

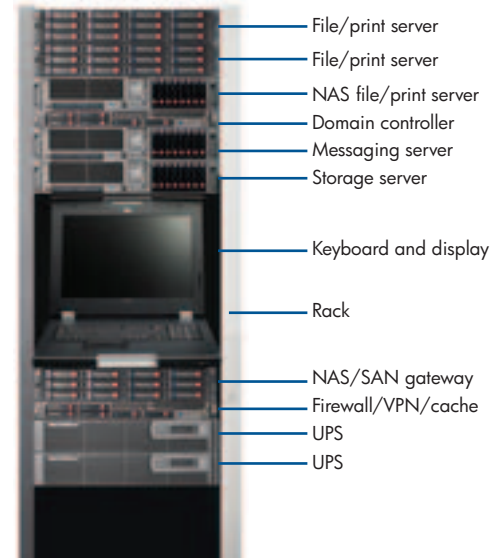


HP server solutions:  
The rack advantage

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Through easy-to-add modular building blocks, racks make it possible to adapt and expand at your own pace. A typical configuration consists of a rack system, power, servers, and storage. In addition, most rack systems require the addition of management and power-monitoring software.



## Managing business change

As organizations grow, they often require more and more servers and storage devices to manage the escalating volume of applications, workload, and data generated. These devices all require power, space, and their own management interface, which can quickly become a burden on any size company. In addition, many businesses rely on a distributed architecture to support their Web applications and remote client access, with individual applications loaded onto multiple systems. This creates the need to efficiently fit a large amount of density-optimized servers into server rooms and data centers. In short, it creates a need for rack solutions.

## Why choose a rack-based server solution?

To see if rack solutions can meet your needs, ask yourself the key infrastructure questions facing your business today. For example:

- Do you have an infrastructure that can sufficiently optimize power management, cooling capacity, and energy efficiencies while managing all functions remotely?
- Is your power supply and protection capacity ready to provide high availability?
- Are your applications, servers, and storage systems secure against physical breakdown?

- Is your technology environment designed and equipped to protect your investments and significantly reduce total cost of ownership (TCO)?

If the answer to any of the above questions is “no,” then you should consider a rack-based solution.

## Server consolidation for improved security and increased manageability

Maintaining efficient management of all the servers in your data centers at all times is challenging. You need to have a strong grasp on access and control, keep on top of cable clutter, ensure that the servers are not overloaded with requests, and manage their cooling requirements as they change over time.

With a rack-based server solution, you can consolidate the management of your technology resources, including servers, and control them from just one central keyboard/video/mouse (KVM) unit—or even control them remotely. A rack-based server deployment is also a logical step toward consolidating storage into a centralized storage area network (SAN) for added efficiency.

What’s more, with improved management tools, you can enjoy local and remote access from a distant console (plus simultaneous multi-user access), which extends flexibility in the way you manage your systems. Furthermore, thanks to cost-effective modular scalability, you can maintain control over your rack environment as it grows.

# HP has sold more than 15 million ProLiant servers worldwide. This gives us the confidence to know that our rack solutions have the capacity to meet your business needs.

## Why choose an HP rack solution?

Whether you're considering switching from tower to rack servers or you simply want to upgrade your existing capacity, rack solutions based on HP ProLiant DL series servers offer the swiftest, most reliable, and most cost-effective route to a high-quality and effective rack environment. Simple and advanced remote management capabilities allow HP rack solutions to deliver technology leadership and hassle-free ownership. It's the rack advantage, and it enables you to designate time, money, and resources toward improving the efficiency of your business.

If you're building or upgrading your server facilities, the challenge is to plan and design the entire infrastructure today—including capacity, power, and cooling—without knowing which technologies it will house tomorrow. To make the right choices, you need a clear understanding of today's infrastructure trends and an effective strategy to address current and future needs. HP rack-based server and storage solutions combine industry-leading technologies and proven expertise to meet all your needs, with the flexibility that today's business systems demand.

### Industry-leading management tools

HP management tools simplify network management with cost-effective, reliable, efficient, and easy-to-use technologies that integrate seamlessly with each other and with your existing HP and standards-based

technology systems. At the heart of any rack solution is HP Systems Insight Manager (HP SIM) software, which forms the foundation of the HP server management strategy and is a key component of our industry-leading management portfolio.<sup>1</sup> It provides single-console monitoring and management of your expanded technology infrastructure and supports value-added packs such as rapid deployment, server migration, vulnerability and patch management, and virtual machine management and control—all within the HP Insight Control Management Software portfolio.

### Holistic approach to energy efficiency

Providing industry-leading, end-to-end energy efficiency, HP Insight Control Power Manager software lets you improve your server density and power efficiency by monitoring actual power consumption and thermal output. It helps you to reduce your server power and cooling overhead across the data center while increasing facility compute capacity. It also provides scalable policy-based power management.

HP rack solutions integrate power and cooling management and control at each level of the infrastructure. Technologies such as Power Regulator for ProLiant, Insight Power Manager, Virtual Machine Manager, and the Modular Cooling System software provide a holistic approach to addressing the infrastructure challenges that affect your power and cooling requirements.

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<sup>1</sup> Applies to ProLiant 300 and 500 series servers only.

HP ProLiant servers offer you flexibility for both performance and energy efficiency. With power tools such as Power Regulator for ProLiant, Integrated Lights-Out (iLO), and HP SIM or Insight Power Manager, ProLiant servers give you the power to adjust performance or power to meet the application's need, either automatically through the operating system or manually with Insight Power Manager.

## Best-in-class components for your rack solution

### Rack infrastructure

HP has invested significant resources to design and produce the best rack in the industry, based on customer feedback and our understanding of data-center issues. For instance, cooling servers is a major concern in today's data center, where hotter processors are jammed into ever-more-dense servers and blades.

Through easy-to-add modular building blocks, HP racks—which are 65 percent perforated—make it possible for you to adapt and expand at your own pace. Front and rear doors provide your servers with the airflow needed for cooling even in dense environments, while cable management features reduce cable clutter and allow you to make cleaner deployments.

What's more, HP rack solutions offer support for multivendor environments and third-party products by using universal components and connectivity options, enabling you to achieve best-in-class solutions for heterogeneous environments.

### Servers

The HP ProLiant DL series provides a wide range of server choices that support a diverse set of requirements, such as multi-server deployments with either attached external storage or integrated low-cost, high-capacity internal storage. These servers are also ideal for data centers and efficient clustering applications.

These density- and cluster-optimized rack servers are engineered for outstanding flexibility, manageability, and efficient power consumption, so you can easily match models to your most specific requirements.

Components built into our servers help them achieve over 88 percent efficiency. They also provide power-efficient disk drives, intelligent power and cooling, power metering and regulation that can yield 12 percent power savings at 50 percent load, and low-voltage processors that consume up to 40 percent less power without sacrificing performance.<sup>2</sup> With simplified serviceability features such as tool-free access and enhanced cable management, HP ProLiant DL series servers are easy to deploy.

You can find out more about which server is right for your business in the "Choosing a suitable server" section of this guide.

### Storage

Data is the lifeblood of your business, and HP StorageWorks offers a broad portfolio of storage solutions to help you optimize your rack-based server infrastructure and move toward a strategic approach to data management. Protect the critical business data on your servers with disk- and tape-based storage devices as well as software for backup and replication. Improve your business efficiency and enable functions such as clustering by consolidating distributed storage pools into a shared storage solution.

HP StorageWorks shared storage solutions utilize industry-standard NAS, iSCSI, and Fibre Channel building blocks layered on top of HP ProLiant and Smart Array components to deliver an end-to-end solution across servers and storage from data creation to data protection. We've worked closely with leading application providers such as Microsoft,<sup>®</sup> Oracle,<sup>®</sup> SAP, and others to develop best practices for unified server and storage deployments.

Find out more at: [www.hp.com/go/storage](http://www.hp.com/go/storage)

To help speed implementation and enhance ongoing support of your rack solution, HP Technology Services provides a single point of contact with resources, specialized expertise, and the cost-effective industry-leading HP Care Pack services portfolio—including enhanced technical support for ProLiant servers, storage, and management software.

## Key portfolio benefits

- Streamline implementation of a rack solution without interruptions to your business
- Improve the performance and reliability of your data-center rack solutions while controlling costs
- Enhance the skills and expertise of your in-house IT staff through training and HP knowledge transfer

By using HP services, you can reduce the complexity of your infrastructure by drawing on the experience and expertise of more than 73,000 IT service professionals in over 160 countries. What's more, our global network of HP Authorized Channel Partners provides you with access to the best quality service, wherever you are and whenever you need it. To find out more, visit: [www.hp.com/services/proliant](http://www.hp.com/services/proliant)

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<sup>2</sup> Based on an Intel<sup>®</sup> Xeon<sup>®</sup> processor operating on a low-voltage power supply.

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# Four steps toward a complete rack solution

Together, we're ready to help you design, build, integrate, manage, and evolve technology infrastructures that will help you to improve productivity, adapt to change more quickly, and enhance the return on your investments.

## 1. Making the right choice

Selecting the server solution that's just right for your business is a simple, seamless process when you have the right backing and support. HP and our partners are on hand to help you along the way, offering valuable assistance with problem identification, product selection, purchase, installation, maintenance, and future upgrades. By working with HP or any one of our authorized partners, you experience the assurance and peace of mind that come from working with people you know and a brand you can trust.

### **HP Consulting & Integration**

HP Consulting & Integration offers real-world consulting and assistance to support the development of your infrastructure consolidation and migration strategies, solution design, system sizing and performance evaluation, storage planning, project management, solution deployment, and more.

For more information about how we can help get your rack-based server solution up and running, visit:

[www.hp.com/hps](http://www.hp.com/hps)

### **Free online tools**

HP eCo-Enterprise Configurator allows you to build your own virtual server solution: Choose your servers, memory, operating system, internal storage, external storage, and tape backup requirements. Configure your power and cooling options. Select appropriate software. Assign necessary services and support.

HP ActiveAnswers provides state-of-the-art applications that help you configure, size, performance analyze, and use HP ProLiant products and solutions.

You can access both of these tools online at:

[www.hp.com/go/activeanswers](http://www.hp.com/go/activeanswers)

The UPS Sizing Tool helps you avoid server failure and system downtime caused by power outages or disturbances with a rack-mountable uninterruptible power supply (UPS). You can determine the appropriate UPS solution based upon your server infrastructure.

The ProLiant DL500 and DL700 series servers are best positioned through sizing. For more information, visit:

[www.upsizer.com](http://www.upsizer.com)

## 2. Designing your rack-based environment

Based on our extensive history of building successful rack infrastructures, combined with our industry-leading portfolio of rack and power management solutions, HP is the perfect choice to construct your rack-based server solution.

### Choosing your rack servers

HP Rack 10000 G2 series and Rack 5000 series—robust, ready-to-run servers; affordable servers

- Broadest choice of standards-based options, including the latest technologies such as blanking panels, baying kits, lights, shelves, and other useful rack options
- Enhanced cable management for simple, reliable power and cooling
- Easy-to-add modular building blocks offer real-time scalability

For more information about HP rack and power solutions, visit: [www.hp.com/go/rackandpower](http://www.hp.com/go/rackandpower)

- **HP ProLiant 100 series servers**—simple and affordable servers
  - Choice of one- and two-processor models
  - Ideal environments: small and medium businesses, single-tier architectures, remote offices, and heterogeneous data centers
  - Ideal workloads: networking, shared Internet access, file-and-print sharing, and simple high performance computing (HPC) clustered and compute grid environments

- **HP ProLiant 300 series servers**—versatile, general-purpose servers
  - Choice of one- and two-processor models
  - Ideal environments: enterprise data centers, application servers, and medium businesses
  - Ideal workloads: smaller e-mail and database applications, directory, domain name server (DNS), security, firewall, file-and-print domain servers, Web services, and proxy and media streaming applications
- **HP ProLiant 500 series servers**—highly scalable, compute-intensive workhorses
  - All models equipped with four processors
  - Ideal environments: mid-tier applications and back-end databases
  - Ideal workloads: large-scale messaging platforms, large databases and data warehouses, back-end enterprise resource planning (ERP) and customer relationship management (CRM) applications, and online commerce and online transaction processing (OLTP)
- **HP ProLiant 700 series servers**—scalable consolidation and virtualization servers
  - 8-socket server; supports Windows®, Linux, and Solaris
  - Ideal environments: Business-critical applications and database, consolidation and virtualization platform, and mainframe migration environments
  - Scalability, performance, easy integration, and management, with all the familiar industry-leading ProLiant tools

### Choosing a suitable server

The following tables provide a simplified guide to choosing the most appropriate server for your environment, based on the applications you will be running on the server and the number of users it is intended to support. For more complex environments, use the online sizing tools discussed on page 6.

Application	1–25 users	25–75 users; up to 75 users (for messaging); or up to 50 IP nodes (for security)	75–400 users; up to 400 users (for Web servers); or 50–250 IP nodes (for security)	400–1,000 users; or more than 250 IP nodes (for security)	Things to consider
<b>Optimized and dedicated file- and print-serving with Microsoft® Windows® Storage Server 2003 R2 (NAS)</b>	HP ProLiant DL160 Storage Server	HP ProLiant DL160 Storage Server HP ProLiant DL320s Storage Server	HP ProLiant DL320s Storage Server HP ProLiant DL380 Storage Server	HP ProLiant DL380 Storage Server HP ProLiant DL585 Storage Server	All ProLiant storage servers come preconfigured with Windows Storage Server 2003 R2, which includes unlimited client access licenses, file deduplication, and performance enhancements in file serving environments.
<b>File, print, and all-purpose serving on Microsoft Windows 2000 and 2003 Server or Novell NetWare 6.5 OES</b>	HP ProLiant DL120 Server HP ProLiant DL320 Server	HP ProLiant DL180 and DL185 Servers	HP ProLiant DL180 G5 and DL185 G5 Servers HP ProLiant DL380 and DL385 Servers	HP ProLiant DL380 and DL385 Servers	File and print is not CPU intensive, but if you will be running other applications, we recommend that you add a second processor. The amount of memory will drive the speed of print management. Windows requires 256 MB minimum, but 512 MB is recommended. With an additional 512 MB of memory, this file and print server can also be used as the domain.
<b>File, print, and all-purpose serving on Linux system (OES, Red Hat, and SUSE)</b>	HP ProLiant DL120 Server HP ProLiant DL320 Server	HP ProLiant DL180 and DL185 Servers HP ProLiant DL180 G5 and DL185 G5 Servers	HP ProLiant DL180 G5 and DL185 G5 Servers HP ProLiant DL380 and DL385 Servers	HP ProLiant DL380 and DL385 Servers	—
<b>Microsoft Small Business Server 2003 (SBS 2003)</b>	HP ProLiant ML350 Server	HP ProLiant ML350 Server HP ProLiant ML370 Server	<ul style="list-style-type: none"> <li>• SBS solutions support approximately 100 users maximum</li> <li>• Requires at least 768 MB of memory</li> <li>• Allocate up to 2.5 GB of disk space per user</li> <li>• SBS requires a client access license (CAL) for every user or shared device</li> <li>• SBS is available in standard and premium licenses. Both are available preinstalled on selected HP ProLiant ML series models, which can be installed in racks with tower-to-rack options</li> <li>• For more information, go to: <a href="http://www.hp.com/go/windowssbs">www.hp.com/go/windowssbs</a></li> </ul>		

For recommendations on the server that best supports your key applications and database, visit the HP ProLiant server buying guide at: [www.hp.com/go/serverselector](http://www.hp.com/go/serverselector)

For specifications of the HP ProLiant DL servers, please visit: [www.hp.com/servers/dl](http://www.hp.com/servers/dl)

## Choosing a suitable server (continued)

Application	1–25 users	25–75 users; up to 75 users (for messaging); or up to 50 IP nodes (for security)	75–400 users; up to 400 users (for Web servers); or 50–250 IP nodes (for security)	400–1,000 users; or more than 250 IP nodes (for security)	Things to consider
<b>Linux Small Business Suite</b>	HP ProLiant DL120 and DL160/DL165 Servers	HP ProLiant DL180 and DL185 Server	Linux Small Business Suite supports up to 100 users maximum	Linux Small Business Suite supports up to 100 users maximum	Linux Small Business Suite supports up to 100 users maximum
<b>Domain controller</b>	HP ProLiant DL160 and DL165 Servers	HP ProLiant DL180 and DL185 Servers	HP ProLiant DL360 and DL365 Servers HP ProLiant DL380 and DL385 Servers	HP ProLiant DL380 and DL385 Servers	SMB environments do not usually require separate domain controllers. A file and print server can fit this purpose well; you can adopt this capability by adding 512 MB or more of memory.
<b>Messaging (concurrent users)</b>	HP ProLiant DL160 and DL165 Servers HP ProLiant DL320 Server (for OpenExchange Server)	HP ProLiant DL180 G5 and DL185 G5 Servers HP ProLiant DL360 and DL365 Servers (for Microsoft Office Exchange, Lotus Domino, and Linux Sendmail)	HP ProLiant DL180 G5 and DL185 G5 Servers HP ProLiant DL380 and DL385 Servers	HP ProLiant DL380 and DL385 Servers	—
<b>Security (IP nodes)</b>	HP ProLiant DL160 and DL165 Servers Firewall/VPN/cache (for Microsoft-based systems) HP ProLiant DL320 Server (for CheckPoint)	HP ProLiant DL320 Server Firewall/VPN/cache (for Microsoft-based systems) HP ProLiant DL320 Server (for CheckPoint) HP ProLiant DL180 G5 and DL185 G5 Servers	HP ProLiant DL320 Server Firewall/VPN/cache (for Microsoft-based systems) HP ProLiant DL320 Server (for CheckPoint)	HP ProLiant DL320 Server Firewall/VPN/cache (for Microsoft-based systems) HP ProLiant DL360 Server HP ProLiant DL380 Server (for CheckPoint)	If the firewall is attached to a DMZ zone, or if there are multiple internal networks, a third NIC is required.
<b>Web server (concurrent users/minimum)</b>	HP ProLiant DL160 and DL165 Servers HP ProLiant DL180 G5 and DL185 G5 Servers HP ProLiant DL360 Server	HP ProLiant DL160 and DL165 Servers HP ProLiant DL180 G5 and DL185 G5 Servers HP ProLiant DL360 and DL365 Servers	HP ProLiant DL160 and DL165 Servers HP ProLiant DL360 and DL365 Servers	HP ProLiant DL380 and DL385 Servers	Memory is affected by dynamic (constantly changing) pages. Also, consider adding a second CPU if there is high dynamic content.

### Preconfigured racks

Preconfigured HP racks provide a ready-to-deploy solution for up to eight servers and includes all the required components. Benefits include:

- Savings in time, costs, and space
- Simplicity of ordering with one SKU
- Professionally installed parts
- Better value than the sum of individual prices

### Powering your rack

To help you manage your systems and protect them from damaged equipment, downtime, and lost productivity, HP offers a full range of power management products, including:

- **HP Uninterruptible Power Supplies (UPSs)**—consistent, reliable, and simple power sources using less space
- **HP Power Distribution Units (PDUs)**—improved power protection, power distribution, cable management, and space efficiency in high-volume deployments with a reliable, redundant source of power
- **HP PDU and UPS Management Modules**—real-time power measurement information with configurable modules to send alert traps to HP SIM software and other SNMP management programs

For more information about UPSs, visit:

[www.hp.com/servers/rackups](http://www.hp.com/servers/rackups)

### Simplifying management and reducing complexity

HP keyboard/video/mouse (KVM) solutions offer outstanding performance, intelligent cable management, cost-effective modular scalability, simple day-to-day management, and flexibility. KVM console switches and cables ease control and lower costs, allowing you to securely access multiple servers from one centralized console in a local loop, or remote access using the HP KVM-over-IP console switch.

### HP storage options

Internal HP ProLiant server storage:

- HP Smart Array RAID controllers reliably offer the highest-level protection against hard drive failures and facilitate future DAS-to-SAN migration.
- HP universal hard disk drives, including Serial Attached SCSI (SAS) drives, provide increased performance, ease, and reliability in a 2.5-inch small form factor that improves space, boosts performance per rack unit, and reduces power consumption by 50 percent.

HP ProLiant DL180 G5 and DL185 G5 Servers:

- These robust server solutions with integrated high-capacity storage deliver essential features, enhanced storage, and high-end performance at an entry-level price.
- With the latest in Quad-Core Intel® Xeon® or AMD Opteron™ processors, up to 14 TB of storage capacity, and DDR2 memory support, these ultra-dense 2U solutions are engineered for both high-growth and scale-out environments.

Direct-attached storage for your servers:

- HP StorageWorks Modular Smart Array enclosures (MSA50/60/70) connect to individual servers via Smart Array controllers and provide easy storage expansion with SAS connectivity. Available in both 2.5" and 3.5" hard drive sizes and with support for mixed SATA and SAS hard drives, the HP StorageWorks 500 Modular Smart Array (MSA500) provides storage to four hosts and is an easy way to deploy a cluster.

Storage consolidation via a storage area network (SAN) and network attached storage (NAS):

- The HP StorageWorks 2000 Modular Smart Array family features the latest in functionality and technology at affordable prices. Both Fibre Channel and iSCSI interfaces are available, allowing for the perfect solution to be selected depending on individual needs. Choose from enterprise-class SAS drives and archival-class SATA drives and add optional controller-based snapshot/clone functionality. Other SAN options include the HP StorageWorks All-in-One Storage System for entry-level environments and the Enterprise Virtual Array (EVA) for larger environments.
- The HP ProLiant storage server family of optimized network attached storage (NAS) file/print servers builds on the industry-leading ProLiant server platform and includes an optimized version of the Microsoft Windows operating system that enables you to consolidate distributed file/print servers into a powerful and dedicated NAS solution. Windows Storage Server 2003 R2 serves files up to 20 percent faster than a general-purpose OS on equivalent hardware and includes productivity enhancements such as optimized search and file deduplication.

Multi-tier disk- and tape-based data protection solutions for your servers (D2D2T):

- HP StorageWorks Ultrium tape drives are available in internal, external, hot-pluggable, and floored-rack models—all with broad server compatibility and the HP StorageWorks One-Button Disaster Recovery (OBDR) solution for quick file restorations. HP StorageWorks D2D and VLS disk-based backup systems dramatically improve backup and recovery performance of LAN and SAN servers using tape and autoloader/library emulation.

For more information about shared storage, visit:

[www.hp.com/products/serverstorage](http://www.hp.com/products/serverstorage) or  
[www.hp.com/go/storage](http://www.hp.com/go/storage)

### 3. Easy deployment and installation with HP

#### Server installation and deployment services

Whether you're upgrading your software, migrating to a new operating system, or moving to a rack solution, HP Services professionals and HP partners can provide the assistance you need to get your systems up and running reliably—in no time at all.

- Server hardware installation—Cost-effective HP installation services are available for your entire server environment, including client PCs, workstations, mobile devices, and peripherals. This service includes equipment unpacking, inspection, assembly, system installation, testing, and diagnosis, plus deployment of appropriate service tools.

- Server software installation—For software deployment, we have the experience and expertise to install a wide range of operating systems, layered products, enterprise applications, and updates. This includes multiple operating environments and multiple server management tools, such as HP Systems Insight Manager (SIM) and HP ProLiant Essentials Rapid Deployment Pack software.

#### **HP ProLiant Essentials Rapid Deployment Pack software**

HP ProLiant Essentials Rapid Deployment Pack (RDP) software automates the process of deploying and provisioning server software, enabling your company to adapt to changing business demands quickly and easily. The RDP solution:

- Provides fast, easy-to-use drag-and-drop functionality for deploying standard server configurations and software builds in an automated fashion from a remote console
- Offers instant out-of-the-box functionality
- Is a key part of the ProLiant server management strategy, simplifying deployment and redeployment to sustain continuous operation and improve efficiency as your environment changes and expands
- Includes HP service and support options—from installation and implementation to software support and education services

As a server deployment solution, RDP software radically reduces the time it takes to install, configure, and deploy high volumes of servers. This can be achieved through either a GUI- or Web-based console, using either scripting or imaging technology. RDP also offers tight integration with HP SIM software and remote Lights-Out capabilities.

For more information about HP ProLiant Essentials RDP software, visit: [www.hp.com/servers/rdp](http://www.hp.com/servers/rdp)

#### **HP ProLiant Essentials Server Migration Pack—Physical to ProLiant Edition software**

This software provides an automated, accurate, and affordable way to migrate your existing servers and their content to the latest server technology. ProLiant Essentials Server Migration Pack—Physical to ProLiant (SMP—P2P) Edition software is the only product of its kind from a server vendor that enables you to upgrade to new server technology with great assurance, speed, and ease—all the while reducing the transition costs of your migration.

If it's time to replace or upgrade your existing technology, you can rest assured because ProLiant Essentials SMP—P2P software covers the migration lifecycle from beginning to end, making your transition to new server technology quick, simple, and error-free.

For more information about ProLiant Essentials SMP—P2P software, visit: [www.hp.com/go/2migrate](http://www.hp.com/go/2migrate)

## 4. Monitoring, managing, and maintaining your rack solution

### **Comprehensive management: HP Insight Control management suites**

HP Insight Control addresses all aspects of HP ProLiant server management by bringing together HP intelligent embedded technology, HP Systems Insight Manager, and core HP ProLiant Essentials software in simple, integrated packages with streamlined licensing. HP Insight Control management suites deliver everything you need to manage your ProLiant infrastructure in one easy-to-install package, including:

- Comprehensive system health monitoring—monitor server health proactively and trigger critical alerts in a timely fashion
- Remote control—take control of your servers securely from anywhere independent of operating system state

- Vulnerability scanning, and patch management—scan for operating system and application security vulnerabilities and patch them in concert
- Proactive performance management—pinpoint and resolve performance bottlenecks quickly to get the most out of your existing server infrastructure
- Rapid, flexible deployment—configure server hardware quickly and reliably and deploy your chosen operating system and applications
- Virtual machine management
- Power management—gain a true understanding of power consumption and thermal output and set power regulation policies across groups of servers

If you decide you need only one or more of the capabilities in the Insight Control family, you can purchase individual components separately. For more information about HP Insight Control Environment software, visit: [www.hp.com/go/ice](http://www.hp.com/go/ice)

## HP ProLiant Essentials product family

The HP ProLiant Essentials family of management tools includes the following products, available individually or as part of an HP Insight Control suite.

Product	Use this tool if you want to:	It enables you to:	Business benefits
<b>Accelerated iSCSI for embedded multifunction gigabit server adapters</b>	<ul style="list-style-type: none"> <li>• Access storage boxes and servers over a single connection</li> <li>• Upgrade from direct-attached storage (DAS) to a storage area network (SAN)</li> </ul>	<ul style="list-style-type: none"> <li>• Integrate the management of servers and storage by leveraging iSCSI technology</li> </ul>	<ul style="list-style-type: none"> <li>• Tangible savings using a low-cost, high-performance protocol</li> </ul>
<b>Systems Insight Manager software</b>	<ul style="list-style-type: none"> <li>• Consolidate the management of servers and increase productivity</li> <li>• Centralize and simplify management of a large and/or geographically dispersed server deployment</li> <li>• Manage clients, printers, and networking devices</li> </ul>	<ul style="list-style-type: none"> <li>• Gain one-click access to data on HP ProLiant server health, configuration, performance, remote management, and server inventory</li> <li>• Gain direct access to select ProLiant Essentials Value Packs</li> </ul>	<ul style="list-style-type: none"> <li>• Increased flexibility</li> <li>• Consistent, centralized management</li> <li>• Greater control and flexibility</li> <li>• Alignment of IT around processes—not platforms</li> <li>• Reduced power and cooling costs</li> </ul>
<b>Insight Power Manager software</b>	<ul style="list-style-type: none"> <li>• Manage the power and thermal impact of HP ProLiant and BladeSystem servers</li> </ul>	<ul style="list-style-type: none"> <li>• Meter and report on power consumption and thermal output</li> <li>• Set power management policy across any grouping of servers</li> </ul>	<ul style="list-style-type: none"> <li>• Increased data-center density</li> <li>• Ability to measure power consumption accurately</li> <li>• Reduced energy consumption through effective power regulation</li> <li>• Improved energy efficiencies</li> </ul>
<b>Integrated Lights-Out Standard Select Pack or Advanced Pack on ProLiant 300 and 500 series servers and ProLiant server blades</b>  <b>Integrated Lights-Out 100i Standard Select Pack or Advanced Pack on ProLiant DL100 series servers</b>	<ul style="list-style-type: none"> <li>• Manage distributed remote servers from a central location</li> </ul>	<ul style="list-style-type: none"> <li>• Perform virtually any task from a Web browser over the network, with complete security</li> </ul>	<ul style="list-style-type: none"> <li>• Increased server uptime</li> <li>• Reduced travel and operational costs</li> <li>• Improved productivity</li> <li>• Reliable security</li> </ul>
<b>Insight Dynamics–VSE software</b>	<ul style="list-style-type: none"> <li>• Easily create server profiles and move them across physical server blades and virtual resources</li> <li>• Manage physical and virtual servers equally</li> <li>• Continuously analyze and optimize server capacity and power</li> </ul>	<ul style="list-style-type: none"> <li>• Drag and drop logical server profiles and activate them instantly</li> <li>• Gain real-time capacity planning for servers and power</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to manage change more predictably and easily</li> <li>• High availability</li> <li>• Reduced data center power consumption</li> <li>• Accelerated time to production</li> </ul>
<b>Performance Management Pack software</b>	<ul style="list-style-type: none"> <li>• Identify and fix bottlenecks before they slow performance</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct continuous performance monitoring, logging, and alerting</li> </ul>	<ul style="list-style-type: none"> <li>• Improved response time and adherence to service-level agreements</li> </ul>
<b>ProLiant Essentials Rapid Deployment Pack software</b>	<ul style="list-style-type: none"> <li>• Deploy or update multiple servers in a high-volume environment</li> <li>• Spend less time and money managing servers</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze and resolve problems</li> </ul>	<ul style="list-style-type: none"> <li>• Higher productivity</li> </ul>

HP ProLiant Essentials product family (continued)

Product	Use this tool if you want to:	It enables you to:	Business benefits
<b>ProLiant Essentials Rapid Deployment Pack software</b>	<ul style="list-style-type: none"> <li>• Deploy or update multiple servers in a high-volume environment</li> <li>• Spend less time and money managing servers</li> </ul>	<ul style="list-style-type: none"> <li>• Fully automate deployment</li> <li>• Deploy imaging and scripting</li> <li>• Use pretested scripts</li> <li>• Use power control and console interface through HP Integrated Lights-Out technology</li> </ul>	<ul style="list-style-type: none"> <li>• Faster, easier deployment</li> <li>• Increased productivity and flexibility</li> <li>• Consistent builds with fewer problems</li> </ul>
<b>ProLiant Essentials SMP—P2P Edition software</b>	<ul style="list-style-type: none"> <li>• Migrate HP and non-HP x86 servers to new servers</li> </ul>	<ul style="list-style-type: none"> <li>• Achieve physical to ProLiant server migrations of Microsoft Windows-based applications and data from a source x86 server to another server</li> </ul>	<ul style="list-style-type: none"> <li>• No need to deploy elements manually on the new server</li> <li>• Easy migration to a new form factor such as blade servers</li> </ul>
<b>Virtual management software (Virtual Machine Manager and ProLiant Essentials Server Migration Pack)</b>	<ul style="list-style-type: none"> <li>• Use Microsoft Virtual Server</li> <li>• Use HP VMware software and gain a unified view of ProLiant servers and a virtual machine</li> <li>• Consolidate servers</li> </ul>	<ul style="list-style-type: none"> <li>• Manage, control, and achieve a unified view of virtual machines and associated host server resources</li> <li>• Simplify management processes</li> <li>• Obtain a single console for physical server and virtual machine resources</li> </ul>	<ul style="list-style-type: none"> <li>• Simplified management of virtual and physical resources</li> <li>• Improved application performance</li> <li>• Reduced hardware management costs</li> </ul>
<b>Vulnerability and Patch Management Pack software</b>	<ul style="list-style-type: none"> <li>• Keep pace with the release of new vulnerability alerts and patches</li> <li>• Leverage existing tools, including HP SIM software</li> <li>• Fix vulnerabilities effectively</li> </ul>	<ul style="list-style-type: none"> <li>• Obtain the latest vulnerability data and patches automatically</li> <li>• Identify new vulnerabilities automatically and schedule and deploy patches and fixes</li> <li>• Check continually to see that patches stay installed</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced risk of problems</li> <li>• Faster implementation and higher return on investment by leveraging existing tools</li> </ul>
<b>ProLiant Essentials Workload Management Pack software</b>	<ul style="list-style-type: none"> <li>• Consolidate multiple applications on fewer Windows-based servers</li> </ul>	<ul style="list-style-type: none"> <li>• Benefit from remote management virtualization</li> <li>• Allocate, protect, and automate application resources to achieve higher availability of applications and achieve server consolidation</li> </ul>	<ul style="list-style-type: none"> <li>• Improved application performance</li> <li>• Reduced hardware management costs</li> </ul>

### **Control: remote management tools**

- HP Lights-Out 100i Remote Management software—Delivers affordable, entry-level remote management capabilities for ProLiant DL100 series servers. With Lights-Out Remote Management software, you can manage ProLiant DL100 series servers easily over a LAN or the Internet to increase IT efficiency, improve security and system uptime, and reduce costs.
- HP Integrated Lights-Out (iLO) technology—Key to any remote management strategy, this intelligent management processor is integrated on most ProLiant servers, offering advanced security and power management capabilities for secure, scalable, and cost-effective remote management. It is available in two forms, both offering completely self-administered “remote control” that eliminates the need for travel or onsite assistance:
  - iLO Standard, which provides basic system-board management functions, diagnostics, and essential Lights-Out functionality. Standard on selected HP ProLiant servers, basic Lights-Out management is accessible right out of the box, making it easy to set up and use while providing robust security, improving server availability, and conserving valuable technological resources.
  - iLO Advanced, which provides remote administration functionality as a licensed option. You can utilize advanced virtual administration features to achieve ultimate control of servers in dynamic data centers and remote locations. With iLO Advanced, you can improve administrator productivity, reduce operational costs, and gain advanced security.
- HP Integrated Lights-Out 2 (iLO2) technology—This next-generation Lights-Out technology, HP Integrated Lights-Out 2 (iLO2), provides high-performance, “in-front-of-the-server” remote control for everyday system administration. Choose from three versions:
  - iLO2 Standard, which enables essential remote control and management capabilities as standard features on next-generation ProLiant servers
  - iLO2 Advanced, which provides comprehensive Lights-Out remote management capabilities, giving you the freedom to achieve full remote control of your ProLiant servers without compromise for routine and emergency situations
  - iLO2 Select, which provides Lights-Out management upgrades for selected ProLiant server environments, including ProLiant 300 and 500 series servers that are managed using iLO2 Standard text-based remote consoles

### **Control: power management software**

- Integrated Lights-Out (iLO) Power Management Pack software—If you’re currently using the iLO2 Advanced Pack and are ready to take the next step on your journey toward building an outstanding server infrastructure, Integrated Lights-Out (iLO) Power Management Pack software is designed just for you. It combines the power of Lights-Out remote control with new power management capabilities delivered through HP Insight Power Manager and SIM software. You will also benefit from HP SIM software’s ability to discover and associate iLO management processors with your host servers and functions, such as health monitoring, server data collection and inventory reporting, and system software version control. The iLO Power Management Pack delivers:
  - Total Lights-Out remote control—take control of your servers securely from anywhere independent of operating system state using the Integrated Lights-Out Advanced Pack capabilities you depend on today
  - Centralized system insight using HP SIM software—monitor your environment proactively to protect against unplanned downtime
  - Improved energy efficiency using Insight Power Manager software—utilize existing power and cooling facilities efficiently

For more information about power management, visit: [www.hp.com/go/ilopowerpack](http://www.hp.com/go/ilopowerpack)

### **Analyze and optimize: HP Insight Dynamics – VSE software**

HP Insight Dynamics – VSE is infrastructure software and the first-ever integrated solution that lets administrators analyze, manage, and optimize virtual and physical resources equally. Based on proven technologies such as HP Systems Insight Manager and HP Insight Control, it offers a powerful toolkit to continuously consolidate the infrastructure, accelerate complex technology projects, and simplify daily operations. HP Insight Dynamics – VSE provides real-time capacity planning and brings the flexibility of virtualization to physical servers.

“EnCompass and HP helped us build an Integrated IT environment that is saving us money today.”

Tammy Johnson, IT director, Physician’s Clinic of Iowa

**Monitor: HP Systems Insight Manager software**

HP Systems Insight Manager (HP SIM) software is a unified server storage management tool that improves IT staff efficiency and hardware availability. It is modular, feature-rich, secure, and extensible, and enables administrators to manage everything from a single console, and it provides:

- Unified server and storage management—based on industry standards, offers simplified and consolidated infrastructure management, automation, and virtualization, and enables structuring IT management around business processes—helping to reduce maintenance costs and increase resources
- Improved efficiency of IT staff—reduces costs by facilitating collaboration between islands of management; eliminates reliance on resource-intensive, error-prone manual processes with a consistent security model across management domains, speeding decision-making processes
- Extensibility through plug-in applications—increases efficiency by using shared components, eliminating redundant, bandwidth-draining processes; delivers easy-to-scale features with value-added modules for servers and storage
- Integrates new technologies in response to changing conditions—reduces reliance on resource-intensive, error-prone manual processes through automation and accelerates problem-solving across management domains—helping you streamline asset management, reduce training and implementation costs, and appropriately deliver powerful lifecycle management

For more information about HP SIM software, visit:

[www.hp.com/support/hpsim](http://www.hp.com/support/hpsim)

**New technologies for advanced capabilities:**

**HP ProLiant G5 servers**

HP ProLiant fifth-generation (G5) technology servers provide improved system reliability through a balanced architecture design, simplified platform and technology transitions, and improved efficiencies. Our G5 servers are designed for multi-core technologies and deliver better resource utilization.

You will experience substantial performance gains through increased memory capacity and I/O bandwidth. CPU utilization is designed for virtualization, and migration is radically simple with ProLiant Essentials SMP—P2P software. In addition to increased flexibility, improved monitoring capabilities, and design enhancements—including improved thermals and reduced acoustics—you also benefit from features that are unique to the ProLiant family, such as Smart Array RAID controller, iLO2, and HP’s power regulator and power meter.

- PCI Express technology for improved performance—New PCI Express (PCI-E) technology, supported on the latest HP ProLiant G5 servers, increases server performance and user productivity dramatically by boosting system bandwidth to 200 MBps per lane. You can take advantage of this technology immediately because HP now supports single-function PCI-E adaptors with up to four ports or connectors. New ProLiant platforms include standard PCI-E and optional PCI-X capable slots for investment protection, enabling you to migrate to the new interface at your own pace.

- Serial Attached SCSI drives—Serial Attached SCSI (SAS) technology satisfies the most demanding enterprise data-center requirements for scalability, performance, reliability, and manageability while leveraging a common electrical and physical connection interface with Serial ATA (SATA). HP offers a wide range of ProLiant DL servers that support the highly reliable small-form-factor hot-pluggable SAS or SATA hard drive to provide ultimate flexibility and improved efficiency. The 2.5-inch small-form-factor serial disk drives provide increased airflow, and a greater number of drives can be accommodated in a reduced footprint.

When you need storage to support high workloads or mission-critical applications, choose SAS drives. The benefits include:

- High performance (3 GBps transfer speeds)
- Superior reliability
- Greater density (smaller standard size and better performance per rack unit)
- 50 percent lower power consumption

For more information about SAS SCSI drives, visit: [www.hp.com/products/harddiskdrives](http://www.hp.com/products/harddiskdrives)

#### **New technologies for advanced capabilities: ongoing data protection**

As you change and expand your disk storage, it's important to protect your business and its data assets. HP Smart Array controllers—now in their seventh generation—provide the flexibility, reliability, and manageability you need, enabling you to:

- Deploy large-capacity drives safely and create large storage volumes
- Establish cost-effective data protection
- Implement the highest-level fault tolerance

Compatibility between controllers makes them simple to upgrade and expand into larger, shared-storage environments. They support both SATA and SAS universal hard drives. And your technical support team or partner can improve, troubleshoot, and expand configurations easily using a single, consistent interface.

For more information about Smart Array controllers, visit: [www.hp.com/products/smartarray](http://www.hp.com/products/smartarray)

## HP Financial Services: your ideal solution, simply and affordably

You can acquire your complete solution at an affordable price quickly and easily with HP Financial Services. Our simple, affordable, pay-as-you-go leasing and financing options span the entire lifecycle of your HP solution—including the hardware, software, services, and any third-party components—to deliver the following benefits:

- Fiscal fitness
- Protection from technology obsolescence
- Increased budget reach
- Safe disposal of old technology assets

All financial services are subject to HP Financial Services credit committee acceptance. Find out more at: [www.hp.com/go/hpfinancialservices](http://www.hp.com/go/hpfinancialservices)

## Accelerate growth, lower costs, and mitigate risks

To find out more about how an HP rack solution based on HP ProLiant DL servers can help you accelerate business growth, lower costs, and mitigate risks with simple, affordable, and reliable solutions, consult these additional resources:

- The HP Server Buying Guide provides the assistance you need when it comes to selecting the correct ProLiant server and storage configuration based on your environment. Visit: [www.hp.com/go/serverguide](http://www.hp.com/go/serverguide)

If you need help choosing the right rack solution for you, contact your local HP representative or Preferred Partner.

## Case study: multispecialty clinic revitalizes its infrastructure

Physicians' Clinic of Iowa, P.C. (PCI) is a physician-owned medical group with four sites in Cedar Rapids, Iowa. In a typical day, the 50-physician group treats more than 500 patients with conditions ranging from osteoporosis to sleep apnea and heart disease. Spread out across the city, PCI physicians and staff must function as though they were in the same building. In addition, they must monitor and treat patients in the city's two hospitals.

In early 2005, PCI decided to replace its aging technology environment with a new infrastructure that would connect all of its Cedar Rapids offices more efficiently. Its solution—an infusion of specialized expertise, products, and services from HP and HP Partner EnCompass—consisted of:

- HP ProLiant DL360 and DL380 Servers
- HP Systems Insight Manager software
- HP KVM Switch
- HP StorageWorks 1/8 Ultrium 460 Tape Autoloader
- HP Compaq Business dc7100 Desktop PCs (small form factor)
- HP Compaq t5710 Thin Clients
- HP Compaq Business Notebook PCs
- HP 17-inch flat-panel monitors (model L1702)
- ProCurve 2626 Power and 2824 Switches

Today the group's technology environment is stronger, faster, and more stable than ever, and PCI is extremely well connected both internally and externally. The new, smarter IT environment is helping to streamline PCI operations, improve regulatory compliance, and produce internal and external collaboration. The staff is more productive and more efficient and can easily continue to provide the quality of healthcare that earned the clinic its ISO 9001 quality management system certification.

## HP Services

Choosing HP means better service support. No matter what you need—whether it's planning a project, designing an infrastructure, or fast, affordable support—we can provide a solution that leverages our decades of experience and extensive global presence to give you peace of mind, both now and in the future.

To streamline implementation and enhance ongoing support of your rack solution, HP recommends the following service options:

**Installation and startup service and 24x7 technical support**—available for:

- Rack and rack options
- ProLiant servers, storage, and network options
- Microsoft and Linux operating-system software
- Open source middleware software
- Insight Control management software
- HP Modular Cooling Systems
- 3 Phase UPS
- Dynamic Smart Cooling

**HP Factory Express**—get your data center up and running with a robust portfolio of flexible, pre-priced, configured, customized, and integrated factory solutions and deployment services delivered to your data center fully racked, cabled, and configured.

**Server hardware support**—covers ProLiant rack and power products. Cover all the options installed in your rack with a single convenient service package. HP Care Pack Services for rack-mounted ProLiant DL servers and storage include coverage for the HP-branded rack options including 22" and smaller external monitors and tower UPS options up to 3kVA. These items are covered at the same service level and for the same period as the server at no additional cost.

**HP Thermal Assessment Services**—to improve cooling efficiency. As enterprises move to high-density computing—running increasingly complex workloads—the issues associated with capacity and cooling costs can increase significantly. To help you improve cooling efficiencies and control costs, we offer a series of Data Center Thermal Assessments as part of HP Critical Facility Assessment services. For more information about HP Services, visit:

[www.hp.com/services/proliant](http://www.hp.com/services/proliant)

For more information about HP warranty terms, visit:

[www.hp.com/products/warranty](http://www.hp.com/products/warranty)

To learn more, visit [www.hp.com/go/serverguide](http://www.hp.com/go/serverguide)

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Technology for better business outcomes