

# Scalability and performance of HP ProLiant servers in an HP SBC environment



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## Executive summary

Deploying HP ProLiant servers in an HP Server Based Computing (SBC) environment offers many benefits to the customer over conventional client server computing:

- Lower application ownership costs
- Elimination of additional development, testing or deployment procedures for individual applications
- Accelerated application deployment
- Extended application availability
- Enhanced security
- Improved data backup and recovery
- Improved end-user support
- Uniform desktop experience from any network access point

Currently, the HP ProLiant servers recommended for HP SBC environments can support the following numbers of users:

HP ProLiant server	Heavy Users
<b>BL20p G3</b> (single-core processors)	154
<b>BL20p G3</b> (dual-core processors)	179
<b>BL25p</b> (single-core processors)	146
<b>BL25p</b> (dual-core processors)	175
<b>BL30p</b>	123
<b>BL35p</b> (single-core processors)	123
<b>BL35p</b> (dual-core processors)	175
<b>DL145 G2</b>	137
<b>DL360 G4p</b> (single-core processors)	158
<b>DL360 G4p</b> (dual-core processors)	168
<b>DL380 G4</b> (single-core processors)	146
<b>DL380 G4</b> (dual-core processors)	172
<b>DL385</b> (single-core processors)	148
<b>DL385</b> (dual-core processors)	180
<b>DL585</b>	190

## Introduction

HP offers a broad range of HP ProLiant servers that are ideal for HP SBC environments:

HP ProLiant server	Problems solved
<b>BL20p G3</b>	A performance Intel® Xeon®-based (single- or dual-core) 2P server blade engineered for the enterprise. With optional Fibre Channel support for Storage Array Network (SAN) implementations, customers can improve data availability, easily scale capacity, and realize management cost savings by consolidating disk resources.
<b>BL25p</b>	Engineered for enterprise performance and scalability while sharing the same infrastructure components as all other HP ProLiant p-Class server blades, the new HP ProLiant BL25p server blade features AMD Opteron™ or Dual-Core AMD Opteron 200 Series processors, SAN storage capability, and four Gigabit NICs standard.
<b>BL30p</b>	A modular, space-saving server blade design that is ideal for high-performance technical computing and environments that fully leverage Network Attached Storage (NAS) and Storage Area Network (SAN) external storage solutions.  This server blade features Intel Xeon processors.
<b>BL35p</b>	The new HP ProLiant BL35p dual-processor server blade delivers uncompromising manageability, maximum computing density, and breakthrough power efficiencies to the high-performance data center. Offering customers a modular, space-saving design, the HP ProLiant BL35p server blade consumes less power, enabling denser rack architectures.  This server blade features AMD Opteron or Dual-Core AMD Opteron 200 Series processors.
<b>DL145 G2</b>	Optimized for the HPC market; designed and engineered with industry-leading performance features in mind. The 1U size, low power consumption, and support for dual AMD Opteron processors provide HPC customers with a high-performance, low-cost solution.  This server features AMD Opteron or Dual-Core AMD Opteron 200 Series processors.
<b>DL360 G4</b>	With concentrated 1U computing power, HP Integrated Lights-Out (iLO) management, and essential fault tolerance, the single- or dual-core Intel Xeon-powered HP ProLiant DL360 G4 server is ideal for space-constrained environments.
<b>DL380 G4</b>	Delivers on its history of design excellence with enterprise-class uptime and manageability, proven Intel Xeon processor performance (with single- and dual-core models), and 2U density for a variety of rack deployments and applications.

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HP ProLiant server	Problems solved
<b>DL385</b>	The HP ProLiant DL385 server builds on the HP ProLiant DL380 server's history of design excellence, enterprise-class uptime, and manageability, delivering proven dual Opteron processor performance and 2U density for a variety of rack deployments and applications. This server features AMD Opteron or Dual-Core AMD Opteron 200 Series processors.
<b>DL585</b>	The best performing x86 four-processor server, combining AMD Opteron processor technology, best-in-class management, and outstanding uptime features in a system that is ideal for large data center deployments. This server features AMD Opteron or Dual-Core AMD Opteron 800 Series processors.

HP continues to upgrade these servers and introduce new servers that meet particular business needs. To help customers select the appropriate server for their environment, HP publishes a series of performance briefs that characterize individual server performance and scalability. Each performance brief includes the following information:

- An outline of new features introduced with the new server
- A description of the test environment and test scenarios used to determine the optimal number of users supported by the server in an HP SBC environment

## Scalability metric

The metric chosen by HP to characterize scalability in an HP SBC environment is the number of users that can be supported by a particular server configuration. Note that HP makes a distinction between the **optimal number** of users that can be supported on a particular server configuration and the **maximum number**, with the optimal number being a more practical metric that reflects the number of users that can be supported **without impacting user response times**.

Historically, HP has defined the optimal value as the number of users that are active when processor utilization reaches 80%. After processor utilization passes 80%, additional users are supported; however, response times may become unacceptable.

The scalability metrics specified in the HP performance briefs reflect optimal numbers of users.

## This white paper

This white paper serves as a high-level summary of HP ProLiant server performance and scalability characteristics in an HP SBC environment, providing information on the following topics:

- [Test results](#) – Summarizes test results for current HP ProLiant servers and provides a graphical comparison
- [Appendix A](#) – Describes the benefits of using HP ProLiant servers in an HP SBC environment
- [Appendix B](#) – Provides more information on sizing servers for a specific HP SBC environment
- [Appendix C](#) – Describes the benefits offered by HP Solution Centers for customers planning HP SBC and other solutions
















To obtain detailed information on how HP tested and characterized individual servers, refer to the appropriate performance brief using the link provided in [Table 1](#).

## Test results

This section summarizes performance test results for HP ProLiant servers that are recommended for deployment in an HP SBC environment.

Table 1 lists the numbers of Heavy, Medium, and Light Users supported by each server. The table is arranged in chronological order based on the date of publication of the particular performance brief; links are provided to additional information on each server and to each performance brief.

**Table 1:** Numbers of users supported by each new server

HP ProLiant server	Date performance brief published	Processor/Speed (GHz)/Cores/Vendor	Heavy Users	Medium Users	Light Users	Link to performance brief
<a href="#">BL20p G3</a>	12/5/2005	2P/2.8/2/Intel	179	227	481 (1)	
<a href="#">DL360 G4p</a>	12/5/2005	2P/2.8/2/Intel	168	229	479 (1)	
<a href="#">DL380 G4</a>	10/19/2005	2P/2.8/2/Intel	172	231	480 (1)	
<a href="#">BL20p G3</a>	9/26/2005	2P/3.8/1/Intel	154	259	478 (1)	
<a href="#">BL25p</a>	9/26/2005	2P/2.8/1/AMD	146	238	490 (1)	
<a href="#">DL145 G2</a>	9/26/2005	2P/2.8/1/AMD	137	226	481 (1)	
<a href="#">DL360 G4p</a>	9/26/2005	2P/3.8/1/Intel	158	263	483 (1)	
<a href="#">DL380 G4</a>	9/26/2005	2P/3.8/1/Intel	146	295	477 (1)	
<a href="#">DL385</a>	9/26/2005	2P/2.8/1/AMD	148	261	482 (1)	
<a href="#">BL25p</a>	6/27/2005	2P/2.2/2/AMD	175	241	478 (1)	
<a href="#">BL35p</a>	6/27/2005	2P/2.2/2/AMD	175	221 (2)	486 (1)	
<a href="#">DL385</a>	6/27/2005	2P/2.2/2/AMD	180	290	473 (1)	
<a href="#">BL35p</a>	4/15/2005	2P/2.4/1/AMD	123	216	450	
<a href="#">BL30p</a>	8/31/2004	2P/3.2/1/Intel	123	201	423	
<a href="#">DL585</a>	6/3/2004	4P/2.2/1/AMD	190	228 (1)	449 (1)	

(1) Virtual memory consumed

(2) Virtual memory may be consumed

## Summary

HP offers server platforms to meet a wide range of business needs. To help customers select the appropriate platforms for their HP SBC environments, HP publishes performance briefs documenting the performance and scalability of new and updated HP ProLiant servers.

These performance briefs contain detailed information on how HP determined the scalability of each server using a metric that relates directly to the user experience – the number of Heavy Users that can be supported before response times start to become unacceptable.

Customers can take advantage of test environments like those described in the performance briefs – and solve many other business problems – at one of over 80 strategically-located HP Solution Centers.

## Appendix A – HP ProLiant servers in an HP SBC environment

Deploying HP ProLiant servers in an HP SBC environment offers many benefits to the customer over conventional client server computing:

- Lower application ownership costs
- Elimination of additional development, testing or deployment procedures for individual applications
- Accelerated application deployment
- Extended application availability
- Enhanced security
- Improved data backup and recovery
- Improved end-user support
- Uniform desktop experience from any network access point

### **HP ProLiant DL servers**

HP ProLiant DL servers provide enterprise-class performance, delivering robust, affordable multi-processors in a slim (1U – 7U) form factor that is ideal for multi-server rack environments. Optimized for clustering operations and attached external storage, HP ProLiant DL servers can handle jobs as large as data warehousing or as small as web hosting. They have become the world's most popular rack-mounted servers.

### **HP BladeSystem servers**

Some of the key challenges facing today's IT organizations are:

- Consolidating and standardizing hardware architectures and operating systems
- Optimizing support for multi-tier applications
- Providing the means to quickly and easily scale out the infrastructure

Given these challenges, the ability to add processing power incrementally at the point of need is highly desirable – and can be met by deploying HP BladeSystem servers in conjunction with virtualization techniques that facilitate resource sharing and increase overall utilization.

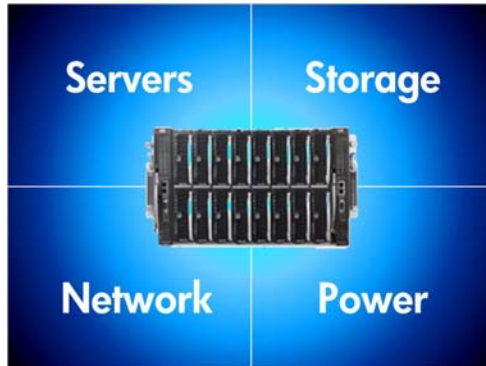
HP BladeSystem provides a highly flexible and scalable environment that empowers organizations to embrace change while dramatically reducing total cost of ownership. The virtualization capabilities of HP BladeSystem allow the enterprise data center to respond automatically to fluctuating business requirements; resources can be allocated flexibly and automatically, with no manual intervention required. In addition, the consolidation capabilities and intelligence built into HP BladeSystem support advanced management tools that can automate and simplify a broad range of IT tasks.

In conjunction with intelligent management tools, HP BladeSystem, provides the foundation on which to build an Adaptive Enterprise, an [infrastructure](#) that is designed to provide scale-out, virtualization, and management.

HP BladeSystem, as shown in Figure A-1, integrates servers, storage, power, and network resources into a cohesive advanced management framework. Wired once into this consolidated infrastructure, modular resources are easily provisioned or repurposed to enhance the linkage between business and IT.

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**Figure A-1:** HP BladeSystem components, showing the infrastructure-wide approach



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With HP Systems Insight Manager (HP SIM), an HP BladeSystem solution can be managed as a single platform; one console provides access to all HP BladeSystem infrastructure components and the tasks necessary to discover, monitor, configure, and provision these resources over the lifecycle of the solution.

## Appendix B – SBC solution sizing

As with any laboratory benchmark, the performance metrics quoted in this performance brief are idealized. In a production environment, these metrics may be impacted by a variety of factors, including the following:

- **Overhead**  
Agents and services (virus scanning, backup and restore, provisioning, security, management and more) automatically consume overhead. Rogue applications can consume additional overhead. The system architect may wish to provide a 25% – 30% buffer to accommodate this overhead.
- **Future growth**  
To accommodate future growth, the system architect may wish to provide an additional buffer. Alternatively, servers can be added as needed, taking advantage of the server farm's inherent ability to scale out.
- **User profiles**  
The particular application in use directly impacts the number of users supported by a particular server. Further, user behavior can also impact scalability:
  - Increased typing rates correspond to fewer users.
  - Opening and closing applications (rather than switching between them) or moving quickly between tasks can place a heavier load on the server.
  - For accurate sizing, system architects must closely match their user profiles with the Heavy, Medium, or Light User profiles used by HP during performance testing. If the profiles do not match, more are available using the online sizer tool (described below); alternatively, the system architect can consult [HP Services](#) for more information.
- **Background grammar checking**  
Background grammar checking can significantly impact scalability, reducing the number of users supported by as much as 50%. HP disabled background grammar checking for the testing described in this performance brief.

### Online sizer tool

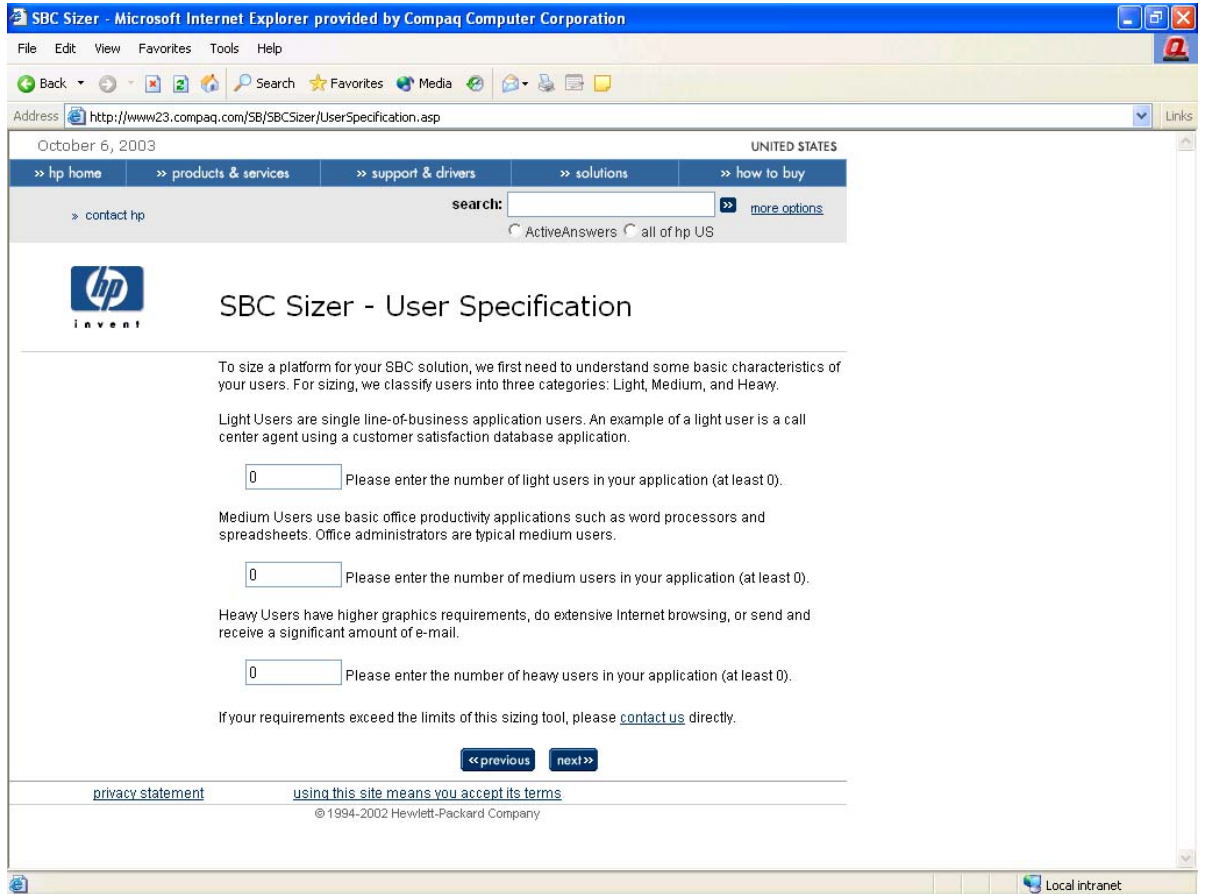
To minimize risk, HP offers automated, online tools that can help the customer size an HP SBC solution. The algorithms and methodology used by the sizer are based on the results of customer surveys and thorough testing.

Sizers are available for the following HP SBC environments:

- [Enterprise](#)
- [Small and Medium Business \(SMB\)](#)

Figure B-1 shows a typical HP SBC sizer screen.

**Figure B-1:** The HP SBC sizer's **User Specification** dialog



Based on information provided by the customer, a sizer can provide a quick, consistent mechanism for identifying the “best-fit” server for a particular HP SBC environment and generate a Bill of Materials (BOM) for that server.

The algorithms and methodology used by the sizers are based on the results of customer surveys and thorough testing.

## Appendix C – HP Solution Centers

Customers can take advantage of test environments like the one described in this performance brief – and solve many other business problems – at an HP Solution Center.

Over the past fifteen years, HP Solution Centers have helped thousands of customers achieve successful solution implementations by answering questions like these:

- How can I keep my IT infrastructure cost effective yet flexible so I can meet changing business needs?
- How can I maximize the availability and performance of my solution?
- How can I exchange data with partners or customers?
- How can I secure my e-commerce transactions?
- Will my server consolidation strategy work?
- How do I minimize the risks and costs associated with my solution?



### **80 worldwide locations to serve customers**

At over 80 locations worldwide, HP is helping customers make better-informed decisions that can save them time and money. HP Solution Centers offer a confidential, risk-free environment and the tools and expertise needed to develop, test, and validate solutions on the latest HP technologies.

By using the services offered by an HP Solution Center, customers can proactively validate their solutions, avoiding the risks associated with an untested deployment. In addition, customers are assured that they will be able to effectively manage and support their solutions.

Services are delivered using industry-standard, enterprise-class tools.

## Services offered

Through the delivery of repeatable, consistent results, HP Solution Centers help customers speed time to market, reduce risk and costs, and increase agility. Key [service offerings](#) include:

- Proof-of-concept testing, sizing exercises, and scalability tests
- Benchmarking new products and services
- Investigating alternatives for enhancing a solution or architecture
- Testing and tuning of solutions based on a variety of hardware architectures
- Demonstrating HP products and solutions

HP Solution Centers can play a critical role in helping customers realize the HP vision of an [adaptive enterprise](#) – an agile organization where business and IT are synchronized to capitalize on change.

## Engaging a Solution Center

The first step toward engaging an HP Solution Center is to contact the nearest [HP sales office](#). More information is available on the [HP website](#).

Figure C-1 shows regional locations.

**Figure C-1:** Regional HP Solution Center locations



## For more information

HP ProLiant servers

<http://h18004.www1.hp.com/products/servers/platforms/>

HP ProLiant Essentials  
Rapid Deployment Pack

<http://h18013.www1.hp.com/products/servers/management/rdp/index.html>

HP SBC online sizer tool for enterprise environments

<http://h71019.www7.hp.com/ActiveAnswers/Render/1,1027,2858-6-100-225-1,00.htm>

HP SBC online sizer tool for Small and Medium Business (SMB) environments

<http://h71019.www7.hp.com/ActiveAnswers/Render/1,1027,6645-6-100-225-1,00.htm>

HP Services

<http://www.hp.com/hps/>

HP Solution Centers

<http://www.hp.com/products1/solutioncenters/index.html>

Microsoft® Windows® Server 2003

<http://www.microsoft.com/windowsserver2003/evaluation/overview/family.msp>

Terminal Server enhancements in Windows Server 2003

<http://www.microsoft.com/windowsserver2003/techinfo/overview/termserv.msp>

Citrix Presentation Server

<http://www.citrix.com/English/PS/products/product.asp?familyID=19&productID=186>

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