Added SN1610E 32Gb Fibre Channel HBAs Obsolete SKUs were removed from the QuickSpecs.
06-Jul-2020	Version 35	Changed	Standard Features, Additional Options and Core Options sections were updated. Renamed Network Interface Card descriptions to include chipset Corrected UPI link quantity for Gold 6xxx-R refresh processors
15-Jun-2020	Version 34	Changed	Core Options section was updated.
01-Jun-2020	Version 33	Changed	Overview, Configuration Information, Core Options, Standard Features and Additional Options sections were updated. Obsolete SKUs were removed
06-Apr-2020	Version 32	Changed	Overview, Standard Features, Pre-Configured Models, Configuration Information, Core Options and Additional Options sections were updated.
16-Mar-2020	Version 31	Changed	Standard Features, Configuration Information and Core Options sections were updated.
24-Feb-2020	Version 30	Changed	Overview, Pre-Configured Models, Service and Support, Configuration Information, Core Options and Additional Options sections were updated. Additional 2nd Generation Intel® Xeon® Scalable Processors and pre-configured models powered by them were added.
03-Feb-2020	Version 29	Changed	Overview, Standard Features, Core Options, Pre-configured Models and Configuration Information and Additional Options sections were updated. European Union (EU) Lot 9 regulation information was added. Obsolete SKUs were removed

Summary of Changes

Date	Version History	Action	Description of Change
02-Dec-2019	Version 28	Changed	Overview, Pre-configured Models, Configuration Information, Core Options, Additional Options and Technical Specifications sections were updated. Obsolete SKUs were removed
07-Oct-2019	Version 27	Changed	Overview, Pre-configured Models, Core Options, and Additional Options sections were updated.
03-Sep-2019	Version 26	Changed	Overview, Standard Features, Pre-configured Models, SMB Models, China Specific, Configuration Information - Factory Integrated Models and Core Options sections were updated.
12-Aug-2019	Version 25	Changed	Overview, Standard, Features, Optional Features, SMB Models, Configuration Information-Factory Integrated Models, China Specific, Core Options, Storage sections were updated.
01-Jul-2019	Version 24	Changed	The 5218N wattage has changed from 105 to 110W TDP The U.S. version of QuickSpecs is no longer being updated, please reference the Worldwide QuickSpecs for latest information.
03-Jun-2019	Version 23	Changed	Standard Features, SMB Models, Pre-configured Models, China Specific, Configuration Information, Additional Options and Core Options sections were updated. New SKUs were added and Obsolete SKUs were removed.
15-Apr-2019	Version 22	Changed	Overview, Standard Features, SMB Models, Pre-configured Models, China Specific, Configuration Information and Core Options sections were updated.
02-Apr-2019	Version 21	Changed	Overview, Standard Features and Pre-configured Models sections were updated.
04-Feb-2019	Version 20	Changed	Overview, Standard Features, Configuration Information, Core Options and Optional Features sections were updated.
03-Dec-2018	Version 19	Changed	Overview, Standard Features, Pre-configured Models, Core Options and Storage sections were Updated.
15-Oct-2018	Version 18	Changed	SKUs descriptions were updated in Core Options section Obsolete SKUs were removed from Core Options section,
01-Oct-2018	Version 17	Changed	Overview, Standard Features, Configuration Information, Core Options, Additional Options, and Memory sections were updated. SKU descriptions were updated.
13-Aug-2018	Version 16	Changed	Maximum Storage and Additional Options were revised.
06-Aug-2018	Version 15	Changed	Added new AMD and NVIDIA Graphics card options. Added new Smart Array P824i-p MR Gen10 (24 Internal Lanes/4GB Cache/CacheCade) 12G SAS PCIe Controller. Added new Solid State Drives offering. Pre-Configured Models, Core Options, and Additional Options were revised. Obsolete SKUs were removed from the QuickSpecs.
11-Jun-2018	Version 14	Changed	Smart Buy Models section for the NA version was revised.
04-Jun-2018	Version 13	Changed	New SSD offering was added to the HPE Drivers section. Core Options, Additional Options, and Memory were revised. Obsolete SKUs were removed from the QuickSpecs.
07-May-2018	Version 12	Changed	New SMB models offering was added. Riser Information and power supply section were revised. Obsolete SKUs were removed from the QuickSpecs.

Summary of Changes

Date	Version History	Action	Description of Change
02-Apr-2018	Version 11	Changed	Standard Features, Core Options and Additional Options were revised. Obsolete SKUs were removed from the QuickSpecs.
05-Mar-2018	Version 10	Removed	Obsolete SKUs were removed from the QuickSpecs.
05-Feb-2018	Version 9	Added	Added new SATA SSDs, NVMe drives and PCIe accelerator cards.
18-Dec-2017	Version 8	Changed	Network controller under Configuration Information – Factory Integrated Models section was revised.
04-Dec-2017	Version 7	Changed	Added new Entry level WW Model-1 sku. HPE Specific IST Processor offering Gold 6143 and Platinum 8165 bins were added. Added new High capacity 12TB LFF drives and Large capacity 15.3TB SSDs. Standard Features, Pre-configured Models, Core Options, Additional Options, Memory, and Acoustic Noise were revised.
23-Oct-2017	Version 6	Changed	Memory speed table was updated to display the 61XX processors running at 2666MT/s.
16-Oct-2017	Version 5	Changed	128GB Memory was added Riser table was added under Core Options. Platform Information, Processors table under Standard Features, FlexibleLOM Adapters, GPU table under Core Options, HPE Storage Controllers, and Rail Kits were revised.
25-Sep-2017	Version 4	Changed	New Gold Processors were added. Added new Hard Drive and SSD offering. GPU information table was added. Platform Information, Core Options, Additional Options, and Storage section were revised. Obsolete SKUs were removed from the QuickSpecs.
14-Aug-2017	Version 3	Changed	Smart Buy Models section was revised (NA version only).
07-Aug-2017	Version 2	Changed	Added new Solid State Drives offering to the HPE Drives section. Added Support Services under Additional Options. Platform Information, Optional Features, Core Options, Additional Options, Memory, and Storage section were revised.
11-Jul-2017	Version 1	New	New QuickSpecs.



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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less

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Processador Intel® Xeon® Silver 4210

cache de 13,75 M, 2,20 GHz

Especificações

Especificações de exportação

Essenciais

Coleção de produtos	Processadores escaláveis Intel® Xeon® da 2ª Geração
Codinome	Produtos com denominação anterior Cascade Lake
Segmento vertical	Server
Número do processador	4210
Status	Launched
Data de introdução	Q2'19
Litografia	14 nm
Condições de uso	Server/Enterprise
Preço recomendado para o cliente	\$501.00 - \$511.00

Especificações da CPU

Número de núcleos	10
Nº de threads	20
Frequência baseada em processador	2.20 GHz
Frequência turbo max	3.20 GHz
Cache	13.75 MB
Nº de links de UPI	2
TDP	85 W

Informações complementares

Opções integradas disponíveis	Sim
Descrição resumida do produto	Ver agora

Especificações de memória

Tamanho máximo de memória (de acordo com o tipo de memória)	1 TB
Tipos de memória	DDR4-2400
Velocidade máxima de memória	2400 MHz
Nº máximo de canais de memória	6
Compatibilidade com memória ECC †	Sim
Memória persistente Intel® Optane™ DC com suporte	Não

Opções de expansão

Escalabilidade	25
Revisão de PCI Express	3.0
Nº máximo de linhas PCI Express	48

Especificações de encapsulamento

Soquetes suportados	FCLGA3647
T _{CASE}	78°C
Tamanho do pacote	76.0mm x 56.5mm

Tecnologias avançadas

Intel® Deep Learning Boost (Intel® DL Boost)	Sim
Intel® Speed Select Technology – Perfil de desempenho	Não
Intel® Speed Select Technology – Frequência básica	Não
Intel® Resource Director Technology (Intel® RDT)	Sim
Tecnologia Intel® Speed Shift	Sim
Tecnologia Intel® Turbo Boost Max 3.0 ‡	Não
Tecnologia Intel® Turbo Boost ‡	2.0
Elegibilidade da plataforma Intel® vPro™ ‡	Sim
Tecnologia Hyper-Threading Intel® ‡	Sim
Tecnologia de virtualização Intel® (VT-x) ‡	Sim
Tecnologia de virtualização Intel® para E/S dirigida (VT-d) ‡	Sim
Intel® VT-x com Tabelas de páginas estendidas (EPT) ‡	Sim
Intel® TSX-NI	Sim
Intel® 64 ‡	Sim
Extensões do conjunto de instruções	Intel® SSE4.2, Intel® AVX, Intel® AVX2, Intel® AVX-512
Nº de unidades de FMA de AVX-512	1
Tecnologia Enhanced Intel SpeedStep®	Sim
Intel® Volume Management Device (VMD - Dispositivo de Gerenciamento de Volume)	Sim

Segurança e confiabilidade

Novas instruções Intel® AES	Sim
Intel® Trusted Execution Technology ‡	Sim
Bit de desativação de execução ‡	Sim
Tecnologia Intel® Run Sure	Não
Controle de Execução baseado em Modo (MBE — Mode-based Execute Control)	Sim

Pedidos e conformidade

Imagens do produto

Produtos compatíveis

Drivers e software

Documentação técnica

Todas as informações fornecidas estão sujeitas a alterações a qualquer momento, sem aviso prévio. A Intel pode alterar o ciclo de vida da fabricação, as especificações e as descrições dos produtos a qualquer momento, sem aviso prévio. As informações aqui contidas são fornecidas "no estado em que se encontram" e a Intel não atribui qualquer declaração ou garantias relacionadas à precisão das informações, nem sobre os recursos dos produtos, disponibilidade, funcionalidade ou compatibilidade dos produtos listados. Para obter mais informações sobre os produtos ou sistemas, entre em contato com o fornecedor do sistema.

As classificações da Intel são apenas para fins informativos e consistem em Export Control Classification Numbers (ECCN — Número de Classificação de Controle de Exportações) e Harmonized Tariff Schedule (HTS — Programa de Tarifas Harmonizadas). Quaisquer usos das classificações da Intel são sem os recursos da Intel e não devem ser interpretados como uma representação ou garantia relacionada ao ECCN ou HTS apropriado. Como exportadora e/ou importadora, sua empresa é responsável por determinar a classificação correta de sua transação.

Consulte a Ficha técnica para obter definições formais de propriedades e recursos de produtos.

‡ Este recurso pode não estar disponível em todos os sistemas de computação. Verifique com o fornecedor do sistema para determinar se seu sistema oferece este recurso ou consulte as especificações de seu sistema (motherboard, processador, chipset, alimentação, HDD, controle gráfico, memória, BIOS, drivers, monitor de máquina virtual [VMM], software de plataforma e/ou sistema operacional) para saber sobre a compatibilidade do recurso. A funcionalidade, o desempenho e outros benefícios deste recurso podem variar, dependendo das configurações do sistema.

Alguns produtos suportam as novas instruções AES com uma atualização da Configuração do processador, em particular, i7-2630QM/i7-2635QM, i7-2670QM/i7-2675QM, i5-2430M/i5-2435M, i5-2410M/i5-2415M. Favor entrar em contato com o OEM para o BIOS que inclui a mais recente atualização da Configuração do processador.

Consulte <https://www.intel.com.br/content/www/br/pt/architecture-and-technology/hyper-threading/hyper-threading-technology.html?wapkw=hyper+threading>

para obter mais informações, incluindo detalhes sobre quais processadores são compatíveis com a Tecnologia Hyper-Threading Intel®.

O TDP máximo e do sistema se baseiam nos piores casos. O TDP real pode ser inferior, se nem todas as E/Ss para chipsets forem utilizadas.

SKUs "anunciados" ainda não estão disponíveis. Favor consultar a data de lançamento para a disponibilidade no mercado.

Os números dos processadores Intel não são indicação de desempenho. Os números dos processadores diferenciam recursos dentro de cada família de processador, e não entre famílias diferentes de processadores. Consulte <https://www.intel.com.br/content/www/br/pt/processors/processor-numbers.html>

para obter mais detalhes.

Frequência máxima de turbo refere-se à frequência máxima do processador de núcleo único que pode ser atingida com a Tecnologia Intel® Turbo Boost. Mais informações estão disponíveis no site <https://www.intel.com/content/www/br/pt/architecture-and-technology/turbo-boost/turbo-boost-technology.html>

Os processadores compatíveis com a computação de 64 bits na arquitetura Intel® requerem BIOS habilitados para arquitetura Intel 64.

Informações sobre a empresa

Nosso compromisso

Diversidade e inclusão

Relações com investidores

Fale conosco

Sala de imprensa

Mapa do site

Empregos



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UNIFIED EXTENSIBLE FIRMWARE INTERFACE (UEFI)

Interface de firmware extensível unificada



QUAIS SÃO AS

NOVIDADES?

- Inicialização segura habilitada, para segurança aprimorada
- Inicializações HTTP/HTTPS e via unidades NVMe agora são suportadas
- Configuração inicial do array inteligente HPE disponível em ambiente de inicialização pré-UEFI e API RESTful iLO
- Perfis de carga de trabalho para otimização do desempenho
- Aprimoramentos de RAS - Suporte à memória rápida com tolerância a falhas HPE

VISÃO GERAL

Está tentando descobrir como colocar o seu servidor HPE ProLiant para funcionar com segurança aprimorada usando interfaces padrão do setor? Todos os servidores HPE ProLiant Gen9 e Gen10 suportam UEFI. Esse padrão do setor é um conjunto de interfaces entre o firmware do sistema, o sistema operacional e entre vários componentes do firmware do sistema, oferecendo vantagens de segurança aprimorada para os servidores HPE. O BIOS do sistema HPE ProLiant é uma solução UEFI baseada nas revisões mais recentes da especificação UEFI. Além disso, a maioria dos servidores HPE ProLiant Gen9 e Gen10 são soluções UEFI classe 2, com suporte a inicialização do BIOS legado e modos de inicialização UEFI, oferecendo, aos usuários, a flexibilidade de alternar entre os modos. O UEFI suporta a API RESTful iLO e está em conformidade com a API Redfish.

RECURSOS

Aumente a segurança do servidor, com Inicialização Segura do UEFI e Inicialização Segura combinadas

O UEFI oferece um nível superior de segurança com proteção contra sistemas operacionais não autorizados e ataques de malware rootkit, validação das ROMs autenticadas somente, aplicativos pré-inicialização e carregadores de inicialização de sistema operacional que tenham sido assinados digitalmente.

Raiz de Confiança de Hardware com Início Seguro.

Todos os drivers UEFI, carregadores de SO e aplicativos da UEFI são assinados digitalmente, e os binários são verificados usando-se um conjunto de chaves confiáveis incorporadas. Somente componentes validados e autorizados são executados.

Executa verificações de segurança para evitar a desativação acidental do recurso Inicialização Segura nos modos de falha e o registro de violações de segurança para fins de auditoria.

Os servidores HPE ProLiant Gen10 suportam o Trusted Platform Module (TPM) opcional. O TPM 2.0 é suportado quando a plataforma está no modo de inicialização UEFI, podendo ser usado pelo sistema operacional para aprimorar a segurança do sistema.

Implantação de maior desempenho disponível nos utilitários de sistema do UEFI

Aproveite os perfis de carga de trabalho para simplificar a otimização do desempenho, correspondendo a carga de trabalho do cliente.

O ajuste de sistema inteligente permite que o Controle de Instabilidades do Processador evite alterações de frequência de processador (incluindo transições de modo Turbo) que causam latência. O algoritmo de redução de instabilidades encontra a frequência que permite o melhor desempenho da maioria das cargas de trabalho, sem instabilidades.

O array inteligente HPE para configuração de servidores Gen10 agora está disponível para a API RESTful iLO e utilitários de sistema do UEFI.

Maior resiliência de memória com RAS (confiabilidade, disponibilidade e capacidade de manutenção). O RAS oferece recursos de detecção e correção de erros de memória (como espelhamento de memória com base em endereços, memória rápida com tolerância a falhas HPE e reparo de pacote POST), para evitar corrupções de dados e interrupções do sistema.

Aproveite as vantagens da API HPE RESTful do iLO e da shell do UEFI integrada - API Redfish em conformidade para capacidade de expansão

O UEFI inclui o shell do UEFI, um aplicativo CLI (interface de linha de comando) que permite a criação de scripts, manipulação de arquivos, obtenção de informações do sistema e execução de outros aplicativos UEFI, além de mais de dez comandos específicos da HPE, para configuração mais fácil.

O shell do UEFI é baseado na especificação 2.1 do shell do UEFI, com aperfeiçoamentos para configuração de servidor, inventário de hardware, atualizações de firmware, implantação e gerenciamento de chave de Inicialização Segura

O UEFI suporta a API RESTful iLO e está em conformidade com a API Redfish. Você pode criar seus próprios aplicativos de UEFI ou configurar a UEFI com a ferramenta de Interface RESTful de script, para gerenciar recursos de BIOS e



registro de atributo de array inteligente HPE e combinar as mais recentes opções de configuração de BIOS/plataforma.

Configure o UEFI com os métodos de inicialização padrão, para uma rede aprimorada e flexível

O UEFI suporta inicialização PXE para redes IPv6, permitindo que uma pilha de rede unificada faça a inicialização PXE de qualquer controlador de rede, mantendo a compatibilidade regressiva e continuando a suportar PXE do IPv4.

Também permite o suporte de inicialização PXE Multicast para implantação de imagem em vários servidores ao mesmo tempo.

Os aperfeiçoamentos do UEFI Extended Network Stack para IPv4 superam as limitações do PXE e do TFTP, usando conexões TCP, mais confiáveis, em vez das UDP.

Inicialização via servidores HTTP ou HTTPS (recurso novo no HPE ProLiant Gen10) com opção de inicialização de URL que pode ser um gerenciador EFI ou uma imagem ISO.

Novo menu de identificação exclusiva DHCP IPv6 System Utilities BIOS/Platform Configuration (RBSU) que permite que os usuários selecionem como o BIOS UEFI usará o identificador exclusivo DHCP (DUID) para inicialização PXE IPv6.



[Para informações técnicas adicionais, modelos e opções disponíveis, faça referência ao QuickSpecs](#)

HPE POINTNEXT

Tenha acesso à expertise, em todas as etapas de sua jornada de TI, com os [HPE Pointnext Services](#). Nossos [serviços de consultoria](#) são focados nos seus objetivos e resultados comerciais, para planejar sua transformação e criar um roteiro adaptado aos seus desafios exclusivos. Nossos [serviços profissionais](#) e [serviços operacionais](#) ajudam a diminuir o tempo até a produção e a manter sua TI estável e confiável.

Serviços operacionais dos HPE Pointnext Services

- O [HPE Datacenter Care](#) ajuda a modernizar e simplificar suas operações de TI. Faça parceria com uma equipe de conta atribuída, tenha acesso à expertise técnica, uma experiência de chamada avançada com acesso prioritário, escolha suporte de hardware e software, implemente monitoramento proativo para ajudar você a ficar pronto para os problemas e acesse as melhores práticas de TI e IP da HPE.
- O [HPE Proactive Care](#) oferece uma experiência de chamada avançada e ajuda a reduzir problemas, com relatórios e consultoria proativos e personalizados. Ele inclui suporte ao software de colaboração para fornecedores independentes de software (ISVs), como Red Hat, VMware, Microsoft, dentre outros. [Leia mais.](#)
- O [HPE Foundation Care](#) ajuda quando acontece um problema e há uma opção de níveis de resposta. O suporte de software de colaboração está incluso, oferecendo solução de problemas para ISVs funcionando no seu servidor. [Leia mais.](#)

Outros serviços relacionados

A [retenção de mídia com defeito](#) é opcional e se aplica somente a unidades de disco ou SSD/Flash substituídas pela HPE devido a mau funcionamento.

[Os Créditos de serviço HPE](#) oferecem um menu de serviços técnicos, acesso a recursos adicionais e especialistas.

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Fale com seu representante de vendas HPE ou parceiro de canal autorizado para tirar dúvidas e ver opções de suporte.

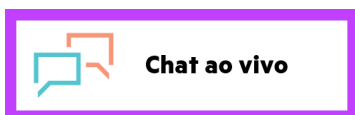
HPE GREENLAKE

O [HPE GreenLake](#) é a oferta de TI como serviço líder da HPE, que traz a experiência da nuvem para aplicativos e dados em qualquer lugar – data centers, multiclouds e bordas – com um modelo operacional unificado. O HPE GreenLake entrega serviços de nuvem pública e infraestrutura como serviço para cargas de trabalho no local, totalmente gerenciadas, em um modelo de pagamento conforme o uso.

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Peças e materiais: A HPE irá oferecer reposição de peças e materiais suportados pela HPE necessários para manter o hardware coberto.

Peças e componentes que tenham atingido a vida útil suportada máxima e/ou as limitações de uso máximo definidas no manual operacional do fabricante, nas especificações rápidas do produto ou na folha de especificações técnicas do produto não serão fornecidos, reparados ou substituídos como parte desses serviços.

A imagem do produto pode ser diferente do produto real
[PSN6935826BRPT](#), April, 2021.

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Model Details

Model :	ProLiant DL360 Gen10	Notes: For further details about BIOS, server product configurations and best practices, please contact the server vendor VMware supports the Intel® Xeon® Scalable Processor series, codenamed "Cascade Lake-SP" (1S, 2S and 4S). Please note the following patch requirements. vSphere 6.7U1: Must apply patch ESXi670-201811001 (ESXi 6.7 EP 5) or later 6.7 patch or update. vSphere 6.5U2: Must apply patch ESXi650-201811001 (ESXi 6.5 EP 11) or later 6.5 patch or update. Note: ESXi 6.5 P03 or ESXi 6.5 EP 12 not recommended for large memory configurations. Details may be found at https://kb.vmware.com/s/article/67208 vSphere 6.0U3: Must apply ESXi600-201811001 (ESXi 6.0 EP 19) or later patch or update
Partner :	Hewlett Packard Enterprise	
CPU Series:	Intel Xeon Silver 4200, Bronze 3200 (Cascade-Lake-SP/Refresh) Series	
System Type:	Rackmount	
Number of Sockets:	2	
Max Cores per Socket:	28	

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Model Release Details

VMware Product Name :

BIOS	Feature Category	Features	Feature Value	Hardware Health
HPE U32_2.40 UEFI Mode (Boot Mode:UEFI)	Server	Fault Tolerant(FT) UEFI Secure Boot		
HPE U32_2.36 UEFI Mode (Boot Mode:UEFI)	Server	VM Direct Path IO Fault Tolerant(FT) UEFI Secure Boot		
HPE U32_2.30 UEFI Mode (Boot Mode:UEFI)	Server	Fault Tolerant(FT) UEFI Secure Boot		
HPE U32_2.22 UEFI Mode (Boot Mode:UEFI)	Server	UEFI Secure Boot		
HPE U32_2.0 UEFI Mode (Boot Mode:UEFI)	Server	Trusted Platform Module (TPM) Fault Tolerant(FT) UEFI Secure Boot	TPM 2.0 with TXT	

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Overview

HPE Hard Disk Drives

HPE Hard Disk Drives (HDDs) are engineered to deliver optimum performance, reliability, compatibility, and data security across HPE server and storage platforms making them the preferred choice for workloads ranging from small businesses to large enterprise.

Performance

- HPE HDDs are tuned and tested with on-going quality monitoring throughout their lifecycle
- HPE optimizes HDD firmware for predictable and consistent HDD performance
- Full portfolio of high-performance Mission Critical and high-capacity Business Critical drive solutions

Reliability

- Hewlett Packard Enterprise’s industry-leading rigorous testing and qualification program, backed by 2.4 million test hours
- Pre-failure Alerts with HPE Smart Array Controller, Systems Insight Manager, and HPE Smart firmware
- 3x faster firmware and software updates with HPE Service Pack for ProLiant (HPE SPP)
- Best-in-class supply assurance program reduces downtime due to product delays

Compatibility

- Simplify HDD planning and standardize HDDs across HPE server and storage solutions
- Common HDD carriers mean re-purposing drives in other servers is a snap

Security

- HPE Digitally Signed Firmware helps prevent against malicious attacks
- HPE Smart Array SR Secure Encryption is a FIPS 140-2 Level 1 validated enterprise class controller-based encryption solution for data-at-rest on all SAS/SATA drives
- HPE Smart Carriers report drive activity and health

HPE HDDs are available for three types of workloads: Enterprise high-performance (Mission Critical), Midline high-capacity (Business Critical) and Entry-level storage solutions.

HPE HDD portfolio: Proven performance for every workload				
Class	Enterprise		Midline	Entry*
Workload	High		Medium	Low
Usage	Mission-critical, high I/O: Email, enterprise resource planning (ERP), customer relationship management (CRM)		Business Critical, High capacity, high availability storage: Backup, archive, reference	Low I/O: Boot and backup
Interface	SAS 12Gb		SAS 12Gb SATA 6Gb	SATA 6Gb
RPM	15000	10000	7200	7200
Form factor	SFF & LFF	SFF	SFF & LFF	LFF
Capacities	Up to 900GB	Up to 2.4TB	Up to 18TB	Up to 4TB
Warranty	3 years	3 years	1 year	1 year
Notes: * Supported on select HPE ProLiant servers only.				



Standard Features

What's New

- Offering drives with new small form factor (SFF) basic carrier (BC) that help on simplifying servers and aligning with HPE's strategy of becoming an as a service provider
- Offering Self-encrypting (SED) drives for Data-at-Rest Encryption to encrypt data without consuming server resources at the expense of performance with TCG Enterprise feature that help on protect data if the storage device is Physically stolen or subject to inappropriate chain of custody.
 - P28028-B21 HPE 300GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD
 - P40431-B21 HPE 600GB SAS 12G Mission Critical 15K LFF LPC 3-year Warranty HDD
 - P40432-B21 HPE 900GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD
 - P40430-B21 HPE 300GB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD
 - P28586-B21 HPE 1.2TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD
 - P28352-B21 HPE 2.4TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty 512e HDD
 - P28610-B21 HPE 1TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty HDD
 - P28505-B21 HPE 2TB SAS 12G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD
 - P28500-B21 HPE 2TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD

Notes: A -B21 suffix may be replaced with -H21 and -K21 to support across different server family lines. Please refer to the appropriate Server QuickSpecs for full compatibility details

Firmware Updates

Digitally Signed Firmware – Prevent unauthorized access to your data with the expansion of integrated HPE Digitally Signed Firmware (DS) on new drives; providing the security and assurance that drive firmware comes from a trusted source and protects against malicious attacks.

For advanced data protection and encryption, customers should consider HPE Smart Array Controllers with HPE Smart Array Secure SR Encryption. It is a controller-based data encryption solution for HPE servers that protect data-at-rest on any bulk attached storage. This solution meets stringent compliance regulations such as HIPAA and Sarbanes-Oxley.

HDD Selection

To streamline the configuration process for Hewlett Packard Enterprise ProLiant servers and to provide the best product availability, HPE recommends HDDs from the list located here: <http://www.hpe.com/products/recommend>

Notes: Best product availability is limited to US, Canada, and Latin America at this time.



Standard Features

Models

Category	Interface	Form Factor	Format	Capacity	HDD Carrier		
					Smart Carrier SKU	Low Profile SKU	Basic Carrier SKU
Enterprise (15K rpm)	SAS 12G	LFF	512n	300GB	P04693- B21 (SCC)		
				600GB	P04695- B21 (SCC)	P40431- B21 (LPCC)	
				900GB	-		
		SFF	512n	300GB	870753- B21		P28028- B21
				600GB	870757- B21		
				900GB	870759- B21		P40432- B21
Enterprise (10K rpm)	SAS 12G	SFF	512n	300GB	872475- B21		P40430- B21
				600GB	872477- B21		
				1.2TB	872479- B21		P28586- B21
		SFF	512e	1.8TB	872481- B21		
				2.4TB	881457- B21		P28352- B21
Enterprise (10K rpm) Self-Encrypting Drives (SED)	SAS 12G	SFF	512n	1.2TB			
		SFF	512e	2.4TB			



Standard Features

Category	Interface	Form Factor	Format	Capacity	HDD Carrier		
					Smart Carrier SKU	Low Profile SKU	Basic Carrier SKU
Midline (7.2K rpm)	SAS 12G	LFF	512n	2TB	872485- B21	833926- B21	
				4TB	872487- B21	833928- B21	
		LFF	512e	6TB	861754- B21	861746- B21	
				8TB	819201- B21	834031- B21	
				10TB	857644- B21 ^{He}	P09149- B21 ^{He}	
				12TB	881779- B21 ^{He}	881781- B21 ^{He}	
				14TB	P09153- B21 ^{He}	P09155- B21 ^{He}	
				16TB	P23863- B21 ^{He}	P23608- B21 ^{He}	
				18TB	P37664- B21 ^{He}	P37669- B21 ^{He}	
		SFF	512n	1TB	832514- B21		
	512e		2TB	765466- B21	P28505- B21		
	SATA 6G	LFF	512n	1TB	861691- B21	861686- B21	
				2TB	872489- B21	861681- B21	
				4TB	872491- B21	861683- B21	
			512e	6TB	861750- B21	861742- B21	
				8TB	819203- B21	834028- B21	
				10TB	857648- B21	P09161- B21	
				12TB	881785- B21 ^{He}	881787- B21 ^{He}	
				14TB	P09163- B21 ^{He}	P09165- B21 ^{He}	
				16TB	P23857- B21 ^{He}	P23449- B21 ^{He}	
18TB				P37673- B21 ^{He}	P37678- B21 ^{He}		
SFF	2TB	765455- B21					
	512n	1TB	655710- B21	P28610- B21			
Category	Interface	Form Factor	Format	Capacity	HDD Carrier		
Entry (7.2K)	SATA 6G				Non Hot Plug Carrier SKU		
LFF	512e	1TB	843266- B21 *				
			512n	1TB	801882- B21		
				4TB	801888- B21		

Notes:

- ^{He} Helium Drive.
- *Also known as "Desktop Drive", this drive has Generic Firmware (Non-HPE)
- A -B21 suffix may be replaced with -H21 and -K21 to support across different server family lines. Please refer to the appropriate Server QuickSpecs for full compatibility details.



Standard Features

What is HPE Hard disk drive?

Hewlett Packard Enterprise drives are tuned to deliver optimum performance for HPE Servers. They undergo an intense qualification process to eliminate firmware and O/S incompatibilities. HPE drive firmware is designed to maximize both functionality and compatibility with HPE ProLiant Rack and Tower Servers, Apollo family, Blade and Synergy Platforms.

Drive Quality and Performance

While selecting the drives in our HPE portfolio, only those drives with a performance level suitable for an enterprise environment are selected through the Hewlett Packard Enterprise qualification process and are labeled "best-in-class."

Pre-Failure Alert

When used in conjunction with a SMART Array Controller and Systems Insight Manager, the SMART capable firmware in HPE hard drives enables extensive fault prediction capabilities. If potential problems develop in one of the drives, the Smart Array Controller, Systems Insight Manager and/or SMART hard disk drive lets you know in advance so you can have the drive replaced, before it fails, under warranty

Notes: All drives are protected by a Pre-Failure Alert when used with a HPE Smart Array controller and Systems Insight Manager, allowing hard drives to be replaced before failure under warranty. In addition, all drives are covered by a one or three-year limited on-site warranty period for the system in which they are installed. The drive warranty is automatically uplifted when used in a server or MSA for which a HPE Pointnext service contract is purchased. Please see the Support Services section below for additional services.

Smart Carriers

HPE Hard Drives with smart carriers are designed to provide an interface to communicate critical status and management information. System status LED icons and a spinning activity ring reflecting the data-writing process notify users of the current system status. A blue LED located behind the handle can be activated remotely to guide users to a specific drive tray, while a do-not-remove icon positioned on the tray's eject button lights up to warn users when the removal of the drive would cause data loss.

Helium Drives

Although hard drives are sealed, they have air inside. Air can create turbulence-induced risk vibrations which can limit the storage density of HDDs. Newer helium-filled drives virtually eliminate turbulence because helium is 1/7th as dense as air. This lower density allows the read/write mechanism to spin more easily and precisely, with less drag. Less internal turbulence means the drive platters can be closer together, allowing more platters and increasing the capacity potential in the same space. Less turbulence also means helium drives tend to use less power, and run cooler and quieter.

Support Matrix

Please see the following URL for the latest list of supported servers and enclosures:

<https://www.hpe.com/us/en/servers/server-options.html>

Warranty

Enterprise hard drives have a 3 year limited warranty regardless of the warranty period for the system in which they are installed. Midline hard drives have a 1 year limited warranty regardless of the warranty period for the system in which they are installed.



Service and Support

HPE Technology Services for Industry Standard Servers

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability powered by a rich portfolio of consulting and support services designed to add value to our core products and solutions connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Support Services

HPE support services offer complete care and support expertise with committed response choices that are designed to meet your IT and business needs.

Notes: HPE Hard drives are covered under the HPE Pointnext /Service Contract applied to the HPE ProLiant Server. No separate HPE Pointnext s need to be purchased.

Connect your devices to HPE

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%¹ reduction in down time, near 100%² diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization.

All of these benefits are already available to you with your server storage and networking products, securely connected to HPE support.

Notes:

- ¹IDC Whitepaper
 - ²HPE CSC Reports 2014-2015
-

HPE Support Center

Personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more

<https://support.hpe.com/hpesc/public/home>

HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Support Services or HPE contractual support agreement.

Notes: HPE Support Center Mobile App above is subject to local availability.

Parts and materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.



Service and Support

Service Coverage

For ProLiant servers and storage systems, the service on the main product covers HPE-branded hardware options not designated by Hewlett Packard Enterprise as requiring separate coverage, that are qualified for the server, purchased at the same time or afterward and internal to the enclosure. These items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been reached.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction. It does not apply Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by Hewlett Packard Enterprise as consumable parts and/or that have reached maximum supported lifetime and/or the maximum usage limits as set forth in the manufacturer's operating manual, the product QuickSpecs, or the technical data sheet are not eligible for the defective media retention service feature option.

Subject to: Maximum supported lifetime: This is a period in years set to equal the warranty for the specific drive. After this period no further service coverage will be available for the drive. Maximum usage limit: This is the maximum amount of data that can be written to the drive. Drives that have reached this limit will not be eligible for services coverage.

For more information

To learn more on services for HPE Server Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit:

<https://www.hpe.com/us/en/product-catalog/servers/proliant-servers.html> or

<https://www.hpe.com/us/en/integrated-systems/bladesystem.html>

Supporting Helpful Links

<http://www.hpe.com/info/rackandpower>

<http://www.hpe.com/info/poweradvisor>

<http://www.hpe.com/info/infrastructurearchitect>

<https://www.hpe.com/us/en/storage/entry-level.html>



Technical Specifications

HDD Specifications

Enterprise (15K rpm)									
Form Factor		SFF (2.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
870753- B21	HPE 300GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	225	220	220	220	2.6	3.6	4.4	3.9
870757- B21	HPE 600GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	225	220	220	220	4.7	6.1	6.3	6.3
870759- B21	HPE 900GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	260	220	220	220	4.7	6.1	6.3	6.3
Enterprise (15K rpm)									
Form Factor		SFF (2.5")		Carrier		Basic Carrier (BC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P28028- B21	HPE 300GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD	225	220	220	220	2.6	3.6	4.4	3.9
P40432- B21	HPE 900GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD	260	220	220	220	4.7	6.1	6.3	6.3



Technical Specifications

Enterprise (15K rpm)									
Form Factor		LFF (3.5")		Carrier		Smart Carrier Converter (SCC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		1.06 in (26.8 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.16 in (105.8 mm)			
Bytes/Sector		512		Depth		6.69 in (170.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P04695-B21	HPE 600GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD	260	220	220	220	5.6	7.2	7.7	6.2
P04693-B21	HPE 300GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD	260	220	220	220	4.3	6.9	7.0	6.4

Enterprise (15K rpm)									
Form Factor		LFF (3.5")		Carrier		Low Profile Carrier Converter (LPCC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		1.06 in (26.8 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.16 in (105.8 mm)			
Bytes/Sector		512		Depth		6.69 in (170.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P40431- B21	HPE 600GB SAS 12G Mission Critical 15K LFF LPC 3-year Warranty HDD	260	220	220	220	5.6	7.2	7.7	6.2



Technical Specifications

Enterprise (10K rpm)										
Form Factor		SFF (2.5")			Carrier		Smart Carrier (SC)			
Rotational Speed		10000 rpm			Dimensions					
Interface		SAS			Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec			Width		2.98 in (75.7 mm)			
Bytes/Sector		512			Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)								
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)	
872475- B21	HPE 300GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	195	180	180	180	3.8	6.9	6.1	5.3	
872477- B21	HPE 600GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	195	165	165	165	4.7	6.9	6.3	6.3	
872479- B21	HPE 1.2TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	195	165	165	165	4.0	7.1	6.4	5.5	
872481- B21	HPE 1.8TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD	230	165	170	185	2.6	3.6	4.4	3.9	
881457- B21	HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD	255	160	180	190	4.8	6.0	7.8	6.6	



Technical Specifications

Enterprise (10K rpm)										
Form Factor		SFF (2.5")			Carrier		Basic Carrier (BC)			
Rotational Speed		10000 rpm			Dimensions					
Interface		SAS			Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec			Width		2.98 in (75.7 mm)			
Bytes/Sector		512			Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)								
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)	
P40430- B21	HPE 300GB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD	195	180	180	180	3.8	6.9	6.1	5.3	
P28586- B21	HPE 1.2TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD	195	165	165	165	4.0	7.1	6.4	5.5	
P28352- B21	HPE 2.4TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty 512e HDD	255	160	180	190	4.8	6.0	7.8	6.6	



Technical Specifications

Midline (7.2K rpm)										
Form Factor		LFF (3.5")		Carrier		Smart Carrier (SC)				
Rotational Speed		7200 rpm		Dimensions						
Interface		SAS		Height		1.06 in (26.8 mm)				
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.16 in (105.8 mm)				
Bytes/Sector		512		Depth		6.69 in (170.0 mm)				
Operating Temperature		50° to 95° F (10° to 35°C)								
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)	
872485- B21	HPE 2TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	190	100	100	100	8.8	12.2	10.8	10.5	
872487- B21	HPE 4TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	190	100	100	100	8.8	12.2	10.8	10.5	
861754- B21	HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD	200	100	105	110	8.8	12.2	10.8	10.5	
819201- B21	HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	230	100	110	110	8.3	9.7	10.4	9.2	
857644- B21	HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	220	105	105	105	5.2	6.7	8.3	6.3	
881779- B21	HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	7.6	6.9	
P09153- B21	HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.7	8.5	8.2	6.9	
P23863- B21	HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD	250	105	120	125	5.2	6.7	8.0	7.2	
P37664- B21	HPE 18TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD	265	115	140	170	5.7	6.6	7.5	6.6	



Technical Specifications

Midline (7.2K rpm)									
Form Factor		LFF (3.5")		Carrier		Low Profile (LP)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SAS		Height		1.028 in (26.1 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.15 in (105.5 mm)			
Bytes/Sector		512		Depth		6.16 in (156.58 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
833926- B21	HPE 2TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	200	108	105	105	4.7	8.3	7.4	5.8
833928- B21	HPE 4TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	200	108	105	105	5.8	9.3	8.7	7.1
861746- B21	HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e HDD	215	100	110	110	6.6	7.9	9.6	7.8
834031- B21	HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e Digitally Signed Firmware HDD	230	100	110	110	7.6	8.8	10.4	8.8
P09149- B21	HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	220	108	105	105	5.2	6.7	8.3	6.3
881781- B21	HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	7.4	6.9
P09155- B21	HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.7	8.5	8.2	6.9
P23608- B21	HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	250	110	120	125	5.2	6.7	8.0	6.4
P37669- B21	HPE 18TB SAS 12G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	265	115	140	170	5.7	6.6	7.5	6.6



Technical Specifications

Midline (7.2K rpm)									
Form Factor		LFF (3.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		1.06 in (26.8 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		4.16 in (105.8 mm)			
Bytes/Sector		512		Depth		6.69 in (170.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
861691-B21	HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty HDD	185	90	90	90	8.8	12.2	10.8	10.5
872489-B21	HPE 2TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	185	90	90	90	8.8	12.2	10.8	10.5
872491-B21	HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	190	100	100	100	8.8	12.2	10.8	10.5
861750-B21	HPE 6TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD	215	100	100	105	8.8	12.2	10.8	10.5
819203-B21	HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	230	100	110	110	7.2	8.5	10.1	9.1
857648-B21	HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	110	115	4.8	6.0	7.7	7.0
881785-B21	HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	8.2	7.3
P09163-B21	HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.6	8.5	7.9	8.2
P23857-B21	HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) SC 1yr Wty 512e ISE HDD	260	105	120	125	4.7	7.2	7.7	6.9
P37673-B21	HPE 18TB SATA 6G Business Critical 7.2K LFF (3.5in) SC 1yr Wty 512e ISE HDD	265	115	140	165	5.4	6.2	7.2	7.1



Technical Specifications

Midline (7.2K rpm)									
Form Factor		LFF (3.5")		Carrier		Low Profile (LP)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		1.028 in (26.1 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		4.15 in (105.5 mm)			
Bytes/Sector		512		Depth		6.16 in (156.58 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
861686- B21	HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	190	90	90	90	4.4	7.7	6.4	6.6
861681- B21	HPE 2TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	195	90	90	90	4.4	7.7	7.0	6.5
861683- B21	HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	200	108	105	105	5.4	8.6	7.9	7.6
861742- B21	HPE 6TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e HDD	215	100	110	110	6.3	7.2	9.1	8.7
834028- B21	HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e Digitally Signed Firmware HDD	230	108	105	105	7.1	8.3	10.1	7.8
P09161- B21	HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	240	110	120	125	4.8	6.0	7.7	7.9
881787- B21	HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	7.4	6.9
P09165- B21	HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.6	8.5	7.9	8.2
P23449- B21	HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	265	110	120	125	4.7	6.2	7.7	6.9
P37678- B21	HPE 18TB SATA 6G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	265	115	140	165	5.4	6.2	7.2	7.1



Technical Specifications

Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
832514- B21	HPE 1TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD	130	105	105	105	2.6	3.6	4.4	3.9
765466- B21	HPE 2TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e HDD	130	105	105	105	2.6	3.6	4.4	3.9
Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Basic Carrier (BC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P28505- B21	HPE 2TB SAS 12G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD	130	105	105	105	2.6	3.6	4.4	3.9



Technical Specifications

Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
655710- B21	HPE 1TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD	130	105	105	105	2.6	3.6	4.4	3.9
765455- B21	HPE 2TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	130	105	105	105	2.6	3.6	4.4	3.9

Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Basic Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P28610- B21	HPE 1TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty HDD	130	105	105	105	2.6	3.6	4.4	3.9
P28500- B21	HPE 2TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD	130	105	105	105	2.6	3.6	4.4	3.9



Technical Specifications

Entry									
Form Factor		LFF (3.5")		Carrier		Non Hot Plug Carrier (RW)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		1.028 in (26.1 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		4.00 in (101.6 mm)			
Bytes/Sector		512		Depth		5.75 in (146.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
843266-B21	HPE 1TB SATA 6G Entry 7.2K LFF (3.5in) RW 1yr Wty HDD	N/A	N/A	N/A	N/A	2.6	3.6	4.4	3.9
801882-B21	HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD	160	95	95	95	8.8	12.1	10.8	10.5
801888-B21	HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD	160	95	95	95	8.8	12.1	10.8	10.5

Carrier Decoder

HPE Hard Disk Drives (HDDs) utilize a wide variety of carriers, which houses the HDD and also enables a specific chassis fit to support a broad range of HPE server and storage products. The table below summarizes the various form factors, plug types, and carrier attributes.

Carriers				
Form Factor	HPE/NHP	Smart/Non-Smart	Carrier Name (Abbreviation)	SFF/LFF
SFF Carrier	Hot Plug	Smart	Smart Carrier (SC)	SFF
		Non-Smart	Standard (ST)	SFF
			Basic Carrier (BC)	SFF
LFF Carrier	Hot Plug	Smart	Smart Carrier (SC)	LFF
			Smart Carrier Converter (SCC)	LFF
		Non-Smart	Low Profile (LP)	LFF
			Low Profile Converter (LPC)	LFF
			Standard (ST)	LFF
No Carrier	Non-Hot Plug	Non-Smart	Raw LFF HDD (RW)	LFF



Technical Specifications

Server Family	Server Model	Generation	SFF Carriers				LFF Carriers				
			Smart Carrier (SCI)/(SCC)	Basic Carrier (BC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	Smart Carrier (SCI)/(SCC)	Low Profile (LP)/(LPC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	
HPE Apollo	HPE Apollo Gen10 Series										
	HPE Apollo pc40	Gen10				Yes				Yes	
	HPE Apollo sx40 Server	Gen10				Yes				Yes	
	HPE Apollo 70 System	Gen10					Yes				
	HPE Apollo 2000 Series										
	HPE Apollo XL170r Gen9 Server	Gen9	Yes					Yes			
	HPE Apollo XL170r Gen10 Server	Gen10	Yes					Yes			
	HPE Apollo XL190r Gen9 Server	Gen9	Yes					Yes			
	HPE Apollo XL190r Gen10 Server	Gen10	Yes					Yes			
	HPE Apollo XL220n Gen10 Plus Server	Gen10 Plus	Yes								
	HPE Apollo XL290n Gen10 Plus Server	Gen10 Plus	Yes								
	HPE Apollo 4000 Series										
	HPE Apollo 4200 Gen9 Server	Gen9	Yes					Yes			
	HPE Apollo 4200 Gen10 Server	Gen10	Yes					Yes			
	HPE Apollo 4200 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE Apollo 4500 System	Gen9	Yes					Yes			
	HPE Apollo 4510 Gen10	Gen10	Yes					Yes			
	HPE Apollo 6000 Series										
	HPE ProLiant XL230k Gen10 Server	Gen10	Yes								
	HPE Blades										
	HPE ProLiant BL460c Gen9 Server Blade	Gen9	Yes								
	HPE ProLiant BL460c Gen10 Server Blade	Gen10	Yes								
	HPE ProLiant BL660c Gen9 Server Blade	Gen9	Yes								
HPE ProLiant WS460c Gen9 Graphics Server Blade	Gen9	Yes									



Technical Specifications

Server Family	Server Model	Generation	SFF Carrier				LFF Carriers				
			Smart Carrier (SCD)/(SCC)	Basic Carrier (BC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	Smart Carrier (SCD)/(SCC)	Low Profile (LP)/(LPC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	
HPE ProLiant	HPE ProLiant DL										
	HPE ProLiant DL20 Gen9 Server	Gen9	Yes			Yes	Yes				
	HPE ProLiant DL20 Gen10 Server	Gen10	Yes			Yes		Yes			
	HPE ProLiant DL120 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL120 Gen10 Server	Gen10	Yes			Yes		Yes			
	HPE ProLiant DL160 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL160 Gen10 Server	Gen10	Yes			Yes		Yes			
	HPE ProLiant DL180 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL180 Gen10 Server	Gen10	Yes					Yes			
	HPE ProLiant DL325 Gen10 Server	Gen10	Yes					Yes			
	HPE ProLiant DL325 Gen10 Plus Server	Gen10 Plus	Yes					Yes			
	HPE ProLiant DL325 Gen10 Plus V2 Server	Gen10 Plus V2		Yes				Yes			
	HPE ProLiant DL345 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL360 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL360 Gen10 Server	Gen10	Yes				Yes				
	HPE ProLiant DL360 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL365 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL380 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL380 Gen10 Server	Gen10	Yes				Yes				
	HPE ProLiant DL380 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL385 Gen10 Server	Gen10	Yes				Yes				
	HPE ProLiant DL385 Gen10 Plus Server	Gen10 Plus	Yes					Yes			
	HPE ProLiant DL385 Gen10 Plus V2 Server	Gen10 Plus V2		Yes				Yes			
	HPE ProLiant DL 560 Gen9 Server	Gen9	Yes								
	HPE ProLiant DL 560 Gen10 Server	Gen10	Yes								
	HPE ProLiant DL 580 Gen9 Server	Gen9	Yes								
	HPE ProLiant DL 580 Gen10 Server	Gen10	Yes								
	HPE ProLiant ML										
	HPE ProLiant MicroServer Gen10	Gen10					Yes				Yes
	HPE ProLiant ML30 Gen10 Server	Gen10	Yes						Yes		Yes
	HPE ProLiant ML110 Gen10 Server	Gen10	Yes						Yes		Yes



Technical Specifications

	HPE ProLiant ML350 Gen10 Server	Gen10	Yes		Yes	Yes
HPE Synergy	HPE Synergy					
	HPE Synergy 480 Gen10 Compute Module	Gen10	Yes			
	HPE Synergy 480 Gen10 Compute Module	Gen10 Plus	Yes			
	HPE Synergy 660 Gen10 Compute Module	Gen10	Yes			
	HPE Synergy 680 Gen9 Compute Module	Gen9	Yes			
	HPE Synergy D3940 Storage Module	N/A	Yes			

HDD SKU Description Decoder

Long Name

HPE 10TB SAS 12G Business Critical 7.2K LFF SC 1-year Warranty 512e HDD

Brand	Storage Capacity	Interface Type/Interface Speed	Workload	Form Factor Type /Size	Carriers	Warranty	Special Features	Drive Type	
HPE	300 -900GB 1-18TB	SATA/SAS 6G/12G	Mission Critical/15/10K (MC 15/10K) Business Critical 7.2K BC 7.2K)	SFF LFF	BC LP LPC QR RW SC SCC ST STC	Basic Carrier Low Profile Low Profile Converter Quick Release Raw Drive Smart Carrier Smart Carrier Converter Standard Carrier Standard Carrier Converter	1yr Wty 1-year Warranty 3yr Wty 3-years Warranty SED ISE SED FIPS FIPS He 512e (no descriptor) 512n Special – Special SKUs	Self Encrypting Drive Instant Secure Erase Self-encrypting FIPS Federal Information Processing Standards Helium 512e Emulation 512n	HDD

Environment friendly Products and Approach End-of life Management and Recycling

Hewlett Packard Enterprise offers end-of-life **U**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **[Hewlett Packard Enterprise web site](#)**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.



Summary of Changes

Date	Version History	Action	Description of Change
06-Apr-2021	Version 21	Changed	Tables were fixed, Overview and Technical Specifications Sections were updated
01-Feb-2021	Version 20	Changed	Overview and Technical Specifications Sections were updated
20-Jul-2020	Version 19	Changed	Overview and Technical Specifications Sections were updated
01-Jun-2020	Version 18	Changed	SKUs were Added in Overview Section
03-Feb-2020	Version 17	Changed	Overview Section was updated
09-Dec-2020	Version 16	Changed	Added new HPE 16TB Midline 7.2K LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models.
02-Dec-2019	Version 15	Changed	Technical Specifications and Overview Sections were updated
03-Jun-2019	Version 14	Changed	Technical Specifications and Overview Sections were updated
04-Feb-2019	Version 13	Changed	Technical Specifications and Overview Sections were updated
15-Oct-2018	Version 12	Changed	Technical Specifications was revised.
01-Oct-2018	Version 11	Changed	Overview, Standard Features, Service and Support, and Technical Specifications were revised.
04-Sep-2018	Version 10	Changed	Technical Specifications Section was updated
04-Jun-2018	Version 9	Changed	P04695-B21 HPE 600GB Enterprise 15K SAS 12G LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD P04693-B21 HPE 300GB Enterprise 15K SAS 12G LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD Power specs for all drives Seek time specs to IOPs From Recommended to Extended: 861590-B21, 861594-B21, 861596-B21 From Extended to Recommended: 801882-B21, 881787- X21
05-Mar-2018	Version 8	Changed	Overview, Service and Support, and Technical Specifications were revised.
05-Feb-2018	Version 7	Changed	Added new HPE 12TB Midline 7.2K SAS LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models: 881779-B21, 881781- X21 , 881783-B21 Change format to breakout recommended and extended portfolios. Obsolete SKUs
04-Dec-2017	Version 6	Changed	Added new HPE 12TB Midline 7.2K LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models. Overview, Service and Support, and Technical Specifications were revised. Obsolete SKUs were removed from the QuickSpecs.
23-Oct-2017	Version 5	Changed	Part number 881458-B21 was changed to 881457- X21 . Care Pack references changed to HPE Pointnext operational services.
25-Sep-2017	Version 4	Changed	Added 881458-B21 HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD Overview, Standard Features, Service and Support, and Technical Specifications were revised.
12-Jun-2017	Version 3	Changed	Overview and Technical Specifications were revised.
27-Mar-2017	Version 2	Changed	Added new HDD offering. Overview and Technical Specifications were revised.
13-Feb-2017	Version 1	New	New QuickSpecs

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.

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Overview

HPE Hard Disk Drives

HPE Hard Disk Drives (HDDs) are engineered to deliver optimum performance, reliability, compatibility, and data security across HPE server and storage platforms making them the preferred choice for workloads ranging from small businesses to large enterprise.

Performance

- HPE HDDs are tuned and tested with on-going quality monitoring throughout their lifecycle
- HPE optimizes HDD firmware for predictable and consistent HDD performance
- Full portfolio of high-performance Mission Critical and high-capacity Business Critical drive solutions

Reliability

- Hewlett Packard Enterprise’s industry-leading rigorous testing and qualification program, backed by 2.4 million test hours
- Pre-failure Alerts with HPE Smart Array Controller, Systems Insight Manager, and HPE Smart firmware
- 3x faster firmware and software updates with HPE Service Pack for ProLiant (HPE SPP)
- Best-in-class supply assurance program reduces downtime due to product delays

Compatibility

- Simplify HDD planning and standardize HDDs across HPE server and storage solutions
- Common HDD carriers mean re-purposing drives in other servers is a snap

Security

- HPE Digitally Signed Firmware helps prevent against malicious attacks
- HPE Smart Array SR Secure Encryption is a FIPS 140-2 Level 1 validated enterprise class controller-based encryption solution for data-at-rest on all SAS/SATA drives
- HPE Smart Carriers report drive activity and health

HPE HDDs are available for three types of workloads: Enterprise high-performance (Mission Critical), Midline high-capacity (Business Critical) and Entry-level storage solutions.

HPE HDD portfolio: Proven performance for every workload				
Class	Enterprise		Midline	Entry*
Workload	High		Medium	Low
Usage	Mission-critical, high I/O: Email, enterprise resource planning (ERP), customer relationship management (CRM)		Business Critical, High capacity, high availability storage: Backup, archive, reference	Low I/O: Boot and backup
Interface	SAS 12Gb		SAS 12Gb SATA 6Gb	SATA 6Gb
RPM	15000	10000	7200	7200
Form factor	SFF & LFF	SFF	SFF & LFF	LFF
Capacities	Up to 900GB	Up to 2.4TB	Up to 18TB	Up to 4TB
Warranty	3 years	3 years	1 year	1 year
Notes: * Supported on select HPE ProLiant servers only.				



Standard Features

What's New

- Offering drives with new small form factor (SFF) basic carrier (BC) that help on simplifying servers and aligning with HPE's strategy of becoming an as a service provider
- Offering Self-encrypting (SED) drives for Data-at-Rest Encryption to encrypt data without consuming server resources at the expense of performance with TCG Enterprise feature that help on protect data if the storage device is Physically stolen or subject to inappropriate chain of custody.
 - P28028-B21 HPE 300GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD
 - P40431-B21 HPE 600GB SAS 12G Mission Critical 15K LFF LPC 3-year Warranty HDD
 - P40432-B21 HPE 900GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD
 - P40430-B21 HPE 300GB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD
 - P28586-B21 HPE 1.2TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD
 - P28352-B21 HPE 2.4TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty 512e HDD
 - P28610-B21 HPE 1TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty HDD
 - P28505-B21 HPE 2TB SAS 12G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD
 - P28500-B21 HPE 2TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD

Notes: A -B21 suffix may be replaced with -H21 and -K21 to support across different server family lines. Please refer to the appropriate Server QuickSpecs for full compatibility details

Firmware Updates

Digitally Signed Firmware – Prevent unauthorized access to your data with the expansion of integrated HPE Digitally Signed Firmware (DS) on new drives; providing the security and assurance that drive firmware comes from a trusted source and protects against malicious attacks.

For advanced data protection and encryption, customers should consider HPE Smart Array Controllers with HPE Smart Array Secure SR Encryption. It is a controller-based data encryption solution for HPE servers that protect data-at-rest on any bulk attached storage. This solution meets stringent compliance regulations such as HIPAA and Sarbanes-Oxley.

HDD Selection

To streamline the configuration process for Hewlett Packard Enterprise ProLiant servers and to provide the best product availability, HPE recommends HDDs from the list located here: <http://www.hpe.com/products/recommend>

Notes: Best product availability is limited to US, Canada, and Latin America at this time.



Standard Features

Models

Category	Interface	Form Factor	Format	Capacity	HDD Carrier		
					Smart Carrier SKU	Low Profile SKU	Basic Carrier SKU
Enterprise (15K rpm)	SAS 12G	LFF	512n	300GB	P04693- B21 (SCC)		
				600GB	P04695- B21 (SCC)	P40431- B21 (LPCC)	
				900GB	-		
		SFF	512n	300GB	870753- B21		P28028- B21
				600GB	870757- B21		
				900GB	870759- B21		P40432- B21
Enterprise (10K rpm)	SAS 12G	SFF	512n	300GB	872475- B21		P40430- B21
				600GB	872477- B21		
				1.2TB	872479- B21		P28586- B21
		SFF	512e	1.8TB	872481- B21		
				2.4TB	881457- B21		P28352- B21
Enterprise (10K rpm) Self-Encrypting Drives (SED)	SAS 12G	SFF	512n	1.2TB			
		SFF	512e	2.4TB			



Standard Features

Category	Interface	Form Factor	Format	Capacity	HDD Carrier		
					Smart Carrier SKU	Low Profile SKU	Basic Carrier SKU
Midline (7.2K rpm)	SAS 12G	LFF	512n	2TB	872485- B21	833926- B21	
				4TB	872487- B21	833928- B21	
		LFF	512e	6TB	861754- B21	861746- B21	
				8TB	819201- B21	834031- B21	
				10TB	857644- B21 ^{He}	P09149- B21 ^{He}	
				12TB	881779- B21 ^{He}	881781- B21 ^{He}	
				14TB	P09153- B21 ^{He}	P09155- B21 ^{He}	
				16TB	P23863- B21 ^{He}	P23608- B21 ^{He}	
				18TB	P37664- B21 ^{He}	P37669- B21 ^{He}	
		SFF	512n	1TB	832514- B21		
	512e		2TB	765466- B21	P28505- B21		
	SATA 6G	LFF	512n	1TB	861691- B21	861686- B21	
				2TB	872489- B21	861681- B21	
				4TB	872491- B21	861683- B21	
			512e	6TB	861750- B21	861742- B21	
				8TB	819203- B21	834028- B21	
				10TB	857648- B21	P09161- B21	
				12TB	881785- B21 ^{He}	881787- B21 ^{He}	
				14TB	P09163- B21 ^{He}	P09165- B21 ^{He}	
				16TB	P23857- B21 ^{He}	P23449- B21 ^{He}	
18TB				P37673- B21 ^{He}	P37678- B21 ^{He}		
SFF	2TB	765455- B21					
	512n	1TB	655710- B21	P28610- B21			
Category	Interface	Form Factor	Format	Capacity	HDD Carrier		
Entry (7.2K)	SATA 6G	LFF	512e	1TB	Non Hot Plug Carrier SKU		
				1TB	843266-B21*		
				1TB	801882-B21		
				4TB	801888-B21		

Notes:

- ^{He} Helium Drive.
- *Also known as "Desktop Drive", this drive has Generic Firmware (Non-HPE)
- A -B21 suffix may be replaced with -H21 and -K21 to support across different server family lines. Please refer to the appropriate Server QuickSpecs for full compatibility details.



Standard Features

What is HPE Hard disk drive?

Hewlett Packard Enterprise drives are tuned to deliver optimum performance for HPE Servers. They undergo an intense qualification process to eliminate firmware and O/S incompatibilities. HPE drive firmware is designed to maximize both functionality and compatibility with HPE ProLiant Rack and Tower Servers, Apollo family, Blade and Synergy Platforms.

Drive Quality and Performance

While selecting the drives in our HPE portfolio, only those drives with a performance level suitable for an enterprise environment are selected through the Hewlett Packard Enterprise qualification process and are labeled "best-in-class."

Pre-Failure Alert

When used in conjunction with a SMART Array Controller and Systems Insight Manager, the SMART capable firmware in HPE hard drives enables extensive fault prediction capabilities. If potential problems develop in one of the drives, the Smart Array Controller, Systems Insight Manager and/or SMART hard disk drive lets you know in advance so you can have the drive replaced, before it fails, under warranty

Notes: All drives are protected by a Pre-Failure Alert when used with a HPE Smart Array controller and Systems Insight Manager, allowing hard drives to be replaced before failure under warranty. In addition, all drives are covered by a one or three-year limited on-site warranty period for the system in which they are installed. The drive warranty is automatically uplifted when used in a server or MSA for which a HPE Pointnext service contract is purchased. Please see the Support Services section below for additional services.

Smart Carriers

HPE Hard Drives with smart carriers are designed to provide an interface to communicate critical status and management information. System status LED icons and a spinning activity ring reflecting the data-writing process notify users of the current system status. A blue LED located behind the handle can be activated remotely to guide users to a specific drive tray, while a do-not-remove icon positioned on the tray's eject button lights up to warn users when the removal of the drive would cause data loss.

Helium Drives

Although hard drives are sealed, they have air inside. Air can create turbulence-induced risk vibrations which can limit the storage density of HDDs. Newer helium-filled drives virtually eliminate turbulence because helium is 1/7th as dense as air. This lower density allows the read/write mechanism to spin more easily and precisely, with less drag. Less internal turbulence means the drive platters can be closer together, allowing more platters and increasing the capacity potential in the same space. Less turbulence also means helium drives tend to use less power, and run cooler and quieter.

Support Matrix

Please see the following URL for the latest list of supported servers and enclosures:

<https://www.hpe.com/us/en/servers/server-options.html>

Warranty

Enterprise hard drives have a 3 year limited warranty regardless of the warranty period for the system in which they are installed. Midline hard drives have a 1 year limited warranty regardless of the warranty period for the system in which they are installed.



Service and Support

HPE Technology Services for Industry Standard Servers

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability powered by a rich portfolio of consulting and support services designed to add value to our core products and solutions connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Support Services

HPE support services offer complete care and support expertise with committed response choices that are designed to meet your IT and business needs.

Notes: HPE Hard drives are covered under the HPE Pointnext /Service Contract applied to the HPE ProLiant Server. No separate HPE Pointnext s need to be purchased.

Connect your devices to HPE

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%¹ reduction in down time, near 100%² diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization.

All of these benefits are already available to you with your server storage and networking products, securely connected to HPE support.

Notes:

- ¹IDC Whitepaper
 - ²HPE CSC Reports 2014-2015
-

HPE Support Center

Personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more

<https://support.hpe.com/hpesc/public/home>

HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Support Services or HPE contractual support agreement.

Notes: HPE Support Center Mobile App above is subject to local availability.

Parts and materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.



Service and Support

Service Coverage

For ProLiant servers and storage systems, the service on the main product covers HPE-branded hardware options not designated by Hewlett Packard Enterprise as requiring separate coverage, that are qualified for the server, purchased at the same time or afterward and internal to the enclosure. These items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been reached.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction. It does not apply Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by Hewlett Packard Enterprise as consumable parts and/or that have reached maximum supported lifetime and/or the maximum usage limits as set forth in the manufacturer's operating manual, the product QuickSpecs, or the technical data sheet are not eligible for the defective media retention service feature option.

Subject to: Maximum supported lifetime: This is a period in years set to equal the warranty for the specific drive. After this period no further service coverage will be available for the drive. Maximum usage limit: This is the maximum amount of data that can be written to the drive. Drives that have reached this limit will not be eligible for services coverage.

For more information

To learn more on services for HPE Server Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit:

<https://www.hpe.com/us/en/product-catalog/servers/proliant-servers.html> or

<https://www.hpe.com/us/en/integrated-systems/bladesystem.html>

Supporting Helpful Links

<http://www.hpe.com/info/rackandpower>

<http://www.hpe.com/info/poweradvisor>

<http://www.hpe.com/info/infrastructurearchitect>

<https://www.hpe.com/us/en/storage/entry-level.html>



Technical Specifications

HDD Specifications

Enterprise (15K rpm)									
Form Factor		SFF (2.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
870753- B21	HPE 300GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	225	220	220	220	2.6	3.6	4.4	3.9
870757- B21	HPE 600GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	225	220	220	220	4.7	6.1	6.3	6.3
870759- B21	HPE 900GB SAS 12G Enterprise 15K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	260	220	220	220	4.7	6.1	6.3	6.3
Enterprise (15K rpm)									
Form Factor		SFF (2.5")		Carrier		Basic Carrier (BC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P28028- B21	HPE 300GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD	225	220	220	220	2.6	3.6	4.4	3.9
P40432- B21	HPE 900GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD	260	220	220	220	4.7	6.1	6.3	6.3



Technical Specifications

Enterprise (15K rpm)									
Form Factor		LFF (3.5")		Carrier		Smart Carrier Converter (SCC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		1.06 in (26.8 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.16 in (105.8 mm)			
Bytes/Sector		512		Depth		6.69 in (170.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P04695-B21	HPE 600GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD	260	220	220	220	5.6	7.2	7.7	6.2
P04693-B21	HPE 300GB SAS 12G Enterprise 15K LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD	260	220	220	220	4.3	6.9	7.0	6.4

Enterprise (15K rpm)									
Form Factor		LFF (3.5")		Carrier		Low Profile Carrier Converter (LPCC)			
Rotational Speed		15000 rpm		Dimensions					
Interface		SAS		Height		1.06 in (26.8 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.16 in (105.8 mm)			
Bytes/Sector		512		Depth		6.69 in (170.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P40431- B21	HPE 600GB SAS 12G Mission Critical 15K LFF LPC 3-year Warranty HDD	260	220	220	220	5.6	7.2	7.7	6.2



Technical Specifications

Enterprise (10K rpm)										
Form Factor		SFF (2.5")			Carrier		Smart Carrier (SC)			
Rotational Speed		10000 rpm			Dimensions					
Interface		SAS			Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec			Width		2.98 in (75.7 mm)			
Bytes/Sector		512			Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)								
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)	
872475-B21	HPE 300GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	195	180	180	180	3.8	6.9	6.1	5.3	
872477-B21	HPE 600GB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	195	165	165	165	4.7	6.9	6.3	6.3	
872479-B21	HPE 1.2TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty Digitally Signed Firmware HDD	195	165	165	165	4.0	7.1	6.4	5.5	
872481-B21	HPE 1.8TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD	230	165	170	185	2.6	3.6	4.4	3.9	
881457-B21	HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD	255	160	180	190	4.8	6.0	7.8	6.6	



Technical Specifications

Enterprise (10K rpm)										
Form Factor		SFF (2.5")			Carrier		Basic Carrier (BC)			
Rotational Speed		10000 rpm			Dimensions					
Interface		SAS			Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec			Width		2.98 in (75.7 mm)			
Bytes/Sector		512			Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)								
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)	
P40430- B21	HPE 300GB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD	195	180	180	180	3.8	6.9	6.1	5.3	
P28586- B21	HPE 1.2TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD	195	165	165	165	4.0	7.1	6.4	5.5	
P28352- B21	HPE 2.4TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty 512e HDD	255	160	180	190	4.8	6.0	7.8	6.6	



Technical Specifications

Midline (7.2K rpm)										
Form Factor		LFF (3.5")		Carrier		Smart Carrier (SC)				
Rotational Speed		7200 rpm		Dimensions						
Interface		SAS		Height		1.06 in (26.8 mm)				
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.16 in (105.8 mm)				
Bytes/Sector		512		Depth		6.69 in (170.0 mm)				
Operating Temperature		50° to 95° F (10° to 35°C)								
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)	
872485- B21	HPE 2TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	190	100	100	100	8.8	12.2	10.8	10.5	
872487- B21	HPE 4TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	190	100	100	100	8.8	12.2	10.8	10.5	
861754- B21	HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD	200	100	105	110	8.8	12.2	10.8	10.5	
819201- B21	HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	230	100	110	110	8.3	9.7	10.4	9.2	
857644- B21	HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	220	105	105	105	5.2	6.7	8.3	6.3	
881779- B21	HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	7.6	6.9	
P09153- B21	HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.7	8.5	8.2	6.9	
P23863- B21	HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD	250	105	120	125	5.2	6.7	8.0	7.2	
P37664- B21	HPE 18TB SAS 12G Business Critical 7.2K LFF (3.5in) SC 512e ISE HDD	265	115	140	170	5.7	6.6	7.5	6.6	



Technical Specifications

Midline (7.2K rpm)									
Form Factor		LFF (3.5")		Carrier		Low Profile (LP)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SAS		Height		1.028 in (26.1 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		4.15 in (105.5 mm)			
Bytes/Sector		512		Depth		6.16 in (156.58 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
833926-B21	HPE 2TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	200	108	105	105	4.7	8.3	7.4	5.8
833928-B21	HPE 4TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	200	108	105	105	5.8	9.3	8.7	7.1
861746-B21	HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e HDD	215	100	110	110	6.6	7.9	9.6	7.8
834031-B21	HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e Digitally Signed Firmware HDD	230	100	110	110	7.6	8.8	10.4	8.8
P09149-B21	HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	220	108	105	105	5.2	6.7	8.3	6.3
881781-B21	HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	7.4	6.9
P09155-B21	HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.7	8.5	8.2	6.9
P23608-B21	HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	250	110	120	125	5.2	6.7	8.0	6.4
P37669-B21	HPE 18TB SAS 12G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	265	115	140	170	5.7	6.6	7.5	6.6



Technical Specifications

Midline (7.2K rpm)									
Form Factor		LFF (3.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		1.06 in (26.8 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		4.16 in (105.8 mm)			
Bytes/Sector		512		Depth		6.69 in (170.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
861691-B21	HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty HDD	185	90	90	90	8.8	12.2	10.8	10.5
872489-B21	HPE 2TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	185	90	90	90	8.8	12.2	10.8	10.5
872491-B21	HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Digitally Signed Firmware HDD	190	100	100	100	8.8	12.2	10.8	10.5
861750-B21	HPE 6TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e HDD	215	100	100	105	8.8	12.2	10.8	10.5
819203-B21	HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	230	100	110	110	7.2	8.5	10.1	9.1
857648-B21	HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	110	115	4.8	6.0	7.7	7.0
881785-B21	HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	8.2	7.3
P09163-B21	HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) SC 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.6	8.5	7.9	8.2
P23857-B21	HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) SC 1yr Wty 512e ISE HDD	260	105	120	125	4.7	7.2	7.7	6.9
P37673-B21	HPE 18TB SATA 6G Business Critical 7.2K LFF (3.5in) SC 1yr Wty 512e ISE HDD	265	115	140	165	5.4	6.2	7.2	7.1



Technical Specifications

Midline (7.2K rpm)									
Form Factor		LFF (3.5")		Carrier		Low Profile (LP)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		1.028 in (26.1 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		4.15 in (105.5 mm)			
Bytes/Sector		512		Depth		6.16 in (156.58 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
861686- B21	HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	190	90	90	90	4.4	7.7	6.4	6.6
861681- B21	HPE 2TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	195	90	90	90	4.4	7.7	7.0	6.5
861683- B21	HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Digitally Signed Firmware HDD	200	108	105	105	5.4	8.6	7.9	7.6
861742- B21	HPE 6TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e HDD	215	100	110	110	6.3	7.2	9.1	8.7
834028- B21	HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e Digitally Signed Firmware HDD	230	108	105	105	7.1	8.3	10.1	7.8
P09161- B21	HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	240	110	120	125	4.8	6.0	7.7	7.9
881787- B21	HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	235	105	115	125	6.3	7.4	7.4	6.9
P09165- B21	HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	250	105	115	120	5.6	8.5	7.9	8.2
P23449- B21	HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	265	110	120	125	4.7	6.2	7.7	6.9
P37678- B21	HPE 18TB SATA 6G Business Critical 7.2K LFF (3.5in) LP 512e ISE HDD	265	115	140	165	5.4	6.2	7.2	7.1



Technical Specifications

Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
832514- B21	HPE 1TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD	130	105	105	105	2.6	3.6	4.4	3.9
765466- B21	HPE 2TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e HDD	130	105	105	105	2.6	3.6	4.4	3.9
Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Basic Carrier (BC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SAS		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		12Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P28505- B21	HPE 2TB SAS 12G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD	130	105	105	105	2.6	3.6	4.4	3.9



Technical Specifications

Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Smart Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
655710- B21	HPE 1TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty Digitally Signed Firmware HDD	130	105	105	105	2.6	3.6	4.4	3.9
765455- B21	HPE 2TB SATA 6G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e Digitally Signed Firmware HDD	130	105	105	105	2.6	3.6	4.4	3.9

Midline (7.2K rpm)									
Form Factor		SFF (2.5")		Carrier		Basic Carrier (SC)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		0.62 in (15.6 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		2.98 in (75.7 mm)			
Bytes/Sector		512		Depth		4.67 in (118.7 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
P28610- B21	HPE 1TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty HDD	130	105	105	105	2.6	3.6	4.4	3.9
P28500- B21	HPE 2TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD	130	105	105	105	2.6	3.6	4.4	3.9



Technical Specifications

Entry									
Form Factor		LFF (3.5")		Carrier		Non Hot Plug Carrier (RW)			
Rotational Speed		7200 rpm		Dimensions					
Interface		SATA		Height		1.028 in (26.1 mm)			
Transfer Rate Synchronous (Max)		6Gb/sec		Width		4.00 in (101.6 mm)			
Bytes/Sector		512		Depth		5.75 in (146.0 mm)			
Operating Temperature		50° to 95° F (10° to 35°C)							
SKU	SKU Description	OD Media Rate, Max Sequential Throughput (MiB/s)	128Kib Random Rd (IOPs)	128Kib Random 70% RD/ 30% WT (IOPs)	128Kib Random 50% RD/ 50% WT (IOPs)	Power Idle Time (Watts)	Power Random R/W (Watts)	Power Sequential Read (Watts)	Power Sequential Write (Watts)
843266-B21	HPE 1TB SATA 6G Entry 7.2K LFF (3.5in) RW 1yr Wty HDD	N/A	N/A	N/A	N/A	2.6	3.6	4.4	3.9
801882-B21	HPE 1TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD	160	95	95	95	8.8	12.1	10.8	10.5
801888-B21	HPE 4TB SATA 6G Midline 7.2K LFF (3.5in) RW 1yr Wty HDD	160	95	95	95	8.8	12.1	10.8	10.5

Carrier Decoder

HPE Hard Disk Drives (HDDs) utilize a wide variety of carriers, which houses the HDD and also enables a specific chassis fit to support a broad range of HPE server and storage products. The table below summarizes the various form factors, plug types, and carrier attributes.

Carriers				
Form Factor	HPE/NHP	Smart/Non-Smart	Carrier Name (Abbreviation)	SFF/LFF
SFF Carrier	Hot Plug	Smart	Smart Carrier (SC)	SFF
		Non-Smart	Standard (ST)	SFF
			Basic Carrier (BC)	SFF
LFF Carrier	Hot Plug	Smart	Smart Carrier (SC)	LFF
			Smart Carrier Converter (SCC)	LFF
		Non-Smart	Low Profile (LP)	LFF
			Low Profile Converter (LPC)	LFF
			Standard (ST)	LFF
No Carrier	Non-Hot Plug	Non-Smart	Raw LFF HDD (RW)	LFF



Technical Specifications

Server Family	Server Model	Generation	SFF Carriers				LFF Carriers				
			Smart Carrier (SCI)/(SCC)	Basic Carrier (BC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	Smart Carrier (SCI)/(SCC)	Low Profile (LP)/(LPC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	
HPE Apollo	HPE Apollo Gen10 Series										
	HPE Apollo pc40	Gen10				Yes				Yes	
	HPE Apollo sx40 Server	Gen10				Yes				Yes	
	HPE Apollo 70 System	Gen10					Yes				
	HPE Apollo 2000 Series										
	HPE Apollo XL170r Gen9 Server	Gen9	Yes					Yes			
	HPE Apollo XL170r Gen10 Server	Gen10	Yes					Yes			
	HPE Apollo XL190r Gen9 Server	Gen9	Yes					Yes			
	HPE Apollo XL190r Gen10 Server	Gen10	Yes					Yes			
	HPE Apollo XL220n Gen10 Plus Server	Gen10 Plus	Yes								
	HPE Apollo XL290n Gen10 Plus Server	Gen10 Plus	Yes								
	HPE Apollo 4000 Series										
	HPE Apollo 4200 Gen9 Server	Gen9	Yes					Yes			
	HPE Apollo 4200 Gen10 Server	Gen10	Yes					Yes			
	HPE Apollo 4200 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE Apollo 4500 System	Gen9	Yes					Yes			
	HPE Apollo 4510 Gen10	Gen10	Yes					Yes			
	HPE Apollo 6000 Series										
	HPE ProLiant XL230k Gen10 Server	Gen10	Yes								
	HPE Blades										
	HPE ProLiant BL460c Gen9 Server Blade	Gen9	Yes								
	HPE ProLiant BL460c Gen10 Server Blade	Gen10	Yes								
	HPE ProLiant BL660c Gen9 Server Blade	Gen9	Yes								
HPE ProLiant WS460c Gen9 Graphics Server Blade	Gen9	Yes									



Technical Specifications

Server Family	Server Model	Generation	SFF Carrier				LFF Carriers				
			Smart Carrier (SCD)/(SCC)	Basic Carrier (BC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	Smart Carrier (SCD)/(SCC)	Low Profile (LP)/(LPC)	Standard Carrier (ST)	Raw Carrier(RW)/(AKA NPH)	
HPE ProLiant	HPE ProLiant DL										
	HPE ProLiant DL20 Gen9 Server	Gen9	Yes			Yes	Yes				
	HPE ProLiant DL20 Gen10 Server	Gen10	Yes			Yes		Yes			
	HPE ProLiant DL120 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL120 Gen10 Server	Gen10	Yes			Yes		Yes			
	HPE ProLiant DL160 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL160 Gen10 Server	Gen10	Yes			Yes		Yes			
	HPE ProLiant DL180 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL180 Gen10 Server	Gen10	Yes					Yes			
	HPE ProLiant DL325 Gen10 Server	Gen10	Yes					Yes			
	HPE ProLiant DL325 Gen10 Plus Server	Gen10 Plus	Yes					Yes			
	HPE ProLiant DL325 Gen10 Plus V2 Server	Gen10 Plus V2		Yes				Yes			
	HPE ProLiant DL345 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL360 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL360 Gen10 Server	Gen10	Yes				Yes				
	HPE ProLiant DL360 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL365 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL380 Gen9 Server	Gen9	Yes				Yes				
	HPE ProLiant DL380 Gen10 Server	Gen10	Yes				Yes				
	HPE ProLiant DL380 Gen10 Plus Server	Gen10 Plus		Yes				Yes			
	HPE ProLiant DL385 Gen10 Server	Gen10	Yes				Yes				
	HPE ProLiant DL385 Gen10 Plus Server	Gen10 Plus	Yes					Yes			
	HPE ProLiant DL385 Gen10 Plus V2 Server	Gen10 Plus V2		Yes				Yes			
	HPE ProLiant DL 560 Gen9 Server	Gen9	Yes								
	HPE ProLiant DL 560 Gen10 Server	Gen10	Yes								
	HPE ProLiant DL 580 Gen9 Server	Gen9	Yes								
	HPE ProLiant DL 580 Gen10 Server	Gen10	Yes								
	HPE ProLiant ML										
	HPE ProLiant MicroServer Gen10	Gen10					Yes				Yes
	HPE ProLiant ML30 Gen10 Server	Gen10	Yes						Yes		Yes
	HPE ProLiant ML110 Gen10 Server	Gen10	Yes						Yes		Yes



Technical Specifications

	HPE ProLiant ML350 Gen10 Server	Gen10	Yes		Yes	Yes
HPE Synergy	HPE Synergy					
	HPE Synergy 480 Gen10 Compute Module	Gen10	Yes			
	HPE Synergy 480 Gen10 Compute Module	Gen10 Plus	Yes			
	HPE Synergy 660 Gen10 Compute Module	Gen10	Yes			
	HPE Synergy 680 Gen9 Compute Module	Gen9	Yes			
	HPE Synergy D3940 Storage Module	N/A	Yes			

HDD SKU Description Decoder

Long Name

HPE 10TB SAS 12G Business Critical 7.2K LFF SC 1-year Warranty 512e HDD

Brand	Storage Capacity	Interface Type/Interface Speed	Workload	Form Factor Type /Size	Carriers	Warranty	Special Features	Drive Type
HPE	300 -900GB 1-18TB	SATA/SAS 6G/12G	Mission Critical/15/10K (MC 15/10K) Business Critical 7.2K BC 7.2K)	SFF LFF	BC LP LPC QR RW SC SCC ST STC	Basic Carrier Low Profile Low Profile Converter Quick Release Raw Drive Smart Carrier Smart Carrier Converter Standard Carrier Standard Carrier Converter	1yr Wty 1-year Warranty 3yr Wty 3-years Warranty SED ISE SED FIPS FIPS He 512e (no descriptor) 512n Special – Special SKUs Self Encrypting Drive Instant Secure Erase Self-encrypting FIPS Federal Information Processing Standards Helium 512e Emulation 512n	HDD

Environment friendly Products and Approach End-of life Management and Recycling

Hewlett Packard Enterprise offers end-of-life **U**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **[Hewlett Packard Enterprise web site](#)**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.



Summary of Changes

Date	Version History	Action	Description of Change
06-Apr-2021	Version 21	Changed	Tables were fixed, Overview and Technical Specifications Sections were updated
01-Feb-2021	Version 20	Changed	Overview and Technical Specifications Sections were updated
20-Jul-2020	Version 19	Changed	Overview and Technical Specifications Sections were updated
01-Jun-2020	Version 18	Changed	SKUs were Added in Overview Section
03-Feb-2020	Version 17	Changed	Overview Section was updated
09-Dec-2020	Version 16	Changed	Added new HPE 16TB Midline 7.2K LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models.
02-Dec-2019	Version 15	Changed	Technical Specifications and Overview Sections were updated
03-Jun-2019	Version 14	Changed	Technical Specifications and Overview Sections were updated
04-Feb-2019	Version 13	Changed	Technical Specifications and Overview Sections were updated
15-Oct-2018	Version 12	Changed	Technical Specifications was revised.
01-Oct-2018	Version 11	Changed	Overview, Standard Features, Service and Support, and Technical Specifications were revised.
04-Sep-2018	Version 10	Changed	Technical Specifications Section was updated
04-Jun-2018	Version 9	Changed	P04695-B21 HPE 600GB Enterprise 15K SAS 12G LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD P04693-B21 HPE 300GB Enterprise 15K SAS 12G LFF (3.5in) SCC 3yr Wty Digitally Signed Firmware HDD Power specs for all drives Seek time specs to IOPs From Recommended to Extended: 861590-B21, 861594-B21, 861596-B21 From Extended to Recommended: 801882-B21, 881787- X21
05-Mar-2018	Version 8	Changed	Overview, Service and Support, and Technical Specifications were revised.
05-Feb-2018	Version 7	Changed	Added new HPE 12TB Midline 7.2K SAS LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models: 881779-B21, 881781- X21 , 881783-B21 Change format to breakout recommended and extended portfolios. Obsolete SKUs
04-Dec-2017	Version 6	Changed	Added new HPE 12TB Midline 7.2K LFF (3.5in) Helium 512e Digitally Signed Firmware HDD models. Overview, Service and Support, and Technical Specifications were revised. Obsolete SKUs were removed from the QuickSpecs.
23-Oct-2017	Version 5	Changed	Part number 881458-B21 was changed to 881457- X21 . Care Pack references changed to HPE Pointnext operational services.
25-Sep-2017	Version 4	Changed	Added 881458-B21 HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware HDD Overview, Standard Features, Service and Support, and Technical Specifications were revised.
12-Jun-2017	Version 3	Changed	Overview and Technical Specifications were revised.
27-Mar-2017	Version 2	Changed	Added new HDD offering. Overview and Technical Specifications were revised.
13-Feb-2017	Version 1	New	New QuickSpecs

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.

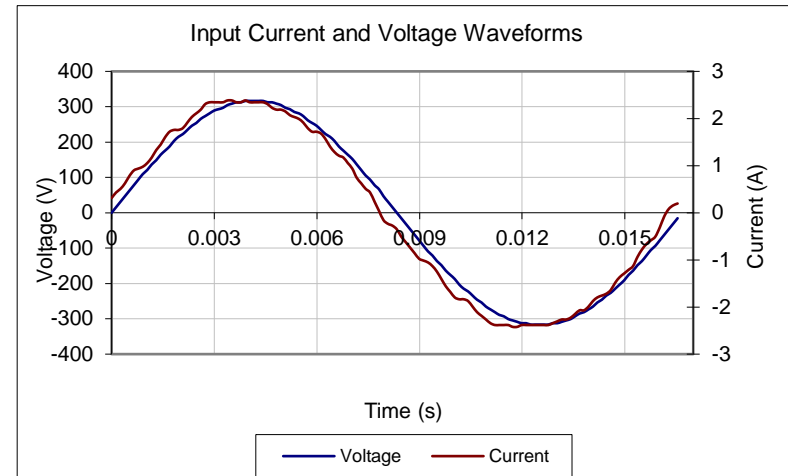
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80 PLUS Verification and Testing Report

TYPICAL EFFICIENCY (50% Load):	94.60%
AVERAGE EFFICIENCY :	93.54%
80 PLUS COMPLIANT:	YES



ID Number	SO-1181
Manufacturer	Hewlett Packard Enterprise Company
Model Number	865412-201
Serial Number	N/A
Year	2016
Type	1U
Test Date	10/19/16



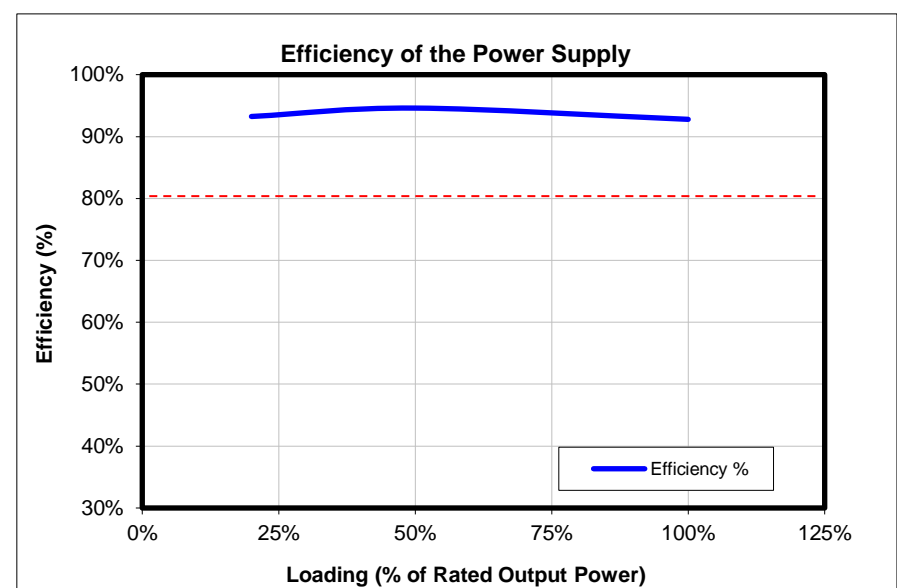
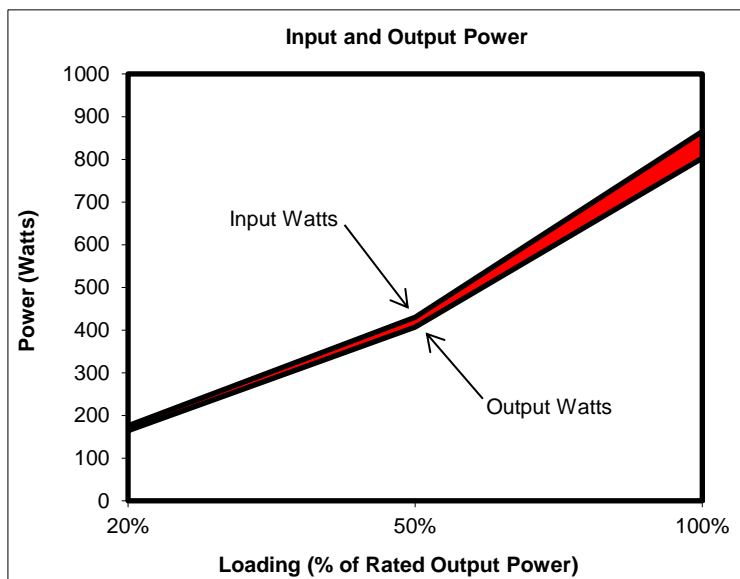
Input AC Current Waveform (ITHD = 3.45%, 50% Load)

Rated Specifications	Value	Units
Input Voltage	100-240	Volts
Input Current	9.4-4.5	Amps
Input Frequency	50-60	Hz
Rated Output Power	800	Watts

Note: All measurements were taken with input voltage at 230 V nominal and 60 Hz.

I _{RMS} A	PF	I _{THD} (%)	Load (%)	Fraction of Load	Input Watts	External Fan (W)*	DC Terminal Voltage (V)/ DC Load Current (A)		Output Watts	Efficiency %
							12V			
0.41	0.96	14.08	10%	Low	91	0.48	12.29/6.69		82	90.77%
0.78	0.98	5.59	20%	Light	176	0.48	12.27/13.37		164	93.24%
1.88	1.00	3.45	50%	Typical	430	0.60	12.18/33.41		407	94.60%
3.77	1.00	1.59	100%	Full	865	1.20	12.01/66.83		803	92.78%

* Fan power is not included in the efficiency calculations



These tests were conducted by a third party independent testing firm on behalf of the 80 PLUS® Program. 80 PLUS is a certification program to promote highly-efficient power supplies (greater than 80% efficiency in the active mode) in technology applications. <http://www.80plus.org/>

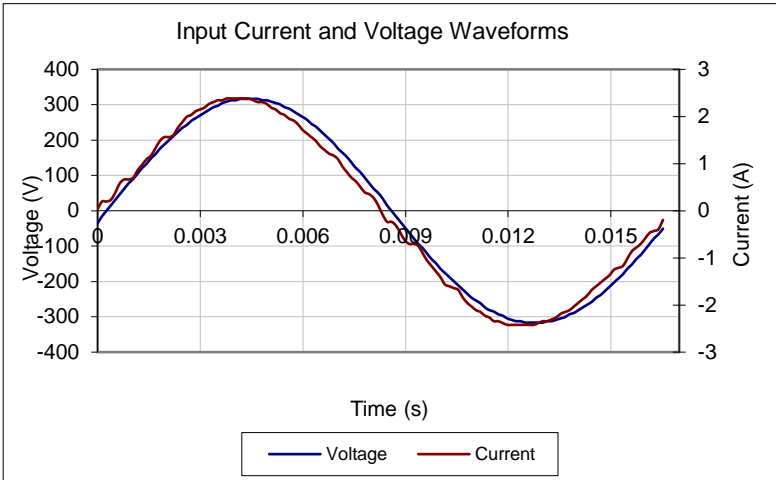


80 PLUS Verification and Testing Report

TYPICAL EFFICIENCY (50% Load):	94.43%
AVERAGE EFFICIENCY :	93.42%
80 PLUS COMPLIANT:	YES



ID Number	SO-1229
Manufacturer	Hewlett Packard Enterprise
Model Number	865412-501
Serial Number	CT:5WEBPX28J4909V
Year	2017
Type	1U
Test Date	01/27/17



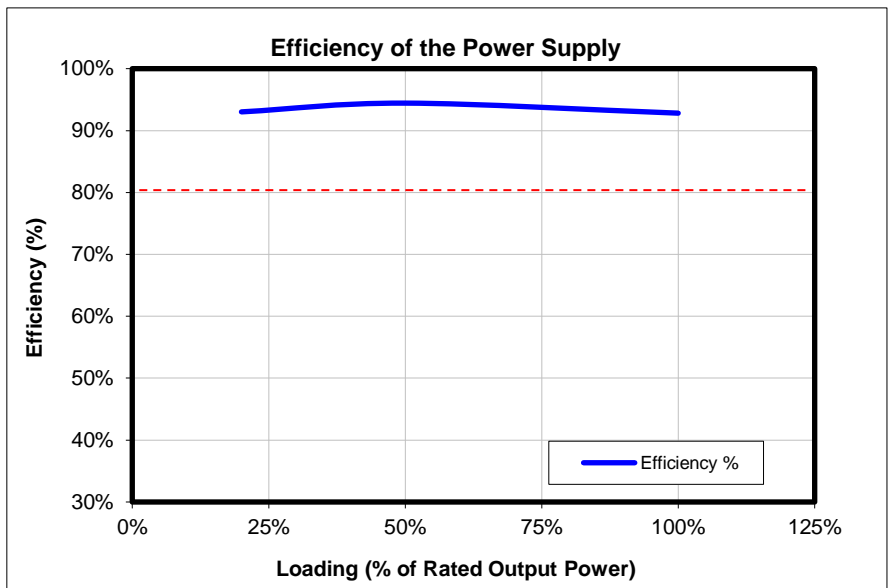
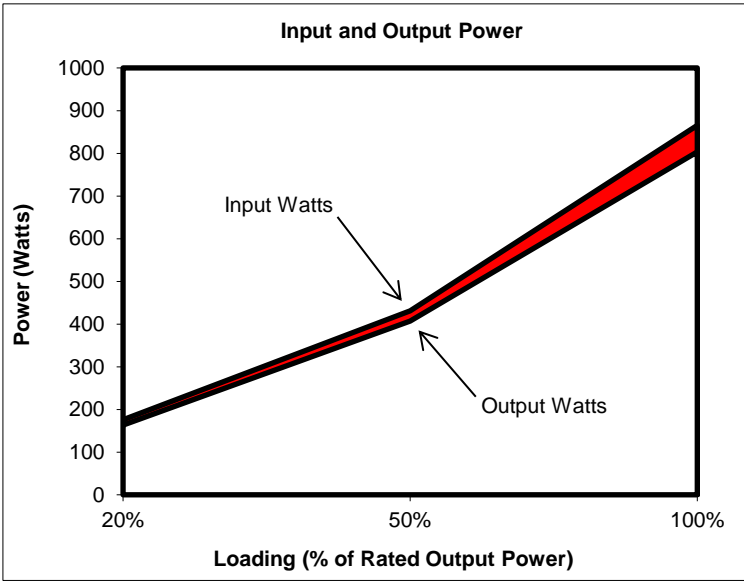
Input AC Current Waveform (ITHD = 3.98%, 50% Load)

Rated Specifications	Value	Units
Input Voltage	100-240	Volts
Input Current	9.4-4.5	Amps
Input Frequency	50-60	Hz
Rated Output Power	800	Watts

Note: All measurements were taken with input voltage at 230 V nominal and 60 Hz.

I _{RMS} A	PF	I _{THD} (%)	Load (%)	Fraction of Load	Input Watts	External Fan (W)*	DC Terminal Voltage (V)/ DC Load Current (A)		Output Watts	Efficiency %
							12V			
0.43	0.92	8.65	10%	Low	92	0.48	12.27/6.68		82	89.33%
0.79	0.96	5.62	20%	Light	176	0.48	12.25/13.37		164	93.02%
1.89	0.99	3.98	50%	Typical	431	0.48	12.17/33.42		407	94.43%
3.78	1.00	1.89	100%	Full	866	1.94	12.02/66.83		803	92.81%

* Fan power is not included in the efficiency calculations



These tests were conducted by a third party independent testing firm on behalf of the 80 PLUS® Program. 80 PLUS is a certification program to promote highly-efficient power supplies (greater than 80% efficiency in the active mode) in technology applications. <http://www.80plus.org/>

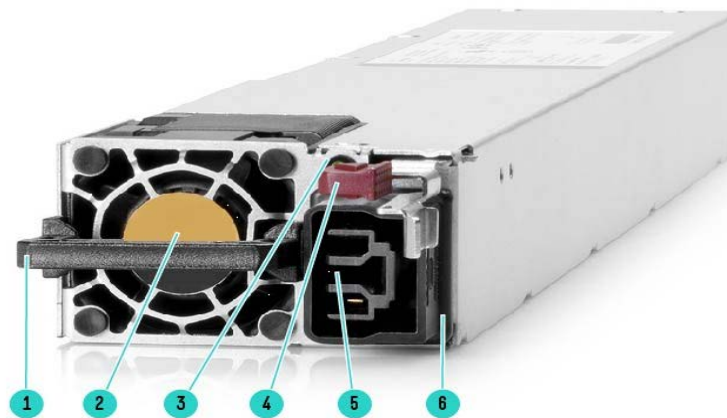


Overview

HPE Flexible Slot Power Supplies

HPE Flexible Slot (Flex Slot) Power Supplies share a common electrical and physical design that allows for hot plug, tool-less installation into HPE server solutions. HPE's Flex Slot power supplies are certified for high-efficiency operation and offer multiple power output options, allowing users to "right-size" a power supply for specific server configurations. This flexibility helps to reduce power waste, lower overall energy costs, and avoid "trapped" power capacity in the data center.

Flex Slot power supplies are rated for Platinum-level certification with efficiency of up to 94%, and Titanium-level certification with efficiency of up to 96%. Support for HPE Power Discovery Services, via embedded power line communication technology on the Gen9 ProLiant Servers, is also available with the 1400W Platinum Plus model. This feature enables each server to communicate identification, location, and power-related data to the Intelligent Power Distribution Unit in the rack which can then be shared with HPE Insight Control to manage power usage and efficiency in the data center.



HPE Flexible Slot Power Supplies

- | | |
|--------------------------------------|--------------------------------------------------------------------------------------|
| 1. Power Supply Handle | 4. Release Lever |
| 2. Identification Label | 5. C-14 Input Connector |
| 3. Power Supply LED Status Indicator | 6. Power Discovery Services Communication Port (Gen9 1400W Platinum Plus model only) |

Overview

Models

HPE Power Supplies

Gen9 Flexible Slot Power Supplies

Notes:

- 1-.Mixing different power supplies in the same server may limit or disable some power supply features including support for power redundancy. To ensure access to all available features, all power supplies within the same server should have the same output and efficiency ratings.
- 2-. Low Halogen Power Supplies are not compatible with HPE Gen9 Servers.

HPE Flexible Slot Platinum Power Supply Kits

Notes: Flex Slot Platinum power supplies support power efficiency of up to 94% and include a standard C-14 power inlet connector.

HPE 800W Flex Slot Platinum Hot Plug Power Supply Kit

720479-B21

HPE Flexible Slot Platinum Plus Power Supply Kits

Notes:

- 1-.Flex Slot Platinum Plus power supplies support power efficiency of up to 94% and include a C-14 power inlet connector that can support HPE Power Discovery Services (blue connector).
- 2-.1400W Flex Slot Platinum Plus power supplies must be used with high-line input (200V – 240V AC).

HPE 1400W Flex Slot Platinum Plus Hot Plug Power Supply Kit

720620-B21

HPE Flexible Slot -48VDC Power Supply Kits

Notes: Flex Slot -48VDC power supplies support power efficiency of up to 94%.

HPE 800W Flex Slot -48VDC Hot Plug Power Supply Kit

720480-B21

Gen10 Flexible Slot Power Supplies

Notes:

- 1-.Mixing different power supplies in the same server may limit or disable some power supply features including support for power redundancy. To ensure access to all available features, all power supplies within the same server should have the same output and efficiency ratings.
- 2-.Low Halogen Power Supplies are not compatible with HPE Gen9 Servers.

HPE Flexible Slot Platinum Power Supply Kits

Notes:

- 1-.Flex Slot Platinum power supplies support power efficiency of up to 94% and include a standard C-14 power inlet connector.
- 2-.1600W Flex Slot Platinum power supplies must be used with high-line input (200V – 240V AC).
- 3-.1800W-2200W Flex Slot Platinum power supplies is only supported on Apollo 2000 Gen10

HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit

865408-B21

HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit

865414-B21

HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit

830272-B21

HPE 1800W-2200W Flex Slot Platinum Hot Plug Power Supply Kit

876935-B21

HPE Flexible Slot Titanium Power Supply Kits

Notes:

- 1-.Flex Slot Titanium power supplies support power efficiency of up to 96% and include a standard C-14 power inlet connector.
- 2-.800W Flex Slot Titanium Plus power supplies must be used with high-line input (200V – 240V AC).

HPE 800W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit

865438-B21



Overview

HPE Flexible Slot -48VDC Power Supply Kits

Notes:

- 1.Flex Slot -48VDC power supplies support power efficiency of up to 94%.
- 2.Flex Slot -48VDC power supplies may require separate purchase of power cords or lugs

HPE 800W Flex Slot -48VDC Hot Plug Low Halogen Power Supply Kit 865434-B21

HPE 1600W Flex Slot -48VDC Hot Plug Power Supply Kit P17023-B21

HPE Flexible Slot HVAC/HVDC Power Supply Kits

HPE 800W Flex Slot Universal Hot Plug Low Halogen Power Supply Kit 865428-B21

Notes: Flex Slot universal power supplies support power efficiency of up to 94% and support both 277VAC/380VDC power inputs.



Standard Features

Features/Benefits

Titanium-Certified Power Efficiency

- Titanium (96%) power efficiency certification from 80Plus program – one of the highest power efficiency certifications available in the IT industry
- Reduces data center operating costs related to power by reducing server power requirements and power waste

Flex Slot Design

- Tool-less hot plug design improves serviceability by allowing quick and easy access to system power supplies
- Common form factor across all ProLiant Gen9 and Gen10 servers allows multiple server platforms to share power supply spares, reducing cost and space requirements for spares

Multiple Power Output Options

- Multiple output options allowing users to "right-size" their power needs and avoid "trapped" power capacity in their data centers caused by over-subscribing power needs
- Support for both low-line and high-line AC input voltages providing additional flexibility to operate in multiple IT environments (500W and 800W Platinum only). -48VDC, 277VAC and 380VDC input voltages are also available.

Power Management

- Supports multiple operating modes to maximize power efficiency when configuring servers with redundant power supplies
 - Integrated support for HPE's Power Discovery Services which communicates with the intelligent PDU to monitor and manage power usage (Gen9 1400W Platinum Plus only)
-



Standard Features

80Plus Certification

The 80PLUS test protocol was developed jointly by Ecova Plug Load Solutions and the Electric Power Research Institute (EPRI) in 2003, with the program being formally launched in 2004.

The 80 PLUS performance specification requires power supplies in servers to be 80% or greater energy efficient at 20%, 50% and 100% of rated load with a true power factor of 0.9 or greater. This makes an 80 PLUS certified power supply substantially more efficient than typical power supplies found in many other electrical devices.

Who benefits from the 80PLUS power supply program?

- Commercial/Residential Consumers - empowered with information regarding energy efficient IT options that help them cut energy costs and reduce their environmental impact
- Utility/Power Providers - participation in a program that focuses on reducing power demands on overburdened grids as well as reducing power waste and its associated environmental impact

What are the efficiency requirements for each certification level?

80 PLUS Certification	230V Internal		
	20%	50%	100%
80 PLUS Bronze	81%	85%	81%
80 PLUS Silver	85%	89%	85%
80 PLUS Gold	88%	92%	88%
80 PLUS Platinum	90%	94%	91%
80 PLUS Titanium	94%	96%	91%

What level of certification do HPE Flexible Slot Power Supplies meet?

HPE's Platinum and Platinum Plus power supply options meet 80PLUS requirements for Platinum certification. HPE's Titanium and Titanium Plus power supply options meet 80PLUS requirements for Titanium certification. To review 80Plus certification reports for each HPE Flexible Slot Power Supply, please refer to the 80Plus website at: <https://www.plugloadsolutions.com/>.



Standard Features

Support for Redundant Power Supplies

An HPE ProLiant server solutions configured with 2 Flex Slot Power Supplies – 500W, 800W, 1400W, 1600W, or 1800W-2200W - supports the following three power scenarios:

- Operation with a single power supply
- Operation with redundant power supplies in load-balanced mode
- Operation with redundant power supplies in high-efficiency mode

A single Flex Slot Power Supply supporting the entire load of the server can achieve the highest efficiency when operating in the middle range (50%) of its capacity.

For redundant Flex Slot Power Supplies operating in load-balanced mode (the default mode when adding redundant power supplies), the load is shared equally between the two power supplies. In general, the load-balanced mode offers better efficiency for loads requiring more than 60 percent of the primary power supply capacity.

When high-efficiency mode is enabled for redundant supplies (via the server's ROM-based setup utility under System options -> Redundancy options), each power supply in the server is designated as either a primary or secondary supply, and the entire server load is shifted to the primary power supply. This allows the primary power supply to operate at higher efficiency points on the load curve while the secondary power supply operates in idle mode, providing no output power and consuming very little energy (typically two to four watts per supply). The user can also specify that odd or even power supplies will be designated manually or automatically as secondary supplies. This flexibility allows users to balance the load across a rack manually or automatically.

Compatibility

HPE Gen9 Flex Slot power supplies are compatible with all HPE ProLiant Gen9 Performance servers including the:

- HPE ProLiant DL360 Gen9
- HPE ProLiant DL380 Gen9
- HPE ProLiant ML350 Gen9
- HPE Apollo 2000 Gen9
- HPE Apollo 4200 Gen9
- HPE Apollo 4500 Gen9

HPE Gen10 Flex Slot Low Halogen power supplies are compatible with most HPE ProLiant servers including the:

- HPE ProLiant DL20 Gen10
- HPE ProLiant DL360 Gen10
- HPE ProLiant DL380 Gen10
- HPE ProLiant DL385 Gen10
- HPE ProLiant DL325 Gen10
- HPE ProLiant DL560 Gen10
- HPE ProLiant DL580 Gen10
- HPE ProLiant ML30 Gen10
- HPE ProLiant ML110 Gen10
- HPE ProLiant ML350 Gen10
- HPE Apollo 2000 Gen10
- HPE Apollo 4200 Gen10
- HPE Apollo 4500 Gen10

To check for power supply compatibility, please review the appropriate HPE Server QuickSpecs at <http://www.hpe.com/info/qs>.



Service and Support

Notes: HPE Flexible Slot Power supplies are supported as a part of the HPE Server Infrastructure. No separate HPE Pointnext operational are needed to be purchased.

HPE Technology Services for Industry Standard Servers

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HPE to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Pointnext operational services

HPE Pointnext operational services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Get connected to HPE to improve your support experience

Connecting products to Hewlett Packard Enterprise will help prevent problems with 24x7 monitoring, prefailure alerts, automatic call logging, and parts dispatch. With Connected products, you can have a dashboard to manage your IT anywhere, anytime, from any device. Please visit <https://www.hpe.com/us/en/services/get-connected.html> for more information.

HPE Support Center

Personalized online support portal with access to information, tools and experts to support Hewlett Packard Enterprise business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers. Learn more <https://support.hpe.com/hpesc>

The HPE Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Pointnext operational or Hewlett Packard Enterprise contractual support agreement.

Notes: *The Hewlett Packard Enterprise Support Center Mobile App is subject to local availability.

Parts and materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.



Service and Support

Warranty / Service Coverage

For ProLiant servers and storage systems, this service covers HPE-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by HPE as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

For more information

To learn more on services for HPE ESSN Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: <http://www.hpe.com/services>



Related Options

Locking IEC Jumper Cables	
HPE C13 - C14 WW 250V 10Amp 0.7m Black Locking Power Cord	Q0P67A
HPE C13 - C14 WW 250V 10Amp 1.4m Black Locking Power Cord	Q0P68A
HPE C13 - C14 WW 250V 10Amp 2m Black Locking Power Cord	Q0P69A
HPE C13 - C14 WW 250V 10Amp 3m Black Locking Power Cord	Q0P70A
HPE C19 - C20 WW 250V 16Amp 1.2m Black Locking Power Cord	Q0P71A
HPE C19 - C20 WW 250V 16Amp 2m Black Locking Power Cord	Q0P72A
HPE C19 - C20 WW 250V 16Amp 2.5m Black Locking Power Cord	Q0P73A
HPE C13 - C14 WW 250V 10Amp 0.7m Black 6-pack Locking Power Cord	Q0Q02A
HPE C13 - C14 WW 250V 10Amp 1.4m Black 6-pack Locking Power Cord	Q0Q03A
HPE C13 - C14 WW 250V 10Amp 2m Black 6-pack Locking Power Cord	Q0Q04A
HPE C13 - C14 WW 250V 10Amp 3m Black 6-pack Locking Power Cord	Q0Q05A
Notes: Standard power cables and jumpers do not support Power Line Communications or Power Discovery Services.	
IEC Jumper Cables	
HPE C13 - C14 WW 250V 10A Gray 0.7m Jumper Cord	A0K03A
HPE C13 - C14 WW 250V 10Amp Flint Gray 2.0m Jumper Cord	AF573A
HPE C13 - C14 WW 250V 10Amp 1.4m Jumper Cord	142257-006
HPE C13 - C14 WW 250V 10Amp 2.0m Jumper Cord	A0K02A
HPE C13 - C14 WW 250V 10Amp 2.5m Jumper Cord	142257-002
HPE C13 - C14 WW 250V 10Amp 3.0m Jumper Cord	142257-003
HPE C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	AF572A
HPE C13 - AS3112-3 AU 250V 10Amp 2.5m Power Cord	AF569A
HPE C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord	AF556A
HPE C13-NEMA 6-15P 10A/250V 3.6m Black Power Cord	A0N33A
HPE C13 - GB-1002 CN 250V 10Amp 1.83m Power Cord	AF557A
HPE C13 - IS-1293 IN 240V 6Amp LV 2.0m Power Cord	AF562A
HPE C13 - IS-1293 IN 250V 10Amp HV 2.5m Power Cord	SG579A
HPE C13 - CNS-690 TW 110V 13Amp 1.83m Power Cord	AF561A
HPE C13 - IRAM -2073 AR 250V 10A 2.5m Power Cord	AF558A
HPE C13 - NBR-14136 BR 250V 10Amp 1.83m Power Cord	AF591A
HPE C13 - DK-2.5A DK 250V 10Amp 1.83m Power Cord	AF566A
HPE C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord	AF568A
HPE C13 - SI-32 IL 250V 10Amp 1.83m Power Cord	AF564A
HPE C13 - KSC- 8305 KR 250V 10Amp 1.83m Power Cord	AF560A
HPE C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord	AF567A
HPE C13 - SEV 1011 CH 250V 10Amp 1.83m Power Cord	AF565A
HPE C13 - Nema 5-15P TH/PH 250V 10Amp 1.83m Power Cord	AF559A
HPE C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord	AF570A
Notes: Standard power cables and jumpers do not support Power Line Communications or Power Discovery Services.	

Additional Options

Localized Power Cords	
HPE C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	AF572A
HPE C13 - AS3112-3 AU 250V 10Amp 2.5m Power Cord	AF569A
HPE C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord	AF556A
HPE C13-NEMA 6-15P 10A/250V 3.6m Black Power Cord	AON33A
HPE C13 - GB-1002 CN 250V 10Amp 1.83m Power Cord	AF557A
HPE C13 - IS-1293 IN 240V 6Amp LV 2.0m Power Cord	AF562A
HPE C13 - IS-1293 IN 250V 10Amp HV 2.5m Power Cord	SG579A
HPE C13 - CNS-690 TW 110V 13Amp 1.83m Power Cord	AF561A
HPE C13 - IRAM -2073 AR 250V 10A 2.5m Power Cord	AF558A
HPE C13 - NBR-14136 BR 250V 10Amp 1.83m Power Cord	AF591A
HPE C13 - DK-2.5A DK 250V 10Amp 1.83m Power Cord	AF566A
HPE C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord	AF568A
HPE C13 - SI-32 IL 250V 10Amp 1.83m Power Cord	AF564A
HPE C13 - KSC- 8305 KR 250V 10Amp 1.83m Power Cord	AF560A
HPE C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord	AF567A
HPE C13 - SEV 1011 CH 250V 10Amp 1.83m Power Cord	AF565A
HPE C13 - Nema 5-15P TH/PH 250V 10Amp 1.83m Power Cord	AF559A
HPE C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord	AF570A
Notes: Standard power cables and jumpers do not support Power Line Communications or Power Discovery Services.	
-48VDC Power Cables and Lugs	
HPE 48VDC 2.85m Power Cable	Q0H80A
Notes: Q0H80A is to be used with both Gen9 HPE 800W Flex Slot -48VDC Hot Plug Power Supply (720480-B21) and Gen10 HPE 800W Flex Slot -48VDC Hot Plug Low Halogen Power Supply Kit (865434-B21)	
HPE 1600W -48VDC 600V 3.5m Power Cable Kit	P22173-B21
HPE 1600W -48VDC Power Cable Lug Kit	P36877-B21
Notes: – 1-.P22173-B21 and P36877-B21 are to be used with HPE 1600W Flex Slot -48VDC Power Supply Kit – 2-. Only one power cable kit or power cable lug kit needs to be selected with the power supply – 3-. Power cable lug kit spare PN: P23149-001	
HPE SAFDGRID-SAFDGRID 277V 15Amp DC 2.0m Jumper Cord	J6X00A
Notes: These cables are only used with 277VAC / 380VDC Flex Slot Power Supplies.	

Technical Specifications

HPE 800W Flex Slot Titanium Hot Plug Power Supply (720482-B21)	HPE's Generic Part Number					734868-001
	HPE's Spare Part Number					754378-001
Input Voltage Range (V rms)	200-240					
Frequency Range (Nominal) (Hz)	50-60					
Nominal Input Voltage (V rms)	200	208	220	230	240	
Maximum Rated Output Wattage Rating (Watts)	800	800	800	800	800	
Nominal Input Current (A rms)	9.1	7.5	7.0	4.4	4.2	
Maximum Rated Input Wattage Rating (Watts)	906	891	878	871	870	
Maximum Rated VA (Volt-Amp)	915	900	887	880	879	
Efficiency (%)	88.3	89.8	91.1	91.9	92.0	
Power Factor	0.99	0.99	0.99	0.99	0.99	
Leakage Current (mA)	0.32	0.38	0.40	0.63	0.65	
Maximum Inrush Current (A peak)	30					
Maximum Inrush Current duration (ms)	10					
Maximum British Thermal Unit Rating (BTU-Hr)	2910	2907	2904	2901	2899	



Technical Specifications

HPE 800W Flex Slot -48VDC Hot Plug Power Supply (720480-B21)	HPE's Generic Part Number			735040-001
	HPE's Spare Part Number			754382-001
Input Voltage Range (V DC)	-40 to -72			
Frequency Range (Nominal) (Hz)	DC			
Nominal Input Voltage (V DC)	-40	-48	-72	
Maximum Rated Output Wattage Rating (Watts)	800	800	800	
Nominal Input Current (A DC)	22.0	18.1	11.9	
Maximum Rated Input Wattage Rating (Watts)	882	871	858	
Maximum Rated VA (Volt-Amp)	882	871	858	
Efficiency (%)	90.7	91.9	93.2	
Power Factor	1.0			
Leakage Current (mA)	0.0			
Maximum Inrush Current (A peak)	30			
Maximum Inrush Current duration (ms)	10			
Maximum British Thermal Unit Rating (BTU-Hr)	3008	2971	2929	

HPE 800W Flex Slot Platinum Hot Plug Power Supply (720479-B21)	HPE's Generic Part Number								723599-001
	HPE's Spare Part Number								754381-001
Input Voltage Range (V rms)	100-240								
Frequency Range (Nominal) (Hz)	50-60								
Nominal Input Voltage (V rms)	100	120	127	200	208	220	230	240	
Maximum Rated Output Wattage Rating (Watts)	800	800	800	800	800	800	800	800	800
Nominal Input Current (A rms)	9.1	7.5	7.0	4.4	4.2	4.0	3.8	3.7	
Maximum Rated Input Wattage Rating (Watts)	906	891	878	871	870	869	868	868	
Maximum Rated VA (Volt-Amp)	915	900	887	880	879	877	876	877	
Efficiency (%)	88.3	89.8	91.1	91.9	92.0	92.1	92.2	92.1	
Power Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Leakage Current (mA)	0.32	0.38	0.40	0.63	0.65	0.69	0.72	0.75	
Maximum Inrush Current (A peak)	30								
Maximum Inrush Current duration (ms)	10								
Maximum British Thermal Unit Rating (BTU-Hr)	3090	3040	2997	2972	2968	2963	2960	2963	



Technical Specifications

HPE 1400W Flex Slot Platinum Plus Hot Plug Power Supply Kit (720620-B21)	HPE's Generic Part Number					733427-001
	HPE's Spare Part Number					754383-001
Input Voltage Range (V rms)	200-240					
Frequency Range (Nominal) (Hz)	50-60					
Nominal Input Voltage (V rms)	200	208	220	230	240	
Maximum Rated Output Wattage Rating (Watts)	1400	1400	1400	1400	1400	
Nominal Input Current (A rms)	7.9	7.6	7.2	6.8	6.5	
Maximum Rated Input Wattage Rating (Watts)	1567	1564	1560	1557	1554	
Maximum Rated VA (Volt-Amp)	1583	1580	1575	1572	1570	
Efficiency (%)	89.4	89.5	89.8	89.9	90.1	
Power Factor	0.99	0.99	0.99	0.99	0.99	
Leakage Current (mA)	0.63	0.65	0.69	0.72	0.75	
Maximum Inrush Current (A peak)	30					
Maximum Inrush Current duration (ms)	10					
Maximum British Thermal Unit Rating (BTU-Hr)	5346	5336	5322	5311	5302	

HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit (865408-B21)	HPE's Generic Part Number								865398-001
	HPE's Spare Part Number								866729-001
Input Voltage Range (V rms)	100-240								
Frequency Range (Nominal) (Hz)	50-60								
Nominal Input Voltage (V rms)	100	120	127	200	208	220	230	240	
Maximum Rated Output Wattage Rating (Watts)	500	500	500	500	500	500	500	500	
Nominal Input Current (A rms)	5.6	4.6	4.4	2.7	2.6	2.5	2.4	2.3	
Maximum Rated Input Wattage Rating (Watts)	557	550	549	539	539	538	537	537	
Maximum Rated VA (Volt-Amp)	563	556	554	545	544	543	543	542	
Efficiency (%)	89.7	90.8	91.1	92.7	92.8	93.0	93.1	93.1	
Power Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Leakage Current (mA)	0.33	0.39	0.41	0.65	0.68	0.72	0.75	0.78	
Maximum Inrush Current (A peak)	30								
Maximum Inrush Current duration (ms)	10								
Maximum British Thermal Unit Rating (BTU-Hr)	1902	1878	1873	1840	1838	1835	1833	1832	



Technical Specifications

HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit (865414-B21)	HPE's Generic Part Number								865409-001
	HPE's Spare Part Number								866730-001
Input Voltage Range (V rms)	100-240								
Frequency Range (Nominal) (Hz)	50-60								
Nominal Input Voltage (V rms)	100	120	127	200	208	220	230	240	
Maximum Rated Output Wattage Rating (Watts)	800	800	800	800	800	800	800	800	
Nominal Input Current (A rms)	9.1	7.5	7.0	4.4	4.2	4.0	3.8	3.6	
Maximum Rated Input Wattage Rating (Watts)	899	887	883	867	866	865	864	864	
Maximum Rated VA (Volt-Amp)	908	896	892	876	875	874	873	873	
Efficiency (%)	89.0	90.2	90.6	92.3	92.4	92.5	92.6	92.6	
Power Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Leakage Current (mA)	0.33	0.39	0.41	0.65	0.68	0.72	0.75	0.78	
Maximum Inrush Current (A peak)	30								
Maximum Inrush Current duration (ms)	10								
Maximum British Thermal Unit Rating (BTU-Hr)	3067	3025	3012	2958	2956	2951	2948	2949	

HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit (830272-B21)	HPE's Generic Part Number					830262-001
	HPE's Spare Part Number					863373-001
Input Voltage Range (V rms)	200-240					
Frequency Range (Nominal) (Hz)	50-60					
Nominal Input Voltage (V rms)	200	208	220	230	240	
Maximum Rated Output Wattage Rating (Watts)	1600	1600	1600	1600	1600	
Nominal Input Current (A rms)	8.7	8.3	7.9	7.5	7.2	
Maximum Rated Input Wattage Rating (Watts)	1734	1732	1726	1727	1725	
Maximum Rated VA (Volt-Amp)	1736	1734	1729	1729	1728	
Efficiency (%)	92.2	92.4	92.7	92.7	92.8	
Power Factor	1.00	1.00	1.00	1.00	1.00	
Leakage Current (mA)	0.63	0.65	0.69	0.72	0.75	
Maximum Inrush Current (A peak)	30					
Maximum Inrush Current duration (ms)	10					
Maximum British Thermal Unit Rating (BTU-Hr)	5918	5911	5888	5891	5884	



Technical Specifications

HPE 800W Flex Slot -48VDC Hot Plug Low Halogen Power Supply Kit (865434-B21)	HPE's Generic Part Number				865431-001
	HPE's Spare Part Number				866728-001
Input Voltage Range (V DC)	-40 to -72				
Frequency Range (Nominal) (Hz)	DC				
Nominal Input Voltage (V DC)	40	48	72		
Maximum Rated Output Wattage Rating (Watts)	800	800	800		
Nominal Input Current (A DC)	22.1	18.2	12.0		
Maximum Rated Input Wattage Rating (Watts)	874	865	854		
Maximum Rated VA (Volt-Amp)	883	873	862		
Efficiency (%)	91.5	92.5	93.7		
Power Factor	1.0				
Leakage Current (mA)	0.13	0.16	0.23		
Maximum Inrush Current (A peak)	30				
Maximum Inrush Current duration (ms)	10				
Maximum British Thermal Unit Rating (BTU-Hr)	2983	2951	2912		
HPE 1600W Flex Slot -48VDC Hot Plug Power Supply Kit (P17023-B21)	HPE's Generic Part Number				P17021-001
	HPE's Spare Part Number				P18510-001
Input Voltage Range (V DC)	-40 to -72				
Frequency Range (Nominal) (Hz)	DC				
Nominal Input Voltage (V DC)	40	48	72		
Maximum Rated Output Wattage Rating (Watts)	1600	1600	1600		
Nominal Input Current (A DC)	44.2	36.6	24.4		
Maximum Rated Input Wattage Rating (Watts)	1766	1758	1755		
Maximum Rated VA (Volt-Amp)	1766	1758	1755		
Efficiency (%)	90.6	91.0	91.2		
Power Factor	1.0				
Leakage Current (mA)	N/A	N/A	N/A		
Maximum Inrush Current (A peak)	30				
Maximum Inrush Current duration (ms)	10				
Maximum British Thermal Unit Rating (BTU-Hr)	6026	6000	5989		
HPE 800W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit (865438-B21)	HPE's Generic Part Number				865435-001
	HPE's Spare Part Number				866793-001
Input Voltage Range (V rms)	200-240				
Frequency Range (Nominal) (Hz)	50-60				
Nominal Input Voltage (V rms)	200	208	220	230	240
Maximum Rated Output Wattage Rating (Watts)	800	800	800	800	800
Nominal Input Current (A rms)	4.3	4.1	3.9	3.7	3.6
Maximum Rated Input Wattage Rating (Watts)	851	851	850	848	848
Maximum Rated VA (Volt-Amp)	860	859	858	857	857
Efficiency (%)	94.0	94.0	94.2	94.3	94.3
Power Factor	0.99	0.99	0.99	0.99	0.99
Leakage Current (mA)	0.65	0.68	0.72	0.75	0.78
Maximum Inrush Current (A peak)	30				
Maximum Inrush Current duration (ms)	10				
Maximum British Thermal Unit Rating (BTU-Hr)	2905	2903	2899	2895	2893



Technical Specifications

HPE 800W Flex Slot Universal Hot Plug Low Halogen Power Supply Kit (865428-B21) 277VAC	HPE's Generic Part Number					865425-001
	HPE's Spare Part Number					866727-001
Input Voltage Range (V rms)	200-277					
Frequency Range (Nominal) (Hz)	50-60					
Nominal Input Voltage (V rms)	200	208	230	240	277	
Maximum Rated Output Wattage Rating (Watts)	800	800	800	800	800	
Nominal Input Current (A rms)	4.4	4.2	3.8	3.6	3.1	
Maximum Rated Input Wattage Rating (Watts)	869	868	865	864	861	
Maximum Rated VA (Volt-Amp)	877	876	874	872	869	
Efficiency (%)	92.1	92.2	92.5	92.6	93.0	
Power Factor	0.99	0.99	0.99	0.99	0.99	
Leakage Current (mA)	0.65	0.68	0.75	0.78	0.90	
Maximum Inrush Current (A peak)	8					
Maximum Inrush Current duration (ms)	10					
Maximum British Thermal Unit Rating (BTU-Hr)	2964	2960	2951	2947	2936	

HPE 800W Flex Slot Universal Hot Plug Low Halogen Power Supply Kit (865428-B21) HVDC	HPE's Generic Part Number					865425-001
	HPE's Spare Part Number					866727-001
Input Voltage Range (V rms)	380					
Frequency Range (Nominal) (Hz)	DC					
Nominal Input Voltage (V rms)	380					
Maximum Rated Output Wattage Rating (Watts)	800					
Nominal Input Current (A rms)	2.3					
Maximum Rated Input Wattage Rating (Watts)	863					
Maximum Rated VA (Volt-Amp)	863					
Efficiency (%)	92.8					
Power Factor	1.00					
Leakage Current (mA)	0.0					
Maximum Inrush Current (A peak)	8					
Maximum Inrush Current duration (ms)	10					
Maximum British Thermal Unit Rating (BTU-Hr)	2943					



Technical Specifications

HPE 1800W-2200W Flex Slot Platinum Hot Plug Power Supply Kit (876935-B21)	HPE's Generic Part Number				876932-001
	HPE's Spare Part Number				882135-001
Input Voltage Range (V rms)	200-240				
Frequency Range (Nominal) (Hz)	50-60				
Nominal Input Voltage (V rms)	200	208	220	230	240
Maximum Rated Output Wattage Rating (Watts)	1800	1900	2000	2100	2200
Nominal Input Current (A rms)	9.75	9.91	9.88	9.94	9.99
Maximum Rated Input Wattage Rating (Watts)	1931	2041	2153	2262	2373
Maximum Rated VA (Volt-Amp)	1951	2062	2175	2285	2397
Efficiency (%)	93.20	93.09	92.90	92.83	92.72
Power Factor	0.99	0.99	0.99	0.99	0.99
Leakage Current (mA)	0.63	0.65	0.69	0.72	0.75
Maximum Inrush Current (A peak)	30				
Maximum Inrush Current duration (ms)	10				
Maximum British Thermal Unit Rating (BTU-Hr)	6590	6964	7345	7719	8096



Technical Specifications

All AC Power Supplies:	
Operating Temperature	41° to 131°F (5° to 55°C)
Operating Relative Humidity (%)	5% to 95%, non-condensing
Operating Elevation	The maximum ambient temperature of the power supply shall have an altitude de-rating, from sea level, of 1.0°C per every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft).
Storage Temperature	-40° to 185°F (-40 to 85°C)
Storage Relative Humidity (%)	5% to 95%, non-condensing
Storage Elevation	0 to 50,000ft (0 to 15,240m)
Input Voltage	Low Line - Rated: 100V - 127V; Min 90V to Max 132V High Line - Rated: 200 - 240V; Min 180V to Max 264V (model 720620-B21, 720482-B21, 830272-B21, 865438-B21, and 876935-B21 supports High Line AC input only) High Line - Rated: 200 - 277VAC; Min 180VAC to Max 305VAC (model 720484-B21 only) 240VDC Support - Rated 240VDC; Min 180VDC to Max 320VDC (model 720479-B21, 720620-B21, 865408-B21, 865414-B21, 865438-B21, 830272-B21, and 876935-B21 only)
Input Frequency	Rated: 50 - 60Hz; Min 47Hz to Max 63Hz
FCC EMI Certification	CE Mark, UL, cUL, IEC, EN, KCC, BSMI, CCC, TUV, C-tick, CISPR Class A
Mechanical Dimensions (WxHxD)	2.68 x 1.59 x 8.87 in (6.80 x 4.04 x 22.53 cm) Notes: Length includes from handle to card-edge.
Unit Weight	2.0 lbs. (0.91 kg) 3.0 lbs. (1.36 kg) (model 720620-B21 only)
Shipping Dimensions (WxHxD)	14.75 x 7.5 x 5.75 in (37.47 x 19.05 x 14.61 cm)
Shipping Weight	3.5 lb (1.59 kg) 4.5 lb (2.04 kg) (model 720620-B21 only)
Kit Contents	Model 720479-B21, 720620-B21 720482-B21, 865408-B21 865414-B21, 830272-B21, and 865438-B21 ship with: (1) Power supply unit, (1) IEC C13-C14 jumper cable, installation/safety guide Model 720484-B21, 865428-B21 ship with: (1) Power supply unit, installation/safety guide
Power Supply Hold-Up time in the event of AC loss	
Condition: 100% rated output power (Time in Milliseconds – Minimum)	Non-Redundant (1+0) – 10ms Redundant (1+1) – 20ms
Condition: 50% rated output power (Time in Milliseconds – Minimum)	Non-Redundant (1+0) – 20ms Redundant (1+1) – 30ms

Technical Specifications

All DC Power Supplies:	
Operating Temperature	41° to 131°F (5° to 55°C)
Operating Relative Humidity (%)	5% to 95%, non-condensing
Operating Elevation	0 to 5,000ft (1,524m) with no derating; The maximum ambient temperature of the power supply shall have an altitude derating from sea level, of 1.0°C per every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft).
Storage Temperature	-40° to 185°F (-40 to 85°C)
Storage Relative Humidity (%)	5% to 95%, non-condensing
Storage Elevation	0 to 50,000ft msl
Input Voltage	48VDC to 54VDC (nominal); Min 40VDC to Max 72VDC (model 720480-B21, 865434-B21, P17023-B21 only) 380VDC(nominal); Min 240VDC to Max 420VDC (model 865428-B21 only)
Input Frequency	DC input
Conformance Standards	CE Mark, UL, CSA, IEC, EN, CNS, KC, CCC, C-tick, TUV, CISPR Class A
Mechanical Dimensions (WxHxD)	1.58 x 2.67 x 7.20 in (4.03 x 6.80 x 18.29 cm)
Unit Weight	2.5 lb (1.13 kg)
Shipping Dimensions (WxHxD)	14.87 x 7.25 x 5.63 in (37.77 x 18.42 x 14.30 cm)
Shipping Weight	3.5 lb (1.59 kg) (for model 720480-B21, 865428-B21, 865434-B21, P17023-B21)
Kit Contents	Models 720480-B21, 865434-B21, P17023-B21 and 865428-B21 ship with: (1) Power supply unit, installation/safety guide



Technical Specifications

800W Power Supply with 400 W BBU	
Operating Temperature	50° to 98°F (10° to 37°C)
Operating Relative Humidity (%)	5% to 95%, non-condensing
Operating Elevation	The maximum ambient temperature of the power supply shall have an altitude de-rating of 2.0°C per every 304.8 m (1000 ft) starting from 1524m (5,000 ft.) up to 3048m (10,000 ft.) above sea level Non-Operating: 15240m (50,000 ft.) above sea level
Storage Temperature	-22° to 104°F (-30 to 40°C) for 3 months -22° to 77°F (-30 to 25°C) for 18 months
Storage Relative Humidity (%)	5% to 95%, non-condensing
Storage Elevation	0 to 50,000ft (0 to 15,240m)
Input Voltage	Low Line - Rated: 100V - 127V; Min 90V to Max 132V 500W Maximum Output Power High Line - Rated: 200 - 240V; Min 180V to Max 264V 800W Maximum Output Power
Input Frequency	Rated: 50 - 60Hz; Min 47Hz to Max 63Hz
FCC EMI Certification	CE Mark, UL, cUL, IEC, EN, KCC, BSMI, CCC, TUV, C-tick, CISPR Class A
Mechanical Dimensions (WxHxD)	2.68 x 1.59 x 8.87 in (6.80 x 4.04 x 22.53 cm) Notes: Length includes from handle to card-edge.
Unit Weight	2.2 lbs. (1 kg)
Shipping Dimensions (WxHxD)	14.75 x 7.5 x 5.75 in (37.47 x 19.05 x 14.61 cm)
Kit Contents	Models 827608-B21 ship with: (1) Power supply unit, installation/safety guide The battery product may require replacement after 3 years operation in order to assure that the battery product retains the required capacity to fulfill the run time requirements of the end use system. The End use system will additionally provide Warning alert IML messaging to inform users of the need to replace the battery product when the remaining battery capacity is determined to be low.

Environment-friendly Products and Approach - End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **Hewlett Packard Enterprise web site**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.



Summary of Changes

Date	Version History	Action	Description of Change
07-Dec-2020	Version 11	Changed	Standard Features, Related Options, and Technical Specifications were revised.
04-May-2020	Version 10	Changed	SKUs were Updated
01-Oct-2018	Version 9	Changed	SKUs were Updated
02-Jul-2018	Version 8	Changed	Standard Features, Related Options, and Technical Specifications were revised.
04-Jun-2018	Version 7	Added	New 1800W-2200W Flex Slot Power Supply was added to the QuickSpecs.
		Changed	Overview, Standard Features, and Power Specifications were revised.
04-Dec-2017	Version 6	Changed	Overview and Standard Features were revised.
25-Sep-2017	Version 5	Added	New HPE Scalable Persistent Memory 800W Flex Slot PSU and 400W BBU 2-pack FIO Kit was added to the QuickSpecs.
		Changed	Overview, Standard Features, Power Specifications, and Technical Specifications were revised.
11-Jul-2017	Version 4	Changed	Overview, Standard Features, Related Options, Power Specifications, and Technical Specifications were revised.
08-Jan-2016	Version 3	Changed	Overview and Related Options sections were revised.
30-Mar-2015	Version 2	Added	Added new Power Supply Kits.
		Changed	Overview, Standard Features, Service and Support, Related Options, Power Specifications, and Technical Specifications were revised.
30-Mar-2015	Version 1	Created	New QuickSpecs



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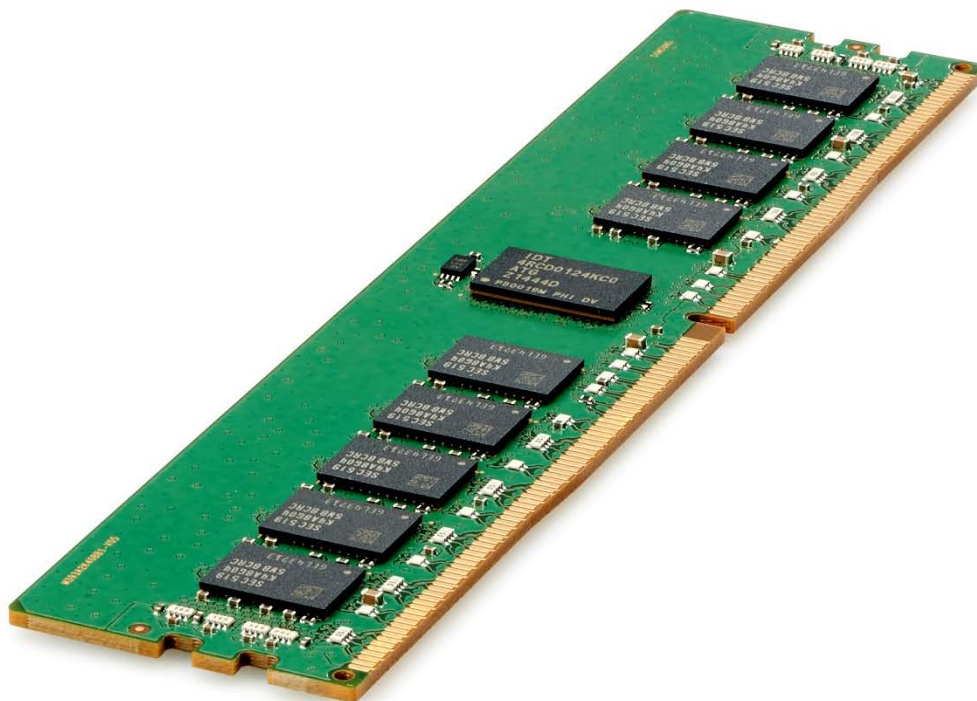
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Overview

HPE DDR4 SmartMemory

HPE DDR4 SmartMemory delivers great performance, reliability, and efficiency. Our large selection of server memory solutions provides the compatibility, capacity and bandwidth you need to productively manage your expanding workload with HPE ProLiant Gen9, Gen10, and Gen10 Plus servers, Apollo family servers, Synergy systems, and Blade systems.

As workloads grow and data center trends such as server virtualization, cloud computing, and the use of large database applications increase the need for higher-capacity memory with greater uptime, the quality and reliability of DRAM become ever more important. HPE SmartMemory goes through additional rigorous qualification and testing processes that unlock extended memory performance features available only with HPE Gen9, Gen10, and Gen10 Plus servers. This extensive testing ensures that HPE server memory is completely compatible with and optimized for HPE servers.



HPE DDR4 SmartMemory

What's New

- HPE SmartMemory 3200 MT/s memory supported on HPE Gen10 Plus AMD servers

Overview

Models

Registered Memory Kits

HPE 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805347- X21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805349- X21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2400 CAS-17-17-17 Registered Smart Memory Kit	P00423- X21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805351- X21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815097- X21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815098- X21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	838081- X21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	835955- X21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	838089- X21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	815100- X21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	838083- X21
HPE 32GB (1x32GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Memory Kit	P38446-X21
HPE Synergy 32GB (1x32GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Memory Kit	P38448-X21
HPE 32GB (1x32GB) Single Rank x4 DDR4-3200 CAS-22-22-22 Registered Memory Kit	P38454-X21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Samsung Memory Kit	P05590- X21
HPE 64GB (1x64GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Smart Memory Kit	P05592- X21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00918- X21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart	P19040- X21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00920- X21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart	P19041- X21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00922- X21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart	P19042- X21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00924- X21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart	P19043- X21
HPE 64GB (1x64GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit	P00930- X21
HPE 64GB (1x64GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart	P19045- X21
HPE 8GB (1x8GB) Single Rank x8 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P07638- X21
HPE 16GB (1x16GB) Single Rank x4 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P07640- X21
HPE 16GB (1x16GB) Dual Rank x8 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P07642- X21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P07646- X21
HPE 32GB (1x32GB) Dual Rank x8 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P07644- X21
HPE 64GB (1x64GB) Dual Rank x4 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P07650- X21



Overview

Models

Load-reduced Memory Kits

HPE 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	805358- X21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2666 CAS-19-19-19 Load Reduced Smart Memory Kit	815101- X21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2666 CAS-19-19-19 Load Reduced Smart Memory Kit	838085- X21
HPE 128GB (1x128GB) Octal Rank x4 DDR4-2666 CAS-22-19-19 3DS Load Reduced Memory Kit	815102- X21
HPE 128GB (1x128GB) Octal Rank x4 DDR4-2666 CAS-22-19-19 3DS Load Reduced Smart Memory Kit	838087- X21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced Smart Memory Kit	P00926- X21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced Smart	P19044- X21
HPE 128GB (1x128GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced	P11040- X21
HPE 128GB (1x128GB) Quad Rank x4 DDR4-2933 CAS-21-21-21 Load Reduced	P19047- X21
HPE 128GB (1x128GB) Octal Rank x4 DDR4-2933 CAS-24-21-21 Load Reduced 3DS Smart Memory Kit	P00928- X21
HPE 128GB (1x128GB) Quad Rank x4 DDR4-3200 CAS-22-22-22 Load Reduced Smart Memory Kit	P07652- X21

Notes: Memory DIMM availability for a specific server platform is dependent upon completion of certification testing.

Fast Fault Tolerance Factory Setting

HPE Smart Memory Fast Fault Tolerance FIO Setting	875293-B21
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Notes: Select this part number to enable HPE Fast Fault Tolerance, which allows server memory to run at the resiliency of double device data correction (DDDC), but with significantly higher performance. HPE Fast Fault Tolerance is available on all HPE Gen10 servers with an Intel® central processing unit.

XXXXXX-**X21** is SKU designation formed by a common six digit part number and a -**X21** suffix that identifies a SKU that is available across multiple server family lines. Refer to the table below to find the SKU suffix that applies to the specific server product line this option can be ordered with.

-B21	-H21	-K21
COMPUTE	SPECIALIZED COMPUTE	STORAGE
HPE Cloudline CL2100/CL2200/CL2800/CL3100/CL4100/CL5200/CL5800 Servers HPE Composable Cloud for ProLiant DL HPE Converged System 700/750 HPE ProLiant BL460c/BL660c Servers HPE ProLiant DL20/DL160/DL180 Servers HPE ProLiant DL325/DL360/DL380/DL385/DL560/DL580 Servers HPE ProLiant DX360/DX380 Servers HPE ProLiant DX170r/DX190r/DX200/DX560/DX4200 Servers HPE ProLiant MicroServer HPE ProLiant for Microsoft Azure Stack HPE ProLiant ML30/ML110/ML350 Servers HPE Synergy 480/660 Systems HPE Synergy D3940 Storage Module	HPE Apollo 35/40/70 Systems HPE Apollo 2000/6000 Servers HPE XL170r/XL190r/XL270d (Apollo 6500) Gen10 Server for BlueData Software HPE Converged System 300/500 HPE Edgeline Systems and Servers HPE Integrity BL860c i6/BL870c i6/BL890c i6 Server Blades HPE Integrity MC990 X Server HPE Integrity rx2800 i6 Server HPE Integrity Superdome HPE SGI 8600 System HPE Solutions for SAP HANA (TDI) HPE Apollo Systems for BlueData Software	HPE Apollo 4200 Gen9/Gen10 Servers HPE Apollo 4200 Gen10 LFF Server for BlueData Software HPE Apollo 4510 Gen10 System HPE D3000/D6020/D8000 Disk Enclosures HPE D2220sb/D2500sb Storage Blade HPE Scalable Object Storage with Scality RING HPE SimpliVity 2600 HPE SimpliVity 325/380 Gen10 HPE Storage File Controllers HPE StoreEasy 1460/1560/1650/1660/1860

Disclaimer: This may not be a complete listing of applicable servers



Standard Features

What is HPE SmartMemory?

HPE SmartMemory uniquely optimizes memory performance on the HPE ProLiant Rack and Tower servers, Apollo family servers, Blade systems, and Synergy systems. Authenticated HPE SmartMemory supports extended memory performance in the competitive landscape and provides customers with service enhancement through HPE Active Health Systems and other HPE proprietary software.

Quality and Performance

HPE SmartMemory undergoes a rigorous qualification process to provide customers with the highest server memory quality options. Its performance is tested and optimized for HPE servers, supporting unique features only available with HPE servers and systems. In addition, it enhances memory throughput up to 23% and achieves an improvement in latency of up to 25%.

HPE Active Health System

HPE SmartMemory works in conjunction with the HPE Active Health System which monitors changes to the server hardware configuration to enable lifecycle monitoring of memory health status. Having insight into memory-related service events will shorten problem diagnosis and deliver rapid resolutions if and when failures occur. Whereas the pre-failure alert simply notifies the administrator of an impending failure, HPE SmartMemory can provide rich insight into memory-related events like multi-bit errors or configuration issues.

Support Matrix

Please visit the following URL for the latest list of supported servers:

<http://www.hpe.com/servers/servermemoryconfigurator>

Other Resources

For the latest updates on HPE Server Options, visit: <http://www.hpe.com/us/en/servers/memory.html>

For more information on HPE Persistent Memory options, visit: <https://www.hpe.com/us/en/servers/persistent-memory.html>



Service and Support

HPE Support Center

HPE Support Center offers personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers. Learn more: <https://www.hpe.com/us/en/services/it-support.html>

The HPE Support Center mobile app helps you resolve issues yourself or quickly connect to an agent for live support. Now you can get access to personalize IT support anywhere, anytime.

Notes: The HPE Support Center mobile app is subject to local availability

Parts and materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

Warranty / Service Coverage

For ProLiant servers and storage systems, this service covers HPE branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, tower UPS products, and external monitors up to 22 inches and tower UPS products. These items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

For details on the HPE Server Options limited warranty, visit:

https://support.hpe.com/hpsc/doc/public/display?docId=emr_na-c00383139

General Memory Population Rules and Guidelines

For details on the memory population rules for HPE Intel Xeon Gen10 servers, visit:

<http://www.hpe.com/docs/memory-population-rules>

For details on the memory population rules for HPE Intel Xeon Gen10 Plus servers, visit:

<http://www.hpe.com/docs/memory-population-rules-Gen10Plus>

For details on the memory population rules for HPE AMD Gen10 servers, visit:

<http://www.hpe.com/docs/amd-population-rules>

For details on the memory population rules for HPE AMD Gen10 Plus servers, visit:

<http://www.hpe.com/docs/amd-population-rules-Gen10Plus>



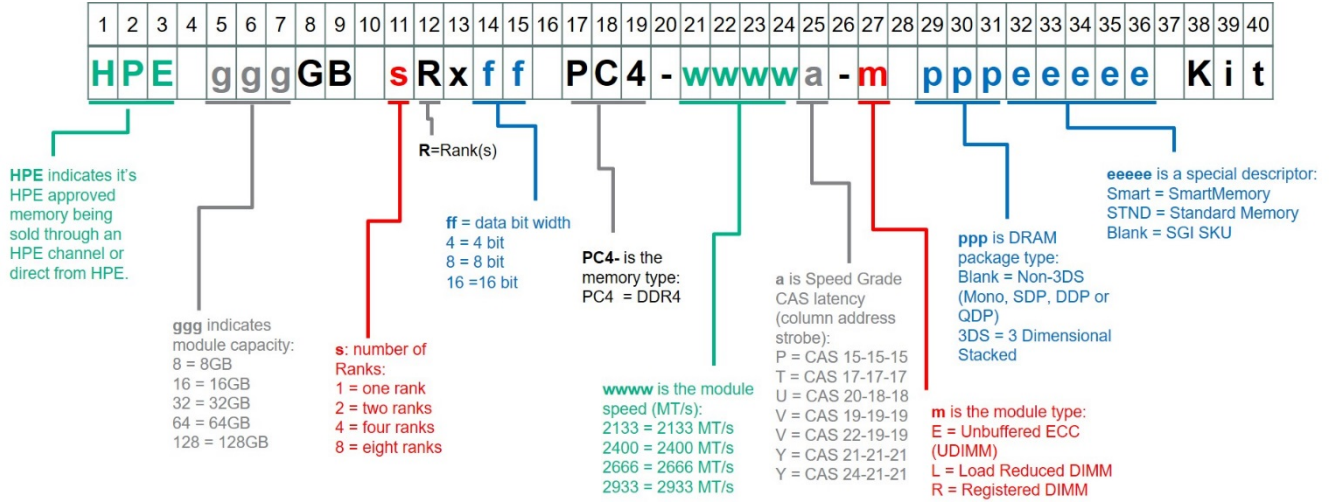
Technical Specifications

Memory Speed by Processor Model

For details on HPE server memory speeds, visit: <http://www.hpe.com/docs/memory-speed-table>

Memory options part number decoder

Short Name



Summary of Changes

Date	Version History	Action	Description of Change
07-Dec-2020	Version 25	Changed	SKUs were updated in Models Section
15-Jun-2021	Version 24	Changed	SKUs were added in Models Section
06-Apr-2020	Version 23	Changed	Technical Specifications Section was updated
09-Dec-2019	Version 22	Changed	SKU Section was updated
02-Dec-2019	Version 21	Changed	Overview SKUs section was updated
07-Oct-2019	Version 20	Changed	Configuration Information section was updated
05-Aug-2019	Version 19	Changed	Overview Section was updated
17-May-2019	Version 18	Added	SKUs were added in Models sections: P19040- X21 , P19041- X21 ,P19042- X21 ,P19043- X21 ,P19044- X21 ,P19045- X21 ,P19046-B21,P19047- X21
02-Apr-2019	Version 17	Changed	Technical Specifications section was updated
17-Dec-2018	Version 16	Changed	Overview section was updated. SKU added in Overview section: P00423- X21 , 838089- X21 . SKU deleted in Overview section: 836220-B21
01-Oct-2018	Version 15	Changed	Overview section was updated.
06-Aug-2018	Version 14	Changed	Overview, Standard Features, and Service and Support sections were updated. SKUs were added in Models sections: P05592- X21 . Obsolete SKUs were deleted: 838079- X21 , 838089- X21 , P05580-B21, 838083- X21 , 726722-B21.
04-Jun-2018	Version 13	Changed	Overview, Standard Features, Service and Support sections were updated. SKUs added in Models section: 726718-B21, 726719-B21, 728629-B21, 805347- X21 , 836220-B21, 815097- X21 , 876181-B21, 838079- X21 , P05586-B21, 838081- X21 , 838089- X21 , P05588- X21 , 838083- X21 , P05590- X21 , 726722-B21, 726724-B21, 805353-B21, 809208-B21, 815102- X21 , 838085- X21 , 838087- X21 .
05-Mar-2018	Version 12	Changed	Obsolete SKUs deleted: 726717-B21, 759934-B21, 726720-B21.
04-Dec-2017	Version 11	Changed	Overview, Standard Features, and Service and Support sections were updated. SKUs added in Models section.
25-Sep-2017	Version 10	Changed	Overview, Standard Features, Platform Information, Service and Support, and Technical Specifications section were updated. Obsolete SKU was deleted: 792278-B21
11-Jul-2017	Version 9	Changed	Overview, Standard Features, Platform Information, Service and Support, and Technical Specifications section were updated. SKUs added in Platform Information section: 815097- X21 , 876181-B21, 815098- X21 , 835955- X21 , 815100- X21 , 815101- X21 , 815102- X21 .
13-Feb-2017	Version 8	Changed	Models section was updated.
06-Jun-2016	Version 7	Changed	Overview, Compatibility, Standard Features, Service and Support, and Technical Specifications sections were updated. Memory Speed Table, Ground rules updates, Tech Term edits
31-Mar-2016	Version 6	Changed	Overview, Overview, Standard Features, Service and Support, and Technical Specifications SKU added in Models section: 805347- X21 , 805349- X21 , 836220-B21, 805351- X21 , 805353-B21, 805358- X21 , 726718-B21, 726719-B21, 728629-B21, 726722-B21, 809208-B21
01-Jun-2015	Version 5	Changed	SKU added in Models section: 726724-B21 What 's new, Technical Specifications and models sections were updated.
30-Mar-2015	Version 4	Changed	Overview, Service and Support and Technical Specifications sections were updated. SKU added on Models: 728629-B21
16-Jan-2015	Version 3	Changed	Performance section on Standard Features was updated
01-Dec-2014	Version 2	Changed	Overview and Technical Specifications sections were updated
09-Sep-2014	Version 1	Added	SKUs added to Models: 726717-B21, 759934-B21, 726720-B21, 792278-
		New	New QuickSpecs.



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Rack Servidor

Rack servidor com portas perfuradas para ventilação, aplicação em sistemas de cabeamento estruturado vertical ou primário, uso interno, em salas de distribuição principal, ou para cabeamento horizontal ou secundário, usado para organização dos cabos e equipamentos ativos, passivos e acessórios da rede estruturada.



Características

- Rack totalmente desmontável;
- Atende especificações ANSI/EIA RS-310-D, I EC 297-2, DIN 41494 partes 1 e 7;
- Grau de proteção IP20;
- Estrutura em aço com 2,0 mm;
- Fornecido com terminais de aterramento;
- Porta frontal com perfil curvo perfurada, com índice de ventilação de 71%, reversível, com moldura, em aço SAE 1010/1020 1,2 mm, com ângulo de abertura de 220°, fechadura escamoteável;
- Porta traseira bipartida perfurada com índice de ventilação de 71%, em aço SAE 1010/1020 1,2 mm, reversíveis em relação ao lado de abertura da porta e intercambiáveis, possibilitando a instalação em ambas as faces do rack (traseira ou frontal), fechadura escamoteável;
- Laterais em aço 1,2 mm, removíveis, com fecho rápido (Opcional fechadura do tipo cilíndrico);
- Planos (frontal e traseiro) em aço 1,9 mm, com numeração de Us, serigrafados
- Entrada e saída de cabos pelo teto ou pela base com tampa modular fechada com parafusos, para que quando não utilizada, não haja ingresso de objetos indesejados no interior do rack;

- Teto em aço SAE 1010/1020 # 1,2 mm, com perfuração tipo colmeia, preparado para instalação de unidade de ventilação;
- Pintura pó em micro epóxi na cor preta RAL 9004;
- Suporte de carga estática para até 800 kg;
- Base em aço SAE 1010/1020 # 1,2 mm, preparada para a instalação de rodízios e pés niveladores simultâneos;
- Planos em aço SAE 1010/1020 # 2 mm, galvanizados e anti-estáticos;

Opcionais

- Fechadura tipo cilindro para fechamento das tampas laterais;
- Kit rodizio de fácil instalação;

Código	Descrição
** 0000000000	RACK SERVIDOR DESMONTÁVEL 19" X 42U 800X1100 mm PT
3004280120	RACK SERVIDOR DESMONTÁVEL 19" X 42U 800X1200 mm PT
3004480000	RACK SERVIDOR DESMONTÁVEL 19" X 44U 800X1000 mm PT
3004480110	RACK SERVIDOR DESMONTÁVEL 19" X 44U 800X1100 mm PT
3004480020	RACK SERVIDOR DESMONTÁVEL 19" X 44U 800X1200 mm PT

ADICIONAL

Racks com largura de 800 mm acompanham 1 par de guias verticais para organização de cabos.



Podemos fabricar outros modelos de acordo com seu projeto técnico, atendendo as exigências solicitadas para diferentes aplicações de utilização e de espaço agregando mais funcionalidade operacional.

CATÁLOGO



IP METAL®

IP METAL®

COMPOSTA POR UMA EQUIPE DE PROFISSIONAIS CAPACITADOS E ESTRUTURA FABRIL DE ÚLTIMA GERAÇÃO, A IP METAL CHEGA AO MERCADO PREPARADA PARA SUPERAR AS EXPECTATIVAS.

Aliado a um design inovador e um acabamento diferenciado, a IP METAL apresenta ao mercado produtos com características modernas para o seu projeto. Seu portfólio conta com uma linha completa de Gabinetes de Parede, Gabinetes de Cabeamento, Gabinetes para Servidores, Gabinetes Abertos de Alta Densidade (HD) e acessórios.

Sua linha de produtos espelha o seu comprometimento com o constante desenvolvimento e aprimoramento, típicos da infraestrutura de TI. Além disso, todos os produtos foram planejados com estrutura desmontável, pensando na facilidade e redução de custo em armazenamento e frete. Considerando a crescente dos problemas ambientais, a IP METAL exerce um papel fundamental ao investir continuamente em práticas sustentáveis em seu processo de produção visando o respeito ambiental.

Esta é a IP METAL, uma indústria que além de disponibilizar produtos de qualidade superior, compromete-se com questões relacionadas ao bem-estar social.



RACK 19" PARA CABEAMENTO ESTRUTURADO DESMONTÁVEL

Os Racks para cabeamento estruturado IP METAL, além de desmontáveis, foram desenvolvidos para acomodação de uma grande quantidade de cabos, com opção de aberturas para passagem de cabos para o teto e base do rack.



CARACTERÍSTICAS:

- Totalmente desmontável
- Atende especificações ANSI/EIA RS-310-D, IEC 297-2, DIN41494 partes 1 e 7
- Grau de proteção IP20
- Estrutura em aço com 1,50 mm
- Fornecido com terminais de aterramento
- Porta frontal reversível em vidro temperado, com ângulo de abertura de 220° e fechadura tipo cilindro
- Tampa traseira em aço, com fecho rápido.
- Laterais em aço, com fecho rápido
- Planos (frontal e traseiro) com numeração de Us
- Entrada e saída de cabos pelo teto ou pela base
- Teto com preparação para instalação de ventiladores
- Acompanha um conjunto com quatro pés niveladores
- Pintura pó em micro epóxi na cor preta RAL 9004

OPCIONAIS:

- Fechadura tipo cilindro para tampas laterais;
- Kit rodízio de fácil instalação

Fabricação	Altura	Largura	Profundidade	Carga	Cor
2002060600	20U (1076 mm)	600 mm	600 mm	800 kg	Preto
2002060800	20U (1076 mm)	600 mm	800 mm	800 kg	Preto
2002460600	24U (1254 mm)	600 mm	600 mm	800 kg	Preto
2002460800	24U (1254 mm)	600 mm	800 mm	800 kg	Preto
2002860600	28U (1432 mm)	600 mm	600 mm	800 kg	Preto
2002860800	28U (1432 mm)	600 mm	800 mm	800 kg	Preto
2003260600	32U (1610 mm)	600 mm	600 mm	800 kg	Preto
2003260800	32U (1610 mm)	600 mm	800 mm	800 kg	Preto
2003660600	36U (1788 mm)	600 mm	600 mm	800 kg	Preto
2003660800	36U (1788 mm)	600 mm	800 mm	800 kg	Preto
2004060600	40U (1966 mm)	600 mm	600 mm	800 kg	Preto
2004060800	40U (1966 mm)	600 mm	800 mm	800 kg	Preto
2004460600	44U (2144 mm)	600 mm	600 mm	800 kg	Preto
2004460800	44U (2144 mm)	600 mm	800 mm	800 kg	Preto
2004480800**	44U (2144 mm)	800 mm	800 mm	800 kg	Preto

**Acompanha um par de guias de cabo verticais.

RACK 19" SERVIDOR DESMONTÁVEL

Devido às perfurações hexagonais (colmeia) nas portas frontal e traseira, os Racks para servidores são ideais para uso em Data Centers e ambientes climatizados.

CARACTERÍSTICAS:



- Totalmente desmontável;
- Atende especificações ANSI/EIA RS-310-D, IEC 297-2, DIN41494 partes 1 e 7;
- Grau de proteção IP20;
- Estrutura em aço com 1,50 mm;
- Fornecido com terminais de aterramento ;
- Porta frontal em aço perfurado, reversível com ângulo de abertura de 220°, com fechadura escamoteável e índice de ventilação de 71%;
- Porta traseira bipartida em aço perfurado, reversível com ângulo de abertura de 220°, com fechadura escamoteável e índice de ventilação de 71%;
- Laterais em aço, com fecho rápido;
- Planos (frontal e traseiro) com numeração de Us;
- Entrada e saída de cabos pelo teto ou pela base;
- Teto com preparação para instalação de ventiladores;
- Acompanha um conjunto com quatro pés niveladores;
- Pintura pó em micro epóxi na cor preta RAL 9004.

OPCIONAIS:

- Fechadura tipo cilindro para tampas laterais;
- Kit rodizio de fácil instalação.

Fabricação	Altura	Largura	Profundidade	Carga	Cor
3004480000**	44U (2144 mm)	800 mm	1000 mm	800 kg	Preto
3004460010	44U (2144 mm)	600 mm	1100 mm	800 kg	Preto
3004480020**	44U (2144 mm)	800 mm	1200 mm	800 kg	Preto
3004480800**	44U (2144 mm)	800 mm	800 mm	800 kg	Preto

**Acompanha um par de guias de cabo verticais.

RACK 19" ABERTO HD

Os Racks Modulares 45 U da linha IP METAL High Density acomodam um grande volume de cabos, possibilitando facilidade no manuseio durante a instalação, além de possibilitar ampliações em qualquer momento.

CARACTERÍSTICAS:



- Compatível com as necessidades de gerenciamento de cabos UTP categoria 6 e 6A da norma EIA TIA 942 para data centers
- Medidas estrutura central: A 2230 mm x L 530 mm x P 460 mm
- Organizadores verticais laterais com fingers plásticos para distribuição horizontal dos path cords L 150 mm e L 300mm
- Estrutura em aço com 1,5 mm
- Guia superior para passagem de cabos
- Furação intermediária de ½ U para maior flexibilidade de montagem
- Porta frontal e traseira do organizador vertical removíveis com fechadura tipo varão
- Numeração de 1 a 45 U serigrafados na parte frontal e traseira da estrutura
- Capacidade de cabos (considerando 60% de ocupação)
 - Organizador 150 mm: aproximadamente 480 cabos cat. 6
 - Organizador 300 mm: aproximadamente 960 cabos cat. 6

Fabricação	Descrição	Altura	Largura	Profundidade	Carga	Cor
4004500000	ESTRUTURA CENTRAL P/ Rack ABERTO HD 19"	45U	530 mm	410 mm	500 kg	Preto
4004515000	ORGANIZADOR VERTICAL Rack ABERTO HD	45U	150 mm	460 mm	-	Preto
4004530000	ORGANIZADOR VERTICAL Rack ABERTO HD	45U	300 mm	460 mm	-	Preto

RACK DE PAREDE 19" DESMONTÁVEL

Praticidade e facilidade na instalação. Projetado para ambientes com limitação de espaço. Com uma estrutura inovadora, os racks de parede IP METAL se adaptam a sua necessidade.



CARACTERÍSTICAS:

- Totalmente desmontável;
- Atende especificações ANSI/EIA RS-310-D, IEC 297-2, DIN41494 partes 1 e 7;
- Grau de proteção IP20;
- Estrutura lateral soldada em aço 0.9mm;
- Estrutura com terminais de aterramento;
- Porta frontal reversível em vidro temperado, com ângulo de abertura de 180° e fechadura tipo cilindro;
- Laterais em aço com fecho rápido;
- Planos (frontal e traseiro) com numeração de Us reguláveis em profundidade;
- Entrada e saída de cabos pelo teto;
- Teto com preparação para instalação de ventiladores;
- Pintura em micro epóxi nas cores: preta RAL 9004 ou Bege RAL 7035.

Fabricação	Altura	Largura	Profundidade	Carga	Cor
1020360350	3U (260 MM)	600 mm	350 mm	30 kg	Preto
1020360450	3U (260 MM)	600 mm	450 mm	30 kg	Preto
1020560450	5U (310 MM)	600 mm	450 mm	40 kg	Preto
1020560550	5U (310 MM)	600 mm	550 mm	40 kg	Preto
1020760450	7U (396 MM)	600 mm	450 mm	50 kg	Preto
1020760550	7U (396 MM)	600 mm	550 mm	50 kg	Preto
1020960450	9U (501 MM)	600 mm	450 mm	50 kg	Preto
1020960550	9U (501 MM)	600 mm	550 mm	50 kg	Preto
1021260450	12U (634 MM)	600 mm	450 mm	50 kg	Preto
1021260550	12U (634 MM)	600 mm	550 mm	50 kg	Preto
1020360351	3U (260 MM)	600 mm	350 mm	30 kg	Bege
1020360451	3U (260 MM)	600 mm	450 mm	30 kg	Bege
1020560451	5U (310 MM)	600 mm	450 mm	40 kg	Bege
1020560551	5U (310 MM)	600 mm	550 mm	40 kg	Bege
1020760451	7U (396 MM)	600 mm	450 mm	50 kg	Bege
1020760551	7U (396 MM)	600 mm	550 mm	50 kg	Bege
1020960451	9U (501 MM)	600 mm	450 mm	50 kg	Bege
1020960551	9U (501 MM)	600 mm	550 mm	50 kg	Bege
1021260451	12U (634 MM)	600 mm	450 mm	50 kg	Bege
1021260551	12U (634 MM)	600 mm	550 mm	50 kg	Bege

GABINETES METÁLICOS TELECOM (OUTDOOR) DESMONTÁVEIS

CARACTERÍSTICAS:



Obs.: Esta caixa não pode ser instalada em ambientes com índice de salinidade (Exemplo: cidade litorâneas).

- Caixa construída em chapa de aço 1,5 mm de espessura.
- Dimensão da caixa : (H) 500 mm, (L) 400 mm e (P) 200 mm, dimensão externa do produto : (H) 535 mm, (L) 435 mm e (P) 245 mm.
- Venezianas nas 2 (duas) laterais da caixa , na parte superior.
- Base de caixa com preparação para instalação de ventiladores.
- Entrada e saída de cabos pela base da caixa.
- Fixação no poste pela traseira da caixa com abraçadeira tipo BAP ou fita de aço.
- Porta em chapa de aço 1,5 mm de espessura, com vedação em borracha e fechadura tipo cilindro.
- Dissipadores de calor em todo o contorno da caixa, em chapa de aço 1,2 mm de espessura.
- Pintura da caixa: eletrostática, cor bege RAL 7035
- Acompanha placa de montagem em chapa de aço 2,0 mm de espessura (interior da caixa).
- Pintura da placa: eletrostática, cor bege RAL 7035
- Acompanha bandeja em chapa de aço 2,0 mm para acomodação de equipamentos.
- Pintura da bandeja: eletrostática, cor bege RAL 7035.

Fabricação	Descrição
5050100001	GABINETE OUTDOOR 19" 10U 530 X 530 X 230 mm BG
5050100011	GABINETE OUTDOOR 500 X 400 X 200 mm PLUS BG

Acessórios

BANDEJA FIXA 19"

Utilizada para acomodação de equipamentos de TI e Telecom em Gabinetes padrão 19"

- Bandeja fixa padrão 19" com 4 pontos de fixação
- Espessura da chapa de 1,5 mm
- Com aletas para ventilação
- Capacidade de carga 60 kg
- Pintura em micro epóxi cor preto RAL 9004



Fabricação	Descrição
5040104000	BANDEJA FIXA 400 mm (19") 60 Kg PT
5040105000	BANDEJA FIXA 500 mm (19") 60 Kg PT
5040106000	BANDEJA FIXA 600 mm (19") 60 kg PT
5040107000	BANDEJA FIXA 700 mm (19") 60 kg PT
5040108000	BANDEJA FIXA 800 mm (19") 60 kg PT
5040110000	BANDEJA FIXA 1000 mm (19") 60 kg PT

BANDEJA TELESCÓPICA 19"

Utilizada para acomodação de equipamentos de TI e Telecom em Gabinetes padrão 19"

- Bandeja telescópica padrão 19"
- Espessura da chapa de 1,5 mm
- Com aletas para ventilação
- Capacidade de carga 40 kg
- Pintura em micro epóxi cor preto RAL 9004



Fabricação	Descrição
5040204000	BANDEJA TELESCOPICA 400 mm (19") 40 kg PT
5040205000	BANDEJA TELESCOPICA 500 mm (19") 40 Kg PT
5040206000	BANDEJA TELESCOPICA 600 mm (19") 40 kg PT
5040207000	BANDEJA TELESCOPICA 700 mm (19") 40 Kg PT
5040208000	BANDEJA TELESCOPICA 800 mm (19") 40 kg PT
5040210000	BANDEJA TELESCOPICA 1000 mm (19") 40 kg PT

BANDEJA FIXA FRONTAL 19"

Bandeja 19" com dois pontos de fixação.

- Espessura da chapa 1,2 mm
- Com aletas para ventilação
- Capacidade de carga 10 kg
- Pintura em micro epóxi cor preto RAL 9004



Fabricação	Descrição
5040302500	BANDEJA FIXA FRONTAL 1U 250 mm 19 POL. PT
5040303500	BANDEJA FIXA FRONTAL 1U 350 mm 19 POL. PT

BANDEJA ESTENDIDA 19"

Bandeja estendida 19" para Rack aberto

- Espessura da chapa de 1,5 mm
- Capacidade de carga 20 kg
- Pintura em micro epóxi cor preto RAL 9004



Fabricação

5040505000

Descrição

BANDEJA ESTENDIDA 19" x 2U X 500 mm PT

FRENTE FALSA 19" ABS COM CLICK

Utilizada para fechamento das posições não ocupadas dos planos de Gabinetes 19".

- Fabricado em plástico de engenharia ABS
- Dispensa o uso de parafusos
- Altura disponível: 1U
- Cor: preto

Disponível nas cores:



- Vermelho, Amarelo, Verde, Azul, Roxo, Laranja (Fluorescente) e Amarelo (Fluorescente)



Fabricação

5100800018

Descrição

FRENTE FALSA 19" 1U PT ABS COM CLICK

FRENTE FALSA 19" EM AÇO

Utilizada para fechamento das posições não ocupadas dos planos de Gabinetes 19".

- Estrutura em Aço SAE 1020 de 1,0 mm
- Alturas disponíveis: 1U, 2U e 4U
- Pintura em micro epóxi cor preto RAL 9004



Fabricação

5030100000

5030200000

5030400000

Descrição

FRENTE FALSA P/ GABINETE METALICO TELECOM 19" X 1U PT

FRENTE FALSA P/ GABINETE METALICO TELECOM 19" X 2U PT

FRENTE FALSA P/ GABINETE METALICO TELECOM 19" X 4U PT

UNIDADE DE TETO PARA GABINETE COM 2 VENTILADORES

Utilizado para exaustão do ar quente de gabinetes fechados, compatível com toda a linha IP METAL.

- Tela de proteção dos ventiladores
- Pintura em micro epóxi cor bege RAL 7035 ou cor preto RAL 9004
- Chave liga/desliga
- Porta-fusível 3 A
- Seletor de voltagem 110/220V AC

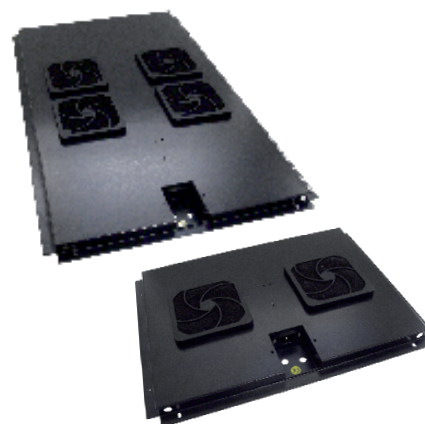


Fabricação	Descrição
5010100010	UNIDADE DE TETO P/ RACK PAREDE C/ 2 VENT. PT
5010100011	UNIDADE DE TETO P/ RACK PAREDE C/ 2 VENT. BG

UNIDADE DE TETO PARA GABINETE

Utilizada em Gabinetes IP METAL, possui ventiladores que auxiliam na exaustão dos equipamentos.

- Bandeja em chapa de aço de 1,5 mm
- Possui 2 ou 4 ventiladores 120 x 120 mm
- Grelha de proteção
- Cabo de alimentação 2,5 m
- Parafusos para fixação
- Bivolt (110/220V)



Fabricação	Descrição
5010206000	UNIDADE DE TETO 2 VENT. 600 mm BIVOLT
5010408000	UNIDADE DE TETO 4 VENT. 800 mm BIVOLT
5010410000	UNIDADE DE TETO 4 VENT. 1000 mm BIVOLT
5010411000	UNIDADE DE TETO 4 VENT. 1100 mm BIVOLT
5010412000	UNIDADE DE TETO 4 VENT. 1200 mm BIVOLT

GUIA VERTICAL 44U X 90 X 70 MM

Guia vertical de cabos compatível com Gabinetes Fechados IP METAL 44U de altura e 800 mm de largura.

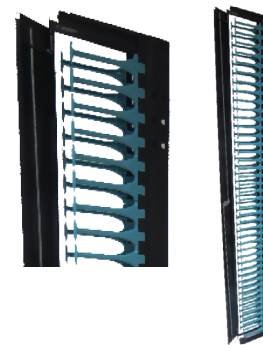
- Permite acomodar cabos lateralmente ao plano de fixação 19"
- Tampas com fechamento sobre pressão
- Produzido em aço SAE 1020 de 1 mm
- Possui anéis internos em materiais termoplásticos
- Pintura em micro epóxi cor preto RAL 9004



Fabricação	Descrição
5004409070	GUIA VERTICAL 44U 90 X 70 mm

GUIA VERTICAL HD 100 X 230 MM

Guia vertical para alta densidade de cabos compatível com Gabinetes Fechados IP METAL 44U de altura e 800 mm de largura.



- Permite acomodar cabos lateralmente ao plano de fixação 19"
- Suporte dos fingers em aço SAE 1020 1 mm
- Fingers plásticos para distribuição horizontal dos patch cords
- Pintura em micro epóxi cor preto RAL 9004

Fabricação

5004410230

Descrição

GUIA VERTICAL HD 100 X 230 P/ RACKS FECHADOS 44U X 800 mm

GUIA DE CABOS METÁLICOS ABERTO 19"

Guia de cabos aberto para organização de cabos na horizontal.

- Instalação em Racks padrão 19"
- Possui 5 anéis soldados para organização dos patch cords
- Fabricado em aço 0,9 mm
- Profundidade 70 mm
- Pintura em micro epóxi cor preto RAL 9004



Fabricação

5060110000

5060210000

Descrição

GUIA CABOS ABERTO 1U PRETO

GUIA CABOS ABERTO 2U PRETO

GUIA DE CABOS METÁLICO FECHADO

Utilizada para acomodação de equipamentos de TI e Telecom em Gabinetes padrão 19"

- Instalação em Gabinetes padrão 19"
- Possui tampa com encaixe
- Possui aberturas na parte traseira para manobras de patch cords
- Personalização opcional com a identificação do cliente
- Fabricado em aço SAE 1020
- Pintura em micro epóxi cor preto RAL 9004



Fabricação

5060100000

5060200000

Descrição

GUIA DE CABO FECHADO 19" X 1U - 70 mm

GUIA DE CABO FECHADO 19" X 2U - 70 mm

GUIA DE CABOS FECHADO ABS 19"

- Permite a instalação em Gabinetes padrão 19"
- Possui tampa com encaixe
- Possui aberturas na parte traseira para manobras de patch cords
- Personalização opcional com o nome/logotipo do cliente
- Fabricado em ABS de cor preto



Fabricação	Descrição
5050100000	GUIA DE CABOS FECHADO ABS 19" X 1U PT

CALHA 19" ABS 10A OU 20A NBR14136

Calhas de tomadas de acordo com a norma ABNT NBR 14136.

- Permite a instalação em gabinetes padrão 19"
- Ocupa 1U de altura
- Fabricado em plástico de engenharia ABS
- Tensão AC entrada e saída de 110/220V
- Porta fusível de 250V 10A ou 20A
- Capacidade máxima de carga 10A ou 20A
- Diâmetro de pinagem de 4,3 mm
- Preto injetado



Fabricação	Descrição
5100400000	CALHA 19" ABS C/4 TOMADAS 10 A NBR14136
5100600000	CALHA 19" ABS C/6 TOMADAS 10 A NBR14136
5100800000	CALHA 19" ABS C/8 TOMADAS 10 A NBR14136
5101000000	CALHA 19" ABS C/10 TOMADAS 10 A NBR14136
5101200000	CALHA 19" ABS C/12 TOMADAS 10 A NBR14136
5110400000	CALHA 19" ABS C/4 TOMADAS 20 A NBR14136
5110600000	CALHA 19" ABS C/6 TOMADAS 20 A NBR14136
5110800000	CALHA 19" ABS C/8 TOMADAS 20 A NBR14136
5111000000	CALHA 19" ABS C/10 TOMADAS 20 A NBR14136
5111200000	CALHA 19" ABS C/12 TOMADAS 20 A NBR14136

KIT DE INTERLIGACAO PARA Gabinetes

Kit de interligação para Gabinetes IP METAL.

- Produzido em aço 2,0 mm
- Acabamento anodizado
- Acabamento niquelado



Fabricação	Descrição
5000300000	KIT DE INTERLIGAÇÃO PARA RACKS

PARAFUSO PHILIPS M5 X 16 C/ ARRUELA

Utilizado com porcas-gaiola M5

- Parafuso tipo Philips cabeça panela,
- Padrão M5 x 16 mm
- Acabamento niquelado
- Acompanham duas arruelas (sendo uma fixa e outra de pressão)



Fabricação	Descrição
90100023	PARAFUSO PHILIPS M5 X 16 NIQUELADO C/ ARRUELA

PORCA GAIOLA M5 METÁLICA

Utilizada para fixação de equipamentos

- Fabricada em aço SAE 1070 bicromatizado
- Utilizada em planos 19"
- Serve em furos de 9 x 9 mm
- Acabamento niquelado



Fabricação	Descrição
9010500010	PORCA GAIOLA M5 METÁLICA

FECHADURA LATERAL COM 2 CHAVES

Fechadura lateral econômica.

- Com fácil operação
- Acabamento niquelado
- Fornecida com jogo de 2 chaves
- Acabamento niquelado



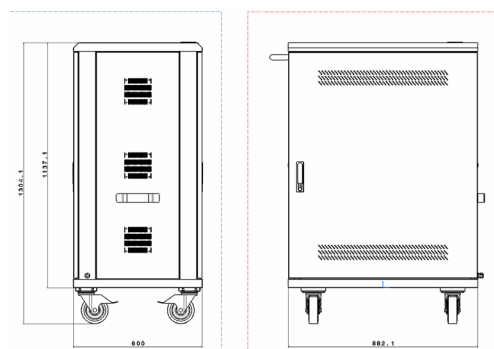
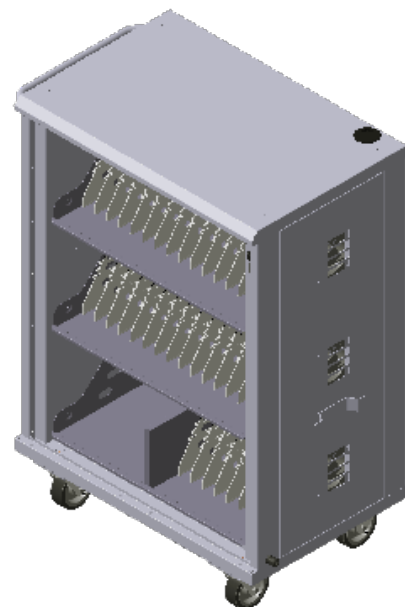
Fabricação	Descrição
9030100009	FECHADURA SIMPLES / LATERAL COM 2 CHAVES

GABINETE DE RECARGA DE EQUIPAMENTOS ELETRÔNICOS

O gabinete está projetado para recarga, transporte e proteção de 32, 40 ou 48 dispositivos móveis. É compatível com os dispositivos, tais como: tablets, netbooks, notebooks e chromebooks, com tamanho de tela de até 14”.

- Estrutura: Monobloco em aço 0,75 mm
- Teto: em aço 0,75 mm, com furo para passa cabos plástico de 60 mm
- Rodízios 5” com rodas de borracha, sendo 2 com trava e 2 sem trava
- Pintura pó em micro epóxi (padrão nas cores bege ou preto)
- Separadores em plástico de engenharia, com grau de proteção antichama (norma UL94V-0), com guia de encaminhamento para os cabos de alimentação do equipamento
- 32, 40 ou 48 tomadas na cor preta (netbooks, notebooks e tablets) e 2 tomadas opcionais (projektor e outros equipamentos) 10 A padrão ABNT NBR 14.136
- Na opção de acomodação de 48 equipamentos, o gabinete possui 3 bandejas com capacidade para 16 equipamentos em cada.
- Na opção de acomodação de 40 equipamentos, o gabinete possui 2 bandejas com capacidade para 16 equipamentos em cada e 1 com capacidade para 8 equipamentos e com compartimento para acomodação de outros produtos.
- Na opção de acomodação de 32 equipamentos, o gabinete possui 2 bandejas com capacidade para 16 equipamentos em cada e 1 bandeja para acomodação de outros produtos.
- Todas as tomadas podem ser ligadas ao mesmo tempo de forma segura
- Proteção: 1 Disjuntor Termomagnético Bipolar 10 A, curva C
- Alimentação 100 ~ 240 VAC 60 Hz
- Projetado para operar em 127 ou 220 VAC 60 Hz

* Obs.: Produto sujeito a personalização, via solicitação comercial.



RACK SERVIDOR MONOBLOCO 19”

- Rack Servidor Monobloco, padrão 19”
- Largura externa: 600 ou 800 mm
- Altura útil: 42 U, 44 U, 45 U, 46 U, 47 U, ou 48 U
- Profundidade externa: 1000, 1100 ou 1200 mm
- As portas frontais e traseiras perfuradas poderão ser fornecidas inteiras, bipartidas, tripartidas ou quadripartidas horizontalmente, dependendo da aplicação
- Ângulo de abertura das portas de 180°;
- Possibilita a instalação das portas em ambas a faces do rack, traseira ou frontal
- Fechaduras frontal e traseira escamoteável, com sistema automático de destrave, com opção para cadeado
- Suporte a carga estática de até 1200 kg
- Pintura eletrostática a pó micro texturizada, nas cores preto ou bege

* Obs.: Produto fornecido apenas para projetos.





Telefone: (41) 3026-3900

E-mail: contato@ipmetal.com

Endereço: Rua Nova Esperança, Pinhais/PR



RACK DE PAREDE

Rack de parede padrão 19" para instalação em parede, projetado para ambientes com limitação de espaço. Utilizado para fixação de equipamentos e acessórios para rede estruturada.

Características

- Totalmente desmontável;
- Atende especificações ANSI/EIA RS 310-D, IEC 297-2, DIN 41494 partes 1 e 7;
- Fabricado em aço SAE 1020;
- Grau de proteção IP 20;
- Estrutura em aço 1,5 mm de espessura, com terminais de aterramento;
- Capacidade de carga estática até 60 kg;
- Altura de 12U – 634 mm;
- Largura: 600 mm;
- Profundidade: 600 mm
- Porta frontal reversível, com moldura em aço 0,9 mm de espessura, com visor de vidro temperado 4 mm, com ângulo de abertura de 180°, fechadura tipo cilindro com fechadura simples;
- Plano frontal e traseiro em aço 1,2 mm, com numeração de Us, serigrafados;
- Entrada e saída de cabos pelo teto, com furações oblongadas;
- Laterais removíveis, com fecho rápido;
- Teto preparado para instalação de ventiladores;
- Pintura eletrostática, micro epóxi nas cores preto RAL 9004/9011 e bege RAL 7035.
- Fixação na parede feita pela estrutura

Opcionais

- Fechadura tipo cilindro para fechamento das tampas laterais;

Código	Descrição
1001260600	RACK PAREDE DESMONTAVEL 12U X 600 MM 19 POL. PT

Podemos fabricar outros modelos de acordo com seu projeto técnico, atendendo as exigências solicitadas para diferentes aplicações de utilização e de espaço agregando mais funcionalidade operacional.



República Federativa do Brasil
Agência Nacional de Telecomunicações

Certificado de Homologação

(Intransferível)

Nº **01943-16-08356**

Validade: **Indeterminada**

Emissão: **17/04/2017**

Requerente:

**CH INTERNATIONAL DO BRASIL LTDA
CONCEIÇÃO Nº233 SALA 1403, 14 ANDAR
CENTRO
13010050 CAMPINAS SP**

Fabricante:

**UBIQUITI NETWORKS LTD.
ORCHARD PARKWAY SAN JOSE, CA
ESTADOS UNIDOS DA AMÉRICA**

Este documento homologa, nos termos da regulamentação de telecomunicações vigente, o Certificado de Conformidade nº NCC 13341/16, emitido pelo **Associação NCC Certificações do Brasil**. Esta homologação é expedida em nome do solicitante aqui identificado e é válida somente para o produto a seguir discriminado, cuja utilização deve observar as condições estabelecidas na regulamentação de telecomunicações.

Tipo - Categoria:

Transceptor de Radiação Restrita - II

Modelo - Nome Comercial (s):

UAP-AC-PRO (*) - (UAP-AC-PRO ())**

Características técnicas básicas:

Faixa de Frequências Tx (MHz)	Potência Máxima de Saída (W)	Designação de Emissões	Tecnologias	Tipo de Modulação
2.400,0 a 2.483,5	0,1067	7M42X9D	SEQÜENCIA DIRETA	DBPSK, DQPSK, CCK
2.400,0 a 2.483,5	0,0838	17M0X9D, 17M9X9D	OFDM	BPSK QPSK 16/64QAM
2.400,0 a 2.483,5	0,0908	36M9X9D	OFDM	BPSK QPSK 16/64QAM
5.725,0 a 5.850,0	0,5035	17M1X9D, 18M0X9D	OFDM	BPSK QPSK 16/64QAM
5.725,0 a 5.850,0	0,4864	35M9X9D, 76M4X9D	OFDM	BPSK QPSK 16/64QAM
5.150,0 a 5.250,0	-	-	OFDM	BPSK, QPSK, 16/64QAM

Ensaio de SAR não aplicável.

Observações

Na instalação do produto, devem ser observadas as condições de uso conforme estabelecido no Regulamento sobre Equipamentos de Radiocomunicação de Radiação Restrita.

Este certificado substitui o de mesmo número emitido em 04/04/2017

Constitui obrigação do fabricante do produto no Brasil providenciar a identificação do produto homologado, nos termos da regulamentação de telecomunicações, em todas as unidades comercializadas, antes de sua efetiva distribuição ao mercado, assim como observar e manter as características técnicas que fundamentaram a certificação original.

As informações constantes deste certificado de homologação podem ser confirmadas no SCH - Sistema de Gestão de Certificação e Homologação, disponível no portal da Anatel. (www.anatel.gov.br).

Marcos de Souza Oliveira
Gerente de Certificação e Numeração



UniFi[®] AC

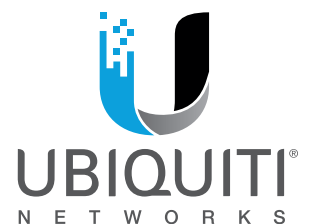
802.11AC Dual-Radio Access Points

Models: UAP-AC-IW, UAP-AC-IW-PRO, UAP-AC-LITE, UAP-AC-LR, UAP-AC-PRO, UAP-AC-EDU

Unlimited Indoor/Outdoor AP Scalability in a Unified Management System

Breakthrough Speeds up to 1300 Mbps in the 5 GHz Band

Intuitive UniFi Controller Software





Scalable Enterprise Wi-Fi Management

UniFi® is the revolutionary Wi-Fi system that combines enterprise performance, unlimited scalability, and a central management controller. UniFi 802.11AC Dual-Radio Access Points (APs) have a refined industrial design and can be easily installed using the included mounting hardware.

Easily accessible through any standard web browser and the UniFi mobile app (iOS or Android), the UniFi Controller software is a powerful software engine ideal for high-density client deployments requiring low latency and high uptime performance.

Use the UniFi Controller software to quickly configure and administer an enterprise Wi-Fi network – no special training required. RF map and performance features, real-time status, automatic UAP device detection, and advanced security options are all seamlessly integrated.

Features

Save Money and Save Time Unlike traditional enterprise Wi-Fi systems that use a hardware controller, UniFi comes bundled with a non-dedicated software controller that can be deployed on an on-site PC, Mac, or Linux machine; in a private cloud; or using a public cloud service.

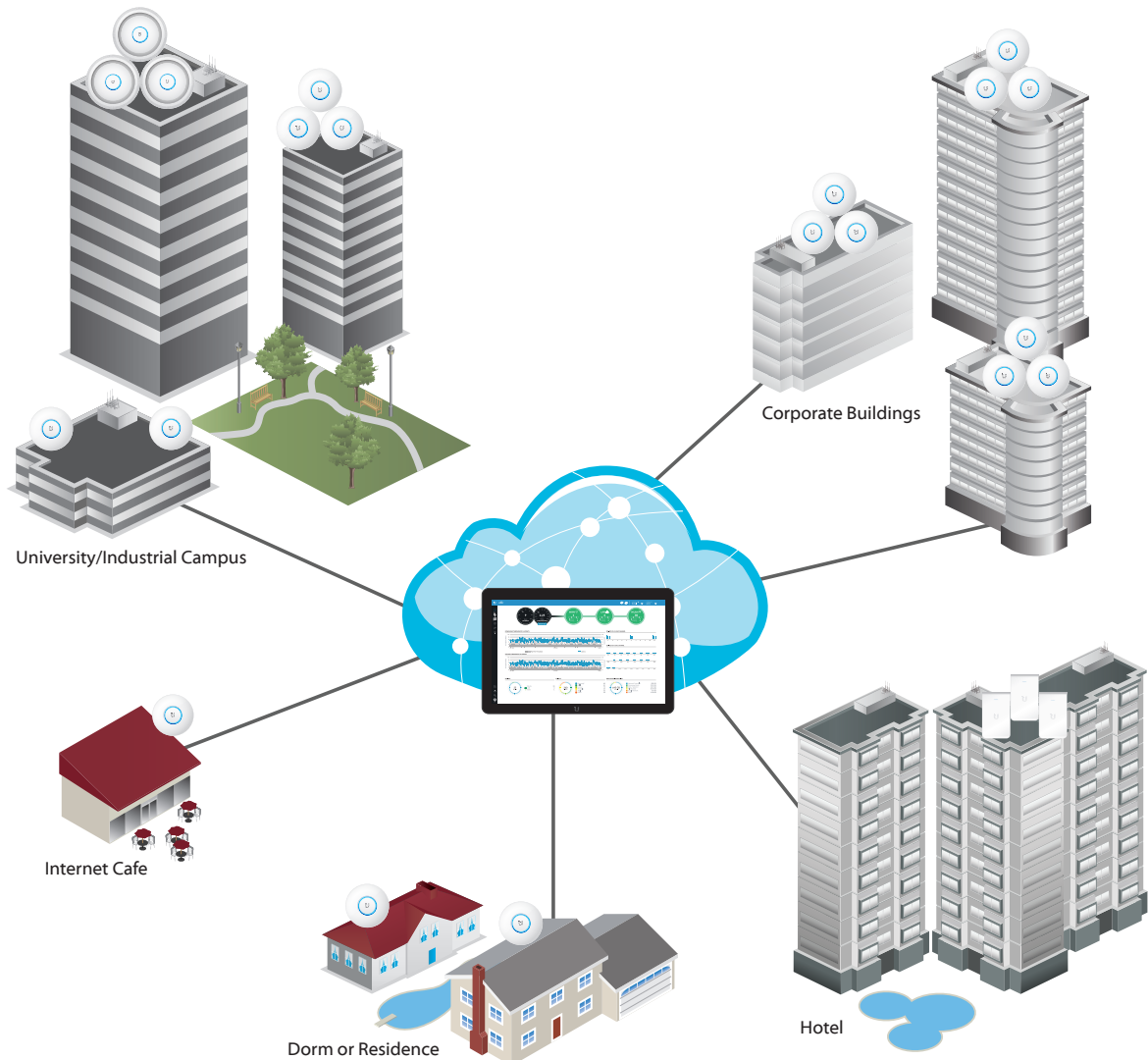
Powerful Hardware The UniFi 802.11AC Dual-Radio APs feature the latest in Wi-Fi 802.11AC MIMO technology.

Intuitive UniFi Controller Software Configure and manage your APs with the easy-to-learn user interface.

Expandable Unlimited scalability: build wireless networks as big or small as needed. Start with one (or upgrade to a three-pack) and expand to thousands while maintaining a single unified management system.

Extend Your Coverage

With the UniFi Controller software running in a NOC or in the cloud, administrators can manage multiple sites: multiple, distributed deployments and multi-tenancy for managed service providers. Below are some deployment examples.



UniFi Controller

Packed with Features

Use the UniFi Controller to provision thousands of UniFi APs, map out networks, quickly manage system traffic, and provision additional UniFi APs.

Breakthrough RF Map

Use the RF map to monitor and analyze radio frequencies for optimal AP placement, configuration, and troubleshooting.

Powerful RF Performance Features

Advanced RF performance and configuration features include spectral analysis, airtime fairness, and band steering.

Detailed Analytics

Use the configurable reporting and analytics to manage large user populations and expedite troubleshooting.

Wireless Uplink

Wireless Uplink functionality enables wireless connectivity between APs for extended range. One wired UniFi AP uplink supports up to four wireless downlinks on a single operating band, allowing wireless adoption of devices in their default state and real-time changes to network topology.

Guest Portal/Hotspot Support

Easy customization and options for Guest Portals include authentication, Hotspot setup, and the ability to use your own external portal server. Use UniFi's rate limiting for your Guest Portal/Hotspot package offerings. Apply different bandwidth rates (download/upload), limit total data usage, and limit duration of use.

All UniFi APs include Hotspot functionality:

- Built-in support for billing integration using major credit cards.
- Built-in support for voucher-based authentication.
- Built-in Hotspot Manager for voucher creation, guest management, and payment refunds.
- Full customization and branding of Hotspot portal pages.

Multi-Site Management

A single UniFi Controller running in the cloud can manage multiple sites: multiple, distributed deployments and multi-tenancy for managed service providers. Each site is logically separated and has its own configuration, maps, statistics, guest portal, and administrator read/write and read-only accounts.

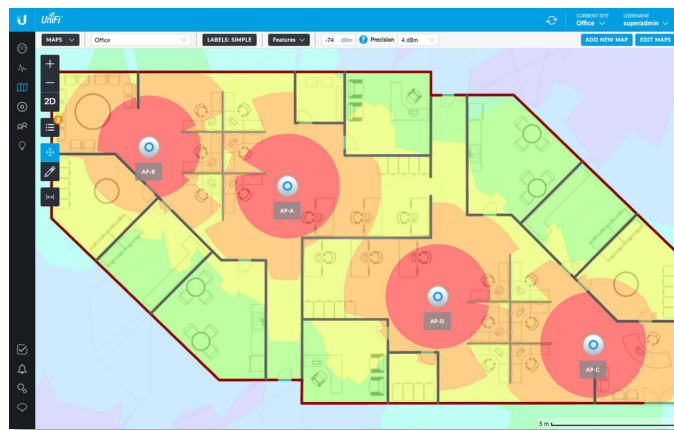
WLAN Groups

The UniFi Controller can manage flexible configurations of large deployments. Create multiple WLAN groups and assign them to an AP's radio.



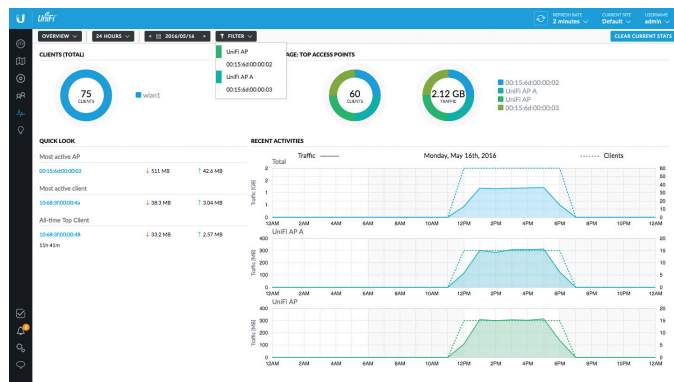
Dashboard

UniFi provides a visual representation of your network's status and delivers basic information about each network segment.



RF Map

Monitor UniFi APs and analyze the surrounding RF environment.



Statistics

UniFi visualizes network traffic in clear and easy-to-read graphs.



UniFi Mobile App

Manage your UniFi devices from your smartphone or tablet.

Models

Hardware Overview

Easy Mounting Sleek design for seamless integration into any environment (all accessories included).

LED Unique provisioning and status LED provides administrator location tracking and alerts for each device.

Designed for the Great Outdoors The UniFi AC Pro features weatherproof casing designed specifically for outdoor applications.

Advanced Acoustic Speaker The UniFi AC EDU AP provides high-quality sound with accurate voice reproduction for announcements over Wi-Fi.

Power over Ethernet (PoE) Includes PoE functionality. Each single-pack – except for the UniFi AC In-Wall AP, In-Wall Pro AP, and Pro AP – includes a PoE adapter.

PoE Switching

UniFi Switch with PoE You can power your UniFi devices with a UniFi PoE Switch (sold separately). Available in 8, 16, 24, and 48-port versions with multiple power output options, the UniFi PoE Switch conveniently offers auto-sensing IEEE 802.3af PoE/802.3at PoE+.



PoE Standards The UniFi AC EDU, In-Wall, In-Wall Pro, and Pro APs are compatible with an 802.3at PoE+ compliant switch. The UniFi AC Pro AP can also use 802.3af PoE.

Model Comparison Chart



	UAP-AC-IW	UAP-AC-IW-PRO	UAP-AC-LITE	UAP-AC-LR	UAP-AC-PRO	UAP-AC-EDU
Environment	Indoor	Indoor	Indoor	Indoor	Indoor/Outdoor	Indoor
Simultaneous Dual-Band	✓	✓	✓	✓	✓	✓
2.4 GHz Radio Rate	300 Mbps	450 Mbps	300 Mbps	450 Mbps	450 Mbps	450 Mbps
2.4 GHz MIMO	2x2	3x3	2x2	3x3	3x3	3x3
5 GHz Radio Rate	867 Mbps	1300 Mbps	867 Mbps	867 Mbps	1300 Mbps	1300 Mbps
5 GHz MIMO	2x2	3x3	2x2	2x2	3x3	3x3
Secondary Ethernet Port	✓ (2 Additional Ports)	✓ (2 Additional Ports)			✓	✓
Loudspeaker						✓
PoE Mode	802.3at PoE+	802.3at PoE+	802.3af/A PoE 24V Passive PoE	802.3af/A PoE 24V Passive PoE	802.3af PoE 802.3at PoE+	802.3at PoE+
Ceiling Mount			✓	✓	✓	✓
Wall Mount	✓	✓	✓	✓	✓	✓
Wireless Uplink	✓	✓	✓	✓	✓	✓
DFS Certification	✓	✓	✓	✓	✓	✓



UAP-AC-IW

The UniFi AC In-Wall AP transforms an Ethernet wall connection into a dual-band 802.11AC Wi-Fi Access Point. It features two Gigabit Ethernet ports, one of which delivers PoE to power and connects an 802.3af device to the network. The UniFi AC In-Wall AP provides simultaneous, dual-band, 2x2 MIMO technology and is available in single- and five-packs¹.



UAP-AC-IW-PRO

The UniFi AC In-Wall Pro AP transforms an Ethernet wall connection into a simultaneous, dual-band 802.11AC Wi-Fi Access Point with 3x3 MIMO technology and 50% higher radio rates than the UAP-AC-IW. The UniFi AC In-Wall Pro features two Gigabit Ethernet ports, one of which delivers PoE to power and connects an 802.3af device to the network. It is available in single- and five-packs¹.



UAP-AC-LITE

Featuring an ultra-compact design, the UniFi AC Lite AP delivers a cost-effective combination of value and performance in a reduced footprint: 25% smaller than the standard UniFi AP. The UniFi AC Lite AP provides simultaneous, dual-band, 2x2 MIMO technology and is available in single- and five-packs².



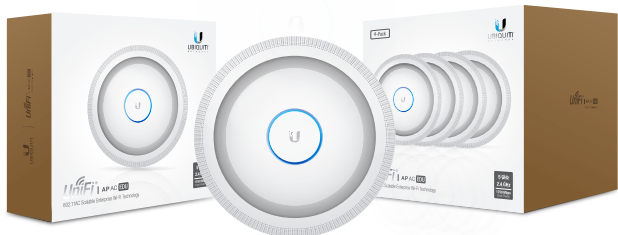
UAP-AC-LR

Ideal for long-range deployments, the UniFi AC LR AP offers simultaneous, dual-band operation with 3x3 MIMO in the 2.4 GHz band and 2x2 MIMO in the 5 GHz band. The innovative antenna design provides a long-range, symmetrical-link coverage area, and the antenna gain of the UniFi AC LR AP performs better than one-way, high transmit power does for connecting distant clients. It is available in single- and five-packs².



UAP-AC-PRO

Deploy the UniFi AC Pro AP indoors or outdoors, in wireless networks requiring maximum performance. Sporting a weatherproof design, the UniFi AC Pro AP features simultaneous, dual-band, 3x3 MIMO technology and convenient 802.3af PoE/802.3at PoE+ compatibility. It is available in single- and five-packs¹.



UAP-AC-EDU

The UniFi AC EDU AP conveniently integrates Wi-Fi and public address capabilities, making it ideal for campus-wide deployment. The UniFi AC EDU AP features simultaneous, dual-band, 3x3 MIMO technology and convenient 802.3at PoE+ compatibility. It is available in single- and four-packs².

¹ We recommend powering the UniFi APs with the UniFi PoE Switch, as PoE adapters are not included.

² Four- and five-packs do not ship with PoE adapters; we recommend powering the UniFi APs with the UniFi PoE Switch instead.

UAP-AC-IW Specifications

UAP-AC-IW	
Dimensions	139.7 x 86.7 x 25.75 mm (5.5 x 3.41 x 1.01")
Weight	200 g (6.43 oz)
Networking Interface	(3) 10/100/1000 Ethernet Ports
Buttons	Reset
Power Method	802.3at PoE+ Supported
Power Supply	UniFi PoE Switch (Not Included)
Power Save	Supported
PoE Out	48V Pass-Through (Pins 1, 2+; 3, 6-)
Maximum Power Consumption with PoE Passthrough	7W 19W*
Maximum TX Power	
2.4 GHz	20 dBm
5 GHz	20 dBm
Antennas	(1) Dual-Band Antenna, Single-Polarity
2.4 GHz	1 dBi
5 GHz	2 dBi
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	1-Gang Electrical Wall Box (Not Included)
Operating Temperature	-10 to 50° C (14 to 122° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

* Requires 802.3at PoE+ switch

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 867 Mbps (MCS0 - MCS9 NSS1/2, VHT 20/40/80)
802.11n	6.5 Mbps to 300 Mbps (MCS0 - MCS15, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps

UAP-AC-IW-PRO Specifications



UAP-AC-IW-PRO	
Dimensions	139.7 x 86.7 x 25.75 mm (5.5 x 3.41 x 1.01")
Weight	210 g (7.41 oz)
Networking Interface	(3) 10/100/1000 Ethernet Ports
Buttons	Reset
Power Method	802.3at PoE+ Supported
Power Supply	UniFi PoE Switch (Not Included)
Power Save	Supported
PoE Out	48V Pass-Through (Pins 1, 2+; 3, 6-)
Maximum Power Consumption with PoE Passthrough	10W 22W*
Maximum TX Power	
2.4 GHz	22 dBm
5 GHz	22 dBm
Antennas	(1) Dual-Band Antenna, Single-Polarity
2.4 GHz	5 dBi
5 GHz	6.5 dBi
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	1-Gang Electrical Wall Box (Not Included)
Operating Temperature	-10 to 50° C (14 to 122° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

* Requires 802.3at PoE+ switch

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 1300 Mbps (MCS0 - MCS9 NSS1/2/3, VHT 20/40/80)
802.11n	6.5 Mbps to 450 Mbps (MCS0 - MCS15, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps

UAP-AC-LITE Specifications

UAP-AC-LITE	
Dimensions	160 x 160 x 31.45 mm (6.30 x 6.30 x 1.24")
Weight	170 g (6.0 oz)
With Mounting Kits	185 g (6.5 oz)
Networking Interface	(1) 10/100/1000 Ethernet Port
Buttons	Reset
Power Method	802.3af/A PoE 24V Passive PoE (Pairs 4, 5+; 7, 8 Return)
Power Supply	24V, 0.5A Gigabit PoE Adapter*
Power Save	Supported
Maximum Power Consumption	6.5W
Maximum TX Power	
2.4 GHz	20 dBm
5 GHz	20 dBm
Antennas	(2) Dual-Band Antennas, 3 dBi Each
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	Wall/Ceiling (Kits Included)
Operating Temperature	-10 to 70° C (14 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

* Only the single-pack of the UAP-AC-LITE includes a PoE adapter.

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 867 Mbps (MCS0 - MCS9 NSS1/2, VHT 20/40/80)
802.11n	6.5 Mbps to 300 Mbps (MCS0 - MCS15, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps

UAP-AC-LR Specifications



UAP-AC-LR	
Dimensions	175.7 x 175.7 x 43.2 mm (6.92 x 6.92 x 1.70")
Weight	240 g (8.5 oz)
With Mounting Kits	315 g (11.1 oz)
Networking Interface	(1) 10/100/1000 Ethernet Port
Buttons	Reset
Power Method	802.3af/A PoE 24V Passive PoE (Pairs 4, 5+; 7, 8 Return)
Power Supply	24V, 0.5A Gigabit PoE Adapter*
Power Save	Supported
Maximum Power Consumption	6.5W
Maximum TX Power	
2.4 GHz	24 dBm
5 GHz	22 dBm
Antennas	(1) Dual-Band Antenna, Tri-Polarity, 2.4 GHz: 3 dBi, 5 GHz: 3 dBi
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	Wall/Ceiling (Kits Included)
Operating Temperature	-10 to 70° C (14 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

* Only the single-pack of the UAP-AC-LR includes a PoE adapter.

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 867 Mbps (MCS0 - MCS9 NSS1/2, VHT 20/40/80)
802.11n	6.5 Mbps to 450 Mbps (MCS0 - MCS23, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps

UAP-AC-PRO Specifications

UAP-AC-PRO	
Dimensions	196.7 x 196.7 x 35 mm (7.74 x 7.74 x 1.38")
Weight	350 g (12.4 oz)
With Mounting Kits	450 g (15.9 oz)
Networking Interface	(2) 10/100/1000 Ethernet Ports
Port	(1) USB 2.0 Port
Buttons	Reset
Power Method	Passive Power over Ethernet (48V), 802.3af/802.3at Supported (Supported Voltage Range: 44 to 57VDC)
Power Supply	UniFi Switch (PoE)
Power Save	Supported
Maximum Power Consumption	9W
Maximum TX Power	
2.4 GHz	22 dBm
5 GHz	22 dBm
Antennas	(3) Dual-Band Antennas, 2.4 GHz: 3 dBi, 5 GHz: 3 dBi
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	Wall/Ceiling (Kits Included)
Operating Temperature	-10 to 70° C (14 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 1300 Mbps (MCS0 - MCS9 NSS1/2/3, VHT 20/40/80)
802.11n	6.5 Mbps to 450 Mbps (MCS0 - MCS23, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps

UAP-AC-EDU Specifications



UAP-AC-EDU	
Dimensions	287.5 x 287.5 x 125.9 mm (11.32 x 11.32 x 4.96")
Weight	1.820 kg (4.012 lb)
Networking Interface	Dual-Band Wi-Fi / Gigabit Ethernet
Ports	(2) 10/100/1000 Ethernet Ports (1) USB 2.0 Port
Buttons	Reset
Power Method	Passive Power over Ethernet (48V), 802.3at Supported (Supported Voltage Range: 44 to 57VDC)
Power Supply	48V, 0.5A PoE Gigabit Adapter*
Power Save	Supported
Maximum Power Consumption	20W
Maximum TX Power	
2.4 GHz	22 dBm
5 GHz	22 dBm
Antennas	(3) Dual-Band Antennas, 2.4 GHz: 3 dBi, 5 GHz: 3 dBi
Wi-Fi Standards	802.11 a/b/g/n/r/k/v/ac
Wireless Security	WEP, WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
BSSID	Up to 8 per Radio
Mounting	Wall/Ceiling (Kits Included)
Operating Temperature	-10 to 70° C (14 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	CE, FCC, IC

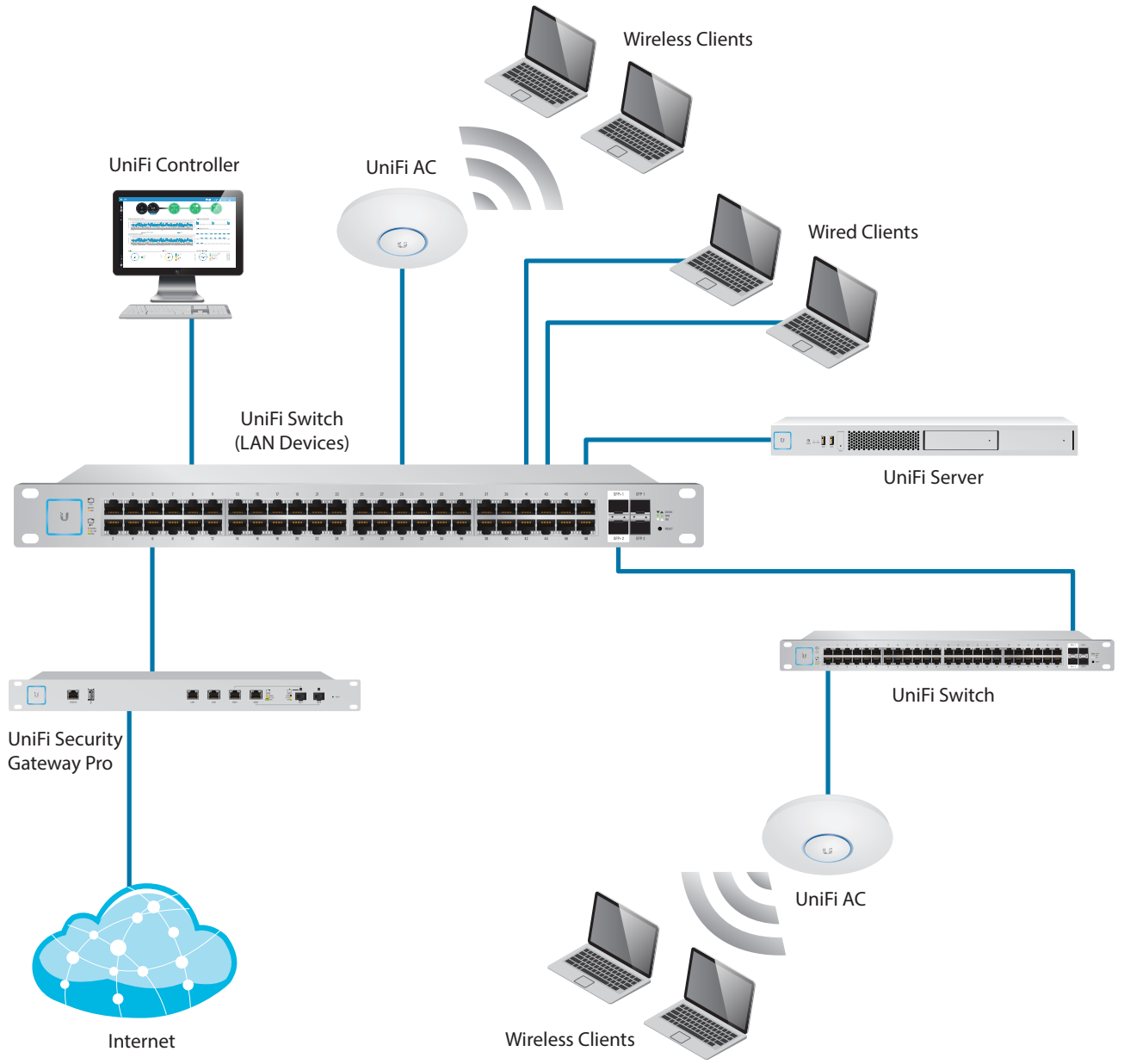
* Only the single-pack of the UAP-AC-EDU includes a PoE adapter.

Advanced Traffic Management	
VLAN	802.1Q
Advanced QoS	Per-User Rate Limiting
Guest Traffic Isolation	Supported
WMM	Voice, Video, Best Effort, and Background
Concurrent Clients	250+

Supported Data Rates (Mbps)	
Standard	Data Rates
802.11ac	6.5 Mbps to 1300 Mbps (MCS0 - MCS9 NSS1/2/3, VHT 20/40/80)
802.11n	6.5 Mbps to 450 Mbps (MCS0 - MCS23, HT 20/40)
802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b	1, 2, 5.5, 11 Mbps







Loudspeaker Acoustics	
Sensitivity	94 dB (1W/1 m)
Maximum SPL	103 dB @ 1 m
Frequency Response	100 - 20,000 Hz
Type	Two-Way Speaker with Second-Order HP Filter

System Example




UniFi Switch Compatibility

The UniFi switches are compatible with UniFi Access Points and UniFi G3 Video Cameras, as detailed below.

AP/Camera Model	US-8	US-8-60W	US-8-150W	US-16-150W	US-24-250W	US-24-500W	US-48-500W	US-48-750W
UVC-G3			✓	✓	✓	✓	✓	✓
UVC-G3-AF	✓	✓	✓	✓	✓	✓	✓	✓
UVC-G3-DOME	✓	✓	✓	✓	✓	✓	✓	✓
UAP			✓	✓	✓	✓	✓	✓
UAP-LR			✓	✓	✓	✓	✓	✓
UAP-PRO	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-LITE	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-LR	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-PRO	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-M	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-M-PRO	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-IW*	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-IW-PRO*	✓	✓	✓	✓	✓	✓	✓	✓
UAP-AC-HD	-	-	✓	✓	✓	✓	✓	✓

✓ Compatible with the UniFi switch

 Requires Instant 802.3af Gigabit PoE Converter:  INS-3AF-I-G or  INS-3AF-O-G

Note:

* For the UAP-AC-IW and UAP-AC-IW-PRO, PoE passthrough is supported by all of the switches listed above except for models US-8 and US-8-60W.

Related Product Datasheets



UniFi Switch 8, UniFi Switch 8-60W:

[dl.ubnt.com/datasheets/unifi/UniFi Switch 8 DS.pdf](https://dl.ubnt.com/datasheets/unifi/UniFi_Switch_8_DS.pdf)



UniFi PoE Switches:

[dl.ubnt.com/datasheets/unifi/UniFi PoE Switch.pdf](https://dl.ubnt.com/datasheets/unifi/UniFi_PoE_Switch.pdf)

Specifications are subject to change. Ubiquiti products are sold with a limited warranty described at: www.ubnt.com/support/warranty
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DECLARAÇÃO

Declaramos que o conteúdo deste embarque está em conformidade com as **Provisões Especiais A64 da RTPP e A67 da IATA e ICAO**. As Baterias Estacionárias Chumbo Ácidas Reguladas por Válvulas, comercializadas pela **POWERSAFE IMPORTAÇÃO, EXPORTAÇÃO LTDA** não oferecem riscos de contaminação radioativa, e não se enquadra como produto inflamável, tóxico, oxidante, venenoso, explosivo, substância infecciosa, material magnético nem outro tipo de radiação que coloque em risco o motorista, nem o desempenho das viagens **Aéreas** ou **Rodoviárias**.

As Baterias Estacionárias Chumbo Ácidas Reguladas por Válvulas são produzidas nas **Tecnologias AGM e GEL**, se enquadram na classificação **ONU 2800** como Baterias Elétricas Úmidas e estão Regulamentadas pelo DOT (EUA) para transportes Ferroviários, Rodoviários, Marítimos e Aéreos e atende todos os requisitos do 49CFR 173.159 (d) e os Regulamentos do IMDG e devem ser rotuladas como Baterias a Prova de Vazamentos.

Portanto não são consideradas como produtos perigosos e ficam isentas do cumprimento das exigências do regulamento, por que:

- **A uma temperatura de 55°C não oferece risco de vazamento de eletrólito por rupturas / trincas no vaso.**
- **As embalagens são especiais para este tipo de transporte e protegem os terminais contra curto circuito.**
- **Atendem aos testes de Vibração e Pressão Diferencial do International Maritime Dangerous Good (IMDG).**

DESCRIÇÃO DO PRODUTO: Baterias Seladas Estacionárias Chumbo Ácidas Reguladas por Válvulas VRLA – TECNOLOGIA AGM E GEL.

MARCA: LEOCH / EVOQUE / RITAR POWER /HAZAN POWER/ JYC.

Modelos Específicos: GP12-7 (12V-7Ah)

O teor das informações acima declarado neste documento é de responsabilidade exclusiva da "Pwersafe Importação e Exportação Ltda".

São Paulo, 06 de Abril de 2021.



Engº Davi Moraes Santana

Powersafe Importação Exportação Ltda.

CNPJ: 06.282.480/0001-07

Rua Senador Vergueiro, 76, Compl. – Centro – São Caetano do Sul – SP – 09521-320

PABX: 11 4227-2477

e-mail: powersafe@powersafe.com.br

homepage: www.powersafe.com.br

GP12-7.0 (12V7.0AH)

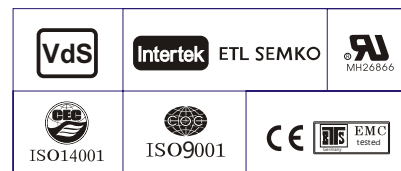


Especificação

Tensão Nominal	12V	
Capacidade Nominal	7.0AH	
Dimensões	Comprimento	151 ± 2mm (5.95 pol)
	Largura	64.5 ± 1mm (2.54 pol)
	Altura	94.5 ± 1mm (3.72 pol)
	Altura Total (com terminal)	100 ± 1mm (3.94 pol)
Peso Aproximado	Aprox 2.18 kg (4.81lbs)	
Terminal	T1	
Material do Vaso	ABS	
Capacidade Nominal	7.00 AH/0.350A	(20hr , 1.80V/cel,25°C/77°F)
	6.53 AH/0.653A	(10hr, 1.80V/cel,25°C/77°F)
	5.80 AH/1.16A	(5hr, 1.75V/cel,25°C/77°F)
	5.13 AH/1.71A	(3hr, 1.75V/cel,25°C/77°F)
	4.26 AH/4.26A	(1hr, 1.60V/cel,25°C/77°F)
Corrente Máx. de Descarga	105A (5s)	
Resistência Interna	Aprox 23mΩ	
Faixa de Temperatura de Operação	Descarga :	-15 ~ 50°C (5 ~ 122°F)
	Carga:	0 ~ 40°C (32 ~ 104°F)
	Estoque:	-15 ~ 40°C (5 ~ 104°F)
Faixa de Temp. de Operação Nominal	25 ± 3°C (77 ± 5°F)	
Uso cíclico	Corrente inicial menor que 2.1A. Tensão de carga	14.4V ~ 15.0V a 25°C(77°F). Coeficiente de temp. -30°mV/C
	Corrente inicial menor que 2.1A. Tensão de carga	13.5V ~ 13.8V a 25°C(77°F). Coeficiente de temp. -20°mV/C
Uso em flutuação	40°C (104°F)	103%
	25°C (77°F)	100%
	0°C (32°F)	86%
Capacidade em Função da Temperatura	A linha GP de baterias pode ser estocada por até 6 meses a 25°C(77°F) e após esse prazo devem ser recarregadas. Para temperaturas mais altas o tempo de estocagem será menor.	
	Auto Descarga	

Aplicações

- ◆ Propósito Geral
- ◆ Sistemas de Energia (UPS)
- ◆ Sistemas Elétricos de energia (EPS)
- ◆ Fontes de energia de emergência
- ◆ Iluminação de Emergência
- ◆ Sinalização Ferroviária
- ◆ Sinalização de Aeronaves
- ◆ Sistemas de Segurança e Alarmes
- ◆ Equipamentos Eletrônicos
- ◆ Fonte de alimentação de comunicador
- ◆ Fonte de Alimentação DC
- ◆ Sistemas de Controle Automáticos



Corrente Constante de Descarga (Ampères) a 25°C (77°F)

T.F./Tempo	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	16.0	11.7	9.97	8.46	6.17	4.52	3.60	2.14	1.60	1.30	1.10	0.95	0.756	0.626	0.343
1.80V/cell	19.2	13.7	11.3	9.20	6.65	4.80	3.83	2.24	1.66	1.35	1.14	0.99	0.783	0.653	0.350
1.75V/cell	21.5	14.9	12.0	9.70	6.92	4.99	3.98	2.31	1.71	1.38	1.16	1.01	0.795	0.663	0.357
1.70V/cell	23.4	15.9	12.8	10.2	7.18	5.12	4.05	2.36	1.75	1.41	1.19	1.03	0.812	0.672	0.361
1.65V/cell	25.5	16.8	13.4	10.6	7.43	5.28	4.17	2.40	1.77	1.43	1.21	1.04	0.823	0.680	0.365
1.60V/cell	26.8	17.6	13.8	10.9	7.64	5.42	4.26	2.46	1.81	1.46	1.23	1.06	0.837	0.690	0.371

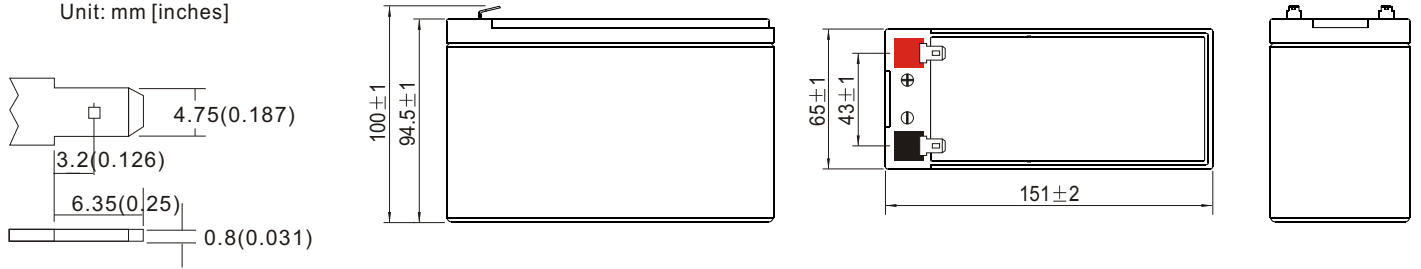
Potência Constante de Descarga (Watts) a 25°C (77°F)

T.F./Tempo	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	30.3	22.3	19.2	16.4	12.0	8.86	7.09	4.23	3.17	2.59	2.20	1.91	1.52	1.26	0.694
1.80V/cell	35.9	25.8	21.5	17.7	12.9	9.37	7.52	4.42	3.30	2.69	2.27	1.97	1.57	1.31	0.704
1.75V/cell	39.8	28.0	22.8	18.6	13.4	9.72	7.79	4.55	3.37	2.74	2.31	2.00	1.59	1.33	0.716
1.70V/cell	42.8	29.5	24.0	19.3	13.8	9.89	7.88	4.61	3.42	2.78	2.34	2.03	1.61	1.33	0.718
1.65V/cell	45.7	30.7	24.8	19.8	14.1	10.1	8.02	4.65	3.45	2.80	2.36	2.05	1.62	1.34	0.720
1.60V/cell	47.0	31.5	25.1	20.1	14.3	10.3	8.13	4.73	3.50	2.83	2.39	2.07	1.63	1.35	0.728

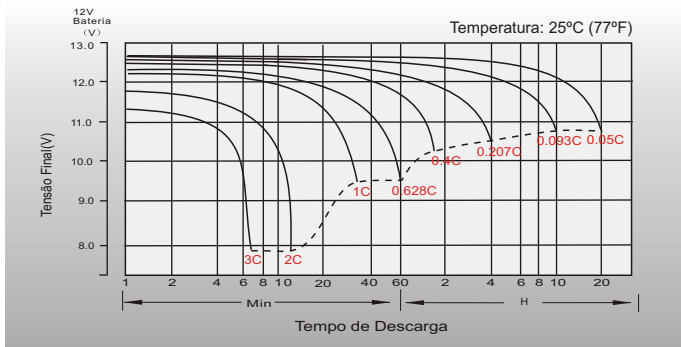
Dimensões

T1 Terminal

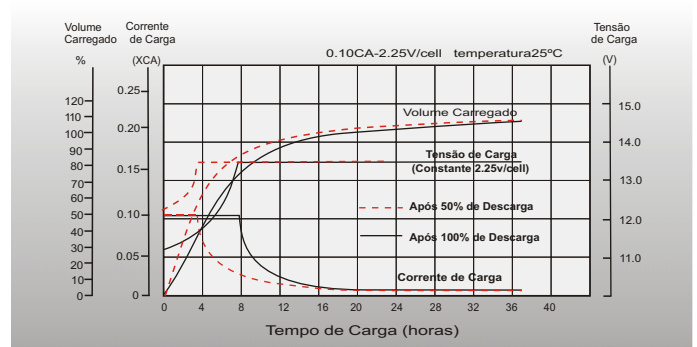
Unit: mm [inches]



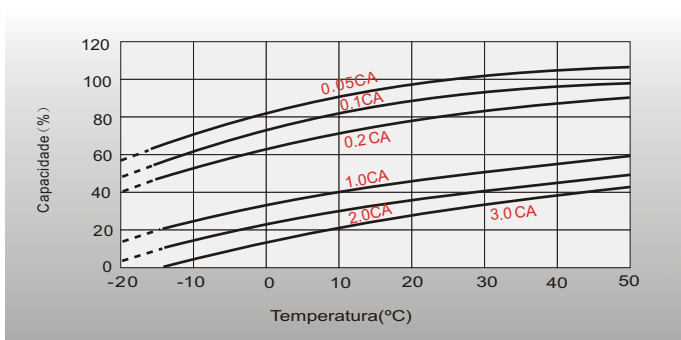
Características de Descarga



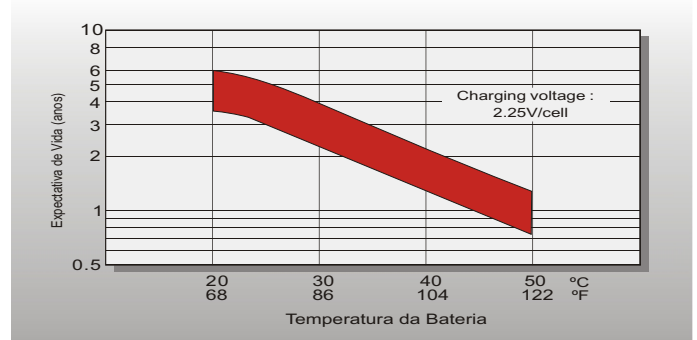
Características de Carga em Flutuação



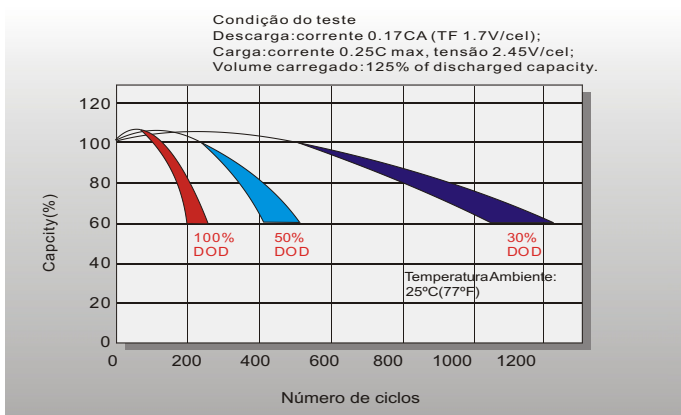
Influência da Temperatura na Capacidade



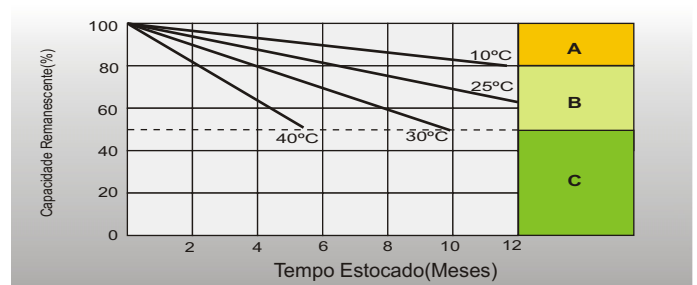
Influência da Temperatura na Vida Útil



Vida em Função da Profundidade de Descarga



Características de Auto-Descarga



- A** Nenhuma recarga suplementar é requerida. Proceder com uma recarga se necessário utilizar 100% da capacidade da bateria.
- B** Recarga suplementar é requerida antes do uso. Opções de recarga abaixo:
1. Carga durante 3 dias com corrente limitada 0.25CA e tensão constante 2.25V/cel.
2. Carga por 20 horas com corrente limitada 0.25CA e tensão constante 2.45V/cel.
3. Carga por 8-10 horas com corrente limitada 0.05CA.
- C** Recarga suplementar pode falhar em recuperar a capacidade da bateria. A bateria nunca deve ficar estocada até atingir esse nível.



FUTURA | 10 ANOS
A TECNOLOGIA AO SEU ALCANCE



Manaus, 12 de abril de 2021.

Ao

**PODER JUDICIÁRIO
TRIBUNAL DE JUSTIÇA DO ESTADO DO AMAZONAS
COMISSÃO PERMANENTE DE LICITAÇÃO**

REFERENTE: PREGÃO ELETRÔNICO Nº. 016/2021 – TJAM

**DECLARAÇÃO CONJUNTA DE CUMPRIMENTO DAS CONDIÇÕES DE
HABILITAÇÃO E DE INEXISTÊNCIA DE IMPEDIMENTO LEGAL PARA
LICITAR OU CONTRATAR COM A ADMINISTRAÇÃO PÚBLICA.**

FUTURA DISTRIBUIÇÃO COMÉRCIO E SERVIÇOS DE INFORMÁTICA LTDA., inscrito(a) no CNPJ nº. 12.713.709/0001-13, por intermédio de seu representante legal o Sr. TIAGO PROCESI COUTINHO, portador(a) da Carteira de Identidade 30.456.221-X e do CPF 216.087.658-57, DECLARA:

- 1) que está ciente e concorda com as condições contidas no edital e seus anexos, e que cumpre plenamente os requisitos de habilitação definidos no edital;
- 2) que até a presente data inexistem fatos impeditivos para sua habilitação no presente processo licitatório, ciente da obrigatoriedade de declarar ocorrências posteriores;
- 3) que não emprega menor de 18 (dezoito) anos em trabalho noturno, perigoso ou insalubre e não emprega menor de 16 (dezesesseis) anos, salvo menor, a partir de 14 (quatorze) anos, na condição de aprendiz, nos termos do inciso XXXIII do art. 7º da Constituição Federal.

Atenciosamente,

12.713.709/0001-13

FUTURA DISTRIBUIÇÃO COMERCIO E
SERVIÇOS DE INFORMÁTICA LTDA-ME
Av. Andre Araujo nº 2151 Lj. 211
Edif. Tropical Center - Aleixo
Cep: 69.060-000

Manaus

AM


Tiago P. Coutinho
Gerente Comercial
CPF- 216.087.658-57
RG- 30.456.221-x
Fone: (92) 813-05008

(92) 3646-5335

www.futuraam.com.br

Av. André Araújo, 2151 - Sala 211 - Aleixo, Manaus - AM



Manaus, 12 de abril de 2021.

Ao

**PODER JUDICIÁRIO
TRIBUNAL DE JUSTIÇA DO ESTADO DO AMAZONAS
COMISSÃO PERMANENTE DE LICITAÇÃO**

REFERENTE: PREGÃO ELETRÔNICO Nº. 016/2021 – TJAM

DECLARAÇÃO DE ELABORAÇÃO INDEPENDENTE DE PROPOSTA

TIAGO PROCESI COUTINHO, empresário, divorciado, portador(a) da Carteira de Identidade 30.456.221-X e do CPF 216.087.658-57, como representante devidamente constituído de FUTURA DISTRIBUIÇÃO COMÉRCIO E SERVIÇOS DE INFORMÁTICA LTDA., inscrito(a) no CNPJ nº. 12.713.709/0001-13, sediada na Av. André Araújo, 2151 – Shopping Tropical Center - Sala 211 – Aleixo CEP: 69060-000 – Manaus/AM, doravante denominado Licitante, em atendimento ao disposto no edital do Pregão Eletrônico/SRP nº. 016/2021, declara, sob as penas da lei, em especial o art. 299 do Código Penal Brasileiro, que:

- a) a proposta anexa foi elaborada de maneira independente pelo Licitante, e que o conteúdo da proposta anexa não foi, no todo ou em parte, direta ou indiretamente, informado a, discutido com ou recebido de qualquer outro participante potencial ou de fato do Pregão Eletrônico/SRP nº. 016/2021, por qualquer meio ou por qualquer pessoa;
- b) a intenção de apresentar a proposta anexa não foi informada a, discutido com ou recebido de qualquer outro participante potencial ou de fato do Pregão Eletrônico/SRP nº. 016/2021, por qualquer meio ou por qualquer pessoa;
- c) que não tentou, por qualquer meio ou qualquer pessoa, influir na decisão de qualquer outro participante potencial ou de fato do Pregão



Eletrônico/SRP nº. 016/2021 quanto a participar ou não da referida licitação;

- d) que o conteúdo da proposta anexa não será, no todo ou em parte, direta ou indiretamente, comunicado a ou discutido com qualquer outro participante potencial ou de fato do Pregão Eletrônico/SRP nº. 016/2021 antes da adjudicação do objeto da referida licitação;
- e) que o conteúdo da proposta anexa não foi, no todo ou em parte, direta ou indiretamente, informado a, discutido com ou recebido de qualquer integrante do Tribunal de Justiça do Amazonas antes da abertura oficial das propostas; e
- f) que está plenamente ciente do teor e da extensão desta declaração e que detém plenos poderes e informações para firmá-la.

Atenciosamente,


Tiago P. Coutinho
Gerente Comercial
CPF- 216.087.658-57
RG- 30.456.221-x
Fone: (92) 813-05008

