

HP Extends 4-Way Choices to ProLiant Servers

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Management Summary

We are all thoughtful human beings who attempt to use sound judgment in making rational decisions. Many times, however, our experiences do not include the necessary information to make those decisions. Thank goodness for television and the myriad commercials that tell us what is really important in evaluating our future purchases! How else would we know how to select our next glass of beer or, on a grander scale, our next car? Do we buy that beer because it tastes good or because of its color? Do we buy that car because it is safe or because it is red?

When we go out to look for a car with more power or better safety features, we typically drive down the highway (in a perfectly usable vehicle, by the way), and we go past any number of dealers offering automobiles from more countries than you can consider. In addition to American cars, there are Asian models from Japan and Korea, European cars from Germany and Italy, and even Scandinavian models from Sweden. In fact, many times we will drive past all of these dealers and go to the location that not only has a variety of cars from one manufacturer (sedan, coupe, convertible, etc.), but may also carry different makes in one location, perhaps Cadillac, Toyota and Saab, for example. You may even return to the dealer who sold you the very vehicle that you are riding in. Whether we are reinforcing the wisdom of our own decision-making or acting because of careful research into crash tests and mileage ratings, we head for the dealer who has treated us honestly and maintained the vehicle well. In short, **we always consider a dealer that we trust.**

Acquisitions are made in exactly the same manner in the world of Information Technology (IT). When the IT director is looking to upgrade his data center with a new four-processor server, for example, he needs to identify the applications that he intends to run and select the architecture best suited to that purpose. While the servers that he is considering may have a common foundation, i.e., CPUs from Intel or AMD, he also has to evaluate how well the CPUs work with the rest of the server's architecture and design. He needs to look for a company that does not rest on its laurels and is continually striving to improve their products through innovation, and is flexible enough to provide their customers with choice. HP is just such a company, a recognized leader in the four-way x86 server market, not willing to rest on any past glory, with a variety of offerings and a superior maintenance organization to keep your data center operational. To find out if the HP *ProLiant* has the price-performance you need, please read on.

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4P Requirements for the Enterprise

Today, the data center is faced with many concerns relative to IT infrastructure. Chief among these are deployment and management, reliability, performance, adherence to standards, and, of course, price. Increasingly, the IT staff is looking to four-way servers¹ as the platforms of choice for the various infrastructure and mission critical applications being rolled out. Four-way servers are ideal, not only for the mundane tasks such as email, file, and print services, but also for the potentially more compute-intensive tasks required in business mode, such as improving CPU utilization through consolidation and high-performance computing (HPC). We see these servers not only as standalone platforms in enterprise departments and smaller businesses, but also as nodes integrated into a scale-out architecture to simplify the data center environment, where savings can be achieved by reducing management costs and floor space, through consolidation and a shared database, lowering the total cost of ownership (TCO).

The 4-way server segment is dominated by x86 systems, most notably with the Intel *Xeon* and AMD *Opteron* processors, and *Windows* or *Linux* operating system. This is where the enterprise can reduce costs via open applications and storage networks. The choice of operating system is usually application driven. The choice of processor is often made based upon a technical evaluation of architecture, clock speed, memory latency, or cache size, driven by the characteristics of the enterprise application set. Infrastructure applications, such as mail, can take advantage of a larger cache; database and HPC applications experience better performance through improved memory latency; consolidations can benefit from an increase in raw horsepower. Almost all applications seem to perform better with multiple cores in the CPU. Specifications show us that the Intel *Xeon* has more cache, while AMD's *Opteron 875* has a direct connect architecture (DCA) to improve memory latency, and dual core architecture to improve performance.

Sometimes the decision is driven by a relationship, one that the enterprise has with a specific vendor. In that case, it is best to have that relationship with a vendor who can give you a choice. In this arena, no IT vendor has a broader offering than HP.

HP Product Set

Ever since the introduction of the *Itanium-2* microprocessor, HP has offered up the widest

variety of *Windows* and *Linux* servers to solve infrastructure and high-performance computing problems for their customers through its *ProLiant* family and the *Integrity* Family. Previously, ProLiant only consisted of multiple 32-bit platforms based on the Intel Xeon processor and 32/64-bit platforms based upon AMD's Opteron chip. These platforms are configurable with from one-to-eight processors, for scale-out environments, to enable the enterprise to consolidate multiple applications in a single IT environment. The Integrity line, based upon the high-performance 64-bit Itanium-2 CPU from Intel, services the enterprise data center with large scale, complex workloads, scaling up to 64 processors in HP's *Superdome*. ProLiant handles the same application mix in smaller, departmental environments with one to four-way servers predominate. (We will not address the 32-bit Xeon or Itanium 2 servers here).

HP has expanded the ProLiant line with the addition of servers based on the 64-bit Intel *Xeon processor MP* with 32-bit compatibility, for legacy applications, and AMD's *Opteron 875* employing DCA and dual-core architecture, enabling two execution paths for each processor. Both of these options were designed for mainstream x86 requirements using industry standard chipsets to reduce cost, outstanding RAS characteristics, and a common design for management compatibility between platforms. In addition, they support a common set of operating environments. (See Exhibit 1, below.) Further, both sets are protected by an onsite 3-year warranty covering parts and labor.

New x86 Servers

HP has announced a third generation (G3) for the Intel Xeon-based *DL580* and *ML570* platforms and a second generation for the AMD Opteron-based *DL585* server along with a new *BL45p* blade, with the *DL585* leading the way for four-way x86 servers in 32-bit mode. The *DL580* and *ML570* are based on the 64-bit Intel Xeon processor MP (see

Exhibit 1 –

ProLiant O/S Compatibility

- Microsoft *Windows 2000 Server*
- Microsoft *Windows 2000 Advanced Server*
- Microsoft *Windows Server 2003*
 - *Standard and Advanced Edition*
- Red Hat *Linux*
- SUSE *Linux*

¹ Servers with four CPUs.

Exhibit 2, below), providing additional power and reliability for legacy Intel server needs, while the DL585 and BL45p add the AMD Opteron 875 with dual-core technology to HP's support of Opteron. (Again, see Exhibit 2.) **This gives HP the broadest processor support available from a single vendor.**

With a 64-bit design and 32-bit compatibility, HP has upgraded ProLiant with the tools necessary to deliver outstanding performance for today's applications while positioning their products for the demands of tomorrow, maintaining a common image across the platforms. These features include a common set of peripherals and adapters as well as a shared theme of virtualization and reliability, availability, and serviceability (RAS) designed into the servers. They have a common integrated lights-out (*iLO*) capability to ease the management of ProLiant systems throughout the network by combining secure, basic management functions and diagnostics with an essential virtual presence. This includes *HP Systems Insight Manager (SIM)*, and *SmartStart 7.20* to aid in deployment. *iLO* is upgradeable to *iLO Advanced* for more robust, remote administration.

New 64-bit Intel Xeon processor MP Platforms

The *DL580 G3* and *ML570 G3* are four-way servers based upon the 64-bit Intel Xeon processor MP with hyper-threading. They are available in a variety of speeds and with different cache sizes. (See Exhibit 2.) These models come with value-added features from an HP architecture redesigned for maximum performance and availability. In addition, no tools are required for service, minimizing any outages, and improved diagnostic indicators to assist in maintaining a high level of

availability. This makes them ideal for use as Web and Java servers, and as virtual machines running partitioning applications such as *VMWare*. ProLiant servers also provide the fundamental infrastructure requirements to function as file, email, and terminal servers, as well as hosting applications that can take advantage of large cache.

ProLiant DL580 G3

Designed in a 4U form factor, optimized for rack mount in a scale-out environment, the DL580 is ideal for server consolidation in a space-constrained data center environment, running database, messaging and business applications. Based upon the Intel CPU, the DL580 is designed with a new memory architecture. **It is the first four-way processor to offer optional high-availability memory.** With an easy to load and remove front-access, the DL580 supports up to 32GB of RAID memory, striped across 4 customer replaceable, hot-swap cartridges in RAID 5 format or mirrored. HP has made it known that the DL580 will support 64GB of memory, when larger chips become available. Using RAID 5, the current memory capacity nets out at 24GB, with advanced memory protection. ProLiant RAID memory helps to eliminate unplanned service interruptions, supporting online spares for failover of degraded DIMMs. This also enables dynamic memory additions without powering down the server under *Windows Server 2003*.

The DL580 also comes with five 64-bit PCI-X slots and the capability to add PCI Express or hot plug PCI-X slots. There is ample room to expand bandwidth with additional I/O controllers, such as an integrated dual port gigabit NIC and Smart Array Ultra320 controller with an optional 128MB battery backed write cache. For additional reliability there is an optional, hot-plug, redundant power supply and a virtually cable-less design. In order to improve performance, the DL580 was designed with a configurable hard disk backplane with duplex mode to enable frequently accessed data to reside on a separate channel from data that is not accessed as frequently. The DL580 is priced from \$6,270.

ML570

The HP ProLiant ML570 G3 server is the first 4-way Xeon server to offer not only exceptional performance, but superior availability also. Designed for maximum versatility and seamless expandability in a tower or 6U rack form factor, the ML570 is also available in multiple processor options (see Exhibit 2) and is an ideal consolidation server within a data center environment, with redundant, hot-plug components, including RAID memory, and the ability to manage both centralized

Exhibit 2 – ProLiant Processor Options

64-bit Intel Xeon processor MP

- 3.16 GHz with 1MB of L2 cache
- 3.66 GHz with 1MB of L2 cache
- 2.83 GHz with 4MB of L3 cache
- 3.00 GHz with 8MB of L3 cache
- 3.33 GHz with 8MB of L3 cache

AMD Opteron with 1MB of L2 cache

- M-844 at 1.8 GHz
- M-848 at 2.2 GHz
- M-850 at 2.4 GHz
- M-852 at 2.6 GHz

and remote data centers. It is also ideal in a remote enterprise environment because of its flexible configurability. The ML570 is priced starting from \$5,270 and can support:

- 48GB of optional hot-plug RAID memory² with advanced ECC (in 24 sockets) for high reliability;
- 10 hot-plug Ultra320 SCSI drives; and
- 10 PCI I/O slots (PCI Express to support high bandwidth devices, or PCI-X for hot-swap adapters).

New AMD Opteron Platforms

With the new DL585, HP becomes the first Tier 1 provider with a 4-way dual core Opteron 875 platform. Using AMD's *HyperTransport* technology along with Opteron's DCA, it is ideal for multi-threaded applications such as data mining, video rendering, database servers, ERP/CRM, and high performance computing applications that can take advantage of AMD's dual core technology and superior memory latency. The dual-core models are priced where the single-core models were priced, with the single core BL45p now priced from \$6,999 and the single-core DL585 from \$9,999.

ProLiant DL585

With dual-core, a 4-way system will have the power of an 8-way single core server, with twice the performance of the DL580G2 in the same footprint and power consumption, providing a significant cost savings for the dual-core architecture. The DL585 enables 32- and 64-bit programs to co-exist, providing outstanding performance for legacy applications. Preliminary indications promise about twice the performance of the DL580G2 for ERP and OLTP applications and a 50% gain for infrastructure applications, making the DL585 HP's highest performing x86 4-way platform. It thus becomes a key enabler of data center consolidation, to reduce the total TCO.

With a performance rating of over 130,000 tps, the single-core DL585 is an outstanding engine for database and OLTP applications. With a projected rating in excess of 187,000 tps, the dual-core DL585 is more than 40% faster. This value is also 25% faster than the IBM single-core 4-way *eServer x366* at over 150,000 tps. **However, it should also be noted, from a price-performance standpoint, that the DL585, single core, has twice the price/performance of the x366, and the dual-core is almost 3 times that of the x366.**

² The ML570G3 will support 64GB when larger DIMMs become available

Exhibit 3 - ProLiant Advantages

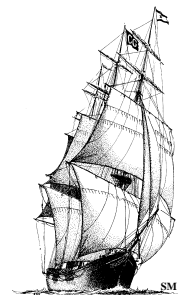
- Superior infrastructure management with SIM and iLO;
- Universal storage;
- Comprehensive rack options;
- Wide availability of both Intel and AMD microprocessors; and
- Common options to reduce qualification time and sparing.

BL45p

The ProLiant BL45p complements an already extensive list of two processor blades in the HP *BladeSystem* arsenal, joining the Xeon-based BL40p in the four-way category, as the first four-way Opteron blade from a Tier 1 vendor, at half the size of the 40p. The BL45p has the power to replace two of any dual-x86 blade. This enables the data center to save on infrastructure costs, providing yet another tool for IT consolidation and reducing the data center TCO. With the BL45p, the data center staff can complement the existing blade architecture with a 4-way, dual-core blade that combines performance and reliability characteristics similar to the DL585 with the high-availability characteristics of the HP *BladeSystem*.

Conclusion

In an era where servers are built around commodity processors and are available from a variety of vendors, purchase decisions must be made based upon the added value that the platform delivers to the enterprise data center. Certainly, price-performance will vary based upon the infrastructure surrounding the compute engine that is the heart of any business solution, but like servers will have similar values and should not be the gating factor. **Your decision must be based upon how any particular business solution lowers the TCO for your IT environment.** This extends far beyond the cost of the hardware. You need to identify what advantages this particular implementation has over any other. The ProLiant advantages are summarized in Exhibit 3. They can all lower the TCO for your data center. If your enterprise is seeking to upgrade its IT environment, you should see if the new ProLiant models would help to cure the pains in your data center.



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