



**Hewlett Packard
Enterprise**

Family guide

HPE Apollo Systems

Enabling the data-driven organization





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Density-optimized solutions for high-performance computing and Big Data

The HPE Apollo Family is designed to deliver efficient rack-scale compute, storage, networking, power, and cooling solutions for your Big Data, analytics, object storage, and high-performance computing (HPC) workloads. With rack-scale efficiency, the HPE Apollo Systems Family delivers excellent business benefits:

- Applies just the right amount of scalability, performance, and efficiency with systems that are optimized for specific workloads
- Accelerates time-to-value by reducing implementation time from months to days
- Provides architectural flexibility with both scale-up and scale-out solutions
- Helps you enjoy significant capital and operating expenditure (CAPEX and OPEX) savings
- Taps into an extended ecosystem of partners, integrators, and independent service vendors (ISVs)
- Gives you peace of mind using our complete service and support offerings

The scale-out compute part of the HPE Apollo System portfolio includes the Apollo 2000 System for hyperscale and general-purpose scale-out computing, the Apollo 4000 System Family for Big Data analytics and object storage, and the Apollo 6000 and 8000 Systems for HPC and supercomputing.

This complete range of offerings makes highly dense server storage, management, and rack-scale efficiency available to organizations of all sizes, with a tiered approach that provides a logical and simplified starting point for companies seeking to utilize Big Data, object storage, and HPC for the data-driven organization.



Different data assets have different value

- Mission-critical data must be stored for a long time—e.g., customer data
- Some data must be stored for regulatory compliance—e.g., email archiving
- Some data has temporal value and can be discarded after its value diminishes—e.g., Social Media feeds

Enabling the data-driven organization through purpose-built compute platforms

The mega-trends of cloud, mobility, Big Data, and security are creating both challenges and strategic opportunities for companies of all sizes and in all industries. The race is on to see who can marshal and monetize data most effectively to secure a sustained competitive advantage in this new era.

Traditional data processing technologies are no longer adequate. High velocity data demands high-performance technologies and systems that can process data instantly and scale on-demand.

But winning the race requires more than just throwing resources at the problem. It requires taking an intelligent and nuanced approach to your data assets. An approach that supports both scale-out and scale-up architectures to provide capacity and performance scalability—one that recognizes that different data assets have different values, and optimizes investments across scale, performance, and cost-efficiency requirements for each type of data so you can manage the volume, velocity, and variety of data in the most efficient way possible. In other words—workload-optimized compute solutions.

Becoming a data-driven organization

The data-driven organization is one that utilizes data in ways that were impossible just a few years ago, due to expense, space limitations, or lack of compute capacity. It recognizes that there is “no one size fits all” approach to managing, processing, and storing data, and leverages different technologies—each specifically optimized across scale, performance, and cost-efficiency attributes—to deliver a specific value proposition for each type of data.

In short, the data-driven organization leverages workload-optimized compute solutions to turn data into an asset that directly impacts the bottom line—through initiatives that empower faster decision making, improved operational efficiency, and direct content monetization.

The data-driven organization is here, and it’s powered by HPE Apollo Systems.

Arctic University of Norway aims to be the most efficient data center in the world with Apollo 8000

Watch the [video case study](#).



Typical Apollo System use cases

Supercomputing

Supercomputers enable the world's leading research scientists and mathematicians to find answers to some of the most difficult challenges of our time. But while the human imagination is limitless, the massive space and energy requirements of traditional supercomputers, combined with the fall off in semiconductor scaling, are slowing the pace of innovation.

Divisional HPC

The demand for more compute performance for applications used by engineering design automation (EDA), financial risk modeling, life sciences, Web hosting, and other modern workloads is relentless. Performance gains from microprocessors have been limited by power and manufacturability challenges that affect scalability. Given today's financial, power, and space constraints, Hewlett Packard Enterprise has taken a new approach: thinking beyond just the server and looking at optimizing performance at the rack level to get the most out of the infrastructure.

Scale-out data center

You need to deploy additional compute power for cloud, Web-based applications, and high-performance computing to speed research and get to market faster, but space and resource restrictions are getting in the way. Hewlett Packard Enterprise is providing a bridge from traditional to scale-out architecture so you can achieve the power of HPC with the space and cost savings of density-optimized infrastructure—without disruption.

Big Data

Cloud and mobile technologies are fueling increasing amounts of data collection and use. Organizations of all kinds are looking to mine these growing collections of Big Data to unlock the insights that will allow them to streamline their operations and reduce costs, target products and services more efficiently and effectively to customers who need them, and build the next generation of products and services to satisfy unmet needs ahead of competition.

To help you compete, Hewlett Packard Enterprise is providing a whole new line of Apollo Systems with a focus on the requirements of Big Data solutions like Hadoop and object storage.

Energy efficiency

Hewlett Packard Enterprise is breaking through traditional supercomputing barriers by rethinking cooling to enable high-density, energy-efficient supercomputing solutions. National Renewable Energy Lab (NREL) researchers partnered with Hewlett Packard Enterprise to build an HPE Apollo 8000 System for the lab's new HPC data center, which was designed to be one of the world's most energy-efficient data centers. It provides an astounding amount of compute power while breaking new ground in energy-efficient computing with a liquid cooling system developed by Hewlett Packard Enterprise. And the data center is designed to capture the "waste heat" from computing systems so it can be used to heat facilities on the NREL campus.

The HPE Apollo Systems Family

Apollo 2000 System: the bridge to enterprise scale-out architecture

Deploy more compute power to reap the benefits of cloud business, deploy Web-based applications, and increase HPC power to speed research and bring new products and services to market faster—within space and resource boundaries. The Apollo 2000 System provides a bridge to scale-out architecture for traditional data centers so you can achieve the space and cost savings of density-optimized infrastructure in a non-disruptive manner.

Apollo 4000 System Portfolio: Server solutions purpose-built for Big Data

This new family is purpose-built to service the technologies that are driving the Big Data IT revolution—Hadoop and other Big Data analytics solutions and object storage systems. These purpose-built systems will give you a competitive edge for accelerated market share and business growth by overcoming your data center challenges of space, energy, and time.

Apollo 6000 System: rack-scale solutions with better density, performance, power efficiency, and cost of ownership

To address the growing demand for HPC and the relentless pursuit of efficiency, Hewlett Packard Enterprise has taken the lead on a new approach: thinking beyond just the server and designing a rack-level solution that gives you the right compute at the right economics so you can get the most out of your infrastructure—and your budget. The HPE Apollo 6000 System delivers industry-leading performance in less space with the flexibility to tailor the system to precisely meet workload requirements.

Apollo 8000 System: advancing the science of supercomputing

The HPE Apollo 8000 System is an HPC solution that uses innovative warm-liquid cooling technology to fuel the future of science and technology—with a “green” answer to some of the industry’s toughest challenges. The HPE Apollo 8000 System reaches new heights of performance density while actually helping reduce your carbon footprint and by providing blade-like serviceability.



The Apollo 2000 System supports a full complement of HPC options

Optimize HPC clusters for many different applications including product design and testing simulation, financial risk modeling and Monte Carlo simulation, and scientific research modeling.

HPC options include top bin CPUs, fast memory, integrated accelerators (GPUs or coprocessors), and fast cluster fabrics and I/O interconnections, making it easy for you to achieve the right performance, and price/performance for your HPC workloads.

HPE Apollo 2000 Systems

The bridge to enterprise scale-out architecture

To reap the benefits of cloud, Web-based applications, and high-performance computing, you need to deploy more compute power—but you need to do so within space and resource constraints. The Apollo 2000 System is a bridge to scale-out architecture for traditional rack-server data centers. It allows you to achieve the space and cost savings of density-optimized infrastructure in a non-disruptive manner.

Configuration flexibility for a variety of workloads

The HPE Apollo 2000 System is a very dense solution that packs a lot of performance and workload capacity into a small amount of data center space—making it ideal for your space-constrained data center or remote site. In fact, four independent hot-pluggable Apollo 2000 servers in a single 2U chassis provide 2X the performance density of standard 1U servers—four servers in 2U vs. 4U of rack space—at a comparable cost.

Flexible configuration options make the Apollo 2000 System a great fit for a variety of workloads, including HPC clusters. The ability to mix and match servers in the same chassis and the unique drive mapping flexibility allow you to create optimized configurations for many applications. Chassis, or groups of chassis, can be custom-configured to act as affordable, modular, 2U building blocks for specific implementations at scale—and for future growth.

Integrate seamlessly—and painlessly—into your data center

The Apollo 2000 System is designed to be deployed in traditional enterprise data centers, without disruption or the need to change anything in your environment. The system can be managed at the individual server level with the same hardware and software tools and the same service procedures and practices used with traditional rack servers, significantly reducing the cost of change.

The HPE Apollo 2000 System has the right characteristics and delivers the right value to make it your enterprise bridge to efficient, space-saving, scale-out architecture.

Key features and benefits

Density-optimized for traditional data centers

- Up to four powerful servers in 2U chassis—2X the density of 1U servers
- Traditional racks and cabling for existing data centers
- Cost-effective in any configuration

Configuration flexibility for variety of workloads

- Mix and match servers for workload optimization
- HPC performance with accelerators, top bin CPUs, and fast HPC clustering
- Storage flexibility and a broad range of I/O options for workload optimization

Simple at scale—it's HPE ProLiant Gen9

- Same HPE ProLiant Gen9 enterprise-class management and operational tools
- **HPE iLO management** saves administration time and cost
- **HPE OneView Monitoring**
- **HPE Advanced Power Manager** enables more efficient capacity per rack
- **HPE Insight Cluster Management Utility** to monitor, manage, and optimize compute clusters of any size

Technical specifications: HPE Apollo 2000 System



HPE ProLiant Gen9 servers and options

| | HPE ProLiant Apollo XL170r: Gen9 1U node | HPE ProLiant Apollo XL190r: Gen9 2U node |
|-------------------------------|--|--|
| Maximum number | 1U half width—Up to four per chassis | 2U half width—Up to two per chassis |
| Processor | Intel® Xeon® E5-2600 v3 and v4 series processor options with choices from 4–22 cores, 1.6 GHz–3.5 GHz CPU speed, 85–145 Watts. And Intel Xeon E5-1630 v3, E5-1650 v3 and E5-1680 processor options | Intel Xeon E5-2600 v3 and v4 series processor options with choices from 4–22 cores, 1.6 GHz–3.5 GHz CPU speed, 85–145 Watts |
| Memory | 16 x DDR4 up to 2,400 MHz 512 GB maximum | 16 x DDR4 up to 2,400 MHz 512 GB maximum |
| Network module | 2 x 1 Gb Ethernet, Serial RJ45 connector, SUV connector (one serial/two USB/one video), optional FlexibleLOM | 2 x 1 Gb Ethernet, Serial RJ45 connector, SUV connector (one serial/two USB/one video), optional FlexibleLOM |
| PCIe 3.0 slots | Two externally accessible I/O options that allow you to choose how the PCIe lanes are utilized to deliver balanced workload performance | Three externally accessible and one internally accessible I/O options that allow you to choose how the PCIe lanes are utilized to deliver balanced workload performance |
| Storage | Up to 24 drives per node Dual SATA host based M.2 2242 NGFF SSDs—internal Hot-plug HDD support Internal USB port Hard drive mapping feature on r2800 chassis | Up to 24 drives per node Dual SATA host based M.2 2242 NGFF SSDs—internal Hot-plug HDD support Internal USB port Hard drive mapping feature on r2800 chassis |
| Storage controller | Integrated Smart Array B140i storage controller Optional PCIe host bus adapters (HBAs) and Smart Array Controllers with advanced array features like HPE SmartCache and RAID 10 Advanced Data Mirroring | Integrated Smart Array B140i storage controller Optional PCIe host bus adapters and Smart Array Controllers with advanced array features like HPE SmartCache and RAID 10 Advanced Data Mirroring |
| Supported accelerators | N/A | NVIDIA® Tesla K2-RAF, K40, K80, M-60 GPUs or Intel Xeon Phi 5110P coprocessors or AMD S9150 |
| Management | HPE iLO Management (iLO 4) HPE Advanced Power Manager (optional rack level management) | HPE iLO Management (iLO 4) HPE Advanced Power Manager (optional rack level management) |
| Common workloads | High-performance computing Cloud Server Density-optimized general-purpose server Computing/storage all-in-one server for SMB, FSI, and EDA | High-performance computing (with GPUs or coprocessors) Density-optimized general-purpose server Computing/storage all-in-one server for SMB, FSI, and EDA Server storage gateway controller for SAN, EDA, and HPC Cloud server for online gaming |

Apollo 2000 System Chassis options

| | HPE Apollo r2200 Chassis | HPE Apollo r2600 Chassis | HPE Apollo r2800 Chassis |
|------------------------------|---|---|---|
| Description | Gen9 12 LFF disk or SSD chassis | Gen9 24 SFF disk or SSD chassis | Gen9 24 SFF disk or solid-state drive (SSD) chassis with drive mapping capability |
| Storage configuration | 12 LFF hot-plug SAS or SATA HDDs or SSDs, allocated equally across server nodes | 24 SFF hot-plug SAS or SATA HDDs or SSDs, allocated equally across server nodes | 24 SFF hot-plug SAS or SATA HDDs or SSDs; supports flexible drive mapping enabling custom drive allocations to match workloads giving you flexible storage density for various applications |
| Size | 2U: 17.64" wide x 31.21" deep | 2U: 17.64" wide x 29.61" deep | 2U: 17.64" wide x 29.61" deep |
| Power supplies | 800 W or 1,400 W Platinum Power Supplies, N+1 redundancy option | 800 W or 1,400 W Platinum Power Supplies, N+1 redundancy option | 800 W or 1,400 W Platinum Power Supplies, N+1 redundancy option |

The HPE Apollo 4200 System provides a bridge to density-optimized Big Data solutions for enterprise and small to medium enterprise customers with traditional rack-server data centers.

For object storage

The HPE Apollo 4200 LFF System is ideal for smaller object storage implementations or for “plug-and-play” integration into traditional enterprise rack-server data centers.

For Hadoop and Big Data analytics

The HPE Apollo 4200 SFF System is ideal for analytics solutions based on parallel Hadoop-based data mining, as well as NoSQL-based Big Data analytics solutions.

Purpose-built for Big Data: HPE Apollo 4000 Systems

Big Data is growing at an exponential rate and enterprises of all kinds are seeking to glean intelligence and translate it into a competitive business advantage. The key is using the new technologies that have emerged to deal with the volume, velocity, and variety of today’s Big Data—notably Hadoop-based Big Data analytics and object storage solutions systems. As effective as these new technologies are, today’s general-purpose infrastructure runs into problems when these workloads move to petabyte scale, and the data center can experience capacity constraints, spiraling energy costs, infrastructure complexity, and inefficiencies.

To maximize the value of Big Data, you need systems that are purpose-built for Big Data workloads.

HPE Apollo 4000 Systems are a new family of systems, designed specifically for Hadoop and other Big Data analytics and object storage systems.

Apollo 4000 Systems allow you to analyze your growing volumes of data—cost-effectively at petabyte scale and beyond—to turn information into insight and enable faster strategic decision making. And Apollo 4000 Systems help you accomplish this while meeting your data center challenges of space, energy, and time to results.

HPE Apollo 4200 Gen9 Server—The enterprise bridge to Big Data solutions

The HPE Apollo 4200 Gen9 Server is an entirely new density-optimized server storage solution designed for traditional enterprise and small to medium enterprise (SME) rack-server data centers. This versatile 2U Big Data server integrates seamlessly into traditional data centers with the same rack dimensions, cabling, and serviceability, as well as the same administration procedures and tools. All of this makes it the ideal bridge system for implementing purpose-built Big Data server infrastructure today, with the capability to scale in affordable increments as you grow.



Key features and benefits**Leadership storage capacity**

- The LFF server features up to 224 terabytes of direct-attached storage per server and 4.48 petabyte storage capacity per rack¹ and supports up to 28 hot-swappable LFF SAS or SATA hard disk drives (HDDs)/SSDs
- The SFF system features up to 207 terabytes of direct-attached storage per server and supports up to 54 hot-swappable SFF SAS or SATA HDDs/SSDs

Designed to fit into traditional rack server data centers today

- Standard size rack, and front/side hot-plug disk serviceable, rear aisle cabling, standard rack server system administration
- Plug-and-play in traditional data centers with same racks, cabling, and servicing accessibility—easy to implement, easy to support, use the same system administration, no re-training, no disruption

Choose the right balance of performance and cost efficiency

- Start and grow enterprise and SME object storage solutions in cost-effective 2U increments
- Two-processor server configuration options for:
 - Intel Xeon E5-2600 v3 or E5-2600 v4 series processors with choices from 4–22 cores, 1.6 GHz–3.5 GHz CPU speed, and power ratings between 55–145 watts
 - 16 memory DIMM slots with up to 1024 GB DDR4 memory at up to 2,400 MHz—ideal for object stores needing fast performance with small objects or in-memory data processing for near-real-time analytics software
 - Storage performance options—the SFF HDD model supports SAS and SSD drives with 12G output and 15k revolutions per minute, to speed data transfer for analytics workloads
 - Up to five low-profile PCIe Gen3 slots or six PCIe Gen3 slots with two of them are full-height half-length slots to meet networking and cluster performance needs in applications requiring higher speed I/O



¹ Based on 8 TB LFF drives

Technical specifications: HPE Apollo 4200 Gen9 Servers



HPE Apollo 4200 Gen9 LFF Server



HPE Apollo 4200 Gen9 SFF Server

| | HPE Apollo 4200 Gen9 LFF Server | HPE Apollo 4200 Gen9 SFF Server |
|---|--|---|
| Form factor | 2U rack server | 2U rack server |
| Storage type | Up to 24 LFF hot-plug SAS/SATA/SSD + Optional four LFF or two SFF in rear drive cage | Up to 48 SFF hot-plug SAS/SATA/SSD + Optional two SFF in rear drive cage |
| Storage capacity | Up to 224 TB (24 + 4 LFF 8 TB HDD) Up to 4.48 PB per 42U rack (20 servers 8 TB HDD) | Up to 100207 TB (48 + 26 SFF 23.84 TB HDD) Up to 2.04.15 PB per 42U rack (20 servers 23.84 TB HDD) |
| Storage controller | Flexible Smart Array P840ar and Dynamic Smart Array B140i Plus optional HPE Smart Array or Smart HBA controller | Flexible Smart Array P840ar and Dynamic Smart Array B140i Plus optional HPE Smart Array or Smart HBA controller |
| Processor family | Intel Xeon E5-2600 v3 or E5-2600 v4 Series | Intel Xeon E5-2600 v3 or E5-2600 v4 Series |
| Processor number | One or two per server | One or two per server |
| Processor cores available | 4/6/8/10/12/14/16/18/20/22 | 4/6/8/10/12/14/16/18/20/22 |
| Processor frequency | From 1.6 GHz–3.5 GHz | From 1.6 GHz–3.5 GHz |
| Memory | HPE SmartMemory 16 DIMM slots Up to 1,024 GB DDR4 memory at up to 2,400 MHz | HPE SmartMemory 16 DIMM slots Up to 1,024 GB DDR4 memory at up to 2,400 MHz |
| Networking | 2 x 1 Gb Ethernet Plus FlexibleLOM and PCIe options | 2 x 1 Gb Ethernet Plus FlexibleLOM and PCIe options |
| Expansion slots | Up to six PCIe slots + FlexibleLOM support With 2 PCIe slots in optional rear cage | Up to six PCIe slots + FlexibleLOM support With 2 PCIe slots in optional rear cage |
| Management Recommended for Management at scale | HPE iLO 4 HPE Advanced Power Manager HPE Insight Cluster Management Utility | HPE iLO 4 HPE Advanced Power Manager HPE Insight Cluster Management Utility |
| Systems fans features | Up to 10 fans (for redundancy) | Up to 10 fans (for redundancy) |
| Power supply type | Up to two power supplies, 800 W and 1,400 W Flex Slot, hot-plug redundant power | Up to two power supplies, 800 W and 1,400 W Flex Slot, hot-plug redundant power |
| QuickSpecs URL | www8.hp.com/h20195/v2/GetHtml.aspx?docname=c04616495 | |

For Hadoop and Big Data analytics

The HPE Apollo 4530 System is ideal for the wide variety of Big Data analytics solutions based on parallel Hadoop-based data mining, as well as NoSQL-based Big Data analytics solutions.

For object storage

The HPE Apollo 4510 System is ideal for object storage solutions at any scale including collaboration and content distribution, content repositories and active archives, back-up repositories and cold storage, and everything in between.

For Clustered Storage

The HPE Apollo 4520 System is ideal for clustered environments which require high availability and extreme density for large scale deployments.

HPE Apollo 4500 System—right-sized for Hadoop analytics, object storage, and clustered applications**Hadoop and Big Data analytics: HPE Apollo 4530 System**

The HPE Apollo 4530 System is purpose-built for the wide variety of Big Data analytics workloads based on parallel Hadoop-based data mining, as well as solutions from Hewlett Packard Enterprise and the HPE Hyperscale Data Ecosystem partners including Hortonworks, Cloudera, and HPE Autonomy and HPE Vertica, and for Big Data analytics solutions using distributions of NoSQL databases. It provides the performance and storage density that enable you to develop a 360-degree view of customers to improve marketing cost-effectiveness, boost online sales, and enhance customer retention and satisfaction.

Key features and benefits

A 4U, three-server system with three two-processor HPE ProLiant Gen9 servers, each with 15 hot-plug SAS or SATA HDDs/SSDs for each server optimized for Hadoop and Big Data analytics.

Efficient analytics scaling

Each server has up to 120 terabytes of capacity—providing economical building blocks for efficient implementations at scale with up to 30 servers and 3.6 petabytes of capacity in a 42U rack.²

Versatile performance for Big Data analytics variety

Choose the right balance of performance and cost-efficiency with:

- Two-processor server configuration options for:
 - Intel Xeon E5-2600 v3 or v4 series processors with choices from 6–20 cores, 1.6 GHz–2.6 GHz CPU speed, and power ratings between 55–135 watts
 - 16 memory DIMM slots with up to 1024 GB DDR4 memory at up to 2,400 MHz—ideal for complex analytics needing fast performance, or in-memory data processing analytics applications
 - Solid-state disks and high-performance storage controllers to speed data transfer
 - Up to four PCIe slots with flexible performance and I/O options to match the variety of analytics workload performance and throughput criteria

Object storage: HPE Apollo 4510 System

The HPE Apollo 4510 System is ideal for a wide variety of object storage solutions including collaboration and content distribution, content repositories and active archives, back-up repositories and cold storage—and everything in between. You can take advantage of object storage solutions supported by the HPE Hyperscale Data Ecosystem partners, such as Cleversafe, Scality, Ceph, and OpenStack®/Swift, as well as HPE's own Helion Content Depot.

Key features and benefits

A 4U, one-server system that has been purpose-built for object storage solutions with up to 68 hot-plug SAS or SATA HDDs/SSDs with up to 544 terabytes storage capacity per server and up to 5.44 petabytes of storage per 42U rack.

Density-optimized for space and power efficiency at scale:

- High direct-attach storage capacity per server for large-scale object storage systems
 - Up to 544 terabytes per 4U chassis (with 8 TB SAS HDDs)
 - Up to 5.44 petabytes per 42U rack (with 10 HPE Apollo 4510 Systems and 680 LFF HDDs)

² Based on 10 Apollo 4530 Systems with 8 TB HDDs

Configuration flexibility to optimize for capacity, throughput, and responsiveness:

- Flexible performance and I/O options to match the variety of object storage response and throughput criteria
 - Intel Xeon E5-2600 v3 or v4 series processors with choices from 6–20 cores, 1.6 GHz–2.6 GHz CPU speed, and power ratings between 55–135 watts
 - 16 memory DIMM slots with up to 1024 GB DDR4 memory at up to 2,400 MHz
 - Solid-state disks and high-performance storage controllers to speed data transfer
 - Up to four PCIe slots with flexible performance and I/O options to match the variety of analytics workload performance and throughput criteria

Clustered Storage: HPE Apollo 4520 System

For high performance storage with demanding I/O requirements, take advantage of HPE's performance tested Intel Enterprise Edition Lustre solution on the Apollo 4520. For enterprise class highly available storage with Microsoft® Storage Spaces, this Microsoft approved platform can meet Petabyte scale requirements without breaking the bank.

Key features and benefits

A 4U, two-server system that has been purpose-built for clustered storage solutions with up to 46 hot-plug SAS HDDs/SSDs, and up to 184 terabytes storage capacity per server and up to 3.4 petabytes of storage per 42U rack.

Cluster-in-a-Box Design

- High availability design simplifies clustered environments
 - No external cables required
 - Built-in SAS expanders for failover applications

Configuration flexibility to optimize for capacity, throughput, and responsiveness:

- Flexible performance and I/O options to match the variety of object storage response and throughput criteria
 - Up to four PCIe slots with flexible performance and I/O options, including InfiniBand, to match the variety of analytics workload performance and throughput criteria
 - Two-processor server configuration options choices from 6–20 cores, 1.7 GHz–2.6 GHz CPU speed, and power ratings between 55–135 watts
 - 16 memory DIMM slots with up to 1024 GB DDR4 memory at up to 2,400 MHz
 - Solid-state disks and high-performance storage controllers to speed data transfer

Technical specifications: HPE Apollo 4510, 4520, and 4530 Systems



HPE Apollo 4510 System



HPE Apollo 4520 System



HPE Apollo 4530 System

| | HPE Apollo 4510 System | HPE Apollo 4520 System | HPE Apollo 4530 System |
|---|---|--|---|
| Form factor | 4U shared infrastructure chassis | 4U shared infrastructure chassis | 4U shared infrastructure chassis |
| Server | 1 server per chassis | 2 servers per chassis | 3 servers per chassis |
| Storage type | Up to 60 LFF hot-plug SAS/SATA/SSD + Optional 8 hot-plug LFF in rear drive cage | Up to 46 LFF hot-plug SAS drives | Up to 15 LFF hot-plug SAS/SATA/SSD per server Up to 45 drives per chassis |
| Storage capacity | Up to 544 TB per server (60 + 8 LFF 8 TB HDD) Up to 5.4 PB per 42U rack (10 servers 8 TB HDD) | Up to 368 TB per server (23 LFF 8 TB SAS HDD) Up to 3.68 PB per 42U rack (10 servers 8 TB HDD) | Up to 120 TB per server (15 LFF 8 TB HDD) Up to 3.6 PB per 42U rack (30 servers 8 TB HDD) |
| Storage controller | HPE Dynamic Smart Array B140i Integrated HPE Smart Array P244br/ HPE H244br controllers for boot drives Plus additional Smart Array or Smart HBA controller options | HPE Dynamic Smart Array B140i Integrated HPE Smart Array P244br/ HPE H244br controllers for boot drives H240 Smart HBA controller options | HPE Dynamic Smart Array B140i Integrated HPE Smart Array P244br/ HPE H244br controllers for boot drives Plus additional Smart Array or Smart HBA controller options |
| Processor family | Intel Xeon E5-2600 v3 and v4 Series | Intel Xeon E5-2600 v4 Series | Intel Xeon E5-2600 v3 and v4 Series |
| Processor number | One or two per server | One or two per server | One or two per server |
| Processor cores available | 6/8/10/12/14/16/18/20 | 6/8/10/12/14/16/18/20 | 6/8/10/12/14/16/18/20 |
| Processor frequency | From 1.6 GHz–2.6 GHz | From 1.6 GHz–2.6 GHz | From 1.6 GHz–2.6 GHz |
| Memory | HPE SmartMemory 16 DIMM slots Up to 1024 GB DDR4 memory at up to 2,400 MHz | HPE SmartMemory 16 DIMM slots Up to 1024 GB DDR4 memory at up to 2,400 MHz | HPE SmartMemory 16 DIMM slots Up to 1024 GB DDR4 memory at up to 2,400 MHz |
| Networking | 2 x 1 Gb Ethernet Plus FlexibleLOM and PCIe options | 2 x 1 Gb Ethernet Plus FlexibleLOM and PCIe options | 2 x 1 Gb Ethernet Plus FlexibleLOM and PCIe options |
| Expansion slots | Up to four PCIe Slots + FlexibleLOM support | Up to four PCIe Slots + FlexibleLOM support | Up to four PCIe Slots + FlexibleLOM support |
| Management Recommended for Management at scale | HPE iLO 4 HPE Advanced Power Manager HPE Insight Cluster Management Utility | HPE iLO 4 HPE Advanced Power Manager HPE Insight Cluster Management Utility | HPE iLO 4 HPE Advanced Power Manager HPE Insight Cluster Management Utility |
| Systems fans features | Five hot-plug fan modules (provide redundancy) | Five hot-plug fan modules (provide redundancy) | Five hot-plug fan modules (provide redundancy) |
| Power supply type | Up to 4 power supplies, 800 W and 1400 W Flex Slot, hot-plug redundant power supplies | Up to 4 power supplies, 800 W and 1400 W Flex Slot, hot-plug redundant power supplies | Up to 4 power supplies, 800 W and 1400 W Flex Slot, hot-plug redundant power supplies |
| QuickSpecs URL | www8.hp.com/h20195/v2/gethtml.aspx?docname=c04616501 | | |

“We are seeing up to a 35 percent performance increase in our EDA workloads; we have deployed more than 5,000 of these servers, achieving better rack density and power efficiency, while delivering higher application performance to Intel® silicon design engineers.”

– Kim Stevenson, Intel CIO

HPE Apollo 6000 System

Rack-scale solutions with improved density, performance, power efficiency, and cost of ownership

To address the growing demand for HPC, and the relentless pursuit of efficiency, Hewlett Packard Enterprise has taken the lead on a new approach: thinking beyond just the server and designing a rack-level solution that gives you the right compute at the right economics so you can get the most out of your infrastructure—and your budget.

Rack-scale efficiency

- Enjoy simplified, rack-scale administration efficiencies with:
 - Smart Update
 - Integrated management tools
 - Networking flexibility
 - Pooled power efficiency with cost-effective redundancy
 - Advanced Power Manager

Flexibility to tailor the solutions to the workload to lower total cost of ownership

- Innovation zone allows for choice of NIC, FlexibleLOM options to fit workload needs while increasing cost savings
- Flexibility to tailor the infrastructure by workload:
 - Simple to scale by chassis or rack with a single modular infrastructure and a selection of compute, storage, and GPU/accelerator trays
 - Flexibility at rack level with compute and storage in the rack
 - Simple to manage with Advanced Power Manager



Technical specifications: Apollo 6000 System



| Chassis | HPE Apollo a6000 Chassis | HPE Apollo 6000 Power Shelf |
|--------------------------|---|---|
| Form factor | 5U (H) x 44.81 cm (W) x 86.23 cm (D) 5U (H) x 17.64 in. (W) x 33.95 in. (D) Supports 10 single-slot trays max | 1.5U (H) x 44.81 cm (W) x 78.44 cm (D) 1.5U (H) x 17.64 in. (W) x 30.88 in. (D) Supports six power supplies max |
| System fans | Five hot-plug, double rotor, redundant fans | N/A |
| Power supply type | N/A | HPE 2,650 W Platinum hot-plug power supply HPE 2,400 W Platinum hot-plug power supply |
| Max power | N/A | 15.9 kW (6 x 2,650 W power supply) 14.4 kW (6 x 2,400 W power supply) |
| AC input | N/A | Single-phase or three-phase AC input |
| Redundancy | N/A | N+0, N+1, and N+N |

Technical specifications: Apollo 6000 System (continued)



HPE ProLiant XL230a Gen9 Server



HPE ProLiant XL250a Gen9 Server

| | HPE ProLiant XL230a Gen9 Server | HPE ProLiant XL250a Gen9 Server |
|-----------------------------|--|--|
| Form factor | 5U (H) x 4.33 cm (W) x 70.79 cm (D) 5U (H) x 1.70 in. (W) x 27.87 in. (D) | 5U (H) x 8.66 cm (W) x 70.79 cm (D) |
| Processor family | Intel Xeon E5-2600 v3 series | Intel Xeon E5-2600 v3 series |
| Cores | 6/8/10/12/14/16 | 6/8/10/12/14/16 |
| Chipset | Intel C612 series chipset | Intel C612 series chipset |
| Number of processors | Two | Two |
| Max processor speed | 2.6 GHz | 2.8 GHz |
| Drive description | Four SFF SAS/SATA/SSD | Six SFF SAS/SATA/SSD |
| Supported drives | Hot-plug 2.5-inch SAS/SATA/SSD | Hot-plug 2.5-inch SAS/SATA/SSD |
| Memory slots | 16 DIMM slots | 16 DIMM slots |
| Memory max | 1024 GB (16 x 4 GB) | 1 0 24 GB (16 x 64 GB) |
| Memory type, ECC | DDR4; R-DIMM/LR-DIMM; 2,133 MHz | DDR4; R-DIMM/LR-DIMM; 2,133 MHz |
| Network options | Network module supporting various FlexibleLOM: 1GbE, 10GbE, and/or InfiniBand | Network module supporting various FlexibleLOM: 1GbE, 10GbE, and/or InfiniBand |
| Storage controller | HPE Dynamic Smart Array B140i HPE H240 Host Bus Adapter HPE H241 Smart HBA HPE Smart Array P440/4G Controller | One HPE Dynamic Smart Array B140i HPE H240 Host Bus Adapter HPE H241 Smart HBA HPE Smart Array P440/4G Controller |
| Expansion slots | One Internal PCIe: 1 PCIe x 16 Gen3, half-height External PCIe: PCIe/FlexLOM module | One Internal PCIe: 1 PCIe x 16 Gen3, half-height External PCIe: PCIe/FlexLOM module |
| Accelerators | N/A | Two accelerator card slots supporting: Intel Xeon Phi-5110, 7120 NVIDIA-K1, K40, K80, M-60 |
| USB ports/SD | 1 Serial/USB/Video port Internal microSD | 1 Serial/USB/Video port Internal microSD |
| Management | HPE iLO (Firmware: HPE iLO 4) Option: HPE Advanced Power Manager | HPE iLO (Firmware: HPE iLO 4) Option: HPE Advanced Power Manager |
| OS support | Microsoft Windows Server®, Red Hat® Enterprise Linux®, SUSE Linux Enterprise Server | Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server |

“A juice glass full of water has the cooling capacity of a room full of air. And the pump energy needed to move that juice glass of water, to eject the heat from the system, is less than the fan energy needed to move that room full of air—much less.”

– Steve Hammond, director of Computational Sciences, National Renewable Energy Labs

HPE Apollo 8000 System

The possibilities are as limitless as your imagination

Supercomputers provide the massive compute power that allows leading research institutions to run the simulations and analytics that are behind incredible breakthroughs in science and technology.

Time is of the essence when trying to find a cure, predict the next earthquake, or create the next game-changing innovation. But the massive space and energy requirements of traditional supercomputers are threatening to slow the pace of innovation.

Hewlett Packard Enterprise is passionate about driving technology to commercialization in the areas most important to our customers—and society. As a leader in HPC solutions, we invest in a forward-looking, ambitious research agenda to fuel the next generation of HPE products, services, and solutions, delivering breakthroughs that can transform current businesses and create new ones.

That drive for innovation is what inspired Hewlett Packard Enterprise to break through the barriers of traditional supercomputing to enable a high-density, energy-efficient, HPC solution that uses a groundbreaking warm-water liquid cooling system to deliver faster, more energy-efficient, and more sustainable infrastructure for research computing workloads than ever before.

Increase performance, density, efficiency, and sustainability

To begin with, liquid cooling is 1,000X more efficient than air cooling,³ giving the HPE Apollo 8000 System the ability to offer higher performance components. Bringing the heat extraction closer to the processor further enhances computational performance capabilities. That allows extremely dense configurations that deliver hundreds of teraflops of compute power in a very compact space.

The ingenious design of the HPE Apollo 8000 System allows you to use the transferred facilities heat for a dramatic reduction in costs—and your carbon footprint. When the National Renewable Energy Lab (NREL) deployed an HPE Apollo 8000 System, they slashed their operating costs by \$1 million USD a year.⁴



³ Liquid cooling is 1,000X more efficient than air cooling according to NREL

⁴ HPE case study, [“National Renewable Energy Lab slashes data center power costs with HPE servers”](#) May 2015



HPE Apollo 8000 System components

The HPE Apollo 8000 System is available with a scalable starting configuration of one HPE Apollo f8000 Rack and one HPE Apollo 8000 iCDU Rack. This converged system has up to 144 x 2P servers per rack with plenty of accelerator, PCIe, and throughput options.

HPE Apollo f8000 Rack

- Standard rack footprint
- Up to 144 servers/rack (72 XL730f or XL750f server trays per rack)
- Support for up to 8 InfiniBand switches per rack
- Integrated 144 port 1GbE Ethernet switch for iLO, management, and HPE Advanced Power Manager traffic
- Disaster recovery (DR) integrated fabric with simplified cabling
- Utility module provides 80 kW of power input
- Eight hot-plug 10 kW power rectifiers
- Three-phase, high-voltage AC power for efficiency
- Integrated liquid cooling with multi-level sensors for monitoring and intelligent rack isolation
- HPE Apollo 8000 System Manager provides environmental rack management and monitoring

HPE Apollo 8000 iCDU Rack

- Dense, half-rack solution with 26U available in the top half of the rack
- Avoids/limits the use of power-hungry chiller units
- Reduces PUE and increases energy savings
- Facility water intake, ASHRAE-spec water
- Vacuum pump maintains pressure, so liquid stays in place
- Quick-connect plumbing kit for easy installation
- Tri-loop technology maintains water pressure while isolating the facility and secondary water loop
- Supports up to four HPE Apollo f8000 Racks of IT



HPE ProLiant XL730f and XL750f Gen9 Servers

- XL730f Gen9 tray has two 2P servers per tray
- XL750f Gen9 tray has a single 2P server with two accelerators per tray
- Processors: Intel Xeon E5-2600 v3 series, Intel Xeon E5-2600 v4 series
- Accelerators: Two NVIDIA Tesla K40 XL GPUs (XL750f Gen9)
- Memory: Up to 512 GB per server HPE DDR4 SmartMemory 2,133 MT/s
- Storage: One SFF SSD per server
- Networking: One InfiniBand FDR port and 1GbE NIC per server
- 1,200 W input power per tray
- Component-level cooling with dry-disconnect server trays
- Reusable energy providing additional savings to the overall energy bill
- Heat sinks and jackets protect processors and memory, with heat pipes to ensure heat transfer
- Hot-plug, independent server trays
- HPE Server and Support Management



HPE InfiniBand Switch for HPE Apollo 8000 System

- 36-port InfiniBand FDR switch, each tray has 18 QSFP uplinks and 18 downlinks for node connectivity
- 4–8 per rack based on configuration
- Integrated in the rack for simplified cabling and network topology

Services for Apollo 8000 System

Site assessment, deployment, and support

HPE Technology Services is ready to engage as you consider the HPE Apollo 8000 System. HPE Consulting Services can help you analyze and prioritize needs for power and cooling, as well as more detailed design and data center implementation planning. HPE recommends Factory Express services to oversee the implementation of HPE Apollo 8000 Systems from the HPE factory floor to the data center floor. And our HPE HPC specialists are ready to configure software solutions and any third-party integration needed. Once the new HPE Apollo 8000 System is in place, Hewlett Packard Enterprise gives you easy access to expertise for routine hardware replacements and the ability to get assistance fast if a more complex situation arises.

HPE Datacenter Care is a flexible, comprehensive, relationship-based approach to personalized support and management of heterogeneous data centers. With a structured framework of repeatable, tested, and globally available services, your team can leverage HPE's experience supporting complex environments, global support partnerships, and technical expertise. You get exactly the services you need—when and where you need them—in a single agreement.

Technical specifications: HPE Apollo 8000 System



HPE Apollo f8000 Rack

| | |
|-------------------------------|---|
| Server | Each rack supports up to 72 HPE ProLiant XL730f/XL750f Gen9 Server trays |
| Networking | Each rack supports a total of eight HPE InfiniBand switches Each rack ships standard with a 144-port integrated HPE Apollo 8000 1GbE Ethernet switch |
| Power | 80 kW input power per rack ships standard with N+1 or N+N redundancy support depending on configuration of the servers Input: 380–415 V AC for international standards and 480 V AC for North American standards (4 x 30 A power cords per rack) |
| Management | HPE Apollo 8000 System Manager |
| Typical configuration | 72 HPE ProLiant XL730f/XL750f Gen9 Server trays and eight HPE InfiniBand switches, associated under-floor plumbing kit, and utility module (includes HPE Apollo 8000 Rack Manager, 2 x 40 KW input power shelves) |
| Weight | 4,700 pounds (2,132 kg) max 2,914 pounds (1,322 kg) max with no server trays |
| Dimensions (W x D x H) | 24 in. x 56.18 in. x 94 in. (607 mm x 1,427 mm x 2,382 mm) |

Technical specifications: HPE Apollo 8000 System (continued)



HPE Apollo 8000 iCDU Rack

| | |
|-------------------------------|---|
| Cooling | An iCDU rack supports a maximum of 320 kW or up to four HPE Apollo f8000 Racks |
| Power | Input: 380–415 for International standards and 480 for North American standards (1 x 30 A power cord per rack) |
| Management | HPE Apollo 8000 System Manager |
| Redundancy | Supports N, N+1, N+N redundancy configurations |
| Configuration | Each iCDU rack ships with one CDU at the bottom of the rack and associated rack plumbing kit. Also, the iCDU rack is configurable to add 22U of IT (server, storage, network switches) in the top half of the rack. Secondary plumbing kit is ordered one for every three racks (f8000 and iCDU) in the solution. Optional IT equipment may be added to the top half of iCDU provided power and cooling requirements for additional IT. |
| IT equipment | 26U of standard 19" rack space for network switches or servers |
| Weight | 2,188 pounds (993 kg) with no hose kits or IT equipment installed |
| Dimensions (W x D x H) | 24 in. x 57 in. x 94 in. (607 mm x 1,427 mm x 2,382 mm) |

Technical specifications: HPE Apollo 8000 System (continued)



HPE ProLiant XL730f Gen9 Server



HPE ProLiant XL750f Gen9 Server

| | |
|------------------------------|---|
| Server | Each HPE ProLiant XL730f Gen9 Server comes standard with two 2P servers Each HPE ProLiant XL740f Gen9 Server and XL750f Gen9 Server comes standard with one 2P server and two accelerators |
| CPU | Intel Xeon E5-2600 series: E5-2699 v3, E5-2698 v3, E5-2697 v3, E5-2695 v3, E5-2690 v3, E5-2683 v3, E5-2680 v3, E5-2670 v3, E5-2667 v3, and E5-2660 v3 |
| Memory | 16 DIMMs per server, max 512 GB HPE DDR4 SmartMemory 2,133 MT/s |
| Network | Integrated NIC: Single port 1GbE per server InfiniBand Adaptor Kit: Single ConnectX-3 Pro InfiniBand FDR or ConnectX-4 EDR port per server |
| Storage | One small form factor (SFF) SSD per server Supports 120 GB, 240 GB, 480 GB, 960 GB |
| Boot | SSD and network (IB or Ethernet) |
| Minimum configuration | Two CPUs per server, single InfiniBand FDR or EDR adaptor, two DIMMs per CPU (up to eight DIMMs max) |
| Accelerator | The HPE ProLiant XL750f Gen9 Server supports two NVIDIA Tesla K40 XL GPUs |
| Power | Max of 1,200 W of high-voltage direct current to 12 V conversion per tray |
| Management | HPE Insight Cluster Management Utility (optional) HPE Insight Online Embedded management—dedicated iLO network support |
| OS | Red Hat Enterprise Linux, SUSE Linux Enterprise Server, CentOS |
| System ROM | UEFI, Legacy BIOS |



HPE InfiniBand Switch for Apollo 8000

| | |
|--------------------|--|
| Switch type | Mellanox 36-port QDR/FDR10/FDR integrated leaf module |
| Ports | Each tray has 18 QSFP uplinks and 18 downlinks for node connectivity |
| Speed | Up to 56 Gb/s InfiniBand FDR per port |
| Cabling | Front cabled uplinks with rear cabled node connectivity |
| Form factor | 1U half-width tray |
| Power | Maximum 250 W per tray (preliminary estimates) |
| Management | Embedded |

System Management for HPE Apollo Systems

A Complete Portfolio of System Management Components

To address the growing demand for HPC, and the relentless pursuit of efficiency, Hewlett Packard Enterprise has taken the lead on a new approach: thinking beyond just the server and designing a rack-level solution that gives you the right compute at the right economics so you can get the most out of your infrastructure—and your budget.

HPE Integrated Light-Out Management Engine

The HPE iLO Management Engine with Integrated Lifecycle Management provides new levels of performance and quality of service. Monitoring the health of HPC solutions usually requires running monitoring software on the systems and stealing cycles from primary computational tasks. With Active Health and Agentless Management, all the monitoring is performed on the iLO Management Engine, allowing extensive monitoring without impacting performance. HPE Integrated Lights-Out (iLO) provides the automated intelligence to maintain complete server control from any place. HPE iLO functions out-of-the-box without additional software installation regardless of the servers' state of operation giving you complete access to your server. HPE iLO management technologies are embedded management technologies that are standard in all HPE Apollo systems.

HPE Insight Cluster Management Utility (CMU)

A highly capable utility for the management of HPC and Big Data clusters, HPE Insight CMU is an integrated easy-to-use tool for cluster administration providing provisioning, management, and monitoring in clusters of any scale. HPE Insight CMU is used at some of the world's largest HPC cluster deployments, supporting multiple HPC Top 500 sites. It is valued for its ability to quickly identify and isolate performance issues enabling administrators to keep their clusters running at peak performance. Its multiple user interfaces (CLI and GUI) and APIs make it easy to use for a variety of users, and interoperable with other software and management components. With extensive capabilities to manage system images, CMU can rapidly re-provision and manage a single server, dynamically defined groups of servers, or entire systems increasing the availability of your Apollo systems, configured as your users need them to be most productive.



HPE OneView

In enterprise and cross-discipline data center environments deploying Apollo systems, HPE OneView is a single integrated management platform which also supports HPE Synergy, HPE BladeSystem, c-Class, ProLiant server platforms, HPE 3PAR storage systems. With best-in-class infrastructure lifecycle management, HPE OneView allows IT to manage their entire infrastructure lifecycle more efficiently, designing, provisioning, monitoring and updating through a single interface developed for the way you think and work. With greater visibility and control of infrastructure, HPE OneView helps IT become more efficient, agile and productive, saving time and money. HPE OneView discovery and monitoring is available on the Apollo 2000 and 4000 systems.

HPE Apollo Platform Manager (APM)

HPE APM provides industry-leading power and chassis level management as an option for Apollo 2000, 4000, and 6000 systems. It delivers power control and measurement at server, chassis, and rack levels, PDU level power outlet control and current measurement, and rack and chassis thermal component management. For energy efficient and power constrained data centers, APM provides critically important rack level static or dynamic power capping. APM also provides DC Power Shelf Management and integration with HPE UPS subsystems. APM functions with other HPC system management components, like CMU, or independently, providing interfaces to third-party management systems.

HPE Apollo 8000 System Manager

With HPE Apollo 8000 System Manager, you can see and manage shared infrastructure power and facility and environmental controls from a single console. Save by avoiding spend on serial concentrators, adaptors, cables, and switches. Flex to meet workload demands with dynamic power allocation and capping. Together with CMU and the embedded APM functionality, HPE Apollo 8000 System Manager gives user full integrated control over power, cooling, and all aspects of systems management in their in Apollo 8000 system.



Apollo Family comparison chart



Apollo 8000 System



Apollo 6000 System



Apollo 2000 System



Apollo 4000 Family

| | Apollo 8000 System | Apollo 6000 System | Apollo 2000 System | Apollo 4000 Family |
|--------------------------|---|--|---|---|
| Typical workload | Supercomputing | HPC clusters | Data center HPC | Big Data analytics and object storage |
| Value proposition | Ground-breaking and highly serviceable warm liquid cooling system enables leading performance density with lower energy costs | Optimizing performance at the rack level | Achieve the power of HPC with the space and cost savings of density-optimized infrastructure—without disruption | Harnessing Big Data will unlock the insights that will streamline operations and reduce costs, target products and services more efficiently and effectively to customers who need them, and build the next generation of products and services to satisfy unmet needs ahead of competition |
| Customer profile | Large research institutions Government Universities Life Sciences | Product design firms using product design and engineering (PD&E) applications Manufacturers leveraging engineering design automation (EDA) Financial Services firms running risk modeling Life Sciences Web-hosters wanting to offer HPC capabilities to customers | Enterprise and SMEs looking to benefit from HPC power within the constraints of a traditional data center | HPE Apollo 4200 Gen9 Server Enterprises and SMEs who want to start or grow Big Data solutions or want to deploy smaller Object Storage systems, Hadoop and NoSQL-based Big Data analytics solutions, and smaller, data-analyzing HPC clusters HPE Apollo 4500 System Enterprises that need to enable Big Data solutions at scale |

HPE financing for HPE Apollo 6000 and 8000 Systems

Having access to technology on terms that align to your business needs is critical, and HPE Financial Services is uniquely positioned to help accelerate your move to the data center of the future with a broad portfolio of flexible investment and transition solutions. Maximize your current data center environment, and access the latest high-performance computing technology when you need it. HPE Financial Services offer:

- Simple transition from existing technology to HPE Apollo 6000 and 8000 Systems
- Dual usage of existing and new equipment to ease the transition
- Flexible payment plans to quickly access HPE Apollo 6000 and 8000 Systems more economically
- Removal of existing technology and recovery of remaining value to help support the transition to new HPE Apollo 6000 and 8000 Systems
- Technology refresh approach to allow for future scalability and upgrades
- Expert support for secure data removal from legacy equipment
- Flexible terms to meet business needs
- Availability globally where HPE Financial Services conducts business⁵



⁵ Financing and service offerings available through Hewlett Packard Financial Services Company and its subsidiaries and affiliates (collectively HPE FSC) in certain countries are subject to credit approval and execution of standard HPE FSC documentation. Rates and terms are based on customer's credit rating, offering types, services, and/or equipment type and options. Not all customers may qualify. Not all services or offers are available in all countries. Other restrictions may apply. HPE FSC reserves the right to change or cancel this program at any time without notice.

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⁶ IDC white paper, "The Business Value of Connected Support from HP (now Hewlett Packard Enterprise)," March 2015, IDC Document #254594

⁷ HP (now Hewlett Packard Enterprise) CSC Reports, 2014–2015

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HPE Technology Services

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- **HPE Datacenter Care**—Our most flexible service, supporting your entire IT environment with the right mix of enhanced call management, proactive services, and hardware and software support for maximum control, performance, and simplicity.
 - **HPE Flexible Capacity**—An option of HPE Datacenter Care, which delivers a public cloud experience with the benefits of public and/or on-premises IT. With this pay-as-you-grow solution, you can scale instantly to handle growth without the usual wait for procurement.
- **HPE Proactive Care Services** come in two versions:
 - **HPE Proactive Care**—Leverages products connecting to HPE for personalized problem prevention, plus up to 77 percent reduction in downtime,⁶ near 100 percent diagnostic accuracy,⁷ and a single consolidated view of the IT environment. You will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. If there is a problem, you will receive rapid access to expertise to stabilize your IT with start-to-finish call management.
 - **HPE Proactive Care Advanced**—Designed for servers running business-critical IT. It expands on Proactive Care service by providing an assigned, local Account Support Manager (ASM) who works with you to help keep your systems in peak performance with best practice advice and access to technical specialists globally, as well as critical event management to quickly address complex issues.
- **HPE Foundation Care**—An economical choice that provides hardware and software support with a simplified choice of coverage windows and response times. It includes collaborative call management for assistance with leading x86 operating system software.
- **HPE Education Services**—Help address the challenge of managing costs and resources while keeping up with the latest technology.
- **HPE Lifecycle Event Services**—Offer access to expertise for every step of the way—from strategy to design, as well as deployment and operations.

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4AA5-8958ENW, March 2016, Rev. 2