HP Lights-Out remote management

Top 10 usage scenarios

Discover the freedom of full remote control without compromise for routine and emergency situations using HP Lights-Out remote management and HP ProLiant servers.

Do you have remote management tools and yet still find yourself visiting your servers frequently? Are you relying too heavily on onsite assistance to troubleshoot or manage your servers in remote sites? Do you need to determine how to truly lock down your data center? Do you want to be able to administer and manage issues from home instead of driving into the office during off-hours? Need to reduce travel costs? Need to increase efficiency or manage more servers without adding staff? Worried about security risks with remote control?

If you answered "yes" to any of these questions, you could benefit from the HP Lights-Out solutions explored in this brochure.

Our capabilities enable you to manage servers without having to be physically in front of the systems, giving your IT organization full control of HP ProLiant servers in remote sites and data centers. This gives you the freedom to efficiently manage remote servers and locate equipment independently from your support teams.

The HP Lights-Out remote management portfolio

Lights-Out technology	Description	Supported servers*
HP Integrated Lights-Out 2 (iLO 2), HP Integrated Lights-Out (iLO)	Industry-leading, comprehensive remote control and management capabilities	HP ProLiant ML 300/500 Series HP ProLiant DL 300/500 Series HP ProLiant BL server blade
HP Lights-Out 100i (LO100i)	Simple, basic remote management for the more cost-sensitive IT budget	HP ProLiant DL 100 Series
HP Lights-Out 100c Remote Management Card	Simple, basic remote management for the more cost-sensitive IT budget	HP ProLiant ML 100 Series

* For a full list of supported servers, please visit www.hp.com/servers/ilo/supportedservers.

What is Lights-Out remote management?

Lights-Out remote management gives you the ability to control and administer your ProLiant servers remotely, as if you were physically at the server. Lights-Out remote management helps you to reduce travel costs, improve efficiency and increase system uptime. It gives you the freedom of full remote control over your ProLiant servers without compromise during routine and emergency situations. With Lights-Out remote management you can perform system administration tasks remotely, just as you would if you were at the server using its keyboard, mouse and monitor, power button or removable storage, regardless of the server's operating condition. Everything you can do if you are physically at the server, you can do remotely anytime from the office, home or hotel using Lights-Out remote management.

As described in the following challenge scenario tables, Lights-Out technology is available for all HP ProLiant servers with a variety of choices to fit your needs:

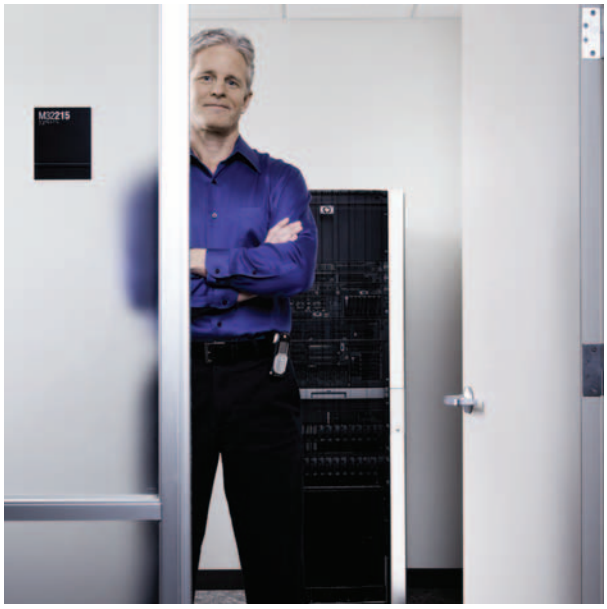
- Standard products provide basic Lights-Out features bundled with supported servers. The offerings typically support remote text consoles, a Virtual Power button and unit ID LED control, and enable access to system information, health status and event logs. Virtual KVM (keyboard, video, mouse) and browser-based Virtual Media are standard features on ProLiant BL server blades.
- Select Packs add optional key-activated features, packaged to enable complete remote management for selected environments such as HP BladeSystem or Linux networks using the console(s) available as standard features. These offerings typically support enhanced security, Virtual Media, console collaboration and replay (iLO 2) and historical power reporting (iLO 2).
- Advanced Packs add optional key-activated features packaged to provide the complete suite of remote management capabilities for general ProLiant ML- and DL-based networks. These offerings typically support the features in Select Packs plus the graphic remote console.

Remote management benefits

Lights-Out solutions offer the industry's most complete solution for remote control without compromise. It helps you:

- **Gain total control**—Reduce travel costs, improve efficiency and increase system uptime with a solution that gives you full control over ProLiant servers anytime, anywhere.
- **Use remote control with confidence**—Use powerful Lights-Out remote management capabilities with the confidence that your IT assets are protected by reliable security features.
- **Fit your environment**—Gain the flexibility that comes with remote management that fits your unique and changing IT environments.

"HP iLO, which allows you to troubleshoot a problem remotely, has been a big time saver for us... We've become much more efficient both in our server tech area and in our data center operations…Time between a failure occurring and getting it resolved has been reduced by about 70 percent in most cases."
—Steve Keselring, IT Infrastructure Manager, Quixtar



Basic challenges

1. Emergency troubleshooting unresponsive systems

Challenge

Some of most costly conditions occur when a system is unresponsive and physically inaccessible by the responsible support staff. Issues causing the problem could include:

- The operating system is locked up.
- The server has lost its network connection.
- The server had been inadvertently turned off.
- The operating system failed to return following a patch.
- A CD left in the server is causing an improper boot order.

Conventional tools that rely on access while the operating system is running are rendered useless in these situations. You're now operating in the dark. Your only recourse is to physically visit the server or find someone onsite to visit the server for something that may be as simple as forcing a power recycle. Requesting help from local non-IT staff members is not a good answer, even if they are available. And onsite help may involve cross charges to your budget.

With conventional management tools, you need to see what is happening through the system console and to control the power and make necessary changes via keyboard and mouse. All of this has negative results—response time suffers, travel costs may be incurred, even if it's paying mileage to drive across town or paying overtime and mileage for visits to the office. And this is true for service providers as well—their customers suffer because they do not have immediate access and total control of their systems.

HP solution

Because Lights-Out solutions provide total control independent of the server's state, you can access the system console (keyboard, video and mouse) and the power button to troubleshoot and recover any unresponsive server. This allows you to see the console when others cannot—when the OS is not operational. The OS-independent remote console allows you to address any situation as if you are in front of the server. For example:

- **Verify a hung operating system:** You can see the blue screen using Virtual KVM and then force a recycle.
- **Detect a stall at a boot prompt:** You can see it using Virtual KVM and take the required action to continue the booting process.
- **View and interact with BIOS screens and power on self-tests as the server boots:** Any errors posted during the boot process will be viewable simultaneously by up to four users.
- **View recorded fault and boot screen sequences:** Diagnose issues automatically or manually from a recorded screen video
- **Change the boot order to bypass a bootable CD or floppy diskette left in a server:** Make changes in the BIOS using the remote console and turn on the server's UID so a person with data center access can remove the media later.
- **Verify the network configuration of a system that has lost its connectivity:** Run ipconfig from the remote console and take action using OS tools

You also have access to the system's event log which is continuously stored on the Lights-Out management processor to identify the sequence of events that led to a failure. Several new server models provide embedded health information so you can troubleshoot basic fan, thermal and power supply issues out-of-band. All of this is possible anytime, anywhere you can connect to the system over a LAN or the Internet.

Features used

- Integrated Remote Console/Remote Console Applet
- Integrated Management Log/System Event Log
- Shared Remote Console (iLO 2 only)
- Console Replay (iLO 2 only)
- Remote Serial Console
- Embedded System Health
- Virtual Power

Supported Lights-Out processors

- HP iLO, iLO 2, LO100i, LO100c Remote Management Card (RMC)

2. Deploying and restoring remote servers

Challenge

You need to remotely deploy or redeploy servers in staging centers, full production data centers or remote sites. These activities typically require that a bootable image, CD/DVD or floppy be available to the server. You also need to be able to power on the server just to get started. And you need the ability to change BIOS settings or interact with the installer software when necessary. Finally, you need to be able to verify the install progress and troubleshoot issues.

HP solution

Lights-Out provides all the capabilities to deploy new operating systems or rebuild failed servers remotely from the office, home or travel location. This solution is ideal when you are working with an individual server and want the convenience of being able to insert a CD or image on a remote server from your workstation or a network directory.

Lights-Out allows you to:

- Power on a failed server or bare metal server that's been racked in a data center or remote site
- Access the BIOS before the OS is installed to verify configurations and change settings
- Boot the server to an install CD such as HP SmartStart CD or a remote floppy drive to kick off an automated or manual install
- Interact with the installation software where prompted from the Lights-Out remote console
- Install from multiple media and images when different drivers must be inserted
- Monitor and interact with the entire process from a remote console

Only embedded, OS-independent remote management tools like iLO, iLO 2 and LO100 completely eliminate the need to be physically at the server for deployment and restore activities. Alternative remote control products, such as software based remote control and KVM over IP, do not provide a total solution.

Features used

- Virtual Power
- Virtual KVM
- Virtual Media

Supported Lights-Out processors

- HP iLO, iLO 2, LO100i, LO100c RMC

3. Updating firmware or software

Challenge

Throughout a server's life, it is necessary to update system BIOS and option ROM, drivers, operating system and applications to support enhancements and address issues. ProLiant servers are easily updated remotely using HP Systems Insight Manager (SIM) Version Control and HP ProLiant Support Packs.

However, there is often some non-HP firmware or software used on a system that requires a visit to the server because there is no way to perform the installation remotely. For example, third-party NICs will require driver or controller firmware updates. Or, if HP SIM is not available, you may need to make a quick update as part of the recovery actions for a single server. In these cases you just want to be able to insert a floppy, CD or ISO image on the remote server, transfer a file or reboot the server, and then watch the process as if you were standing in front of the server.

There is also the challenge of being able to boot the server if it's been shut down and being able to view the entire install process via a remote console. This is not possible with software-based remote control products. Without access or trained local staff, this becomes a logistical problem that may increase downtime, costs and frustration.

HP solution

Lights-Out solutions offer the convenience of total remote control over system power, attached removable storage and KVM. From your workstation PC, you can insert your CD and either restart the server using Virtual Power to install firmware or copy files directly from your hard drive, execute installers through the remote console and check the monitor to make sure it's successful. Lights-Out total control makes this possible.

With Lights-Out products, system administration is even easier than working in front of the server since all the tools are at your fingertips. The iLO 2 Integrated Remote Console puts all of these tools—Virtual KVM, Virtual Power, Virtual Media and Virtual Folders—in a single screen. By connecting to iLO 2 or the other Lights-Out processors from a standard browser or command line on your PC, you can virtually insert a floppy, CD or DVD disc, or images (Virtual Media) on the remote server. You can then use Virtual Power to boot the server over a network. The management processor connects your floppy, CD or flash drive with the server and makes it appear as a local, bootable drive on the server.

Better yet, if you have a floppy or CD image on your PC, you don't even have to insert a diskette, disc or key. And just to verify that the BIOS install proceeds smoothly to a successful completion, your PC can act as the remote system monitor via the Lights-Out remote console (Virtual KVM) through the whole process. And, finally, with the new Virtual Folders feature, you can drag and drop files directly from a folder on your hard drive to the remote server without burning a CD or creating an image.

Features used

- Virtual Media
- Virtual Folders
- Virtual Power
- Integrated Remote Console
- Virtual KVM

Supported Lights-Out processors

- HP iLO, iLO 2, LO100i, LO100c RMC

4. Isolating and repairing infected servers

Challenge

When a server becomes infected with a virus, worm or other invasive program or software, the first action is typically to disconnect it from the network. The challenge then becomes this: How do you fix it without physically visiting it or sending a patch to a person at the remote site?

HP solution

Lights-Out technology on ProLiant servers allows you to stop the spread of an infectious program or software by disconnecting the host from the network while leaving a path open to administer a patch. This is possible because Lights-Out technology provides out-of-band access independent of the operating system.

Using either the dedicated Lights-Out network access and the VLAN-enabled iLO 2 Shared Network Port, you are able to remotely insert a client folder, CD/DVD, floppy or USB flash Virtual Media (as discussed in the previous two scenarios), transfer a file to the remote server and run the installer over the management network. So iLO gives you an alternate connection to the server even if host access is disconnected.

Features used

- Virtual Media
- Virtual Folders
- Virtual KVM
- Out-of-band network access

Supported Lights-Out processors

- HP iLO, iLO 2, LO100i, LO100c RMC

5. Administering BIOS and software settings

Challenge

In the past, day-to-day remote administration of servers has typically required the use of at least two different remote consoles—a software-based console such as Microsoft® Remote Desktop to make the operating system available and an out-of-band console such as iLO or switched KVM over IP for use when the OS is not available. Previous versions of embedded out-of-band remote console products have not provided the performance necessary to productively perform routine tasks. Also, remote access to the console has been limited to one user at a time.

In some cases, companies have used switched KVM over IP for all occasions—such as accessing BIOS, operating systems and applications. However, most businesses have typically relied on software-based consoles, such as Microsoft Remote Desktop, for use when a system is running. When a system is distressed, they have resorted to out-of-band consoles for administering BIOS changes. They have also used out-of-band consoles in situations where software-based consoles do not present the session 0 console from which all system administration functions can be accessed. The result is that companies are forced to support multiple consoles.

HP solution

Both iLO/iLO 2 and LO100i/100c RMC provide remote consoles with performance that meets the requirements of routine and emergency system administration. Lights-Out Virtual KVM technology now allows you to standardize on a single remote control tool for any system task regardless of the state of the operating system. The iLO 2 Integrated Remote Console also allows up to four administrators to view and share control of the remote console simultaneously when collaboration is required.

Additionally, both are complemented with other system control capabilities that are unmatched by any other remote control product. In the event a preference for Microsoft Remote Desktop remains, it can be integrated with iLO 2 to automatically switch between the iLO 2 Integrated Remote Console and Remote Desktop, depending on OS state. This also improves remote desktop security by removing it from the production network.

Features used

- Virtual KVM
- Terminal Services Pass-through (iLO/iLO 2)
- iLO 2 Shared Remote Console

Supported Lights-Out processors

- HP iLO, iLO 2, LO100i, LO100c RMC

6. Reducing data center cabling and equipment

Challenge

Computer room space issues have long been a challenge for most companies. Among other things there are too many cables to manage effectively. This not only causes space problems but also slows down troubleshooting, installing new equipment, etc. Remote console products that add more cables and switches do just that—they take up more space with cables and connectors and add more hardware.

HP solution

Lights-Out goes hand-in-hand with the dense server rack environments often found in data centers. HP iLO requires no more than one Ethernet cable connection when using the dedicated NIC and existing network infrastructure. HP iLO 2 Shared Network Port allows both the management and production data to share the same wire, eliminating the need for any extra cables or network switch ports.

Features used

- Shared Network Port
- Dedicated Network Port

Supported Lights-Out processors

- HP iLO, iLO 2, LO100i, LO100c RMC

"We knew from the beginning that we wanted pure remote administration, which is why iLO Advanced was so important to us."
—Daniel Strzelec, Senior System Engineer, Arch Insurance Group

Advanced challenges

7. Automating server deployment without PXE

Challenge

Many enterprises have embraced Preboot Execution Environment (PXE) and Dynamic Host Configuration Protocol (DHCP) to enable automated, scalable server deployment to meet the challenges of rapid server growth. However, for some companies, corporate policy prevents the use of these protocols on IT networks. Many automated server deployment tools require PXE or DHCP, making it more difficult for these companies to use them in their environments.

HP solution

HP iLO and iLO 2 Virtual Media are scriptable, allowing for the automation of server deployment without PXE and DHCP. This allows you to establish a Virtual Media server on your network from which multiple iLO management processors can be programmatically instructed to install standard images. This HP capability is unique among embedded management processors. It allows you to deploy multiple servers simultaneously over a network in an unattended fashion. It also eliminates the need to maintain and transport maintenance CDs.

Features used

- Virtual Media scripting

Supported Lights-Out processors

- HP iLO, iLO 2

8. Managing DMZ servers

Challenge

Remote management of servers in a corporate DMZ is inherently challenging. These servers must be secure both physically and logically. Opening additional ports in the firewall for management compromises the security of the intranet. Typically, these servers are installed in facilities with highly restricted access so even physically visiting the server for administration and maintenance may not be practical. These situations require a server that can be managed over an out-of-band path on a separate sub-network. Software console products will not meet these needs.

HP solution

HP iLO and iLO 2 allow you to deploy DMZ servers without compromising your remote management. With its unique MAC, IP address and dedicated NIC, a management network that is physically and logically isolated from the production network can be implemented. With iLO 2, it is possible to use a high performance Virtual KVM remote console and Virtual Power control over a separate network.

In addition, iLO and iLO 2 SNMP pass-through enables management communication between the server and management consoles like SIM to be routed over the iLO management network. This makes full in-band and out-of-band management of DMZ servers possible without compromising the firewall.

Features used

- Dedicated NIC
- SNMP Pass-through

Supported Lights-Out processors

- HP iLO, iLO 2

9. Monitoring power and heat

Challenge

Power consumption and data center cooling requirements are an increasing problem. Companies have few tools at the server level to collect data to analyze and manage data center power usage and heat generation. Most data must be collected externally with equipment that is costly to install and makes for difficult data collection. That's why you need the ability to collect and analyze power and heat data from the source without setting up and monitoring additional collection instruments. You also need to control power consumption to manage the infrastructure power and cooling.

HP solution

HP iLO 2 provides a new embedded monitoring and collecting mechanism for power and heat data. This feature exposes present and historical power and heat information that can be invaluable in understanding and managing power and cooling in data centers. It also allows this data collection to be automated and centralized through scripting. In addition, iLO 2 allows you to remotely control a power-capping setting to limit system thermal output on supported servers.

Features used

- Power Regulator and power meter reporting
- Power capping
- HP iLO 2 scripting
- HP iLO 2 scripting

Supported Lights-Out processors

- HP iLO 2

10. Integrating server controls with automation tools

Challenge

To improve efficiency and support rapid change, companies are increasingly automating IT processes. These processes are dependent upon the ability to control server operations such as power, and retrieve certain system information such as configurations. These capabilities may be required whether an operating system is present or not, so management agents and operating systems are not always suitable.

HP solution

HP iLO and iLO 2 scripting allows virtually any control to be programmed and a wide range of server information to be retrieved. This allows in-house custom tools and other third-party automation tools to incorporate controls like Virtual Power to be used in processes such as deployment and provisioning.

Features used

- Lights-Out scripting

Supported Lights-Out processors

- HP iLO, iLO 2

For more information, download the HP Integrated Lights-Out Security Technology Brief from the HP Business Support Center website at **www.hp.com/bizsupport** (select Manuals and search on iLO 2).

Security

Lights-Out products enable powerful access to server configuration and control capabilities. We carefully considered security requirements of the enterprise and architected iLO/iLO 2 solutions to include robust authentication, authorization, data integrity and privacy features. Every function of iLO/iLO 2—the remote console, virtual serial port, Virtual Power capability, Virtual Media, etc.—builds on a solid foundation of authentication and authorization and encryption techniques to help you protect your IT assets.

HP iLO and iLO 2 employ standards-based enterprise authentication and authorization for effective and efficient access control. Both directory services (Microsoft Active Directory and Novell eDirectory) and strong two-factor (Smart Card) authentication provide reliable access with enhanced security features. For environments with a small number of users, locally stored user names and passwords provide simpler access security on all Lights-Out products, including Lights-Out 100i/100c RMC.

Lights-Out products provide enhanced security features, including support for industry-standard encryption, Secure Socket Layer for browser, script and Secure Shell command line access. Numerous other security features are designed into the architecture of iLO and iLO 2 that will give you the confidence to deploy these tools while keeping your company's IT assets safe.

Are you ready for Lights-Out remote management?

The previous scenarios illustrate the power of and potential of our Lights-Out remote management tools. With these tools at work, you can now manage servers without having to be physically in front of the systems.

These capabilities help you reduce travel costs, improve efficiency and increase system uptime. In short, you can now do it all remotely, anytime and from virtually anyplace with an Internet connection.

To learn more about Lights-Out remote management, please contact your HP representative, or visit us online at **www.hp.com/servers/ilo**.

For more information please visit www.hp.com/servers/ilo

4AA0-6089ENW, Rev. 1, June 2007