HP ProLiant DL585 G7 server technology

Technology brief

Introduction

The new HP ProLiant DL585 G7 server delivers industry-leading efficiencies to reduce costs in both capital and operating budgets.

This server features the latest scale-up AMD Opteron™ 6100 series processor, a maximum of 512 GB of memory, and up to 11 PCIe 2.0 I/O slots. This balance of new system architecture, large memory capacity, and I/O footprint gives you the high performance needed for large-scale enterprise applications.

The DL585 G7 is ideal for the following applications:

- **Server Consolidation and Virtualization** – The server's large memory footprint in combination with greater I/O bandwidth allows within a virtual environment the optimal running of multiple applications along with their network traffic demands.

- **Large Enterprise Database** – The DL585 G7's large memory footprint along with its multiple processor cores provides performance when mining large databases for information. (The closer the database content within memory is to the processor, the lesser the content-access time.)

- **Virtual Desktop Infrastructure (VDI)** – Effectively utilizing VDI thin clients requires a backend server with a large memory footprint (each client requires approximately 4GB of memory) along with the I/O capacity to move a large amount of small data packet traffic contributed by a potentially large number of VDI clients.

- **Web Hosting** – The DL585 G7's large memory footprint is optimally utilized by the memory requirements and demands of web-hosted applications.

- **High Performance Numeric Computing** – High I/O bandwidth requirements of these applications are easily handled by the DL585 G7 through its support of up to 4 double-wide or 3 triple-wide x16 General- Purpose Computing on Graphics Processing Units (GPGPUs). The GPGPUs are utilized to offload repetitive floating-point applications (numeric computing intensive, high precision arithmetic). GPGPUs have a 10x floating point advantage over processors.

Operating Systems and Virtualization Software Support

The DL585 G7 supports the following operating systems and virtualization software:

- Microsoft Windows
- Red Hat Enterprise Linux
- SuSE Linux Enterprise Server
- Oracle Enterprise Linux
- VMware ESX
- XenServer

Comparison between the DL585 G7 and G6 servers

The DL585 G7 offers multiple enhancements compared to its predecessor. They include:

- **Processors** – The DL585 G7 supports up to 48 cores (12 cores per CPU) compared with the 24 cores supported on the G6, allowing for better performance of multi-threaded applications and more resources for virtual machine operations.
- **Memory** - The DL585 G7 has twice the number of memory channels and an increase in bus frequency compared to the G6. This more than doubles the bandwidth of the memory subsystem. In addition, by supporting low-voltage memory, the DL585 G7 reduces power consumption over previous generations.
- **Expansion Slots** - The DL585 G7 chipset features PCI Express Gen 2.0. This achieves twice the bandwidth when compared to PCI-Express 1.1 in G6. The DL585 G7 supports up to 11 I/O slots with dual IOH. It also supports up to four 300 W Graphic Cards and GPGPUs. The G7 also features a modular I/O subsystem (base I/O feature set, plus an I/O expansion module) for more choices in configuration. The DL585 G7 has the standard 5-slot PCI-Express I/O. You can upgrade the server using the optional 6-slot PCI-Express or PCI-X modules for a maximum number of 11 slots.
- **Storage Controller** – The DL585 G7 has an integrated Smart Array P410i storage controller, instead of the PCIe card version used on the G6. The DL585 G7 comes standard with Flash-Backed Write Cache (FBWC), eliminating worry about losing data with loss of battery power.
- **Network Controller** - The DL585 G7 provides two more embedded 1 gigabyte (GbE) Ethernet NIC ports for a total of four. An optional NC524SFP module will upgrade two of the ports to 10 GbE without requiring the use of an onboard I/O slot.
- **Redundancy** - The DL585 G7 supports up to four hot-plug fans and up to four HP common-slot power supplies providing N+1 redundancy.

Table 1. Component Comparisons

Component	DL 585 G7	DL 585 G6
Chipset	AMD SR5690/SP5100	NVIDIA NForce Professional 2200 and 2050 chipsets, and AMD-8132 chipset
Processors	AMD Opteron 6100 series processors	AMD Opteron 8400 series processors
Memory	512GB 48 sockets DDR3 – 800/1066/1333 MHz; RDIMM only	256GB 32 Sockets PC2-6400 Registered DIMMs up to 800 MHz
Storage Controller	HP Smart Array P410i Controller	HP Smart Array P410 Controller
Internal Drive Support	8 SFF SAS/SATA/SSD	8 SFF SAS/SATA

Network Controller	NC375i Quad Port GbE Multifunction NIC; optional Dual Port 10GbE upgrade	Two embedded NC371i Multifunction Gigabit Network Adapters
Ex pansion Slots	Up to 11 FL/FH I/O slots Base : 2 PCI-E 2.0 x16, 3 PCI-E 2.0 x8 Optional Mezzanines Option 1: 2 PCI-E 2.0 x16, 4 PCI-E 2.0 x8 Option 2: 1 PCI-E 2.0 x16, 2 PCI-E 2.0 x8, 1 PCI-E 2.0 x4, 2 PCI-X	Up to 9 I/O slots 3 PCI-Express (x8), 4 PCI-Express (x4), and 2 PCI-X (100 MHz)
USB Ports	USB: (6) Total USB 2.0 Ports: (2) front; (2) rear; (2) internal	USB: (5) Total USB 2.0 Ports: (2) front; (2) rear; (1) internal
Video	One front and one rear video ports	One front and one rear video ports
Redundancy	Fan: Hot swap, N+1 redundant fans Power: Up to 4x 1200W Efficient Power Supply	Fans: 6 Hot Plug redundant fans
Management	ProLiant Onboard Administrator featuring the HP Integrated Lights-Out 3 (iLO 3)	ProLiant Onboard Administrator powered by iLO2

HP ProLiant DL585 G7 processor architecture

The DL585 G7 servers support four AMD Opteron 12-core 6100 Series processors. AMD 12-core technology delivers high performance and reduced latency for multi-threaded applications and multi-tasked environments.

The DL585 G7 servers feature HyperTransport™ 3.0 (HT3) technologies, which provides a direct, scalable bandwidth interconnection between the processor, the I/O subsystem, and the chipset (Figure 2). HT3 is an enhancement of HT1, and increases the interconnect rate from two giga-transfers per second (GT/s) available on previous AMD processors to a maximum of 4.8 GT/s. Each processor operates at speeds of up to 2.4 GHz, maintains 512 KB of L2 cache memory, and shares a total of 12 MB of L3 cache. An integrated memory controller supports PC3-10600 (DDR3-1333) DIMMs.

Figure 1. Major components of the AMD Opteron twelve-core processors

HyperTransport™ technology Assist

HyperTransport™ technology Assist (HT Assist) reduces cache probe traffic between processors, resulting in faster queries that increase performance for cache sensitive applications such as database, virtualization, and compute intensive applications. HT Assist™ resides in the first 1MB of L3

cache and reduces coherence-traffic overload on the HT links, resulting in faster queries in both cache- and compute-intensive applications.

AMD Dual Dynamic Power Management™

AMD Opteron processors use AMD Dual Dynamic Power Management. This feature powers the processor core and memory controller independently and delivers increased performance and improved power management.

AMD Virtualization™ technology

AMD Virtualization (AMD-V) technology is a hardware-based feature that translates virtual to physical memory addresses using Rapid Virtualization Indexing. AMD-V technology provides increased performance and reduced latency.

AMD Core Select

AMD Core Select uses the BIOS to select the number of software-visible cores per processor. Compliant operating systems and applications can recognize the reduced core count, which decreases software-licensing costs. This can improve performance of applications not written to make use of the full number of processor cores in the system by giving them access to more cache and greater memory bandwidth per thread. The DL585 G7 has a ROM-Based Setup Utility (RBSU) option (Advanced->Processor Options) that allows two different configurations:

- All cores enabled [default]
- Enable only half of the cores [half disabled] per socket

In a multi-processor configuration, the number of active cores per processor must be equal.

AMD SR5690 and SP5100 chipsets

The DL585 G7 makes use of both the AMD SR5690 Northbridge and SP5100 Southbridge chipsets to offer high performance and increased expandability. With transfer speeds up to 2.5Gb/s per lane, the primary SR5690 chipset interfaces to the secondary SP5100 chipset by utilizing a four-lane A-link Express II interface.

Additional features of the SP5100 chipset are:

- Generation II SATA ports with transfer rates up to 3 Gb/s, compliant with the SATA 2.5 specification, supporting both 1.5 and 3.0 compliant devices. The server uses two ports, one for an internal optical drive (DVD), and one for an internal Solid State Drive (SSD).
- Eight USB 2.0 ports consisting of two internal ports, two front ports, two rear ports, one USB to SD card reader bridge interface, and one Baseboard Management Controller interface.
- One PCI host bus controller that supports a 33 MHz PCI bus that in turn supports six bus master devices. The DL585 G7 also supports a single internal graphics controller on this interface.
- SMBus Rev 2.0 compliant controller.
- Legacy Interrupt and DMA controllers.
- LPC Host Bus controller that supports two Master/DMA devices, including support of TPM version 1.1 and 1.2 devices.
- Serial Peripheral Interface (SPI) device support.
- Advanced Host Controller Interface (AHCI) support.

- Timer support including legacy 8254 compatible timer, Microsoft High Precision Event Timer (HPET), ACPI power management timer, and watchdog timer.
- Real Time Clock (RTC) with 256-byte battery-backed CMOS RAM.
- Power management Supports ACPI spec 3.0 compliant power management schemes.

Features of the SR5690 chipset include:

- Support for multiple SR5690 Northbridge processors. The HP ProLiant DL585 G7 supports four total devices, one per processor.
- Support for 46 total PCI Express lanes per SR5690. Forty-two lanes are dedicated to external PCI Express devices. Four lanes are dedicated to the A-link Express interface to the SP5100.
- Support for 16-bit up/down Hypertransport 3 interface with up to 5.2 GT/s.
- Support for 200 Hypertransport 1 frequencies and 2600 MHz Hypertransport 3 frequencies.
- Compliant with revision 1.0 PCI Express Address Translation Services (ATS) specification to enhance memory protection d support of hardware-based I/O virtualization.
- Support for AMD Virtualization (AMD-V) technology.

HP ProLiant DL585 G7 Configurations

The basic DL 585 G7 configuration consists of two processors and five PCI-E expansion slots. A space is available for one of two optional PCI-E I/O expansion boards. One option has six PCI-E slots. The other option has four PCI-E and two PCI-X slots for customers needing to use PCI-X legacy cards.

In addition to the basic two-processor DL 585 G7 configuration, Figure 2 shows how you can install an optional secondary CPU board. The secondary CPU board adds two processors along with 24 DDR3 memory slots.

Figure 2. Block diagram of a configured DL585 G7 architecture
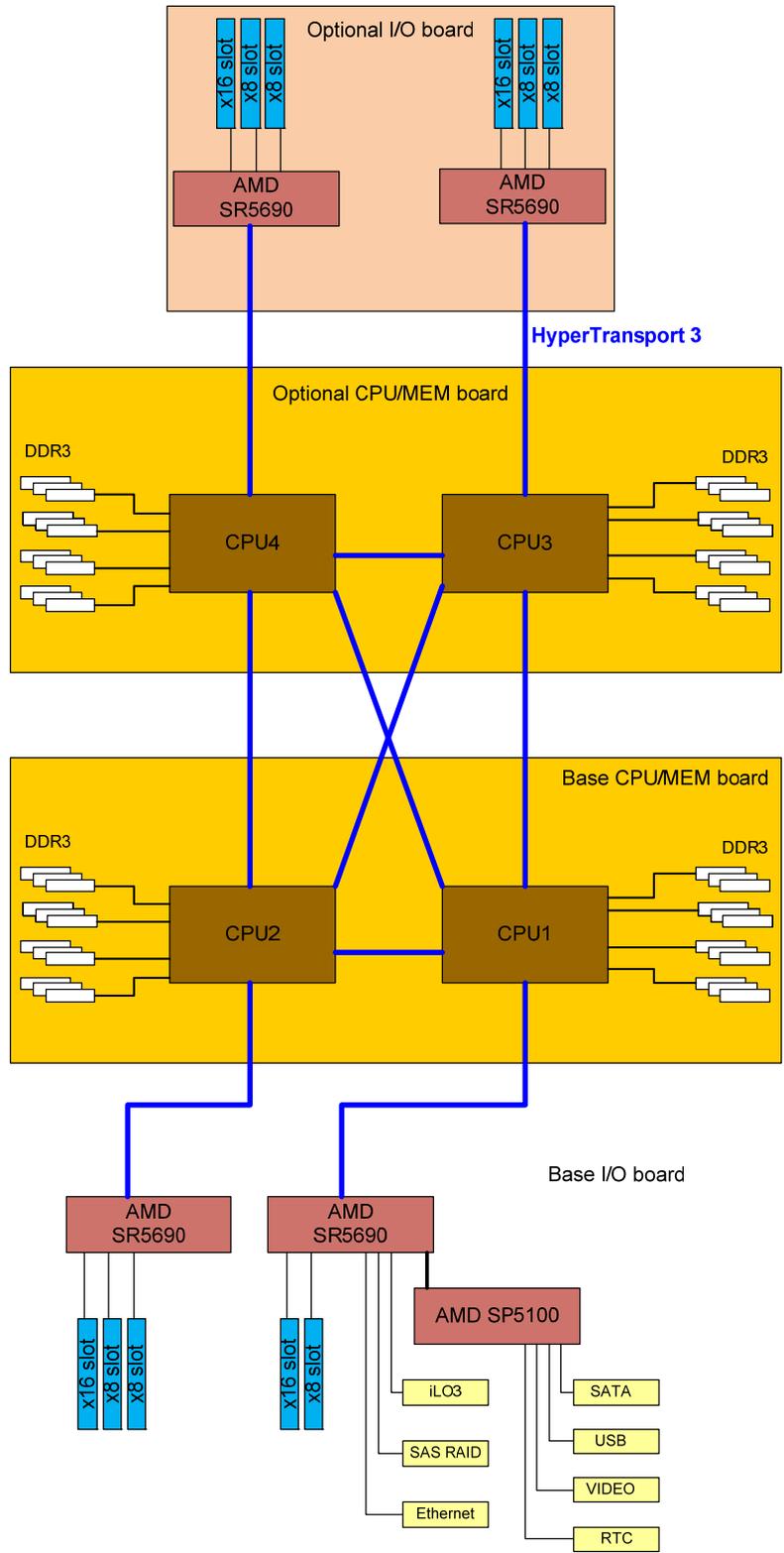
Memory technologies

In AMD Opteron architecture, the processor chip has an integrated memory controller. The on-die memory controller reduces memory latency by eliminating the bus contention between memory and I/O cycles found on a typical Northbridge processor.

In addition, with each processor containing its own memory controller, the aggregate bandwidth for system-accessible memory is scalable in multi-processor systems such as the HP ProLiant DL585 G7.

The Opteron 6100 series processor includes two memory controllers and supports four memory channels of DDR3 memory with bus speeds of up to 1333 MHz. This architecture doubles the memory capacity compared to previous generations of AMD Opteron processors.

The architecture supports up to four processors and 48 DIMMs, allowing the maximized memory footprint of 512 Gb for an optimal price.

The DL585 G7 supports single-, dual- or quad-rank RDIMMs. In addition, it supports ECC and On-Line Spare memory.

The load on the memory bus determines the maximum memory bus speed. The processor controls the memory bus speed according to the rules shown in Table 2.

Table 2. Memory configuration options in the DL585 G7

DIMMs per processor	Maximum memory speed
2, 4	1333 MHz
6	1066 MHz
8	800 MHz

For more information on the topic of DDR3 memory visit:
http://h20000.www2.hp.com/bc/docs/support/SupportManual/c02126499/c02126499.pdf

I/O technologies

The HP ProLiant DL585 G7 server supports two expansion bus technologies, PCI Express and PCI-X. With the DL 585 G7 architecture, you can install a PCIe expansion card into any slot it fits, and it will work correctly.

The server base configuration supports five PCI Express slots, three of which are full-length x8 slots. The remaining two are full-length x16 slots.

Two optional I/O expansion boards are available, adding an additional six slots for expansion. One option adds two full-length x16 PCIe slots and four full-length x8 PCIe slots.

The other option adds one full-length x16 PCIe slot, two full-length x8 PCI-e slots, one full-length x4 PCIe slot, and two 64-bit, 100 MHz, full-length PCI-X slots.

Since the processors and their associated chipsets split the management of PCIe handling, you can achieve optimal performance by balancing the load of multiple PCIe cards across the HyperTransport links. This reduces the likelihood of applications associated with high I/O traffic causing bottlenecks.

Refer to the Figure 2 block diagram for details and to Table 3 and Table 4 for slot assignments. Shaded table rows are slot assignments occupied by either of the two possible expansion kits.

Table 3. HP ProLiant DL585 G7 Expansion Slots - PCIe/X Option Kit expansion board

Expansion Slot	Technology	Bus Width	Connector Width	Form Factor
1	PCI-X	64-bit	N/A	Full Length/Full Height
2	PCI-X	64-bit	N/A	Full Length/Full Height
3	PCI-Express	x4	x8	Full Length/Full Height
4	PCI-Express	x8	x16	Full Length/Full Height
5	PCI-Express	x8	x16	Full Length/Full Height
6	PCI-Express	x16	x16	Full Length/Full Height
7	PCI-Express	X8	x16	Full Length/Full Height
8	PCI-Express	X8	x16	Full Length/Full Height
9	PCI-Express	x16	x16	Full Length/Full Height
10	PCI-Express	x8	x16	Full Length/Full Height
11	PCI-Express	x16	x16	Full Length/Full Height

Table 4. HP ProLiant DL585 G7 Expansion Slots - PCI Express Option Kit expansion board

Expansion Slot	Technology	Bus Width	Connector Width	Form Factor
1	PCI-Express	x8	x16	Full Length/Full Height
2	PCI-Express	X8	X16	Full Length/Full Height
3	PCI-Express	16	X16	Full Length/Full Height
4	PCI-Express	x8	x16	Full Length/Full Height
5	PCI-Express	x8	x16	Full Length/Full Height
6	PCI-Express	x16	x16	Full Length/Full Height
7	PCI-Express	X8	x16	Full Length/Full Height
8	PCI-Express	X8	x16	Full Length/Full Height
9	PCI-Express	x16	x16	Full Length/Full Height
10	PCI-Express	x8	x16	Full Length/Full Height
11	PCI-Express	x16	x16	Full Length/Full Height

The shaded table rows above are slot assignments occupied by either of the two possible expansion kits.

NOTE:
The below listed option kits can populate slots 1 through 6.
HP DL585G7 PCI-E Option Kit, Part No. 590485-B21
Adds: 2 PCI-E 2.0 x16, 4 PCI-E 2.0 x8
HP DL585G7 PCI-E/X Option Kit, Part No. 590487-B21
Adds: 1 PCI-E 2.0 x16, 2 PCI-E 2.0 x8, 1 PCI-E 2.0 x4, 2 PCI-X

Storage technologies

The HP ProLiant DL585 G7includes the latest storage technologies.

Smart Array P410i controller

The DL585 G7 includes the HP Smart Array P410i controller, the latest in the series of Smart Array controllers. The Smart Array P410i is the HP PCI Express 2.0 (PCIe) Serial Attached SCSI RAID controller. The P410i is ideal for RAID 0/1, 1+0, and 5+0. The controller uses DDR2-800 memory for on-board data storage. The 512 MB BBWC module and Smart Array Advanced are upgrades using a license key for RAID 6 and 6 +0. The P410 has eight ports for up to eight drives providing up to 4.8TB of total disk storage (8 x 600GB HDD). It also supports tape storage.

On the Smart Array P410i, a flash-backed write cache (FBWC) module comes standard with either 512 MB or1GB, depending on the model. Battery-backed write cache (BBWC) modules are also available on factory-configured systems.

The following failure-detection features keep the server running and data available while automatically replacing a failed drive and taking preventive action:

- Self Monitoring Analysis and Reporting Technology (SMART), developed at HP, detects possible disk drive failure before it occurs, allowing replacement of the component before failure occurs.
- Drive Parameter Tracking monitors drives' operational parameters, predicting failure and notifying the administrator.
- Dynamic Sector Repairing continually performs background surface scans on the hard disk drives during inactive periods and automatically remaps bad sectors, ensuring data integrity.
- RAID 6 with ADG (Advanced Data Guarding) allocates two sets of parity data across drives and allows simultaneous write operations. This level of fault tolerance can withstand two simultaneous drive failures without downtime or data loss.
- RAID 5 (Distributed Data Guarding) allocates one set of parity data across drives and allows simultaneous write operations. This level of fault tolerance can withstand a single drive failure without downtime or data loss.
- RAID 5+0 is a RAID 0 array striped across elements. It combines the straight block-level striping of RAID 0 with the distributed parity of RAID 5.
- RAID 1, 1+0 (Drive Mirroring) allocates half of the drive array to data and the other half to mirrored data, providing two copies of every file. It is a high-performance RAID.
- Smart Array Cache Tracking monitors the integrity of the controller cache, allowing pre-failure preventative maintenance.
- Recovery ROM stores a redundant copy of the image in case of firmware image corruption. If the active image becomes corrupt, the controller will use the redundant image and continue operating.
- DRAM ECC detects and corrects data bit errors.
- Battery-backed write cache upgrade provides up to two days of battery power for data cache retention. You can extend the data backup duration any time the server's auxiliary power is available.
- On-Line Spares minimize downtime, reconstruct data, and facilitate a quick recovery from drive failure. You can install up to two spare drives prior to drive failure. If a failure occurs, recovery begins with an On-Line Spare and data reconstruction occurs automatically.

Online Drive Flashing is available on the SA-P410. With Online Drive Flashing, you can download an updated hard disk drive (HDD) firmware image to the SA-P410 and update all of your SAS HDDs the next time you reboot the server, greatly reducing the time involved in updating disk drive firmware.

Mirror Splitting and recombining with HP Smart Array Advanced Pack (SAAP) let you divide a RAID 1 array into two RAID 0 arrays and later combine the two RAID 0 arrays into a single RAID 1 array.

The Array Configuration Utility (ACU) lets you combine any two RAID 0 arrays of the same size and select which drive contains the data to keep. This feature is only available offline. You must boot to the Smart Start CD and run ACU from there. Typically, you use this feature when testing out a software patch. You could split the mirror as a means to save the current data and then perform any type of destructive software update necessary, keeping the resulting data set or reverting back to the old data. BBWC is not required to enable this feature.

Capacity expansion is the adding of configured physical drives to the array. The logical drives (or volumes) that exist in an array before the expansion takes place remain unchanged, and only the amount of free space in the array changes. BBWC is required for this feature.

All Smart Array controllers use the same configuration utility and diagnostic software, Array Configuration Utility (ACU) and management software (HP Insight Manager). In addition, the SA-P410 provides Option ROM Configuration for Arrays (ORCA) that allows a simplified configuration tool at the time of controller boot.

Serial Attached SCSI

Serial Attached SCSI (SAS) leverages a common electrical and physical connection interface with Serial ATA (SATA), while offering logical SCSI compatibility and SCSI reliability, performance, and manageability. SAS provides investment protection in compatible SCSI software and middleware. It gives you the choice of direct-attach storage devices (SAS or SATA).

In addition, SAS offers greater performance, longer cabling distances, smaller form factors, and greater addressability, all leading to a new level of flexibility when you deploy mainstream data center servers and subsystems. This compatibility provides you with many choices for server and storage subsystem deployment by leveraging the SATA development effort on smaller cable connectors. This design provides customers a downstream compatibility with desktop class ATA technologies.

SAS and SATA Small Form Factor hard drives

The SAS architecture enables system designs that deploy high-performance SAS and high-capacity SATA Small Form Factor (SFF) drives. This capability provides a broad range of storage solutions that give IT managers the flexibility to choose storage devices based on reliability, performance, and cost.

SFF drives provide higher performance than large form factor drives. The smaller SFF platters reduce seek times because the heads have a shorter distance to travel. RAID performance improves by increasing the numbers of spindles.

HP ships SATA drives with Drive Write Cache (DWC) disabled. Selecting the preset configuration provides greater safety for drive data in case of sudden power loss and when there is no battery on the controller to protect the cache. Enabling DWC may result in data loss if power is lost to the server and there is no power protection configured for the server.

Native Command Queuing (NCQ) increases SATA HDD performance by internally prioritizing read and write command execution. This reduces unnecessary drive head movement and results in increased performance especially in server or storage-type applications with outstanding multiple simultaneous read/write requests. Without NCQ, the drive can process and complete only one command at a time. In order to use NCQ, both the controller and the drive have to support it. Please see the SATA Hard Drive QuickSpecs for specific SATA hard drive capacities that support NCQ.

Networking technologies

The DL585 G7 includes an integrated NC375i network controller. The NC375i is a quad port Gigabit Server Adapter that allows access to four 1GbE ports. The NC375i has an eight lane (x8)

PCI Express data path. With four ports on a single integrated controller, this density design contributes to saving DL 585 G7 I/O slots and makes this controller configuration ideal for virtualization and security applications, server consolidation, and increased network segmentation. The quad port NC375i meets the needs of customers desiring high bandwidth but are not yet ready to move to 10 Gigabit Ethernet (10 GbE).

In addition, the NC375i supports the NC524SFP 10 GbE upgrade module, allowing two of the four ports to move to10 GbE. The NC524SFP module, with its theoretical maximum of 40 Gbps, dual port, bi-directional full duplex mode, delivers optimum network performance designed to improve response time and remove bottlenecks across the entire network. The NC375i provides full driver support, including teaming drivers for all major operating systems, along with management utilities.

Network Adapter Teaming

ProLiant Network Adapter Teaming provides fault tolerance and load balancing across a team of two or more network adapters. The team of adapters works together as a single virtual adapter. Support for several different types of teaming is included. Teaming options offers an easy, efficient, and cost-effective way to provide network fault tolerance and increased network bandwidth.

Jumbo Frames

Jumbo frames (also known as extended frames) permit a 9K byte transmission unit (MTU), which is six times the size of a standard 1500-byte Ethernet frame. The NC375i supports jumbo frames as a way to achieve higher throughput and better CPU utilization. Jumbo frames are particularly useful for database transfers and tape backups.

Server management technologies

The HP ProLiant DL585 G7includes the latest server management technologies.

HP Insight Control

HP Insight Control gives you more control over your ProLiant servers. With Insight Control, you can deploy ProLiant servers quickly and reliably, migrate between servers, catalog your environment accurately, and monitor health to pinpoint failures before they result in unplanned downtime. In addition, you can manage systems remotely, away from your office, and optimize power confidently. You can reduce unplanned downtime and deliver stable IT services to your line of business users. You can also respond to pressing business needs faster by facilitating the rapid rollout of new IT services and optimizing the utilization of compute resources and data center facilities.

HP Insight Control for Microsoft System Center and HP Insight Control for VMware vCenter deliver the hardware management expertise of Insight Control into Microsoft System Center and VMware vCenter environments. You need only purchase one Insight Control license to take advantage of both System Center and vCenter integrations

HP Insight Control helps you unlock the potential of your infrastructure with deep insight, precise control, and ongoing optimization. With HP Insight Control, you can:

- Deploy ProLiant servers quickly with a reliable drag-and-drop tool that turns manual server deployment into an unattended, repeatable, and highly automated deployment. Utilize a complete set of wizard-driven server migration capabilities (P2P, P2V, V2P, and V2V).
- Monitor ProLiant server health with one simple, integrated interface and receive notification of any actual or impending component or server failure
- Control ProLiant servers from anywhere, regardless of location, and improve system recovery times. With Insight Control, you can eliminate the cost of visiting servers. Insight Control taps

into and unleashes the HP iLO Advanced technology, a set of licensed embedded management capabilities that enhances the remote management experience.

- Measure power consumption accurately, reduce power usage, and reclaim trapped power and cooling capacity to extend the life of their existing data centers
- Support all leading hypervisors, such as Microsoft Hyper-V, VMware vSphere, and Citrix XenServer. You also have the option of Linux-based Central Management Console -Insight Control for Linux for IT shops requiring full-Linux management.

HP Integrated Lights-Out 3 (iLO 3)

As previously noted, the HP ProLiant DL585 G7 server comes with iLO 3. An HP Advanced license (included with the HP Insight Control software or can be purchased separately) upgrades the iLO firmware, enhancing your remote management experience.

The iLO 3 hardware and firmware provide remote server management capabilities over Ethernet. Since the iLO 3 management processor obtains its power from the auxiliary power plane of the server, it is always available when you plug in the server. This is great news when it comes to remote troubleshooting.

HP iLO 3 connects through a dedicated Ethernet port. This port can connect to a highly secured, dedicated management network that is out of the server's data path. Alternately, iLO 3 provides a Shared Network Port (SNP) that allows network access to both iLO and the host server using a single network port. SNP routes iLO network traffic through a sideband connection on one of the server NIC interfaces. Although the iLO traffic shares a port with the server OS traffic, both the iLO processor and the server NIC have their own Media Access Control (MAC) address, which gives iLO and the server separate Internet Protocol (IP) addresses. Using the SNP simplifies hardware installation and reduces overall hardware costs, because both corporate and iLO network traffic comes through the system NIC.

Using iLO 3

With iLO 3, you can:
- Reduce expense and travel costs by accessing a high-performance, secure Remote Console to the server from anywhere in the world
- Use the shared iLO 3 Remote Console to collaborate with up to six server administrators
- Remotely mount high-performance Virtual Media devices to the server from anywhere on the network
- Securely and remotely control the power state of the managed server
- Send alerts from iLO 3 regardless of the state of the host server
- Access advanced troubleshooting features through the iLO 3 interface
- Experience a fast Remote Console incorporating the newest technologies like Simple Network Time Protocol (SNTP) and IPMI over LAN (Intelligent Platform Management Interface) DCMI (Data Center Manageability Interface)
- Launch URL or scriptable Virtual Media from Remote Console
- Experience a streamlined user interface using Web 2.0 technologies
- Experience AES (in addition to RC4) encryption in the hardware for improved performance

For more information on the topic of HP Integrated Lights Out Security visit:
http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00212796/c00212796.pdf

Power management technology

The HP ProLiant DL585 G7includes the latest server management technologies

HP Power Regulator

The DL585 G7 includes HP Power Regulator, an innovative OS-independent power management tool. HP Power Regulator is a ROM-based utility used to set the server to one of four power modes:

- Static high power – Server runs continuously in the highest performance state.
- Static low power – Server runs continuously in the lowest power state.
- OS Control – Server uses AMD Opteron PowerNow!™ Technology that allows the operating system or drivers to control processor power states.
- Dynamic power savings –Server processor-power adjusts according to application activity.

HP Power Regulator improves the energy efficiency of the DL585 G7. Opteron processors run at full power when they need to, but with reduced application activity, they run in a power savings mode without performance degradation. RBSU during POST or the iLO 3 remote management console allows selection of the HP Power Regulator modes.

HP Power Capping and Dynamic Power Capping

Server performance-per-watt continues to increase steadily. However, the number of watts-per-server also continues to climb steadily. These increases, combined with the increasing number of servers and density in modern data centers, make planning and managing facility power and cooling resources critically important. HP Power Capping and HP Dynamic Power Capping are ProLiant power management tools that assist the data center administrator in these critical tasks.

HP implements both Power Capping and HP Dynamic Power Capping in system hardware and firmware. Therefore, they are not dependent on the operating system or applications. Power capping uses the power monitoring and control mechanisms built into ProLiant servers. These mechanisms allow an administrator to limit, or cap, the power consumption of a server or group of servers. Power capping lets you manage the data center parameters that server power consumption directly influences, including data center cooling requirements and electrical provisioning. Power capping also lets you control server power consumption in emergencies such as loss of primary AC power. For more information on the topic of HP Power Capping visit:
http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01549455/c01549455.pdf

Conclusion

The HP ProLiant DL585 G7 is a 4U rack-optimized, four-processor server created for large data center deployments requiring enterprise-class performance, uptime, and scalability, plus ease of management and expansion. It offers customers running both 32- and 64-bit applications increased performance and memory speed. This platform's balance of new system architecture, extensive memory capacity and I/O throughput provides the high performance needed for large-scale enterprise applications.

For more information

For additional information, refer to the resources listed below.

Resource description	Web address
"AMD Opteron™ and Intel® Xeon® x86 processors in industry-standard servers" technology brief	http://h20000.www2.hp.com/bc/docs/support/SupportManual/C02731435/C02731435.pdf
DDR3 memory technology	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c02126499/c02126499.pdf
AMD white paper "*HyperTransport™ Technology: Simplifying System Design*, October 2002"	http://www.hypertransport.org/docs/26635A_HT_System_Design.pdf
Up-to-date information on operating systems and versions supported by the HP ProLiant DL585 G7 server	http://www.hp.com/go/supportos
Latest drivers available for the HP ProLiant DL585 G7 server	http://www.hp.com/support/files
HP ProLiant Integrated Lights-Out	http://www.hp.com/go/iLO
Details about HP Insight Control	http://www.hp.com/go/insightcontrol
HP ProLiant Integrated Lights-Out 3 v 1.00 User Guide	http://bizsupport1.austin.hp.com/bc/docs/support/SupportManual/c02063196/c02063196.pdf
HP Integrated Lights Out Security	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00212796/c00212796.pdf
Drive technology overview	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01071496/c01071496.pdf
Information about SAS technology	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01613420/c01613420.pdf
Details about Serial ATA technology	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00301688/c00301688.pdf
"Memory technology evolution: an overview of system memory technologies" technology brief	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00256987/c00256987.pdf
HP Power Regulator	http://h18013.www1.hp.com/products/servers/management/ilo/power-regulator.html
HP Power Capping and HP Dynamic Power Capping for Proliant servers	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01549455/c01549455.pdf
Smart Array P410i controller QuickSpecs	http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html
ProLiant Network Adapter Teaming	http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp?lang=en&cc=us&objectID=c01670286&jumpid=reg_R1002_USEN
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