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Prepared by OS Development

Compaq Computer Corporation

Contents

Compaq ProLiant Server Deployment and Management

Abstract: This paper provides a guide to server deployment and management, shows what the options are, and provides links to additional information. Readers are assumed to be familiar with PC technology, but not with Compaq ProLiant servers. Customers switching from another brand of server can use this paper to quickly come up to speed on the ProLiant server.

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Notice

ProLiant Server Deployment and Management
White Paper prepared by Industry Standard Servers, Mainstream OS Development

Introduction

Compaq *ProLiant*™ servers are purchased by customers ranging from one-person home offices to the largest Fortune 500 companies. Compaq offers a variety of tools, products, and services to help all types of customers deploy and manage their servers. This paper will help you understand the deployment process, show you what your options are, and provide links to additional information.

While ProLiant servers can run many different operating systems, this paper restricts itself to the following:

> Microsoft Windows NT 4.0
> Microsoft Windows 2000
> Microsoft Windows .NET
> Novell Netware 5.1
> Novell Netware 6.0
> Linux (kernel version 2.4)

ProLiant BL blade servers are only supported running Windows 2000 and Linux. Compaq does not support running "desktop" operating systems like Windows 98 or Windows XP on any server.

Tools

Before discussing the actual steps for deploying a server, the following sections describe the tools that are available.

SmartStart for Servers

Compaq *SmartStart*™, a component of the ProLiant Essential Foundation Pack, simplifies ProLiant server installation by providing a method to reliably deploy consistent single server configurations. SmartStart is a bootable CD-ROM shipped standard with every ML and DL ProLiant Server (BL blade servers come with the Rapid Deployment Pack). SmartStart prepares servers for deployment, assists with operating system installation, and includes software such diagnostics and drivers.

If you've never deployed a server before, Compaq recommends that you use the **SmartStart Assisted** option if it's available for your operating system. While not the fastest or most feature-rich option, it is the easiest, and it guarantees a working server. If assisted installation isn't available, the **SmartStart Manual** option will still help get the server installed right the first time. Even if you have many servers to deploy, and you plan to set up an automated system, Compaq still recommends deploying your first server with SmartStart.

Web Links:

General SmartStart information: http://www.compaq.com/SmartStart

Support Paqs, Smart Components, and SoftPaqs

Compaq releases drivers, agents, tools, and utilities in several ways. The primary mechanism for Windows and Netware is the Compaq Support Paq, or CSP. A CSP is a bundle of Smart Components, an XML file describing the bundle, and an installation program called the Compaq Remote Deployment Utility. There are CSPs for Windows NT 4.0, Windows 2000, and Netware

5.1, and Netware 6.0. The CSP includes software for many different Compaq servers, from old ProLineas to the newest ProLiant. CSPs can be downloaded from The Compaq Web site, but the easiest way to get them is from the SmartStart CD-ROM. If you perform an Assisted installation, SmartStart will automatically install the appropriate CSP. For manual installations, the Windows CSPs are in `\CPQSUPSW\NTCSP` and the Netware CSPs are in `\CPQSUPSW\NWCSP`.

A Smart Component is a self-installing executable (.EXE for Windows, .NLM for Netware), typically containing a single driver, utility, etc. The filename will be "CP" followed by a six-digit number. You can install Components separately, or use the Remote Deployment Utility to automate the process (despite the name, the utility is also used to install Components on a local server). One of the things that makes these Components "smart" is that they will only install themselves when needed. If you are unsure if a driver/utility is up to date, or even needed on a server, just run the Component, select Install, and it will tell you.

Smart Components are not only self-installing, but also self-extracting. If you're manually installing an operating system that does not have built-in drivers for your boot disk controller, you may need to extract those drivers to a floppy disk. Simply run the Component and choose the Extract option. See Appendix B for more information.

It's important to understand that while a CSP consists of Smart Components, not all Smart Components are bundled in a CSP. Some Components are only distributed individually, and must be downloaded from the Compaq Web site.

Not all ProLiant software fits into the CSP/Smart Component model. Some programs are distributed as a SoftPaq, which is a self-extracting archive. SoftPaq files are named "SP" followed by a six-digit number. SoftPaqs must be executed on Windows, and will either create one or more floppy diskettes, or extract files to a temporary directory. You must read and follow the instructions that accompany each specific SoftPaq.

A Compaq *ROMPaq*™ is simply a SoftPaq that creates a bootable floppy disk containing a ROM upgrade. System Firmware (BIOS) upgrades are often distributed two ways: as a ROMPaq, and as a Smart Component that performs an "online" upgrade while the operating system is running. Online upgrades are faster and more convenient, but you still need to reboot the server before the upgrade takes effect. Smart Components used for System Firmware upgrades are distributed individually, and are not part of a CSP.

Whenever new versions of a Smart Component or SoftPaq are released, they are assigned new CP/SP numbers. This paper does not refer to specific CP or SP numbers because there is no way of knowing what will be current at the time you read it. Instead, Components and SoftPaqs are referred to by name.

Each CSP, Smart Component, and SoftPaq has its own version number, and these numbers are not related. For example, a CSP version 5.40 may contain a disk driver version 1.5.20.0 and a network driver version 75.1.1.2. Also, diskette-based ROMPaq and Online System Firmware Upgrade components will have different version numbers, even though they install the same BIOS ROM image.

Drivers, agents, tools, and utilities for Linux are all separate RPM or SCEXE packages. There is no CSP, or tools to automate deployment to remote servers.

Web Links:

Information about CSPs:
http://www.compaq.com/support/files/server/us/WebDoc/SmartStartwin2000.pdf and
ftp://ftp.compaq.com/pub/manage/csp-users-guide.pdf

Information about the Remote Deployment Utility: http://www.compaq.com/manage/rdu.html and ftp://ftp.compaq.com/pub/products/servers/management/214611.001bm.pdf

Information about Online ROM Flash: http://www.compaq.com/support/files/server/us/webdoc/ROM/OnlineROMFlashUserGuide.pdf

SmartStart Scripting Toolkit

The SmartStart Scripting Toolkit simplifies high volume server deployment by delivering a hands-off, unattended installation and configuration solution by creating a flexible way to create standard server configuration scripts. These scripts are used to automate many of the manual steps in the server deployment process.

The SmartStart Scripting Toolkit requires the user to create a custom boot CD or boot diskette to start the OS installation. The toolkit contains customizable pre-configured scripts for unattended deployment of Windows NT/2000, Netware, and Red Hat Linux. The scripts are not trivial samples – they are production quality and usable "out of the box" in many situations. The toolkit leverages the support each operating system already provides for unattended installation. If major customization is required, you'll need to refer to the documentation provided by the OS vendor.

The SmartStart Scripting Toolkit is not included on the SmartStart CD-ROM; it must be downloaded from the Compaq Web site.

Web Links:

SmartStart Scripting Toolkit: http://www.compaq.com/manage/toolkit.html

Preboot eXecution Environment (PXE)

PXE (pronounced "Pixie") is an industry standard that allows a computer to boot over the network and download software, including the operating system, from a deployment server. PXE automates setting up and configuring new systems, enables decentralized software distribution, and remote troubleshooting and repairs. All current ProLiant servers support PXE.

Web Links:

PXE white paper: ftp://ftp.compaq.com/pub/products/servers/management/pxe_wp.pdf

ProLiant Essentials Rapid Deployment Pack (RDP)

The ProLiant Essentials Rapid Deployment Pack (RDP) is an integrated server deployment product that facilitates the installation, configuration, and deployment of high-volumes of servers using either scripting or imaging technology. This fast and easy deployment solution offers a drag-and-drop, graphical interface to deploy operating systems and applications. RDP works best with PXE, but supports other options as well.

The Rapid Deployment Pack was co-developed by Compaq and Altiris. It combines the Altiris eXpress Deployment Server with the ProLiant Integration Module. The ProLiant Integration Module builds upon the SmartStart Scripting Toolkit, and comes with pre-configured scripts to install Windows 2000 Server Edition and Red Hat Linux 7.2, as well as Compaq value-added software (CSP, agents, etc).

Altiris eXpress Deployment Server acts as a PXE server. PXE requires DHCP, but the PXE server and DHCP server don't have to be on the same machine. Setting up a PXE server requires some coordination with whoever is managing the DHCP server, and there can only be one PXE

server per physical subnet. In many organizations, this means that the corporate Information Systems group must be involved in setting up a PXE server, even if ongoing management is handled at the departmental or workgroup level.

When using the Rapid Deployment Pack to deploy Linux, you will also need an NFS server. The NFS server must be running Red Hat Linux 7.2 and should have at least 2GB free disk space on the /usr filesystem. An NFS setup script must be run on the NFS server; directions are included on the RDP CD.

Web Links:

RDP home page: http://www.compaq.com/manage/rapiddeploy

RDP support matrix: ftp://ftp.compaq.com/pub/manage/270099-002.pdf

Best Practices for Implementing a Deployment Infrastructure:
ftp://ftp.compaq.com/pub/products/servers/management/15C3-1101A-WWEN.pdf

Other Disk Imaging Products

There are other disk imaging products that are similar to the Rapid Deployment Pack – Norton Ghost is probably the best known. These products will work on ProLiant servers, however RDP offers greater functionality and is backed by Compaq technical support.

Remote Insight Lights-Out Edition (RILOE)
Integrated Lights-Out (iLO)

The Remote Insight Lights-Out Edition (RILOE) is a PCI board that can be plugged into a standard server to make it "headless," so it no longer requires a monitor, keyboard, or a mouse. IT managers can use the RILOE to perform most of the in-front-of-the-server operations remotely using a standard Web browser. The hardware-based virtual graphical console and virtual floppy can be used to install, configure, monitor, update, reboot, and troubleshoot ProLiant servers located in a data center or remote site.

Integrated Lights-Out (iLO) is the next generation of ProLiant Lights-Out technology integrated on the system board. iLO Standard includes virtual text console, virtual power button, diagnostics, status, and logs. iLO Advanced adds virtual graphical console and virtual floppy. iLO Standard is free of charge on all iLO-equipped servers. iLO Advanced is included on ProLiant BL20p blades, and can be licensed as an extra-cost option on other iLO servers.

Using virtual floppy, the user can designate a virtual floppy image, power on the server, and complete a network based installation. This technology can be used for deployment of the operating system when integrated with the SmartStart Scripting Toolkit (boot floppy method), or any other network based installation.

Web Links:

General RILOE information: http://www.compaq.com/manage/remote-lightsout.html

General iLO information: http://www.compaq.com/manage/ilo-description.html

Description of iLO Advanced: http://www.compaq.com/manage/iloadv-description.html

Example of deploying Linux on a remote server using RILOE:
http://www.tru64unix.compaq.com/linux/compaq-remote-insight-board.htm

Deployment

There are six basic steps to deploy a server:

1. Configure the motherboard.
2. Configure the BIOS.
3. Configure the Disk Controller.
4. Create the System Partition.
5. Install the Operating System.
6. Install Drivers, Agents, Tools, and Utilities.

These steps are explained in detail in the following sections. Deployment options are discussed after all the steps are defined.

Configure Hardware

Step 1 - Configure the motherboard

It is extremely unlikely that you'll ever need to touch anything on the server motherboard. If hardware maintenance is required, all ProLiant servers have a chart attached to the inside of the case, showing the location of major components, jumpers, switches, and cables. A detailed technical reference manual is included on CD-ROM with every server, and can be downloaded from the Compaq Web site.

Step 2 - Configure the BIOS

Newer ProLiant servers have a ROM Based Setup Utility (RBSU) for configuring the BIOS. As the name implies, RBSU is built into the BIOS ROM, so it's always available. Older ProLiant servers use the System Configuration Utility (SCU). SCU is not included in the BIOS ROM, and has to be run from a system partition, SmartStart CD-ROM, or floppy disk.

RBSU: ML330, ML330 G2, ML350, ML350 G2, ML370 G2, ML750, DL320, DL360 G2, DL380 G2, DL580 G2, DL760, BL10e, BL20p

SCU: ML370, ML530, ML570, DL360, DL380, DL580

All that most people will ever need to configure in the BIOS is the date, time, and operating system. Servers with Advanced Memory Protection must also be configured to select the type of protection (Advanced ECC, Online Spare, etc.). The defaults are likely to be correct for every other setting. ProLiant servers are optimized to provide maximum performance with total reliability. Many "White Box" computers have BIOS options to trade off slightly higher performance for less reliable operation. ProLiant servers never do this.

Web Links:

RBSU User Guide: ftp://ftp.compaq.com/pub/products/servers/management/smartstart/rbsu-userguide.pdf

Step 3 - Configure the Disk Controller

Regular (non-RAID) SCSI controllers never require configuration, unless a non-disk device (e.g. tape drive) is attached. Even then, the defaults are likely to be OK. Refer to the documentation for the other device to determine if configuration is required.

RAID controllers all require some initial setup, to define at least one logical drive on which to install the operating system. There are three different ways to configure RAID arrays:

- Option ROM Configuration for Arrays (ORCA)

  ORCA is built into the BIOS ROM on newer RAID controllers, and is intended to create the logical drive that will contain the operating system (the boot disk). ORCA can't be used to create logical data disks.

- Array Configuration Utility (ACU)

  ACU can be run from the SmartStart CD-ROM during server setup, or installed on Windows or Netware and run "online". If the RAID controller does not support ORCA, you must run ACU from SmartStart to create a logical drive for the operating system (the boot disk). You can create additional data disks at that time, or wait until after the operating system is installed.

- Array Configuration Utility-XE (ACU-XE)

  ACU-XE is the next generation disk array configuration utility, and is currently supported only on Windows. It has a Web-based user interface and allows remote disk configuration. ACU-XE can create additional logical drives for data, however the boot drive must be created with ORCA, or ACU run from SmartStart.

Web Links:

Integrated Smart Array Controller User Guide (includes ORCA information):
ftp://ftp.compaq.com/pub/supportinformation/tecCompaqubs/user_reference_guides/153236-001.pdf

ACU documentation:
http://www.compaq.com/products/storageworks/software-management/acu_matrix.html

ACU-XE documentation:
ftp://ftp.compaq.com/pub/products/servers/proliantstorage/acu-xe-userguide.pdf

Step 4 - Create the System Partition

Creating a system partition is highly recommended on servers that use SCU. If you don't create it, you'll have to boot the SmartStart CD or an SCU floppy to run setup or diagnostics. At best this will be inconvenient, at worst, you won't be able to find the CD/floppy at a time of crisis. On servers with RBSU the system partition is not strictly needed, however there is no harm in creating it. If you perform a SmartStart Assisted or SmartStart Manual installation, SmartStart will create the system partition.

Install Software

Step 5 - Install the Operating System

You may need a floppy diskette with drivers for the boot disk controller. Appendix B lists which drivers are included with the operating system, and which must be obtained from a Compaq Support Paq (CSP).

Windows NT/2000: Install TCP/IP and the SNMP service if you plan on installing any management agents. TCP is installed by default starting in Windows 2000, but SNMP is optional on all Windows versions.

Web Links:

Linux installation information:
http://www.compaq.com/products/servers/linux/compaq-howto.html

Step 6 - Install Drivers, Agents, Tools, and Utilities

The boot disk driver was part of the OS install, but it may need an update. If you used a disk driver that was supplied with the operating system, you are encouraged to install the latest version from the CSP.

All ProLiant servers have a System Management Controller chip that monitors internal temperatures and controls system fans, and will shut down the server if environmental conditions exceed safe levels. The driver for this chip is often called the "health driver". Health drivers use relatively little memory and CPU time, and have no network exposure. Older servers run their fans at full speed unless you load the health driver to control them. Compaq highly recommends installing the health driver on every server. Even if you believe in "clean" servers without lots of support software, consider running the health driver.

All agents and utilities are optional. If order to run any agents, you must install the Health Driver and Foundation Agents. All other agents may be individually installed or removed.

Deployment Options

There are several ways to accomplish the six deployment steps. They are listed here from the least to the most automated:

- **Fully Manual**

  In a Fully Manual installation, you do all the work. The SmartStart CD is never booted. If you need drivers for your boot disk controller, you must manually put them on a floppy (possibly by taking the SmartStart CD to another machine and extracting the drivers from the appropriate Smart Component). Fully Manual installation is only possible on servers with RBSU and ORCA. If the server uses SCU, or has a RAID controller without ORCA, you have to use SmartStart Manual.

- **SmartStart Manual**

  A SmartStart Manual installation prepares the server to receive an operating system, but does not actually install one. It automates deployment steps 2, 3, and 4. If you need drivers for your boot disk controller, SmartStart Manual will let you run the Diskette Builder to copy them to a floppy.

- **SmartStart Assisted**

  SmartStart Assisted installations handle everything: they automate deployment steps 2 through 6. The down side is that you do not get to choose all the options available during a regular operating system installation, and you may get more drivers, utilities, and agents loaded than you want (SmartStart will install the full set).

- **SmartStart Scripted**

  SmartStart Scripted installations are primarily used to deploy many servers with identical configurations. The SmartStart Scripting Toolkit has two basic components: (1) a set of utilities that automate deployment steps 2, 3, and 4, and (2) sample unattended installation scripts for Windows, Netware, and Linux that automate steps 5 and 6. These scripts can be

customized to control how the OS is installed, and to control which drivers, utilities, and agents get loaded.

- **Rapid Deployment Pack**

  The Rapid Deployment Pack (RDP) is used in the same situations as the SmartStart Scripting Toolkit: deploying many servers with basically the same configuration. RDP provides central administration and control of the deployment, and with disk images, is often much faster than scripted installations.

Web Links:

General information about server deployment: http://www.compaq.com/manage/deployment.html

Other Information

Video Drivers

All current ProLiant servers have a SuperVGA subsystem based on the ATI Rage XL video chip. Drivers for the Rage XL are included with Windows NT 4.0, 2000, and .NET. Older ProLiant servers, and the RILOE PCI board, use the ATI Rage IIC chip. Drivers for this chip are supplied in the CSP. You can use a standard VGA driver, but it won't offer the full range of resolutions and won't take advantage of the graphics acceleration hardware.

USB Devices

USB ports are a standard feature on new ProLiant servers and can be used during OS installation by attaching USB devices. Compaq enhanced the system ROM to include support for USB devices in environments without native USB support, known as legacy USB support. With this support and the OS USB support, a USB floppy or USB CD-ROM can be connected to the server to complete a network installation booting from a USB floppy, or to use the SmartStart Scripting Toolkit. A USB CD-ROM can be used to install operating systems that have native USB support. Note that Windows 2000 cannot use a USB floppy to load a new SCSI disk driver during installation. The ProLiant BL10e requires the diagnostic adapter to connect USB devices; see the server documentation for details on how to connect this adapter.

Web Links:

Information on USB support:
http://www.compaq.com/products/servers/platforms/usb-support.html

Management

Day-To-Day

Management Agents

Management agents support the industry standard SNMP management protocol, but they also have their own Web-based user interface. You don't need Insight Manager to benefit from running the agents. Connect to agent Web interface using http://*hostname*:2301/. Replace *hostname* with the name or IP address of the server. Use **localhost** to connect to the local server.

Appendix C has brief descriptions of the management agents and links to detailed documentation.

Compaq Insight Manager (CIM)

Compaq Insight Manager™ 7 helps maximize system uptime and performance and reduces the cost of maintaining the IT infrastructure by providing proactive notification of problems before those problems result in costly downtime and reduced productivity. Compaq Insight Manager 7 is easy to set up and provides rapid access to detailed fault and performance information gathered by the management agents. One-click-access to the RILOE board or iLO management processor allows systems administrators to take full graphical control of ProLiant servers in remote locations or lights-out data centers. This dramatically reduces the need to dispatch valuable IT resources to fix routine problems.

By leveraging industry standard SSL encryption, RSA public key cryptography, and Microsoft Windows 2000 and Microsoft Windows NT user administration and security, CIM ensures that system software updates and other "state changing" operations are carried out in a highly secure fashion.

Web Links:

http://www.compaq.com/products/servers/management/cim7-description.html

Keeping up to date with drivers and utilities

Compaq releases new and updated drivers/utilities on a regular basis, and you need to decide how you will keep your server(s) up to date.

Version Control Repository

With the combination of Compaq Insight Manager 7, the Version Control Agent, and the Version Control Repository Manager, systems administrators are able to version manage their ProLiant system software according to corporate system software baselines. Compaq Insight Manager 7 also allows them to quickly isolate ProLiant servers running specific versions of BIOS, drivers, or agents, and update those systems through a single operation.

ActiveUpdate

Compaq *ActiveUpdate*™ automates the process of keeping the Version Control Repository stocked with the latest drivers, agents, and utilities. Simply tell it which servers you need to

support, and it will proactively download that latest software, as well as support bulletins and engineering alerts. ActiveUpdate works best with a broadband Internet connection.

Web Links:

ActiveUpdate information: http://www.compaq.com/activeupdate/

SmartStart subscription

If Internet bandwidth is limited or non-existent, a SmartStart CD subscription is a good way to keep current with the latest drivers.

Web Links:

SmartStart subscription information:
http://www.compaq.com/products/servers/SmartStart/ss_subscription.html

Download updates from the Compaq Web site

Individual components or bundled support packs can easily be downloaded from the Compaq Web site. You can list available downloads by server model and operating system, or operating system and category.

Web Links:

Download Compaq support files: http://www.compaq.com/support/files/server/us/index.html

Appendix A:
High Density Rack Mounted Servers

High density rack mounted servers are intended for "headless" operation, without having a physical keyboard, mouse, or video display attached. This affects the way these servers are deployed, especially installing the operating system.

Compaq offers traditional rack mounted servers in the DL product line, and two distinct Blade Server products lines: the BL e-Class and BL p-Class.

ProLiant DL360 Generation 2 Server

The DL360 G2 server is a traditional 1U rack mount server, containing a physical floppy drive and CD-ROM. The DL360 G2 server has an iLO management processor, which can optionally provide virtual floppy and remote graphics console. The server also has standard keyboard, mouse, video, and USB connectors, allowing it to be used with a traditional KVM switch or crash cart.

BL e-Class: ProLiant BL10e Server Blades

e-Class server blades are intended as "edge-of-network" servers, primarily for static Web content and wireless applications, or as "utility servers" (DHCP, DNS, Gateway, Firewall). The e-Class enclosure has a management processor, called the Integrated Administrator, which provides remote power control and text console for all the blades. The blades themselves do not have iLO management, so there is no virtual floppy and no remote graphics console.

The remote text console works well for RBSU and Linux, but not for Windows. e-Class blades can be used with a Diagnostic Adapter, which plugs into the front of a blade and allows you to connect a standard keyboard, mouse, video display, and USB devices such as a floppy drive or CD-ROM.

BL p-Class: ProLiant BL20p Server Blades

p-Class server blades are intended as high performance servers ideally suited for delivering dynamic Web content. There is no Diagnostic Adapter for p-Class blades. Each BL20p blade has its own iLO management processor, providing a total remote management solution including virtual floppy and graphics console.

Web Links:

Headless Server Operations and Issues whitepaper:
ftp://ftp.compaq.com/pub/supportinformation/papers/16az-0202a-wwen__rev0_us.pdf

Appendix B:
Driver Reference

Driver filenames are shown for reference purposes. Never copy driver files manually – always use the appropriate operating system installation mechanism. Drivers included with the operating system are labeled "Built-in," while drivers that must be installed from a Compaq Support Paq are labeled "CSP." Even when a driver is included with the operating system, a newer version is often available from Compaq.

Disk Drivers

Disk Controller	Servers	Driver name and source
Integrated Single Channel Wide Ultra2 SCSI Adapter Integrated Dual Channel Wide Ultra2 SCSI Adapter	ML530 ML570 DL320 SCSI	Windows NT 4: cpqfws2e.sys (CSP) Windows 2000: cpqfws2e.sys (Built-in) Windows .NET: cpqfws2e.sys (Built-in) Netware 5.1: cpqscsi.ham (Built-in) Netware 6.0: cpqscsi.ham (Built-in) Linux: Built-in
64-bit/66-MHz Single Channel Ultra3 SCSI Adapter 64-bit/66-MHz Dual Channel Ultra3 SCSI Adapter	ML330 G2 SCSI ML350 G2 ML370 G2	Windows NT 4: adpu160m.sys (CSP) Windows 2000: adpu160m.sys (Built-in) Windows .NET: adpu160m.sys (Built-in) Netware 5.1: adpt160m.ham (Built-in) Netware 6.0: adpt160m.ham (Built-in) Linux: Built-in
Integrated Smart Array Controller Integrated Dual Channel Smart Array Controller Compaq RAID LC2 Controller Smart Array 4250ES Controller Smart Array 431 Controller	ML750 DL580 DL760	Windows NT 4: cpqarry2.sys (Built-in) Windows 2000: cpqarry2.sys (Built-in) Windows .NET: cpqarry2.sys (Built-in) Netware 5.1: cpqarray.ham (Built-in) Netware 6.0: cpqarray.ham (Built-in) Linux: Built-in
Integrated Smart Array 5i Controller Smart Array 532 Controller Smart Array 5302/32 Controller Smart Array 5302/64 Controller Smart Array 5304/128 Controller	DL360 G2 DL380 G2 DL580 G2 ML350 G2 Array ML370 G2 (Opt) ML530 (Opt) BL20p	Windows NT 4: cpqcissm.sys (CSP) Windows 2000: cpqcissm.sys (CSP) Windows .NET: cpqcissm.sys (Built-in) Netware 5.1: cpqraid.ham (CSP) Netware 6.0: cpqraid.ham (Built-in) Linux: Built-in
Integrated Dual Channel Ultra ATA/100 IDE Adapter	ML330e ML330 G2 ATA BL10e	Windows NT 4: Built-in Windows 2000: Built-in Windows .NET: Built-in Netware 5.1: Built-in Netware 6.0: Built-in Linux: Built-in

Network Drivers

Network Interface	Servers	Drivers
NC3123 Fast Ethernet NC3131 Dual Fast Ethernet NC3134 Dual Fast Ethernet NC3163 Fast Ethernet	ML330 G2 ML350 G2 ML370 G2 ML530 ML570 DL320 DL380 G2 DL580 DL760 BL10e BL20p	Windows NT 4: n100nt.sys (CSP) Windows 2000: n100nt5.sys (Built-in) Windows .NET: n100325.sys (Built-in) Netware 5.1: n100.lan (Built-in) Netware 6.0: n100.lan (Built-in) Linux: e100 (Built-in)
NC7780 Gigabit Ethernet	DL360 G2 DL580 G2	Windows NT 4: q57nt4.sys (CSP) Windows 2000: q57w2k.sys (CSP) Windows .NET: b57xp32.sys (Built-in) Netware 5.1: q57.lan (CSP) Netware 6.0: q57.lan (Built-in) Linux: bcm5700 (Built-in)

System Management Controller ("Health Driver")

System Management	Servers	Drivers
Advanced System Management Controller	ML330 ML350 ML370 ML530 ML570 DL320 DL360 DL380 DL580 DL760 BL10e	Windows NT 4: cpqasm.sys (CSP) Windows 2000: cpqasm.sys (CSP) Windows .NET: cpqasm.sys (CSP) Netware 5.1: cpqhlth.nlm (CSP) Netware 6.0: cpqhlth.nlm (CSP) Linux: cpqhealth (CSP)
iLO Advanced System Management Controller	DL360 G2 DL580 G2 BL20p	Windows NT 4: cpqasm2.sys (CSP) Windows 2000: cpqasm2.sys (CSP) Windows .NET: cpqasm2.sys (CSP) Netware 5.1: cpqhlth.nlm (CSP) Netware 6.0: cpqhlth.nlm (CSP) Linux: cpqhealth (CSP)

Appendix C:
Agent, Tool, and Utility Reference

Web Links:

Detailed Windows agent information:
http://www.compaq.com/support/files/server/us/WebDoc/530/Agwinnt.pdf

Detailed Netware agent information:
http://www.compaq.com/support/files/server/us/WebDoc/530/Agnetw.pdf

Foundation Agents

The Foundation Agent collects information for the host server including clustering, software version, and external MIB status. It also generates SNMP alarms when thresholds on key parameters are exceeded.

Server Agents

The Server Agent collects information on the system and the Remote Insight Board. It also generates SNMP alarms when thresholds on key parameters are exceeded.

Storage Agents

The Storage Agent collects information on fibre channel, drive array, SCSI, and IDE subsystems. It also generates SNMP alarms when thresholds on key parameters are exceeded.

NIC Agents

The NIC Agent collects information on logical Network Interface Controllers (NICs) that are configured on the system being managed. It also generates SNMP alarms when thresholds on key parameters are exceeded.

Version Control Agent

The Version Control Agent enables management of the ProLiant software and firmware on the system, in conjunction with the Version Control Repository Manager.

Version Control Repository Manager

The Version Control Repository Manager (VCRM) enables management of CSPs, Smart Components, and Support Paqs in a central repository. The Promotional Version of the VCRM is licensed for use until October 1, 2002. The VCRM will be available for purchase in the first half of 2002 as part of a new Change Management software option.

Survey Utility

The Survey Utility gathers critical hardware and software information to give comprehensive server configuration information. It allows resolution of problems and streamlines the service process without taking the server off-line.

Remote Monitor Service

The Remote Monitor Service provides support for PCI Hot Plug devices and remote management utilities. This service gives hot plug device drivers a means for communication amongst themselves and a way to log events to the Windows 2000 Event Log. Additionally, this service allows client utilities to gain access to remote machines.

Integrated Management Log Viewer

The Integrated Management Log Viewer is a utility that allows you to view and manage the Integrated Management Log (IML) system event entries on a local or remote system. This non-volatile log records system events and errors for post diagnosis review, thus helping system administrators to promptly identify server failures. This utility is based upon client/server architecture. It can run on any machine and connect to any machine on the network that is running the Remote Monitor Service.

BL Rack Upgrade Utility

The BL Rack Upgrade Utility is used on p-Class blade servers to update the firmware in the rack infrastructure components. In order to use this utility, the blade must also be running the Integrated Lights-Out Management Interface Driver and Rack Infrastructure Interface Service. The driver and service provide the link between the blade, the iLO management processor, and the management processors in the rack.