Hewlett Packard Enterprise

Family guide

HPE Apollo Systems

Enabling the data-driven organization

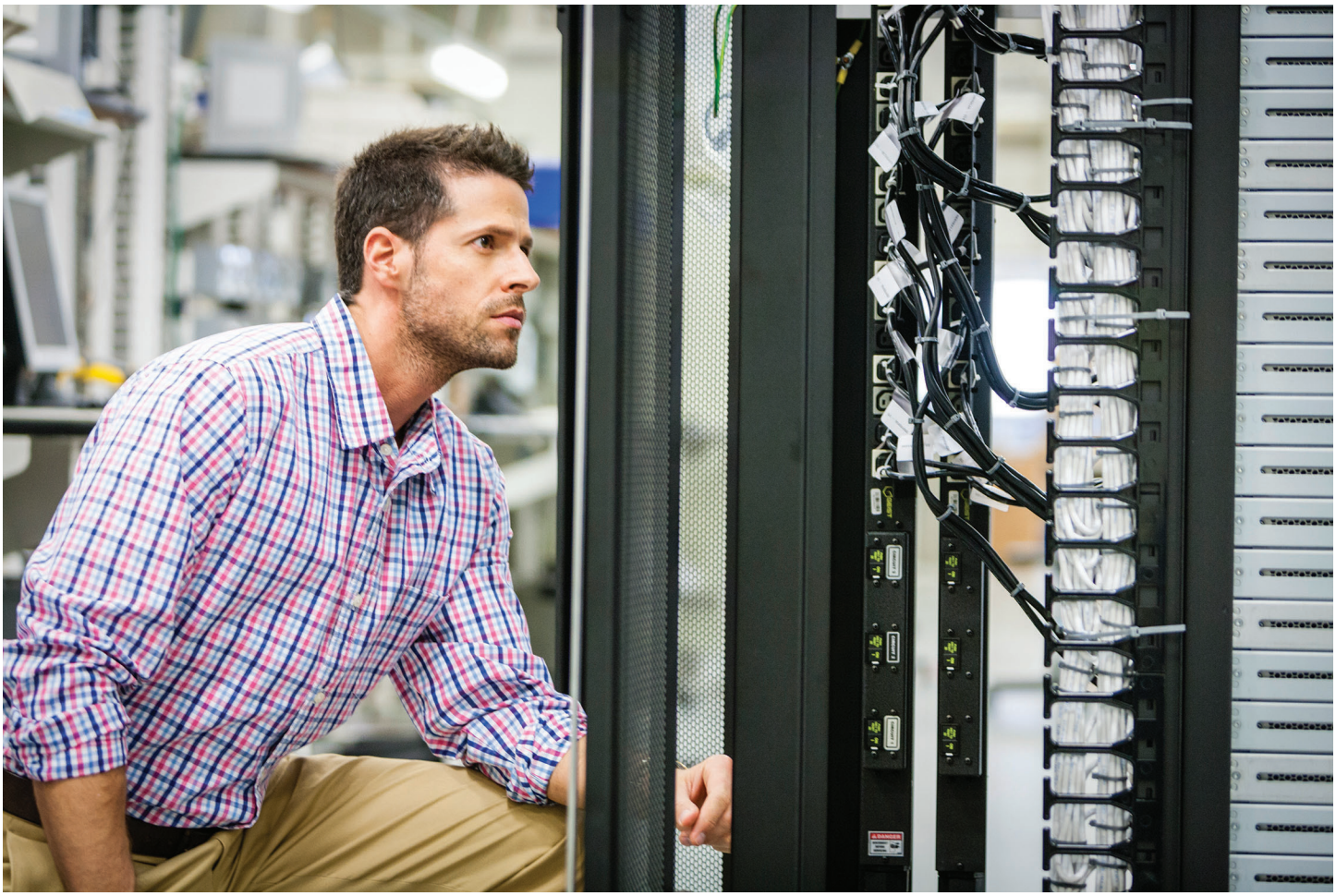


Table of contents

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

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

The HPE Apollo Family is designed to deliver efficient rack-scale 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:

- Delivers just the right amount of performance and efficiency with systems that are optimized for specific workloads and scalable
- Accelerates time-to-value by reducing implementation time
- Provides architectural flexibility with both scale-up and scale-out solutions
- Helps you reduce capital and operating expenditures (CAPEX and OPEX)
- Gives you peace of mind with complete HPE service and support offerings

The scale-out compute portion 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 storage, high performance, and rack-scale efficiency available to organizations of all sizes, with a tiered approach that provides a simplified starting point. HPE Apollo Systems are the logical choice for companies seeking to utilize Big Data, object storage, and HPC in their data-driven organization.

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

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

Watch the **video case study**.

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.

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 contemporary supercomputers, combined with the drastic slowing of processor speed increases, are slowing the pace of research.

Hewlett Packard Enterprise is breaking through traditional supercomputing barriers by rethinking cooling to enable high-density, energy-efficient supercomputing solutions. A prime example: 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, 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. The NREL data center is even designed to capture the "waste heat" from computing systems so it can be used to heat facilities on the campus.

Divisional and departmental HPC
The demand for more compute performance for applications used by engineering design automation (EDA), financial risk modeling, life sciences, 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 optimizing performance at the rack level to get the most out of the entire system infrastructure.

Scale-out data center
You need to deploy additional compute power for cloud, web-based applications, web hosting, and other workloads to speed research and get to market faster, but space and resource restrictions are getting in the way. Hewlett Packard Enterprise Apollo systems provide a bridge from traditional to scale-out architecture so you can achieve the power of HPC systems 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.

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 6500 System: high density GPU compute
The HPE Apollo 6500 system solve problems faster with up to 15 Tflops of single-precision performance per 2U node. The new HPE Apollo 6500 increases your return on IT investment by accelerating the performance of your data center workloads with up to eight GPUs or coprocessors. With high-powered analysis and prediction, you will solve your most demanding problems in the shortest time.

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

- The HPE Apollo 2000 System uses the same HPE ProLiant Gen9 enterprise-class and HPC management software; HPE Insight Cluster Management Utility, HPE iLO software, and HPE OneView and other system management tools like Apollo Platform Manager for advanced power and server control.

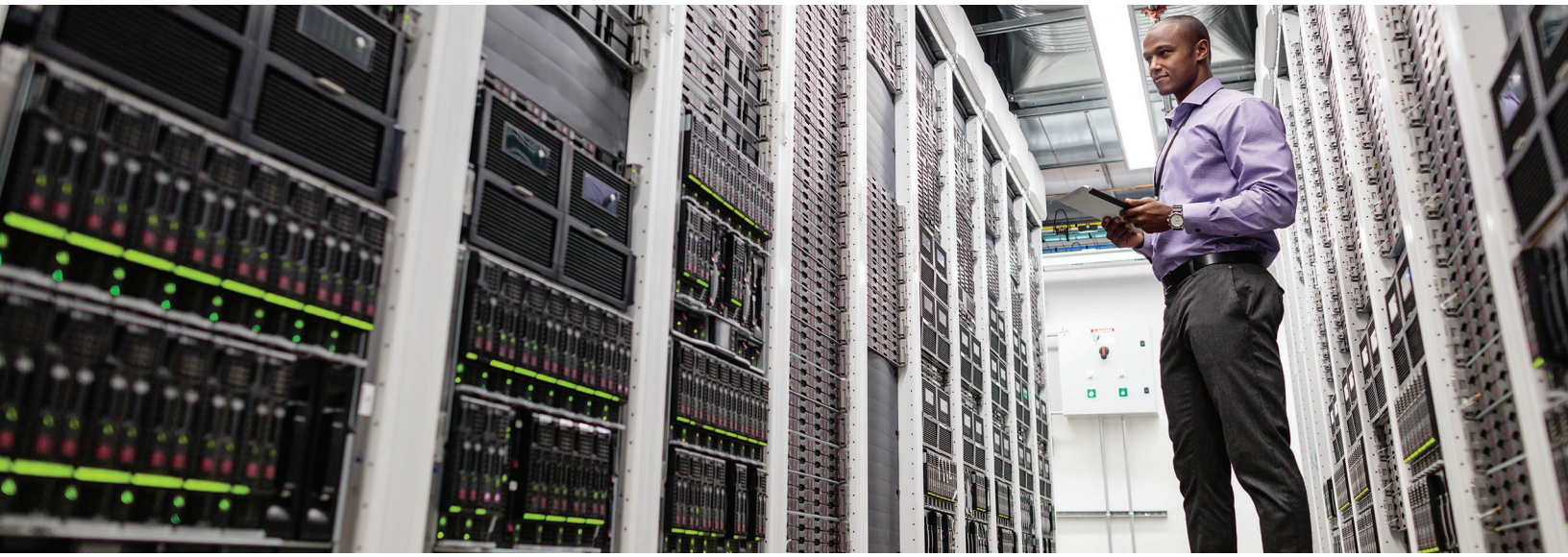
Technical specifications: HPE Apollo 2000 System

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, and Intel® Omni-Path	2 x 1 Gb Ethernet, Serial RJ45 connector, SUV connector (one serial/two USB/one video), optional FlexibleLOM and Intel Omni-Path
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 interface options	HPE iLO (iLO 4) HPE Apollo Platform Manager HPE Insight Cluster Management Utility (CMU) HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)	HPE iLO (iLO 4) HPE Apollo Platform Manager HPE Insight Cluster Management Utility (CMU) HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)

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 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 rack[1] 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
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 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 interface options	HPE iLO 4 HPE Insight Cluster Management Utility HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)	HPE iLO 4 HPE Insight Cluster Management Utility HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)
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

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 6–22 cores, 1.6 GHz–2.6 GHz CPU speed, and power ratings between 55–145 watts
  - 16 memory DIMM slots with up to 1,024 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 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 6–22 cores, 1.6 GHz–2.6 GHz CPU speed, and power ratings between 55–145 watts
  - 16 memory DIMM slots with up to 1,024 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 3.68 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 55–145 watts
  - 16 memory DIMM slots with up to 1,024 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
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	6/8/10/12/14/16/18/20/22	6/8/10/12/14/16/18/20/22	6/8/10/12/14/16/18/20/22
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 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	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 plus PCIe and FlexibleLOM Options	2 x 1 Gb Ethernet Plus FlexibleLOM and PCIe Options plus PCIe and FlexibleLOM Options	2 x 1 Gb Ethernet Plus FlexibleLOM and PCIe Options plus PCIe and FlexibleLOM 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 interface options	HPE iLO 4 HPE Apollo Platform Manager HPE Insight Cluster Management Utility HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)	HPE iLO 4 HPE Apollo Platform Manager HPE Insight Cluster Management Utility HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)	HPE iLO 4 HPE Apollo Platform Manager HPE Insight Cluster Management Utility HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)
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 1,400 W Flex Slot, hot-plug redundant power supplies	Up to 4 power supplies, 800 W and 1,400 W Flex Slot, hot-plug redundant power supplies	Up to 4 power supplies, 800 W and 1,400 W Flex Slot, hot-plug redundant power supplies

"The power of the HPE Apollo 6000 System strengthens scientific research for Ghent University and allows our researchers to quickly test new hypotheses and explore areas like bioinformatics, weather prediction, fluid dynamics, nanotechnology, physics, computational chemistry, and linguistics. The ability to swiftly process massive amounts of data enables innovative analysis that opens up new worlds of research and exploration."

– Ewald Pauwels, Scientific Coordinator for High-Performance Computing, Ghent University

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
  - Apollo Platform 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 Apollo Platform 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

	HPE ProLiant XL260a 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 1.70 in. (W) x 27.87 in. (D) 5U (H) x 4.33 cm (W) x 70.79 cm (D)	5U (H) x 8.66 cm (W) x 70.79 cm (D)
Processor family	Intel Xeon Phi x200 series	Intel Xeon E5-2600 v3/v4 series	Intel Xeon E5-2600 v3/v4 series
Cores	64/68/72	6/8/10/12/14/16/18/20/22	6/8/10/12/14/16/18/20/22
Chipset	Intel C612 series chipset	Intel C612 series chipset	Intel C612 series chipset
Number of processors	1	2	2
Max processor speed	1.3 GHz (Turbo 1.7 GHz)	2.8 GHz	2.8 GHz
Drive description	4 SFF SATA or M.2	4 SFF SAS/SATA/SSD	6 SFF SAS/SATA/SSD
Supported drives	Hot-plug 2.5-inch SATA	Hot-plug 2.5-inch SAS/SATA/SSD	Hot-plug 2.5-inch SAS/SATA/SSD
Memory slots	6 DIMM slots	16 DIMM slots	16 DIMM slots
Memory max	384 GB (6 x 64 GB)	2048 GB (16 x 128 GB)	2048 GB (16 x 128 GB)
Memory type, ECC	DDR4; R-DIMM/LR-DIMM 2,400 MHz	DDR4; R-DIMM/LR-DIMM; 2,133/2,400 MHz	DDR4; R-DIMM/LR-DIMM; 2,133/2,400 MHz
Network options	Network module supporting various fabric options: 10GbE, InfiniBand EDR, Intel Omni-Path	Network module supporting various FlexibleLOMs: 1GbE, 10GbE, and/or InfiniBand/Omni-Path	Network module supporting various FlexibleLOMs: 1GbE, 10GbE, and/or InfiniBand/Omni-Path
Storage controller	HPE H241 Smart Host Bus Adapter	1 HPE Dynamic Smart Array B140i SATA controller HPE H240 Host Bus Adapter	1 HPE Dynamic Smart Array B140i SATA controller HPE H240 Host Bus Adapter
Expansion slots	N/A	1 internal PCIe: 1 PCIe x16 Gen3, half-height 1 PCIe/FlexLOM I/O module (optional)	1 internal PCIe: 1 PCIe x16 Gen3, half-height 1 PCIe/FlexLOM I/O module (optional)
Accelerator	N/A	N/A	2 accelerator card slots supporting: Intel Xeon Phi 5110P/7120P NVIDIA K40/K80/K1/M60 AMD S9150/S7150x2
USB ports/SD	1 Serial/USB/Video port Internal microSD	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	HPE iLO (Firmware: HPE iLO 4) Option: HPE Advanced Power Manager
OS support	Red Hat® Enterprise Linux® SUSE Linux Enterprise Server	Microsoft Windows Server® Red Hat Enterprise Linux SUSE Linux Enterprise Server	Microsoft Windows Server Red Hat Enterprise Linux SUSE Linux Enterprise Server

HPE Apollo 6500—Massive GPU compute

Do you need to rapidly transform massive data streams into actionable results? Are you running massively parallel data models that require more processing horsepower? Would you like to deliver the maximum amount of performance from each of your HPC racks?

The HPE Apollo 6500 System provides the tools and the confidence to deliver high-performance computing (HPC) innovation. With up to 56 Tflops of single precision performance per server with eight NVIDIA Tesla M40, and up to 15 Tflops of double precision performance with the NVIDIA Tesla K80 GPUs, HPE ProLiant XL270d Gen9 Accelerator Tray delivers the performance you need. The configurable internal PCIe Gen3 fabric provides the flexibility to choose the optimal GPU topology to match your specific needs.

The system consists of three key elements:

- The HPE ProLiant XL270 Gen9 Server tray
- The HPE Apollo 6500 Chassis, and
- The HPE Apollo 6000 Power Shelf

High-bandwidth, low-latency networking is tightly coupled to the accelerators allow you to take full advantage of your network. And the two x16 PCIe Gen3 slots add to your flexibility when choosing high-speed fabrics.

The Apollo 6500 System: Your next accelerated computing solution.

What's new

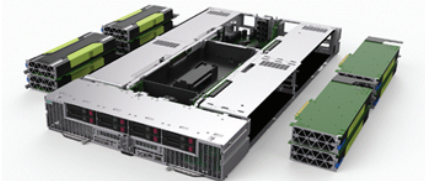
- Solve problems faster with up to 15 Tflops of single precision performance per 2U node.
- Optimize accelerator configurations to match your workload.
- Faster communications between nodes with two PCIe Gen3 x16 slots to enable your choice of high-speed fabrics.

Features

- Flexible configuration for the most demanding high-performance computing workloads. The HPE Apollo 6500 System supports up to eight 300 W GPU or coprocessors delivering increased performance.
- For workloads optimized for high peer-to-peer communication among the accelerators, place four (4) GPU on a single high-speed PCIe switch, and two banks to a CPU for eight (8) GPU per CPU.
- For workloads requiring higher CPU to GPU communications, choose our four (4) GPU per CPU configuration.
- The HPE ProLiant XL270 Gen9 Server supports industry standard Intel Xeon E5-2600 v4 processors, solid state drives (SSD) with 12G SAS and 512 GB DDR4 2,400 MHz memory for blazing performance.
- Up to 16 HPE DDR4 2,400 MHz Memory Modules per HPE ProLiant XL270 Gen9 Server for faster performance with data-intensive application workloads.
- High-bandwidth, low-latency networking between Accelerator Nodes.
- The HPE Apollo 6500 System includes two low profile PCIe Gen3 x16 slots to enable your choice of high-speed fabrics.
- In the 8:1 GPU to CPU topology, networking is directly attached to the PCIe Gen3 fabric of the GPU for reduced latencies between GPU nodes.
- Supports GPUDirect with four (4) GPUs per HPE InfiniBand Adapter.

Technical specifications: HPE Apollo 6500 System





	HPE ProLiant XL270d Accelerator Tray
Rack	Optimized for 1,200 mm deep racks
Chassis	HPE Apollo d6500 Chassis (4U, 2 server trays, up to 16 GPU/chassis) 6.96 x 17.638 x 37 in.
Processor	Intel Xeon E5-2600 v4 family
Power	HPE Apollo 6000 Power Shelf
Memory	16 2,400 MHz DDR4 DIMMs, 1,024 GB max (16 x 64 GB)
Network options	Two 1GbE single-port module Two x16 PCI Express low profile slots supporting InfiniBand/OPA/Ethernet (1GbE or 10GbE)
I/O slots	Support for 8 350 W GPU per tray 1 x8 PCIe mezzanine form factor (Smart Array) 2 x16 PCIe low profile Gen3
Storage	Up to 8 SFF hot plug SAS/SATA/SSD—front accessible storage
Accelerator	NVIDIA Tesla: K40, K80, M40, and the AMD FirePro S9150 NVIDIA Pascal GPU, and Intel's future Xeon Phi
Management interface options	HPE iLO 4 HPE Insight Cluster Management Utility HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)

"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.

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

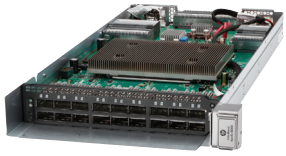
HPE Apollo 8000 System components
The HPE Apollo 8000 System is available with a scalable starting configuration of one HPE Apollo f8000 Rack and one HPE Apollo 8000 iCDU Rack. This converged system has up to 144 x 2P servers per rack with plenty of accelerator, PCIe, and throughput options.

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 Apollo Platform 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 2,400 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.

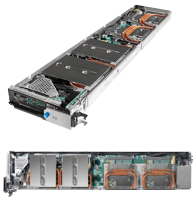
Technical specifications: HPE Apollo 8000 System

	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) or a single 150 A feed/rack
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 V AC for International standards and 480 V AC for North American standards (1 x 30 A power cord per rack)
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 2,400 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 interface standard options	HPE iLO 4 HPE 8000 System Manager HPE Insight Cluster Management Utility HPE iLO Standard and Advanced HPE OneView (3.0—Discovery and monitoring only)	

	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 rack-level solutions that gives you the right compute at the right price so you can get the most out of your infrastructure—and your budget.

HPE Integrated Lights-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, and HPE 3PAR storage systems. With best-in-class infrastructure lifecycle management, HPE OneView allows IT to manage their entire infrastructure lifecycle more efficiently 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 all Apollo systems.

HPE Apollo Platform Manager (APM)
HPE APM provides industry-leading power and chassis level management as an option for Apollo 2000, 45xx, 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
HPE Apollo 8000 System Manager monitors and manages shared infrastructure power, 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 users full-integrated control over power, cooling, and all aspects of systems management in the Apollo 8000 system.

Apollo Family comparison chart




	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 business[4]

[4] Financing and service offerings available through Hewlett Packard Enterprise 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.

For more information on HPE Technology Services Consulting and Support, go to:
hpe.com/services

HPE Factory Express provides customization and deployment services along with your storage and server purchases. You can customize hardware to your exact specifications in the factory—helping speed deployment.
hp.com/go/factoryexpress

Optimize your IT investment strategy with new ways to acquire, pay for and use technology, in lock-step with your business and transformation goals.
hpe.com/solutions/hpefinancialservices

Gain the skills you need with ExpertOne training and certification from HPE. With HPE ProLiant training, you will accelerate your technology transition, improve operational performance, and get the best return on your HPE investment. Our training is available when and where you need it, through flexible delivery options and a global training capability.
hp.com/learn/proliant

HPE Technology Services

HPE Technology Services delivers confidence, reduces risk, and helps you realize agility and stability, with a single-source solution that helps make the most of your HPE Apollo System investment. You can choose from a flexible selection of service levels to meet your requirements. Utilizing HPE Technology Services consulting and support helps you reap the benefits of your HPE Apollo solution as we help you successfully deploy and operate your Apollo solution with minimal disruption to your current environment.

Connect to HPE to help prevent problems and solve issues faster. Our support technology lets you tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, anytime.

Choose from a flexible selection of services

- **Installation and Startup**—Will help you rapidly get up and running smoothly.
- **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,[5] near 100 percent diagnostic accuracy,[6] 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.

Learn more at
hpe.com/info/apollo

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

[6] HP (now Hewlett Packard Enterprise) CSC Reports, 2014–2015

Sign up for updates

Hewlett Packard Enterprise

4AA5-8958ENW, October 2016, Rev. 3