

Portfolio and technology guide

HP ProLiant Gen8

Find the right platform for your compute needs



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In 1989, HP developed the first x86 servers built on industry standards. Since then, we've focused on making the HP ProLiant series deliver what you need and expect from an industry leader—reliability, innovation, quality, and best-in-class embedded server management.

Your business inspired our HP ProLiant Gen8 design

In designing the eighth generation of the HP ProLiant line, we wanted to not only draw on our 24 years of server experience, but also gain from the depth of knowledge and insight of you, our customers. After all, no one knows your business and technology challenges better than you do.

The result is a user-inspired design that does more than simply improve and upgrade the processor and features—we revolutionized the server from the inside out. With intelligence designed in, the HP ProLiant Server drastically reduces the time you spend on tasks such as startup and install, troubleshooting and resolution, as well as updates and maintenance. Greater freedom from mundane IT chores means more time to focus on what matters most to your business—growth and innovation.

Harnessing the world's most intelligent servers

The demands on your IT organization have never been greater—the number, complexity, and required performance of applications continue to increase while budgets and data center space are always limited. In the cloud era, you're tasked with delivering exceptional, robust services at scale. To respond to these challenges effectively, you need smarter systems that can learn, connect, and adapt.

HP ProLiant Gen8 Servers provide the heart and mind of a self-aware and intelligent converged infrastructure. From creating the most modern technology foundation all the way to the cloud, HP is committed to delivering servers so intelligent they redefine management productivity. Built on the HP ProActive Insight architecture, the HP ProLiant line provides you with powerful, streamlined tools for maintenance, application optimization, energy efficiency, and support so you can increase application uptime and reduce operational costs. These are the world's smartest and most intelligent servers.



What HP ProActive Insight means for you—an overview

HP ProActive Insight architecture fundamentally redefines how administration is performed across the entire server lifecycle. Powerful new capabilities automate and simplify system provisioning, troubleshooting, and software updates. HP built the HP ProLiant Gen8 Servers and HP ProActive Insight architecture around four distinct pillars:

Integrated Lifecycle Automation

The industry's most comprehensive set of built-in management tools

Dynamic Workload Acceleration

Increased storage capacity to stay ahead of data growth

Integrated Lifecycle Automation is the industry's most comprehensive set of built-in management tools to increase administrator productivity and system uptime. Taking advantage of an industry-first HP Active Health, embedded tools, simplified firmware and software maintenance, and agentless management, HP ProLiant Servers use intelligence to automate your most common tasks during each step of the IT lifecycle. New innovations simplify server deployment so that no physical media is needed—the firmware, drivers, and tools are built right into the system. With cutting-edge innovations such as continuous, proactive health monitoring and configuration change logging, you can start problem analysis faster. In addition, a system maintenance tool keeps server firmware and software up to date with minimal operator intervention, freeing server administrators to focus on strategic IT initiatives like cloud and virtualization.

- **HP Intelligent Provisioning:** No more physical media needed for firmware, drivers, and tools. HP Intelligent Provisioning is a single embedded tool for all server setup and configuration tasks.
- **HP Active Health:** An essential part of the HP iLO Management Engine portfolio, this industry-first technology provides continuous proactive health monitoring of over 1600 system parameters.¹
- **HP Smart Update:** A breakthrough system maintenance tool with one-click simplicity that systematically updates servers and blade infrastructures at the scale of your data center.

Dynamic Workload Acceleration increases storage capacity quickly and easily to stay ahead of data growth. It accelerates the performance of application workloads with increased memory bandwidth and faster data throughput. These innovations protect data from hardware failures, application crashes, and human errors while improving uptime with advanced memory error detection and providing capacity and performance that are optimized in a cost-effective manner.

- **Solid state optimized:** Engineered for solid state storage to deliver a dynamic balance of performance and capacity. To optimize solid state media performance, HP ProLiant Gen8 Servers include an embedded next-generation HP Smart Array controller with six times the performance of previous-generation controllers.² HP SmartCache caches hot data onto lower latency SSDs to dynamically accelerate application workload with up to four times better workload performance.
- **Smart data protection:** Confidently protect data and enable uptime for continuous business operations.
- **Smart data services:** Orchestrated with real-time analysis to build the future of converged storage. Enable real-time application tuning and acceleration. HP Smart Storage analytics technology provides workload-aware intelligence for real-time application tuning and acceleration to optimize system performance.

¹Based on internal HP calculations.

²New HP Smart Array controllers (HP ProLiant Gen8) compared to the current generation HP Smart Array controllers (HP ProLiant G7) in a RAID configuration. Performance varies depending on server configuration. Internal HP Lab testing. February 2012.

Automated Energy Optimization

Reduced power consumption and operation cost to get more IT out of your power and cooling capacity

HP Proactive Service and Support

Support experience with automated 24x7 event monitoring and support case generation

HP iLO Management Engine— Complete lifecycle management

Embedded management features



ProActive Insight Architecture Alliance

ProActive Insight architecture is more than a design or even a transforming design philosophy. It's also the alignment of over 900 patents, over 150 customer innovations, and an alliance of the world's top technology provider allied to transform the server experience.

Visit the alliance partners: <http://h17007.www1.hp.com/us/en/whatsnew/proliantgen8/alliance.aspx>.

Automated Energy Optimization reduces power consumption and operation costs so that you can get more IT out of every bit of power and cooling capacity. Avoiding tedious manual discovery and inventory processes not only saves you time, but also decreases the likelihood of data center outages by reducing the risk of power redundancy failures and circuit overloads.

- **HP Thermal Discovery Services:** Reduce energy usage and map server thermal status.
- **HP Location Discovery Services:** Automatically records the exact location of new server installations and tracks when their location is changed. This eliminates the tedious manual processes currently used for asset tracking. Knowing, without a doubt, where equipment is located, down to the U space in the rack, speeds up the repairs should service ever be needed.
- **HP Power Discovery Services:** Automatically configures the HP Intelligent PDU to accurately track all components in the rack and provide power redundancy, which prevents unplanned downtime by eliminating common human errors.

HP Proactive Insight experience gives customers a superior manageability and serviceability solution for their IT infrastructure. This experience allows customers to access their IT environments anytime, anywhere. It enables them to automate routine tasks to reduce costs and save time, and prevent problems before they occur to keep business running smoothly.

- **HP Insight Online:** Provides one-stop cloud-based remote monitoring and support of your infrastructure.
- **HP Proactive Care Services:** Rapid access to Advanced Solution Center, features remote and onsite support, proactive scans and reports, and regular consultations with HP technology experts.

A closer look at HP ProLiant Gen8 smart technologies

Here are some of the most innovative technology features that have helped to revolutionize the HP ProLiant Server series.

HP iLO Management Engine—Complete lifecycle management

HP iLO Management Engine is a complete set of embedded management features supporting the complete lifecycle of the server, from initial setup and deployment, through ongoing management, to service alerting and remote support. HP iLO Management Engine comes standard on all HP ProLiant Gen8 Servers:

- **HP iLO—The IT administrator in every HP ProLiant Server.** The HP iLO (integrated Lights-Out) management processor is the core foundation for the HP iLO Management Engine. HP iLO management processors for HP ProLiant Servers simplify server setup, engage in health monitoring of power and thermal control, and promote remote administration for HP ProLiant BL, DL, ML, and SL Servers. HP iLO is the intelligence that drives and manages all the server components and how they interact. It provides an outstanding remote console and virtual media. With the new HP iLO you can now have the same homogeneous server management experience across all HP ProLiant Gen8 Servers. Furthermore, with the "HP iLO Mobile App" you have the ability to access, deploy, and manage your server anytime, anywhere from select smartphones and mobile devices.



HP Insight Online—Smart cloud-based IT management and support portal

Industry's first comprehensive cloud-based support portal

• HP Intelligent Provisioning—Quickly and easily get your system up and running.

The embedded pre-boot startup and diagnostics tool accelerates system configuration and creates greater visibility. This allows you to identify and correct configuration errors before you deploy your systems. In addition, the built-in smart update capability recognizes if the system software is out of date and will automatically download the latest update for you. With Intelligent Provisioning, server provisioning capability is now embedded across all HP ProLiant Gen8 Servers. This means you can quickly deploy servers without having to rely on physical media. This fully integrated system and OS configuration tool eliminates 45% of the steps, so you can deploy servers three times faster.³

• HP Active Health System—Continuously running diagnostics to minimize downtime.

Active Health is an industry-first technology that provides continuous, proactive health monitoring of over 1600 system parameters.³ In addition, 100% of configuration changes are logged⁴ for more accurate problem resolution. HP SmartMemory and HP SmartDrive devices also log failure information to accurately document events and avoid inadvertent reuse of failed components. This information enables you to start problem analysis five times faster⁴ and spend less time with support reproducing or describing errors. In addition, the consolidated health and service alerts with precise time stamping are synchronized to improve root cause diagnosis across systems and solutions. With this advanced system telemetry you can more accurately troubleshoot and resolve problems faster than other servers. And because it's completely agentless, HP Active Health doesn't impact application performance.

• HP Remote Support—Rapid phone-home support setup and configuration.

Embedded Remote Support functions build on the already established HP Insight Remote Support (version 7.05 or greater) application that can run either on a standalone central system or as a plug-in to HP Systems Insight Manager (HP SIM). Key elements of that technology now are part of the HP iLO Management Engine and are ready to start working for you, after a few keystrokes on a single activation screen.

HP Insight Online—Smart cloud-based IT management and support portal

In today's data centers, valuable staff time is too often lost to IT support issues. When a system goes down and a service call begins, you might spend hours digging through spreadsheets and log files to find and communicate dozens of pieces of data to a support desk. Taking advantage of the rich data collected by the HP ProActive Insight architecture, HP Insight Online transforms the support experience. It combines device monitoring, asset management, and service warranty information together into the industry's first comprehensive cloud-based support portal.

- Manually managing paper contracts and warranties is a thing of the past. You can easily track and proactively monitor these online, saving as much as 90%⁵ in time and resources versus doing it the time-consuming manual way.
- The combination with HP Insight Remote Support enables you to solve problems up to 66% faster⁶ and proactively prevent problems before they occur.
- Transform the way your environment is managed and supported with the industry's first cloud-based IT management and support portal.
- After installing Insight Online, add HP Proactive Care Services to prevent problems before they occur. This combination will allow you to take full advantage of the HP Proactive Insight experience.

³Based on internal engineering calculation, with ProLiant Gen8 Active Health, over 1600 pieces of unique data were downloaded. All configuration changes were logged.

⁴Based on internal testing to run and send the RPS report vs. ProLiant Gen8 Active Health, February 2012.

⁵HP internal estimate.

⁶66% faster problem resolution time for HP Insight Remote Support-initiated cases (HW versus traditional phone support, HP internal call center data, Q4 FY11.

HP Smart Update—Update servers with one-click simplicity

This breakthrough system maintenance tool with one-click simplicity systematically updates servers and blade infrastructures at the scale of your data center. HP Smart Update dramatically simplifies the system update process by automating maintenance. The firmware, drivers, and tools are bundled into a single, HP-validated Service Pack for ProLiant that is customizable to your baseline. Rather than waiting for one operation to complete before the next one starts, HP Smart Update Manager automatically sequences, schedules, and stages updates across your infrastructure to enable the update execution in parallel. In addition, the best-in-class discovery, analysis, and compliance-based reporting easily manage to meet your IT standards. With this intelligence and online updates, administrators can deploy updates three times faster, with 93% less downtime during online updates.⁷ The bottom line is less time on maintenance and more confidence in the stability of the updates and resulting solutions.



HP Smart Update—Update servers with one-click simplicity

Breakthrough system maintenance tool to scale with your data center.

HP SmartMemory—Avoid data loss and downtime

Provides additional memory capacity faster at lower power levels.

HP SmartDrives—Completely redesigned for ProLiant Gen8

Management support for all operating systems.

HP SmartMemory—Avoid data loss and downtime

As today's data-intensive applications demand more, HP SmartMemory provides applications with not only additional memory capacity, but memory that operates faster at lower power levels for the ProLiant Gen8 Servers. HP SmartMemory helps you avoid data loss and downtime with enhanced error handling—while delivering up to 25%⁸ increase in memory bandwidth to improve workload performance and increase power efficiency.

HP ProLiant Gen8 Servers with HP SmartMemory now support DDR3-1600 and LRDIMM. DDR3-1600 is new to the Intel® platforms and allows for 20% higher memory bandwidth.⁹ LRDIMMs or load reduced memory is an industry technology that alleviates loading on the memory data bus, which lets you populate all three DIMM sockets per channel (translating to 50% greater memory¹⁰ capacity with three-socket systems supporting up to 768 GB).

HP ProLiant Gen8 systems authenticate the presence of genuine HP SmartMemory by verifying that the memory meets our highest quality standards for reliability. And because the memory has been optimized for HP ProLiant Servers, HP SmartMemory can unlock enhanced memory performance and high-efficiency features that go above and beyond the processor/chipset manufacturer's specifications.

HP SmartDrives—Completely redesigned for ProLiant Gen8

HP SmartDrives offer many benefits such as management support through HP tools including Active Health monitoring, System Management home page support, HP SIM, storage agents for all operating systems, and online firmware upgrades and service packs, plus all the benefits of Smart Array features, such as RAID integration, rebuild, and support for data erasure.

HP SmartDrives are rigorously tested for interoperability with HP ProLiant servers, backplanes, external enclosures, and controllers. HP SmartDrives have firmware optimized for performance and reliability in HP ProLiant server environments.

HP has completely redesigned both the small and large form factor hot plug drive carriers with a more intuitive design.

- The hard drive status indicator light will inform you of the drive's current status and whether the system is configured or not, the system is rebuilding, or if a predictive failure or even full failure is imminent.
- The drive activity spinner indicator shows an animated green circle that spins anytime the HDD has one or more outstanding commands.
- The Do Not Remove indicator illuminates white when a drive should not be removed to reduce logical drive failures due to accidental removal.

⁷ Based on internal engineering testing with fully online firmware and system software update, November 8, 2011.

⁸ HP internal Lab testing, UDIMM supports 25% higher bandwidth (1333 MT/s vs. 1066 MT/s) up to two DIMMs per channel.

⁹ 1600 MT/s memory is 20% faster than 1333 MT/s memory.

¹⁰ Ability to install 32 GB memory in all 24 sockets provides 50% more memory capacity versus the ability to install memory in only 16 sockets.

HP FlexibleNetwork—Enhancing network connectivity and data access

Demands for reliability, bandwidth, low latency, and security will continue to grow on your network and increase the need for infrastructure simplification and reduced costs. The new HP FlexibleNetwork adapters offer solutions to meet these complexities.

The FlexibleNetwork adapters allow your enterprise to:

- Gain precise timing and synchronization over packet-based Ethernet networks through IEEE1588-based adapters
- Reduce power during periods of low data activity managed by energy-efficient Ethernet adapters
- Optimize power and cooling with embedded temperature sensor on each adapter
- Grow your environment without overhauling the infrastructure when the FlexibleLOM provides the ability to customize the networking of today and the ability to change to meet future needs
- Reduce infrastructure costs and complexity by unifying network and storage fabrics in the FlexibleFabric adapters
- Connect faster with the highest bandwidth and lowest latency dual-function InfiniBand/Ethernet adapters



HP FlexibleNetwork—Enhancing network connectivity and data access

Solutions for your network demands.

HP IO Accelerator—Smarter and faster applications

Reduced data access latency for faster business.

HP IO Accelerator—Smarter and faster applications

Slow applications get in the way of doing business. HP IO Accelerators can help you make faster business decisions by reducing the data access latency common with mechanical spinning storage media. The HP IO Accelerator overcomes I/O bottlenecks resulting from performance gaps between high-speed processors and mechanical hard drives, accelerating application response times with microsecond data access latency. And because solid state memory operates at lower power than mechanical drives, you can achieve this while reducing data center space, power, and cooling requirements.

HP IO Accelerators for HP ProLiant Servers are advanced NAND flash storage devices and are part of our comprehensive solid state storage portfolio. HP IO Accelerators are available in a PCI Express (PCIe) form factor for HP ProLiant BL, DL, ML, and SL servers, and in a mezzanine card form factor for HP BladeSystem c-Class server blades.

By connecting to HP servers via the PCIe bus, HP IO Accelerators increase application performance with microsecond access latencies. They also integrate seamlessly into your existing data center environment to provide:

- Higher IOPS performance and faster read/write capabilities
- Zero-footprint server integration through use of existing internal server slots
- Accelerated database/data-mining performance
- Faster business intelligence and financial transactions
- Enterprise-class quality, endurance, and reliability
- More efficient data center operation

Data center efficiency—Intelligent infrastructure

With embedded intelligence across three dimensions—sense of location, power utilization, and thermal demand—HP ProLiant Gen8 servers provide a unique level of visibility and control over the energy efficiency of your data center.

As data centers grow, power and cooling costs take an ever-larger piece of the IT budget. HP takes a proactive approach with server infrastructure so smart that it helps maximize the use of space, power, and cooling while eliminating tedious and error-prone management processes for asset tracking, checking, and documenting power and rack configurations. With this innovation, HP has created HP Location Discovery Services, HP Thermal Discovery Services, and HP Power Discovery Services to help reduce energy use, reclaim data center power capacity, and extend the life of your data center.

HP Thermal Discovery Services

The new HP ProLiant Gen8 Servers build upon a track record of delivering the leading compute capacity per watt. HP Thermal Discovery Services reduce energy usage and increase compute capacity.

- 3D array of temperature sensors helps precisely control server fans.
- HP Intelligent Series Racks have 26% more rack door open area for higher airflow.¹¹
- Ten percent less energy is consumed.¹²
- Get \$1828 savings per 10 kW rack.¹³
- Critical time saved—automatically identifies over-utilized servers with real-time system temperature data in Insight Control Power Management.¹¹

HP Location Discovery Services

HP Location Discovery Services optimize workload placement with servers that self-identify and inventory themselves. HP is the first to provide built-in location awareness in the next generation of HP ProLiant Servers that works hand in hand with technology in the new HP Intelligent Series racks.

- Rack identification number and precise U location automatically sent to servers.
- 100% manual and error-prone inventory tracking eliminated.
- System administrators no longer have to use manual, inaccurate, and tedious asset collection and tracking approaches such as spreadsheets and bar code scanners.
- Workload placement optimized with automated system location data combined with the unique graphical power, temperature, and performance display of HP Insight Control.

¹¹ Compared to key competitive products. Based on HP internal testing comparing an HP Intelligent Series Rack with a leading vendor rack, comparing HP door perforation at 63% versus competitor's 56%, resulting in a 7% improvement in door perforation area.

¹² HP ProLiant Gen8 server compared to a similarly configured HP ProLiant G6 server. Based on HP internal testing, the 10% power savings comes from a combination of: 1) 20% reduction in system memory power from operating HP SmartMemory at 1.35v DIMM versus 1.5v; 2) 30% reduction in system fan power due to ProLiant Sea of Sensors technology improvements; and 3) 5% improvement in system power efficiency with HP ProLiant Gen8 94% efficient Common Slot Platinum Plus power supplies. Total power savings includes both server power and the power required for server cooling.

¹³ Total annual energy savings using HP ProLiant Gen8 servers versus similarly configured HP ProLiant G6 servers. Utilizing the 10% reduction in power consumption for HP ProLiant Gen8 servers, the annual power costs to operate a 10 kW capacity rack (with 20x HP ProLiant DL380p Gen8 servers installed) will be reduced by up to \$1828 per rack when compared to a 10 kW capacity rack with similarly configured ProLiant G6 servers (assumptions: \$0.10/kWh; PUE = 2).



HP Power Discovery Services

The HP Power Discovery Services eliminate power configuration errors and precisely track power usage by rack and server while eliminating manual recordkeeping.

- Up to 26% reduction in the causes of data center outages.¹⁴
- Automatically eliminate power redundancy and circuit overload errors that lead to many unplanned outages.¹⁵
- Minutes vs. hours to deploy power. Power Discovery Services offering reduces hours of manual configuration, documentation, and monitoring setup time from hours to minutes.¹⁶
- 10% more usable power per circuit. Through identification of excess power capacity, reclaim stranded power and provide 10% more usable power per circuit for additional servers.¹⁷

HP Intelligent Series Racks

The HP Intelligent Series Racks allow all of the innovations outlined above while enhancing rack serviceability and reliability over time—in any data center.

- Convenience—Unmatched cable management in the back of the rack provides tool-less operations and extra space for hot air to pass from the rack.
- Structural integrity—Up to 3000 pounds of dynamic loading enables HP racks to work with all types of equipment anywhere in the world.

¹⁴ Based on an Aperture survey in 2007, 57% of all data center outages are the result of human error. This includes 26% caused by PDU and breaker overloads.

¹⁵ 57% of outages are caused by human errors. The HP Power Discovery Services offering automatically eliminates power redundancy and circuit overload errors that lead to many of these unplanned outages.

¹⁶ Based on HP internal analysis, compares manual documentation of power configuration vs. automatic documentation performed by HP iPDU. In manual operation, equipment and its corresponding outlet location are manually documented on paper or spreadsheet as rack wiring takes place. HP Power Discovery Services solution using HP iPDU automatically maps servers to outlets and verifies redundant server power connections.

¹⁷ Based on an average PDU power monitoring accuracy of 94% vs. the HP iPDU's 99%+ accuracy. Monitoring accuracy is a +/- spread, so that 5% difference equates to better monitoring and measuring of up to 10% of the power going to a rack. Accurately monitored power can now be used for new equipment without increasing the size of the circuit.

Selecting the right HP ProLiant Gen8 Server

HP ProLiant Gen8 Servers have a new look and new names to help you understand the differences among servers within the family. These changes will help make sure you get the right server to meet your current and future needs.

Everyday business versus application performance

With the launch of HP ProLiant Gen8 Servers, HP is offering a more consistent set of foundational innovations across all HP ProLiant Servers, new model descriptions, and a simplified nomenclature. Now there are two distinct categories of rack and tower servers: the HP essential series, ideal for everyday business needs, and the performance series, ideal for more demanding applications. The table below summarizes the differences.

One of the major changes you'll notice with HP ProLiant Gen8 Servers is that, in both the DL and ML families, the 100 series offerings are transitioning into the 300 "e" series. The needs and requirements of traditional 100 series customers will be met by the new 300 "e" series servers, packaged with a balanced set

of essential features and HP innovations. You will also notice that our original DL and ML 300 series products have now transitioned to the DL300 "p" and ML300 "p" series servers respectively for leading performance and versatility.

Now the numerical series is less about distinguishing feature set differences and is more about grouping platform levels.

The basic series indicators are:

"e" = Essential: Balanced offering of ProLiant innovation focused on value

"p" = Performance: Highest end, most comprehensive ProLiant innovation

"c" = c-Class: Blades architecture, flexible, modular infrastructure

"s" = Scalable system: Purpose-built for scale environments

Whether it's a departmental server, an enterprise data center, or anything in between, HP can meet your exact business needs. You can choose the right levels of performance, availability, expandability, and manageability from the world's most comprehensive portfolio of industry-standard servers and options.

Figure 1
Conveying the value of e-Series vs. p-Series built on HP ProActive Insight architecture



e-Series (essential)

Redefining essential and easy-to-use computing

- Right-sized I/O bandwidth and memory
- Essential storage performance
- 1Gb embedded Ethernet
- Gold-level 92% power efficiency
- Industry-leading management with HP Insight Control¹⁸
- Key serviceability features
- Standard warranty offering

p-Series (performance)

THE data center standard with leading performance and versatility

- Top performance with 2x I/O and memory
- Leading storage performance
- Most flexible integrated networking options
- Best power management and 94% efficiency¹⁹
- Industry-leading management with HP Insight Control²⁰
- Enhanced user experience and serviceability
- Premium warranty offering

¹⁸ Insight Control is available on the e-Series 2P rack performance server models only

¹⁹ Intelligent Power Discovery built in.

²⁰ Bundled on all performance models

The HP ProLiant Gen8 Server family

HP offers ProLiant Servers in four different family lines to meet your diverse needs. We have the most extensive server portfolio in the industry, ranging from server blades (BL), to rack-optimized (DL), tower servers (ML), and extreme hyperscale (SL).

Industry's most complete portfolio
Workload optimized, built for any demand



HP ProLiant BL family

Change-ready converged infrastructure engineered to maximize every hour, watt, and dollar



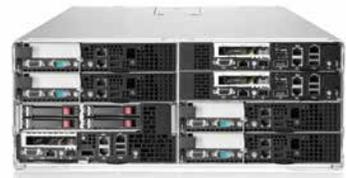
HP ProLiant DL family

Versatile, rack-optimized servers with a balance of efficiency, performance, and management



HP ProLiant ML family

Expandable tower servers ideal for remote and branch offices, and growing businesses



HP ProLiant SL family

Purpose-built for the world's most extreme data centers

Model-by-model transitions

HP ProLiant models throughout the BL/DL/ML/SL lines are being transitioned and introduced in phases. We've included a view of the initial transitions on a model-by-model basis. This information is to be used as reference only. Please work with your HP sales representative or HP partner on actual transition plans and future purchases. To learn more about the new HP ProLiant family, visit hp.com/go/proliantgen8.

A closer look at the HP ProLiant Gen8 BL Server family

HP BladeSystem is the ultimate converged infrastructure and is designed to reduce IT costs up to 68%²¹ over traditional infrastructures with payback in just over seven months.

HP BladeSystem utilizes a modular design to share power, network, and storage infrastructure at the enclosure level to deliver:

- Next-generation technologies in a change-ready system architecture
- Engineered with built-in intelligence to maximize every hour, watt, and dollar
- One converged infrastructure, hundreds of industry leading solutions from client to cloud



HP ProLiant BL420c Gen8 Server Blade

Provides breakthrough server blade economics for essential enterprise workloads. The HP ProLiant BL420c Gen8 Server Blade offers better performance, more memory, high availability via hot-plug drives, and superior management over its predecessor, the HP ProLiant BL280c G6. Cost-effective, scalable,

ProLiant Server blades deliver the best value across workloads and offer industry-leading memory and I/O capacity. They are built to simplify and address the issues of virtualization/consolidation projects, IT infrastructures, web infrastructure, and collaboration applications.

The new next-generation ProLiant Server blades offer increased performance capacity and manageability, with options for the latest Intel and AMD processors, as well as networking, memory, storage, and I/O expansion mezzanine adapters.

HP ProLiant Gen8 Server blades offer these unique capabilities:

- Increased memory footprints with DIMMs that run up to 1600 MHz memory speeds
- Enhanced I/O mezzanine bandwidth, reduced latency, and enhanced processor throughput
- Improved integrated RAID controller performance and enhanced internal drive serviceability
- FlexibleLOM for choice of “embedded” network technology, speed, and OEM partner
- Advanced set of embedded and optional management features essential for the converged infrastructure

and adaptable, this server blade is designed for large cost-sensitive enterprise data centers, mid-sized data centers, as well as small workplaces and branch offices. It spans multiple workloads, whether it is for single applications and small deployments, or web services and IT infrastructure.

Feature	HP ProLiant BL420c Gen8 Server Blade
Compute	Up to 2 Intel® Xeon® E5-2400, 4/6/8 cores, PCIe 3.0
Memory	12 DDR3, up to 1600 MHz (384 GB maximum)
Storage	Choice of: HP Smart Array P220i Controller with 512 MB FBWC or HP Dynamic Smart Array B320i with FBWC and SAS RAID options 2 SFF hot-plug 2.0 TB maximum - HDD/SSD
Networking	One FlexibleLOM choice of: 2x10Gb FlexFabric, 2x10GbE Flex-10, 2x10GbE, or 2x1GbE
Management	HP iLO Management Engine

²¹ HP BladeSystem and CloudSystem Matrix TCO calculator: roianalyst.hp.com/bladestystemmatrixtco/.



HP ProLiant BL460c Gen8 Server Blade

Provides an ideal balance of 2P performance, scalability, and expandability, and offers a simpler way to manage a data center. This dual-socket server blade is engineered with enhanced memory and storage capacities, next-generation HP Integrated Lights-Out

(iLO) Management Engine, and cloud-enabled Insight Management. With new features that give it improved flexibility and simplified management, the HP ProLiant BL460c Gen8 Server Blade is an ideal choice for data center computing.

Feature	HP ProLiant BL460c Gen8 Server Blade
Compute	Up to 2 Intel® Xeon® E5-2600, 2/4/6/8 cores, PCIe 3.0
Memory	16 DDR3, up to 1600 MHz (512 GB maximum)
Storage	HP Smart Array P220i controller with 512 MB FBWC, 2 SFF hot-plug 2.4 TB maximum - HDD/SSD
Networking	One FlexibleLOM choice of: 2x10Gb FlexFabric, 2x10GbE Flex-10, or 2x10GbE
Management	HP iLO Management Engine



HP ProLiant BL465c Gen8 Server Blade

The first server blade to deliver over 2000 cores per rack. It provides a unique blend of core density with a broad memory footprint in a half-height form factor, providing unparalleled price/performance leadership for virtualized environments. Designed for

midmarket and enterprise IT environments, the HP ProLiant BL465c Gen8 Server Blade is an intelligent server that can meet the demands of your growing business, while enhancing the performance of applications and improving the computing power.

Feature	HP ProLiant BL465c Gen8 Server Blade
Compute	Up to 2 AMD Opteron™ 6200 or 6300 Series , 4/8/12/16 cores, PCIe 2.0
Memory	16 DDR3, up to 1600 MHz (512 GB maximum)
Storage	HP Smart Array P220i controller with 512 MB FBWC, 2 SFF hot-plug 2.4 TB maximum - HDD/SSD
Networking	One FlexibleLOM choice of: 2x10Gb FlexFabric, 2x10GbE Flex-10, or 2x10GbE
Management	HP iLO Management Engine



HP ProLiant BL660c Gen8 Server Blade

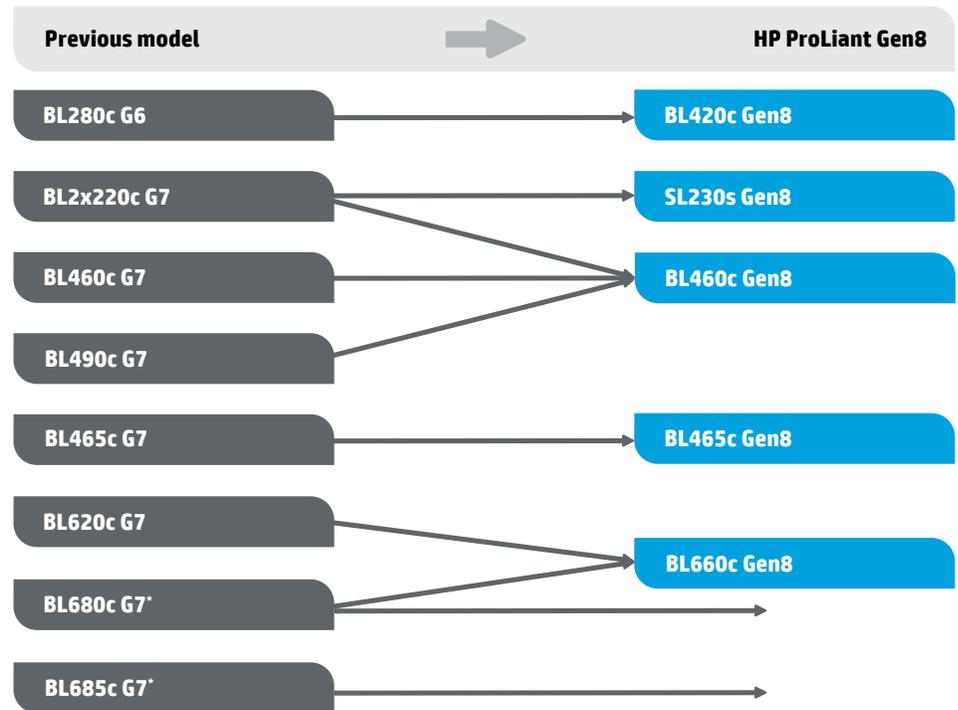
Redefines density optimized 4S blade technology. This scale-up server blade offers the ideal four-socket dense form factor without compromising on 4P performance, scalability, and expandability. The HP ProLiant

BL660c Gen8 Server Blade is ideal for virtualization, database, business processing, and general 4P data-intensive applications where data center space and price/performance are paramount.

Feature	HP ProLiant BL660c Gen8 Server Blade
Compute	2x or 4x Intel® Xeon® E5-4600, 4/6/8 cores, PCIe 3.0
Memory	32 DDR3, up to 1600 MHz (1.0 TB maximum)
Storage	HP Smart Array P220i Controller with 512 MB FBWC** 2 SFF hot-plug 2.4 TB maximum - HDD/SSD
Networking	One or two FlexibleLOM choice(s) of: 2x 10Gb FlexFabric, 2x10GbE Flex-10, or 2x10GbE
Management	HP iLO Management Engine

** 512 MB FBWC standard on pre-configured models and optional on configure-to-order models.

Figure 2
HP ProLiant BL Server model transitions



*** = Model continuing

A closer look at the HP ProLiant Gen8 DL Server family

HP ProLiant DL (Density Line) Rack Series are versatile rack optimized servers with a balance of efficiency, performance, and management. HP ProLiant DL Servers deliver decades of engineering knowledge and integration experience to speed the implementation of new business computing technology. The HP DL family is ideal for performance-driven compute processes and storage in a dense rack package. For HP ProLiant Gen8, the servers offer an increased processor core count, memory, internal storage capacities, as well as the next generation of embedded Smart Array technology.

HP ProLiant Gen8 highlights over previous generation:

- New and enhanced manageability with HP iLO Management Engine, now standard on all HP ProLiant Gen8 Servers
- Up to two times more cache capacity with 2 GB FBWC options for indefinite data retention
- FlexibleLOM for choice of embedded or optional network technologies
- Easier accessibility with enhanced cable routing
- Improved serviceability with the new clear and numbered air baffle designs



HP ProLiant DL160 Gen8 Server

High-performance computing with increased manageability in a dense 1U design. The HP ProLiant DL160 Gen8 is a dual-socket, high-performance, 1U rack server. With its enhanced

manageability and scalability, it is perfectly suited for high-performance computing (HPC) environments, web serving, and other hyperscale environments.

Feature	HP ProLiant DL160 Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2600, 2/4/6/8 cores, PCIe 3.0
Memory	24 DDR3, up to 1600 MHz (768 GB maximum)
Storage	HP Dynamic Smart Array B120i controller, 8 SFF/4 LFF maximum - HDD/SSD
Networking	HP Ethernet 1Gb 2-port 361i Adapter
Management	HP iLO Management Engine



HP ProLiant DL320e Gen8 Server

Ideal single-application and IT infrastructure server. HP ProLiant DL320e Gen8, the new entry-level single-socket, 1U rack-optimized platform, delivers affordable and yet powerful performance while providing essential

features for varied computing needs. It is ideal for enterprise data centers and service providers requiring a low cost server to run single dedicated/ IT applications, file/print, web, and edge-of-network applications.

Feature	HP ProLiant DL320e Gen8 Server
Compute	1 Intel® Xeon® E3-1200v2, 2/4 cores, or Intel® Pentium® 2 cores , or Intel® Core™ i3 PCIe 3.0/2.0
Memory	4 DDR3, up to 1600 MHz (32 GB maximum)
Storage	HP Dynamic Smart Array B120i controller, 8 SFF/4 LFF maximum - HDD/SSD
Networking	HP Ethernet 1Gb 2-port 330i Adapter
Management	HP iLO Management Engine



HP ProLiant DL360e Gen8 Server

Essential features in an optimized design. HP ProLiant DL360e Gen8, a dual-socket 1U rack server, delivers maximum price performance, enterprise-class management, and scalable

capabilities to meet the needs of general workloads today and tomorrow. It is ideal for SMBs and value-focused enterprise customers requiring essential features in an optimized design.

Feature	HP ProLiant DL360e Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2400, 4/6/8 cores, PCIe 3.0/2.0
Memory	12 DDR3, up to 1600 MHz (384 GB maximum)
Storage	HP Dynamic Smart Array B120i/B320i controller, 8 SFF/4 LFF maximum - HDD/SSD
Networking	HP Ethernet 1Gb 4-port 366i Adapter
Management	HP iLO Management Engine



HP ProLiant DL360p Gen8 Server

Best-in-class compute and storage in 1U. The HP ProLiant DL360p Gen8 comes with industry-leading two-socket performance, efficiency, capacity, and reliability in a space-saving 1U size. It offers enterprise-class design for general purpose applications, such as,

file/print or web, as well as, dynamic computing workloads, virtualization, and cloud solutions. The HP ProLiant DL360p Gen8 was built to protect your investment and extend its life with reliability, accessibility, and serviceability features designed within it.

Feature	HP ProLiant DL360p Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2600, 2/4/6/8 cores, PCIe 3.0
Memory	24 DDR3, up to 1600 MHz (768 GB maximum)
Storage	HP Smart Array P420i controller, 10 SFF/4 LFF maximum - HDD/SSD
Networking	FlexibleLOM for rack servers—choice of 4x1GbE or 2x10GbE
Management	HP iLO Management Engine



HP ProLiant DL380e Gen8 Server

Compute and storage, ideal for essential data center needs. The HP ProLiant DL380e Gen8 offers unprecedented configuration flexibility to suit a wide range of infrastructure sizes and compute. With enterprise-class

uptime, enhanced storage performance, serviceability, and management capabilities, this dual-socket, 2U rack server is a perfect match for those looking for great value and essential features with the flexibility to boost configurations in the future.

Feature	HP ProLiant DL380e Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2400, 4/6/8 cores, PCIe 3.0/2.0
Memory	12 DDR3, up to 1600 MHz (384 GB maximum)
Storage	HP Dynamic Smart Array B120i/B320i controller, 27 SFF/14 LFF maximum - HDD/SSD
Networking	HP Ethernet 1Gb 4-port 366i Adapter
Management	HP iLO Management Engine



HP ProLiant DL380p Gen8 Server

THE no-compromise data center standard for 2U two-socket rack servers. The HP ProLiant DL380p Gen8 Server offers increased performance via higher core processors, an increased memory footprint, a variety of internal storage capacities, FlexibleLOM network solutions, and a powerful embedded

HP Smart Array technology (P420i). Besides improving expandability and flexibility, HP designers also enhanced serviceability with improved PCIe riser solutions, HP Smart technology, and easier-to-service cabling creating the perfect solution for dynamic compute requirements of growing small businesses as well as demanding data centers.

Feature	HP ProLiant DL380p Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2600, 2/4/6/8 cores, PCIe 3.0
Memory	24 DDR3, up to 1600 MHz (768 GB maximum)
Storage	HP Smart Array P420i controller, 25 SFF/12 LFF maximum - HDD/SSD
Networking	FlexibleLOM for rack servers—choice of 4x1GbE or 2x10GbE
Management	HP iLO Management Engine



HP ProLiant DL385p Gen8 Server

Performance and flexibility that mean business for your business. The HP ProLiant DL385p Gen8 Server series sets the price/performance leadership standard for this-generation of AMD rack servers. With designed-in quality

and ease of serviceability, performance, and enhanced configuration flexibility, this customer-inspired design offers the perfect solution for virtualization, database, and dynamic computing workloads.

Feature	HP ProLiant DL385p Gen8 Server
Compute	Up to 2 AMD Opteron™ 6200 or 6300 Series, 4/8/12/16 cores, PCIe 2.0
Memory	24 DDR3, up to 1600 MHz (768 GB maximum)
Storage	HP Smart Array P420i controller, 25 SFF/12 LFF maximum - HDD/SSD
Networking	FlexibleLOM for rack servers—choice of 4x1GbE or 2x10GbE
Management	HP iLO Management Engine



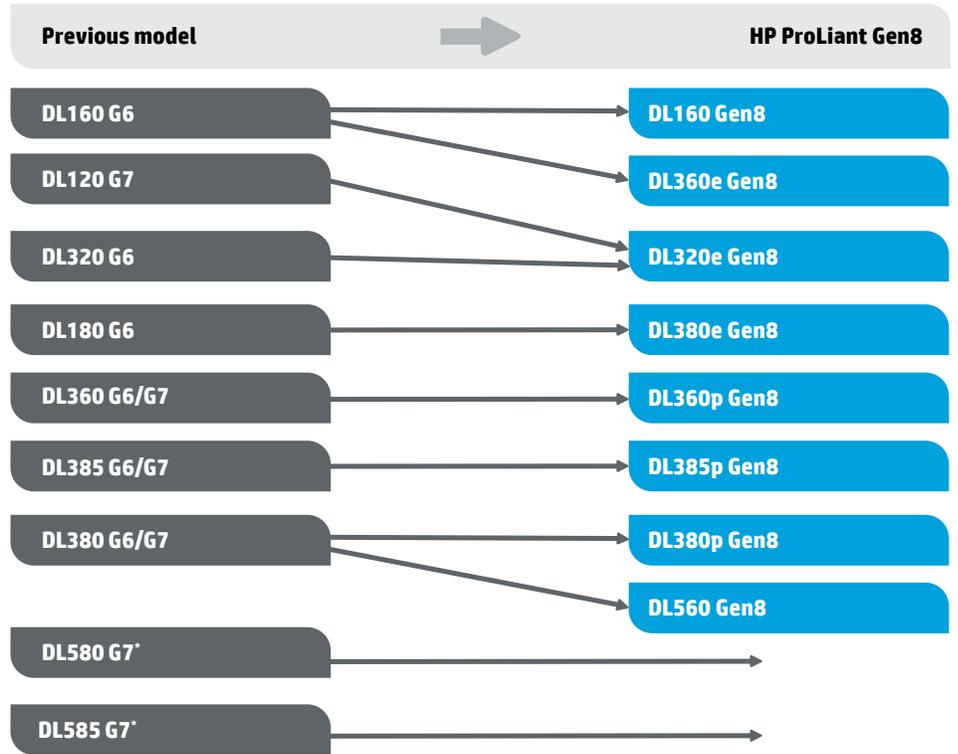
HP ProLiant DL560 Gen8 Server

Concentrated compute without compromise. The HP ProLiant DL560 Gen8 redefines density-optimized four-socket rack server technology without compromising on performance, scalability, and expandability. The DL560 Gen8

scale-up server is ideal for virtualization, server consolidation, database, business processing, and general 4P data-intensive applications where optimization of data center space and price/performance is paramount.

Feature	HP ProLiant DL560 Gen8 Server
Compute	Up to 4 Intel® Xeon® E5-4600, 4/6/8 cores, PCIe 3.0
Memory	48 DDR3, up to 1600 MHz (1.5 TB maximum)
Storage	HP Smart Array P420i controller, 5 SFF maximum - HDD/SSD
Networking	FlexibleLOM for rack servers—choice of 4x1GbE or 2x10GbE
Management	HP iLO Management Engine

Figure 3
HP ProLiant DL Server model transitions



*"e" = Essential balanced offering of HP ProLiant innovation focused on value
*"p" = Performance highest end, most comprehensive HP ProLiant innovation
**"*" = Model continuing

A closer look at the HP ProLiant Gen8 ML Server family

HP ProLiant ML (Modular Line) Server Tower Series are expandable tower (tower/rack option) servers that offer maximum in-chassis flexibility and all-inclusive server/storage solutions for small, remote/branch offices, or SMB customers that require a server that can provide maximum performance for current requirements and expansion for future growth.



HP ProLiant ML310e Gen8 Server

Essential availability and expansion in a 1P tower. HP ProLiant ML310e Gen8, a single-socket 4U tower server, delivers essential availability and expansion needed to

HP ProLiant Gen8 highlights over previous generation:

- New and enhanced manageability with HP iLO Management Engine, now standard on all ProLiant Gen8 Servers
- Two times more cache capacity with 2 GB flash-backed write cache (FBWC) options for indefinite data retention
- Reduce unnecessary fan power with HP 3D Sea of Sensors
- Improve memory reliability and performance with HP SmartMemory
- Prevent accidental data loss with user-friendly HP SmartDrives

accommodate changing business needs. It is ideal for remote sites and corporate branch offices running file/print, web messaging, and small vertical applications or databases.

Feature	HP ProLiant ML310e Gen8 Server
Compute	1 Intel® Xeon® E3-1200v2, 2/4 cores, PCIe 3.0/2.0
Memory	4 DDR3, up to 1600 MHz (32 GB maximum)
Storage	HP Dynamic Smart Array B120i controller, 8 SFF/4 LFF maximum - HDD/SSD
Networking	HP Ethernet 1Gb 2-port 330i Adapter
Management	HP iLO Management Engine



HP ProLiant ML350e Gen8 Server

Essential performance with room to grow. HP ProLiant ML350e Gen8, a dual-socket tower server, delivers essential performance with

room to grow, while requiring low upfront investment. It is ideal for growing businesses running file/print, web messaging, and small vertical applications or databases.

Feature	HP ProLiant ML350e Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2400, 4/6/8 cores, PCIe 3.0/2.0
Memory	12 DDR3, up to 1600 MHz (192 GB maximum)
Storage	HP Dynamic Smart Array B120i controller, 24 SFF/18 LFF maximum - HDD/SSD
Networking	HP Ethernet 1Gb 2-port 361i Adapter
Management	HP iLO Management Engine



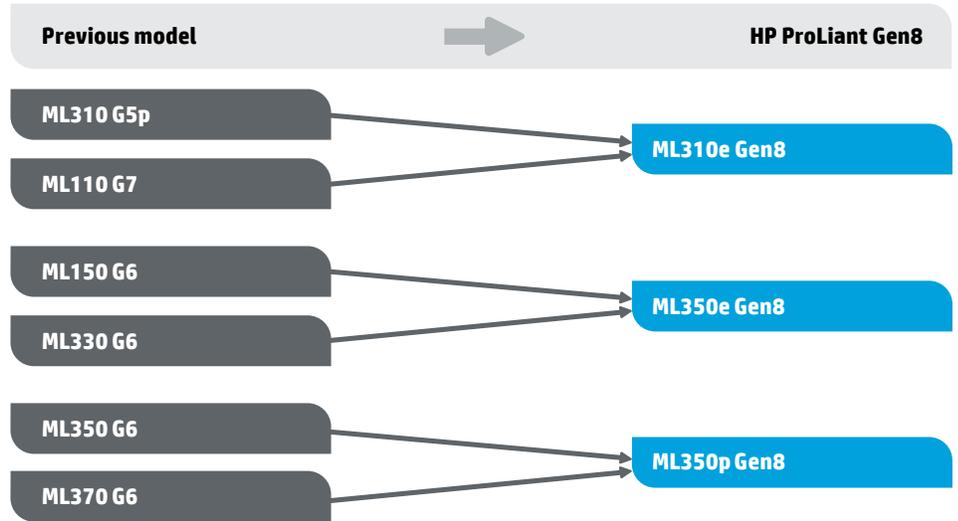
HP ProLiant ML350p Gen8 Server

Best-in-class performance with maximum expandability and availability. The ML350p Gen8 offers increased performance and capacities with processors, memory, and

storage; ideal for remote branch offices of large enterprises, growing businesses and data centers. It also utilizes the HP Smart Storage family of controllers and drives and offers next-generation, cloud-enabled Insight Management.

Feature	HP ProLiant ML350p Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2600, 2/4/6/8 cores, PCIe 3.0
Memory	24 DDR3, up to 1600 MHz (768 GB maximum)
Storage	HP Smart Array P420i controller, 24 SFF/18 LFF maximum - HDD/SSD
Networking	HP Ethernet 1Gb 4-port 331i Adapter
Management	HP iLO Management Engine

Figure 4
HP ProLiant ML Server model transitions



"e" = Essential balanced offering of HP ProLiant innovation focused on value
"p" = Performance highest end, most comprehensive HP ProLiant innovation

A closer look at the HP ProLiant Gen8 SL Server family

HP ProLiant SL Servers are purpose-built for the most demanding hyperscale environments. Ideal for web hosting and cloud service providers and other high-performance computing environments, the SL family of servers enables rapid deployment, greater agility, and lower operational cost.



HP ProLiant SL230s Gen8 Server

Maximum CPU compute and I/O performance for dense hyperscale environments. The HP ProLiant SL230s Gen8 Server was purpose-built for hyperscale computing environments, service

providers and high-performance computing. These businesses depend upon maximum performance, higher density, increased power efficiency, and versatile configurations.

Feature	HP ProLiant SL230s Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2600, 2/4/6/8 cores, PCIe 3.0
Memory	16 DDR3, up to 1600 MHz (256 GB maximum)
Accelerators	Up to 1 PCIe I/O Accelerator
Storage	HP Smart Array B320i controller—2 NHP LFF HDD or 4 NHP SFF HDD, optional 2 SFF hot-plug HDD in front
Networking	2x1GbE, and FlexibleLOM, including support for 56 Gb/s FDR InfiniBand
Management	HP iLO Management Engine



HP ProLiant SL250s Gen8 Server

Balanced CPU accelerator performance for extreme hyperscale applications. Designed for the high-performance computing (HPC) market segment. Its half-width, 2U form factor and its innate ability to integrate up to three accelerators, including NVIDIA Tesla GPUs and Intel Xeon Phi Co-Processors, make this an ideal solution for the most

challenging computational workloads in HPC. Additionally, with specific GPUs, the HP ProLiant SL250s Gen8 can be used for client virtualization, centralizing both computation and visualization into the data center. Up to four SL250s can be loaded into the HP ProLiant SL6500 series chassis making it a very dense accelerator-based solution.

Feature	HP ProLiant SL250s Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2600, 2/4/6/8 cores, PCIe 3.0
Memory	16 DDR3, up to 1600 MHz (256 GB maximum)
Accelerators	Up to 3 NVIDIA GPGPUs or Intel Xeon Phi Co-Processors
Storage	HP Smart Array B320i controller 4 hot-plug SFF HDD, optional 4 SFF NHP HDD
Networking	2x1GbE, and FlexibleLOM, including support for 56 Gb/s FDR InfiniBand
Management	HP iLO Management Engine



HP ProLiant SL270s Gen8 Server

Maximum accelerator density in a two-socket solution. The SL270s was purposely designed for the high-performance computing market

segment, specifically applications requiring a dense installation with extensive use of accelerators, including NVIDIA Tesla GPGPUs or Intel Xeon Phi Co-Processors.

Feature	HP ProLiant SL270s Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2600, 4/6/8 cores
Memory	16 DDR3, up to 1600 MHz (256 GB maximum)
Accelerators	Up to 8 NVIDIA GPGPUs or Intel Xeon Phi Co-Processors
Storage	HP Smart Array B320i 8 SFF Hot-Plug HDD
Networking	2x1GbE and FlexibleLOM
Management	HP iLO Management Engine



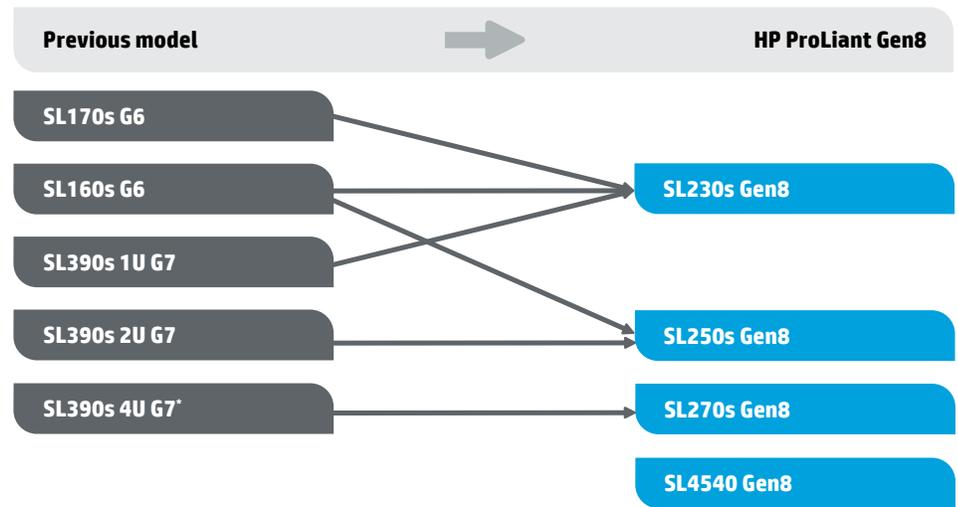
HP ProLiant SL4540 Gen8 Server

The first server purpose-built for Big Data, with up to three server nodes or up to 60 large form factor drives. Ideal for including Big Data workloads such as object storage, exchange and parallel data processing (such

as Hadoop). A highly efficient converged design that delivers the right combination of capacity and performance in the least amount of space and at lower cost, with the reliability and manageability you expect from HP ProLiant Gen8, the world's most intelligent servers.

Feature	HP ProLiant SL4540 Gen8 Server
Compute	Up to 2 Intel® Xeon® E5-2400, 4/6/8 cores, PCIe 2.0 (6)
Memory	12 DDR3, up to 1333 MHz (192 GB maximum) per node
Storage	HP Smart Array P420i controller 60 LFF/2 SFF maximum - HDD/SSD/SAS per node
Networking	2x1GbE and 2x10GbE (optional) per node
Management	HP iLO Management Engine

Figure 5
HP ProLiant SL Server model transitions



s = Scalable System purpose built for hyperscale environments
s = Model continuing



HP Services

HP offers a comprehensive set of services to manage and optimize every aspect of the server environment. Our end-to-end Lifecycle Event Services include working with your IT team to design your environment from scratch or integrate new technology into your existing infrastructure. We understand many businesses rely on a complex mix of solutions on various platforms, so we work closely with partners and leading technology partners to provide expertise across the board. Our services help you quickly get systems up and running, and provide ongoing reactive and proactive support.

We offer easy-to-use, cost-effective support packages at various levels to meet your specific business needs. In addition, we offer automated 24x7 support and tailored solutions to proactively monitor, rapidly identify, and resolve issues. And HP education services help address the challenge of managing costs and resources while keeping your IT staff trained with the latest technology and solutions.

These services include:

- **HP Foundation Care Services:** Receive cost-effective reactive services, with separate or integrated hardware and software support options. This support includes HP Collaborative Support, with ISV software problem resolution and enhanced call management.
- **HP Proactive Care Services:** This advanced support is integrated reactive and proactive support. It offers rapid access to the advanced solution center, a single point of contact for remote and onsite support by HP technology experts to help you proactively address potential issues and minimize downtime. After installing HP Proactive Care Services, add HP Insight Online to access your IT infrastructure anytime, anywhere. This combination will allow you to take full advantage of the HP Proactive Insight experience.
- **HP Data Center Care Services:** These services support your entire data center environment and are available for environments that have HP as well as multivendor equipment. The services are customized for your specific needs and SLAs.
- **HP Lifecycle Event Services:** These services provide comprehensive end-to-end services—covering strategy, planning, deployment, technical, and education services, which can be used at any stage of the IT and solution lifecycle.

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HP Financial Services

Not every technology acquisition has to be a traditional cash-and-carry transaction. HP Financial Services offer a variety of customized leasing and financing options to facilitate your HP ProLiant purchase and keep your technology expenditures in line with your overall budget.

For more information, visit
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HP is making the transition to ProLiant Gen8 Servers as easy and affordable as possible. Through our Refresh for Less program, you can start saving money immediately with no upfront cash outlay. The efficiency gains in HP ProLiant Gen8 servers are so great, that it will actually cost you less to lease and operate HP ProLiant Gen8 Servers.

For more information on Refresh for Less, visit hp.com/go/refresh-for-less.

Find out more

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