Overview

HP Integrated Lights-Out (iLO)

HP iLO is the core foundation and intelligence of all HP ProLiant servers. HP iLO functions out-of-the-box without additional software installation regardless of the servers' state of operation. HP iLO can be accessed from any location via a web browser or the iLO mobile application, helping customers unleash the value of the HP ProLiant platform and deliver the highest possible quality of IT service to the business.

HP iLO Management helps simplify server setup, engage health monitoring as well as power and thermal control, and promotes remote administration. Building on the legendary HP iLO technology, key elements like HP Agentless Management, HP Active Health System, HP Intelligent Provisioning, and Embedded Remote Support are standard features built into iLO (iLO4) and all HP ProLiant Gen8 and Gen9 servers.

What's New

iLO Federation, a key enablement feature within iLO(iLO 4) lets you discover and manage numerous servers as easy as one through rapid discovery and the creation of security groups.

- **Built in standard - iLO Federation Discovery** uniquely recognizes numerous servers at once via multicast discovery methods supporting both IPv4 and IPv6 environment providing the following information:
    - Queries and displays group health status
    - Displays group configuration
    - Provides registered server name
    - Discovers and identifies what servers have licenses installed

- **Licensed features - iLO Federation Management**, requires an iLO Advanced or iLO Scale-Out license, and enables users to manage multiple servers as one via:
    - Group Power Control
    - Group Power Capping
    - Group Firmware Update
    - Group Configuration
    - Group Virtual Media
    - Group License Activation

Agentless Management 2.0 – New Agentless data now visible through the iLO GUI

- External storage attached to the Smart Array – Provides Health status and serial number
- Gen9 HP Branded HBA storage support– Provides Health status, model, serial number & firmware version
- Monitors status of Smart Storage Battery– Provides Model, serial number & capacity
- Smart Cache – Provides and monitors health status

iLO Reboot Switch allows you to reset the iLO or HP ProLiant hardware via the UID button in the case where iLO may not be responding. Use the following methods for reset by holding UID button for:

- 5 seconds to request a graceful iLO reboot
- 10 seconds demands a hardware iLO reboot

This applies to all 300 series servers and blades (via OA CLI).
This action is recommended instead of pulling the power cord.
Other methods for reset include:

- XML script (reset_rib.xml)
- IPMI Cold Reset
- SSH CLI (cd map1, reset)
- iLO web GUI (diagnostics page)
- Agents

Pre-Boot Health Summary – This is a simply diagnostic screen which allows you to troubleshoot and view iLO diagnostic information through the server's external monitor prior to powering on. Available information includes, server data, iLO access

Overview

information, firmware versions and critical Integrated Management Logs (IML). You gain access to this information by pressing the UID button once for display and press again to turn it off. Be careful not to trigger the iLO Reboot Switch function when pressing the UID button. For Blades are done via Serial USB Video (SUV cable) on front of system. Please note both of this features do not work over KVM or iLO Remote console – you must be standing in front of the servers.

HP RESTful API –HP ProLiant Gen8 and Gen9 servers are now designed with the Industry recognized HP RESTful architecture. The HP RESTful API is a simple programmatic web interface that allows you to monitor and manage your server infrastructure using basic HTTP operations (GET, PUT, POST, DELETE and PATCH). Support is now included in HP iLO 4 firmware to perform tasks such as configuration, inventory and monitoring of HP ProLiant servers via iLO. Some of the capabilities include the ability to do a full inventory, control power and reset, configure BIOS and iLO settings, fetch event logs etc. HP RESTful API for iLO is the preferred management interface for iLO 4 and Moonshot iLO Chassis Management Module-based HP servers. HP RESTful API conforms to the Redfish 1.0 DMTF standard (iLO firmware version v2.30 or higher required for Redfish conformance). For more details on HP RESTful API visit: http://www.hp.com/go/restfulapi. For more details on Redfish visit: http://www.dmtf.org/standards/redfish.

1GB Embedded User Partition – Beginning with the HP ProLiant Gen9 servers, this space is accessible for additional utilization or storage with a 4GB iLO NAND installed in the server.

iLO Tiering - Staring with HP ProLiant Gen9 servers, each server may have a different iLO NAND. Based on the type of server, each NAND size provides different capabilities.

iL04 hardware and firmware feature/Functionality	Mid-Tier Servers	Enterprise Server
Platform	• 10\100-series and below servers • XL series servers	• 300-series and above servers • Blades servers
NAND Size	**2GB\4GB NAND** (Reference platform specific Quick specs)	**4GB NAND**
Dedicated network port for management traffic		
(TS) Support viewable Active Health System logs and Factory birth certificate	512 MB	768 MB
Staging RESTful API commands for applying later		
Customer user partition	NA	1 GB
Intelligent Provisioning UI		
iLO firmware license *		

Models

HP Integrated Lights-Out (iLO) Licenses for ProLiant and Blade Servers

HP iLO licenses can be purchased regardless of the version of iLO you are using.

NOTE: For more specific license information, visit our iLO Family Datasheet.

HP Integrated Lights-Out (iLO) Advanced for ProLiant

HP iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU	E6U59ABE
HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU	E6U64ABE
HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21
HP iLO Advanced including 1yr 24x7 Technical Support and Updates Flexible Quantity License	512486-B21
HP iLO Advanced including 1yr 24x7 Technical Support and Updates Tracking License	512487-B21
HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates	BD505A

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HP iLO Advanced Flexible Qty License with 3yr 24x7 Tech Support and Updates	BD506A
HP iLO Advanced Tracking License with 3yr 24x7 Tech Support and Updates	BD507A
HP Integrated Lights-Out (iLO) Advanced for ProLiant BladeSystem Remote Management	
HP iLO Advanced for BladeSystem including 1yr 24x7 Technical Support and Updates E-LTU	E6U60ABE
HP iLO Advanced for BladeSystem including 3yr 24x7 Technical Support and Updates E-LTU	E6U63ABE
HP iLO Advanced for BladeSystem including 1yr 24x7 Support Single Server License	512488-B21
HP iLO Advanced for BladeSystem including 1yr 24x7 Support Flexible Quantity License	512490-B21
HP iLO Advanced for BladeSystem including 1yr 24x7 Support Tracking License	512491-B21
HP iLO Advanced Blade 1 Server License with 3yr 24x7 Tech Support and Updates	BD502A
HP iLO Advanced Blade Flex Qty License with 3yr 24x7 Tech Support and Updates	BD503A
HP iLO Advanced Blade Tracking License with 3yr 24x7 Tech Support and Updates	BD504A

NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.

NOTE: Tracking licenses may only be purchased by customers that have implemented an activation key agreement (AKA) with HP. For more information on Activation Key Agreements please visit: http://h18013.www1.hp.com/products/servers/proliantessentials/license/options.html

HP Integrated Lights-Out Essentials	
HP Integrated Lights-Out Essentials including 3yr 24x7 Technical Support and Updates E-LTU	E6U61ABE
HP Integrated Lights-Out Essentials including 1yr 24x7 Technical Support and Updates E-LTU	E6U62ABE
HP Integrated Lights-Out Essentials including 3yr 24x7 Tech Support and Updates Single Svr License	BD774A
HP Integrated Lights-Out Essentials including 1yr 24x7 Tech Support and Updates Single Svr License	BD775A
HP Integrated Lights-Out Scale Out	
HP Integrated Lights-Out Scale-Out 3yr 24x7 Tech Support and Updates Flex Quantity License	BD776A
HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License	BD778A
HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD776AAE
HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD778AAE
HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Tracking License	BD777A
HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License	BD779A

NOTE: For more information, visit: http://www.hp.com/go/ilo

Factory Integration Rules:

NEW iLO Advanced and iLO Essentials Electronic SKUs

HP has introduced a **major additional advantage** with the new iLO Advanced and iLO Essentials electronic license (E-LTU) SKUs. HP can now offer the same benefit of HP Factory Integration with the E-LTU's as the Physical iLO license SKU's. If any of the below listed new iLO electronic license SKUs are ordered, the License Key Code can be installed via the normal HP Factory CTO process at **no additional cost**, and without the need for a customer to purchase an additional service.

Old skus	New skus	Part Number description
TA850AAE	E6U59ABE	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License
BD506AAE	E6U64ABE	HP iLO Advanced including 3yr 24x7 Tech Support and Updates Electronic License
TA851AAE	E6U60ABE	HP iLO Advanced for BladeSystem including 1yr 24x7 Support Electronic License
BD503AAE	E6U63ABE	HP iLO Advanced for BladeSystem including 3yr 24x7 Tech Support and Updates E-LTU
BD775AAE	E6U62ABE	HP Integrated Lights-Out Essentials including 1yr 24x7 Tech Support and Updates E-LTU
BD774AAE	E6U61ABE	HP Integrated Lights-Out Essentials including 3yr 24x7 Tech Support and Updates E-LTU

RELATED FAQS for HP iLO Advanced

Q: Can the iLO Advanced license key of the new electronic SKU's be installed via normal HP factory CTO process?

A: YES, ALL the iLO Advanced licenses listed above **CAN** have the access key code installed in the Factory just as the physical iLO

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Advanced license access key codes have. This is done upon order entry by associating the license with the server as option.
NOTE: Factory Integration is now the default for these SKUs.

Q: Can the iLO Advanced E-LTU SKU be shipped standalone and **NOT** installed in the factory.
A: YES, upon order entry the SKU is entered as a standalone item on the order not associated with the server.

Q. Can the **FLEX or TRACKING license SKU's** be HP Factory Integrated?
A: NO, the FLEX and TRACKING license SKU's cannot be installed in the HP Factory.

Licensing Redemption
EG has moved to a new system and will no longer maintain license redemption in the old portal.
The new link: http://licensing.hp.com/redirectionEMS
If the customer goes to the old link http://www.hp.com/software/licensing they will be redirected to the new site, which will then take them to the new portal if they are trying to activate an EG product.
NOTE: For now HPSW products will still use the old portal so the redirect page will determine if the customer needs to go to the new or old portal based on their EON.

Q: What does the customer receive when the electronic version of either the iLO or Insight Control license is ordered?
A: The customer will still receive an email that contains a link to the licensing portal. **Customers are HIGHLY encouraged to register the product on the licensing portal because this is how the TS organization gets the customer data on new purchases that come bundled with support (24x7 TS&U).** The license key that was installed in the factory is also available on the portal in case the customer needs it in the future (for re-install). For e-delivery products, the entitlement order number (EON) used to the register the product on the licensing portal will be the same as the HP sales order number.
NOTE: HP Services will know that the license key is active and under support so if the customer calls in for support. However, all of the customer data (name, address, and phone number) isn't always transferred to the Services organization unless it is registered on the licensing portal. The Service team pulls a report for all EG products that contains customer data from the licensing portal every month. This allows them to setup the SAIDs with the information provided upon registration.

Standard Features

NOTE: This document is a consolidation of previous QuickSpecs and covers HP iLO 4, HP iLO 3 and HP iLO 2 for HP ProLiant servers. Please visit: http://www.hp.com/go/iLO

Advanced Server Management (ASM) for HP ProLiant	The HP Integrated Lights-Out (iLO) for ProLiant management ASIC includes all of the Health and Wellness features of the Advanced Server Management controller. The Health drivers interface with the HP iLO ASIC to provide system management support, including monitoring of server components, event logging, and support for the Management Agents.
Alert Administration for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant support delivery of SNMP server agent alerts as well as internally generated management processor alerts (e.g. unsuccessful login attempt), to a management console such as HP Systems Insight Manager. Traps forwarded by the processor can be configured in Insight Manager for delivery to an administrator's pager or e-mail.
Auto-Configuration of IP Address using DNS/DHCP for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant provides automatic network configuration. A default name and Dynamic Host Configuration Protocol (DHCP) client that leases an IP address from the DHCP server on the network are standard with HP iLO for ProLiant. This allows the management processor to register its device name with Domain Name Services (DNS) and Windows® Internet Naming Service (WINS). For systems that do not use DNS/DHCP, IP configuration is also supported.
Automated Group Administration & Actions for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant group administration automates configuring and managing large deployments of Integrated Lights-Out processors. Using iLO's extensive scripting language with HP Lights-Out Configuration Utility or the HP Lights-Out Online Configuration Utility, an administrator can easily configure all settings for mass deployments, control all functions and activate the HP Integrated Lights-Out (iLO) for ProLiant Advanced license keys simultaneously on multiple HP ProLiant iLO processors. With a batch process or HP System Insight Manager's powerful device query mechanism, these utilities enable scalable use and management of HP ProLiant iLO's. Sample scripts are available at: http://www.hp.com/go/iLO.
Auxiliary Power for HP ProLiant	Because the HP Integrated Lights-Out (iLO) for ProLiant management processor obtains its power from the auxiliary power plane of the server, it is always on when the server is plugged into a power source. If the server provides Redundant Power Supplies (RPS) then the HP iLO for ProLiant will use redundant power and will continue operation in the event of a power supply failure.
Diagnostic Port & POST LED Indicator for HP ProLiant	For convenient walk-up access or in the event that some portion of the network is down and the administrator cannot reach the Integrated lights-Out (iLO) through the network, the c-class blade is equipped with an "iLO Diagnostic Port" that guarantees access to Integrated Lights-Out (iLO). The Integrated Lights-Out (iLO) has been designed to provide feedback during the POST process as a blade system does not include a directly attached monitor. The Integrated Lights-Out (iLO) blinks the Server Health LED during the boot process to enable the onsite administrator the results of the POST process.
Embedded System Health for HP ProLiant	On supported server models, the HP iLO for ProLiant management processor monitors fans, temperature sensors, power supply sensors and VRMs without having the System Management Driver loaded. The status of these is accessible from all HP iLO for ProLiant user interfaces (browser, SMASH CLP command line and script) independent of the host operating system. The management processor also reports sensor status to the operating system through an IPMI specified interface. The intelligence of iLO manages the Sea of Sensors thermal control, directs the Dynamic Power Capping technology and monitors the health of server components.
Flexible Interfaces for HP ProLiant	Using any of the HP iLO for ProLiant interfaces, customers can configure, update and control all HP iLO for ProLiant Standard functions regardless of the state of the host server or operating system • **Browser** - HP iLO for ProLiant is fully accessible by means of Microsoft® Internet Explorer®, and Mozilla Firefox® (Linux® and Windows® only). • **Command line** - HP iLO for ProLiant supports the new industry standard command line, DMTF System Management Architecture for Server Hardware, Server Management Command Line Protocol (SM CLP) specification. These commands can be used on other SM CLP compliant HP

products, such as the first generation iLO, Lights-Out 100 Management Processors, HP Integrity iLO, and other non-HP products.

- **Scripting** - HP iLO for ProLiant supports a scalable scripting interface using either programmable XML or PERL scripting. This enables scalable, simultaneous configuration, update and operation large groups of HP iLO for ProLiant servers as well as iLO and RILOE II management processors.
- **Intelligent Platform Management Interface** (IPMI) is a standardized computer system interface used by system administrators for out-of-band management of computer systems and monitoring of their operation. System administrators can use IPMI messaging to monitor platform status (e.g. system temperatures, voltages, fans, power supplies and chassis intrusion); to query inventory information; to review hardware logs of out-of-range conditions; or to perform recovery procedures such as issuing requests from a remote console through the same connections e.g. system power-down and rebooting, or configuring watchdog timers. The standard also defines an alerting mechanism for the system to send a simple network management protocol (SNMP) platform event trap (PET).

Flexible Network Connectivity for HP ProLiant

HP Integrated Lights-Out (iLO) for ProLiant provides a choice between two network connection methods to access all functionality:

- **Dedicated connection** - Access HP iLO for ProLiant via an embedded 10/100-MB dedicated Ethernet NIC dedicated to. This enables remote management over a dedicated, out-of-band management network. In-band SNMP notification of server problems on a real-time basis is also supported without separate telephone connections or modem sharing devices. The dedicated NIC can auto-select speeds between 10 Mbps and 100 Mbps.
- **Shared Network Port** - On selected ProLiant server models, HP iLO for ProLiant supports network connectivity through a new high-speed shared connection via one of the embedded system NICs. The latest version of iLO also supports. Shared network port over the Flexible - LOM providing full accessibility to all HP iLO for ProLiant functions including browser, Virtual Media and Virtual Keyboard Video and Mouse in graphics mode. The management processor maintains a unique IP address and MAC allowing the network controller to route HP iLO for ProLiant and host data correctly. With the new Shared Network Port, out-of-band management and production data can share the same wire eliminating the separate network connection for each server.

Flexible Setup Options for HP ProLiant

An onboard ROM-based configuration utility allows fast and easy setup without additional software. HP iLO for ProLiant can also be setup via the browser or command line interface over the network. Integration with SmartStart Scripting Toolkit allows configuration of the card as part of the initial server deployment. For large deployments, the HP Lights-Out Configuration Utility can be used to configure groups of HP iLO for ProLiant processors, saving time and resources.

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Integrated Lights-Out (iLO) Management for HP ProLiant

HP Agentless Management 2.0 the base hardware monitoring and alerting capability is built into the system (running on the HP iLO chipset) and starts working the moment that a power cord and an Ethernet cable is connected to the server. This means that:

- All core management is out-of-band for increased security and stability: no OS software required, no open SNMP port on the OS and zero downtime updates
- Monitor and Alerting on key internal server components: fans, hard drives (including cache modules), power supplies failures
- HP Systems Insight Manager (HP SIM) can see the system and will give customers preview of the System Health Summary and Sub-System Details

HP Active Health System: HP Active Health System is an essential component of the HP iLO Management. It provides customers with: Diagnostics tools/scanners wrapped into one; Always on, continuous monitoring for increased stability and shorter downtimes; Rich configuration history; Health and service alerts; Easy export and upload to Service and Support. This is accomplished through the increase the functionality of the popular HP's Sea of Sensors. HP Sea of Sensors 3D adds approximately 28 additional thermal sensors on HP branded networking and storage PCI cards, backplanes, and mezzanine cards for a 3D view of system cooling that automatically tracks thermal activity - heat - across the server. When temperatures get too high, sensors can kick on fans and make other adjustments to reduce energy usage.

HP Intelligent Provisioning: Lets customers provision and configure a single server without any separate media. No more SmartStart CDs or Smart Update Firmware DVDs are needed. For more information regarding Intelligent Provisioning please go to website at http://www.hp.com/go/intelligentprovisioning

HP Embedded Remote Support: HP offers embedded remote support that allows a customer to enable remote support directly from iLO (also OA and IP) without installing OS agents on the device, greatly reducing the time to activate remote monitoring. Through Insight Remote Support 7.0.5 and later versions and Insight Online direct connect capability, customers now benefit from 24x7 remote monitoring, auto-generated service events, support cases and anywhere, anytime monitoring with HP Insight Online, a personalized cloud-based IT dashboard. Through the HP Support Center portal, Insight Online displays devices remotely monitored by HP and lets you easily track your auto-generated service events and support cases, view device configurations, and proactively monitor your HP contracts and warranties as well as HP Proactive service credit balances. The Insight Online dashboard is also available in the HP Support Center Mobile App.

Integrated Lights-Out (iLO) Event Log for HP ProLiant

The HP iLO for ProLiant Event Log stores detailed management processor events and data independent of the host operating system. Actions like server power on/off, reset, changes in user configuration, clear event log, successful and unsuccessful login attempts are logged along with the user's access machine name in the Event Log enabling audits for security or troubleshooting purposes. The Event Log is easily accessible through the browser, command line, script or Insight Manager

Integrated Lights-Out (iLO) Standard Blade Edition Features for HP ProLiant

HP iLO for ProLiant Standard Blade Edition is enhanced to include several features that are essential for blade operation. The following additional features are supported as standard features on HP ProLiant BL c-Class and HP Integrated Lights-Out (iLO) supported c-Class BladeSystem servers:

- Virtual Keyboard Video and Mouse remote graphic console
- Terminal Services Pass-Through supported in iLO2. Improvements in the iLO 3. Integrated Remote Console displaces the need for this feature. Virtual Media (browser access only to floppy disk, CD-ROM, DVD-ROM and USB-Drive based virtual media)

Standard Features

Integrated Management Log for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant captures and stores the server's Integrated Management Log for access via browser or command line even when the server is not operational. This capability can be helpful when troubleshooting remote host server problems.
Integration with HP Systems Insight Manager and other management applications for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant is integrated with HP and other leading management applications to allow seamless use in lifecycle tasks and processes from deployment to fault management and administration. HP Systems Insight Manager (SIM) intelligently discovers HP iLO for ProLiant devices and associates them with their host servers for fast access during fault management activities. HP Insight Control Server Provisioning integrates tightly with HP iLO when provisioning HP ProLiant servers, including the Intelligent Provisioning capabilities of HP ProLiant Gen8 servers. Intelligent discovery and launch of HP iLO for ProLiant browser is also supported in HP Openview Operations for Windows® and Network Node Manager®, Microsoft Operations Manager® and CA Unicenter®.
Integrated Remote Console for HP ProLiant	HP iLO runs on Microsoft .NET Framework® 3.5 and takes advantage of Microsoft DirectX® based hardware acceleration to provide high performance and outstanding user graphics. HP iLO has an enriched viewing experience with maximum resolution of 1600 x 1200 and maximum color depth of 32k colors. With HP iLO, remote screen fits within one window and the screen can be scaled to any size, avoiding the use of scroll bars. HP iLO for ProLiant has a Java-free Integrated Remote Console for environments with Microsoft Windows® host and client operating systems. With HP iLO Standard and HP iLO Standard Blade Edition, Integrated Remote Console provides access to Virtual Keyboard Video and Mouse in pre-OS text mode and Virtual power from a single screen. ProLiant OA/iLO Standard Blade Edition also allows virtual media to be controlled from the IRC. The IRC runs on an ActiveX Control® that is a one-time, automatic download to clients running Windows Internet Explorer® allowing users to operate without installing any Java clients.
Local User Accounts And Logon Records for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant Standard supports up to 12 local user accounts with customizable access rights, individual logins and passwords. HP iLO for ProLiant also provides logging of user actions in the event log, progressive delays for failed login attempts, and login legal warning.
Microsoft Emergency Management Service Console Integration for HP ProLiant	The Microsoft Emergency Management Service® console provides a text-based screen to access the host server. HP Integrated Lights-Out (iLO) for ProLiant provides the option to access the EMS console from the Integrated Lights-Out (iLO) browser interface. The Emergency Management Service console option is available on all HP ProLiant servers using Windows Server 2003® or later.
Mobile App for HP iLO	HP iLO brings additional efficiency and effective remote management at the touch of your fingertips with the HP iLO Mobile App. The HP iLO Mobile App gives you immediate secured access to your server from the touch of your Smartphone or Tablet devices. Today we support Apple's iOS (iTouch, iPhone4, iPad) and Android devices (Android Phone and Android Tablet). This feature is supported on HP iLO 3 and HP iLO 4.To learn more visit: http://www.hp.com/go/ilo/mobileapp
Multi-Language Support	We provide our customers with the ability to read the HP iLO GUI in the following languages: English, Japanese and simplified Chinese.
Power Consumption Reporting for HP ProLiant	On supported server models, the HP iLO for ProLiant management processor displays the present power consumption in Watts and BTU. The present power is a five minute average that is calculated and displayed via all HP iLO interfaces (browser, CLI, script).
Power Regulator for HP ProLiant for HP ProLiant	Power Regulator for ProLiant can be enabled on supported server models from HP iLO for ProLiant Standard browser, CLP and script interfaces. Power Regulator Static Low Power and Dynamic Power Savings Modes as well as Operating System based modes (AMD PowerNow or Intel Demand Based Switching) can be enabled to save on server power and cooling costs. On supported ProLiant servers, Power Regulator allows CPU's to operate at lower frequency and voltage during periods of reduced

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	application activity. **NOTE:** For additional information about Power Regulator visit: http://h18004.www1.hp.com/products/servers/management/ilo/power-regulator.html
Power Supply High-Efficiency Mode for HP ProLiant	Beginning with the HP ProLiant G6 servers, power supply high efficiency mode enables servers to run at maximum power efficiency even at low loads. When operating in this mode, the ProLiant OA will channel load through a single primary supply, as opposed to balancing power load equally across both supplies. In the event of a power supply outage, the secondary supply will immediately assume the load for the server. Power supply high-efficiency mode is not enabled automatically and must be configured through the iLO user interface.
Remote Firmware Update for HP ProLiant	This feature ensures that HP Integrated Lights-Out (iLO) for ProLiant is always up-to-date with the latest firmware available from HP. Updates to the ROM code on HP iLO for ProLiant are accomplished through the browser interface, command line, XML script, or using online flash components for Windows® and Linux®.
Remote Serial Console (Virtual Serial Port) for HP ProLiant	Access to the host server's serial, text-based (Virtual Serial Port) during all server states over an Ethernet network is a standard feature on all HP Integrated Lights-Out for ProLiant management processors. From the operating system-independent console you can monitor and control the BIOS and the server during Power-On System start-up testing (POST), as well as Microsoft Emergency Management Services® and serial tty sessions on systems running Linux operating systems. After OS is installed access can be set up to be re-directed to the Virtual Serial Port. Also in the event of a crash you can configure the OS to send the core data dumps to the Virtual Serial port.
ROM-base Setup Utility (RBSU) for HP ProLiant	Embedded configuration utility within the system ROM and accessible through the HP Integrated Lights-Out (iLO) for ProLiant interface that facilitates pre-OS display of server resources, configuration of primary boot controller and boot order, and configuration of system devices and installed options.
Security for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant provides strong security for remote management in distributed IT environments by using industry-standard Secure Sockets Layer (SSL) encryption of HTTP data transmitted across the network. SSL encryption (128-bit) ensures that the HTTP information is secure as it travels across the network. HP Integrated Lights-Out (iLO) for ProLiant also uses Secure Shell version 2 to provide strong authentication and encryption of commands executed on iLO management processors over a network. PuTTY and OpenSSH clients may be used to access HP iLO for ProLiant over a Secure Shell connection. In addition, HP iLO for ProLiant provides a configurable option to enable strong encryption Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interfaces. AES/3DES is the US government encryption standard to protect sensitive information.
Single Sign-on for HP ProLiant	When using local user accounts on HP Integrated Lights-Out and BladeSystem Onboard Administrator, single-sign on is supported. This allows users to access automatically, login to HP ProLiant iLO from the BladeSystem OA user interface.
Static IP Bay Configuration for HP ProLiant	The Static IP Bay Configuration feature simplifies deployment by automatically assigning IP addresses to individual blades from a reserved static pool as they're powered on even if DHCP is present.
System Diagnostics for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant may be used to diagnose systems. The Remote Console, Integrated Remote Console and Remote Serial Console may be used to monitor the system for POST error messages. The Integrated Management Log and HP iLO for ProLiant Event Log record events useful for diagnostics. HP Integrated Lights-Out (iLO) for ProLiant Virtual Media (if activated by an iLO

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	Advanced key) may be used to boot and run System Diagnostics.
Virtual Indicators for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant provides the ability to control server Unit ID LEDs from the HP iLO browser, command line (SM CLP), XML scripting or WS Management interfaces. The server Unit ID LED is the blue LED on the ProLiant server that is used for identifying systems in a rack full of servers.
Virtual Key Video Mouse remote text console for HP ProLiant	Embedded hardware remote console capabilities in a text mode screen prior to loading of the operating system; is provided as a standard feature on all ProLiant Integrated Lights-Out (iLO) management processors. This provides access to system BIOS and during Power-On System start-up testing using Virtual KVM technology. Remote text in "pre-OS" mode is accessible from the Integrated Remote Console and the Java applet Remote Console. The Java applet supports both Microsoft® and Sun Java® software.
Virtual Power Button for HP ProLiant	Using a supported browser, command line or script interface, HP Integrated Lights-Out (iLO) for ProLiant can be used to remotely operate the power button of a host. For example, if the host server is off, you can turn it on from the HP ProLiant iLO browser, command line (SM CLP), XML scripting or WS Management interfaces. You can also power off and on the server in one step. A "press and hold" option is available for the Virtual Power Button in the event a momentary press is insufficient to power off a server experiencing an operating system failure.
Virtual Private Network (VPN) **support for HP ProLiant**	iLO for ProLiant functionality is available securely over the Internet around the world when used in conjunction with VPN technology. VPN is supported on both HP iLO for ProLiant network connection methods, dedicated and shared network ports.
Simple Network Management Protocol Version 3 (SNMPv3)	SNMP is the protocol developed to manage nodes (servers, workstations, routers, switches and hubs etc.) on an IP network. HP iLO now has SNMP Version 3 (SNMPv3) which has added security and remote configuration capabilities over the previous versions. The SNMPv3 architecture introduces the User-based Security Model (USM) for message security and the View-based Access Control Model (VACM) for access control. The architecture supports the concurrent use of different security, access control, and message processing models. More specifically: Security, authentication and privacy, authorization and access control, Administrative Framework, naming of entities, people and policies, usernames and key management, notification destinations, proxy relationships , and remotely configurable via SNMP operations.
IPv6 on Dedicated NIC	Within HP iLO 4 on the dedicated NIC it now supports IPv6, which uses a 128-bit encryption address, allowing for 2128, or more than 7.9×1028 times as many as IPv4, which uses only 32-bit encryption addresses.
iLO Federation Discovery	**Built in standard** uniquely recognizes numerous servers at once via multicast discovery methods supporting both IPv4 and IPv6 environment providing the following information: - Queries and displays group health status - Displays group configuration - Provides registered server name - Discovers and identifies what servers have licenses installed To learn more see the iLO Federation User Guide: http://www.hp.com/support/ilo4_federation_ug_en
HP RESTful Application Program Interface (API)	The HP RESTful API management interface functionality is available for iLO 4 and Moonshot iLO Chassis Management Module-based. HP servers uses the basic HTTP operations (GET, PUT, POST, DELETE, and PATCH) to either submit or return a JSON formatted “resource” to or from a URI. The API enables users to manage one or multiple servers to: • Get full inventory • Control Power and reset • Configure BIOS and iLO 4 settings • Status of server health

Standard Features

- Fetch event logs and SSH Serial Console
- And more

iLO 4 2.30 is Redfish 1.0 conformant while remaining backward compatible with the existing HP RESTful API. To learn more see the Managing HP Servers Using the HP RESTful API Guide or http://www.hp.com/go/restfulapi

Additional Features

NOTE: All Additional Features listed in this section require the corresponding iLO license.
Advanced functionality, through the HP iLO Advanced license such as graphical remote console, multi-user collaboration, and video record/playback can be activated with the optional HP iLO Advanced or HP iLO Advanced for BladeSystem licenses. These HP iLO Advanced licenses can be purchased stand-alone or as part of HP Insight Control or HP OneView. The Advanced licensed features offer sophisticated remote administration of servers in dynamic data center and remote locations and can help significantly reduce cost associated with IT-related travel and unplanned downtime. For more specific license information, visit our iLO Family Datasheet.

iLO Federation Management	The next generation enabling technology delivering unprecedented scale, speed and simplicity. iLO Federation Management, requires an iLO Advanced, iLO Advanced for BladeSystem or iLO Scale-Out license, and enables users to manage multiple servers as one via: - Group Power Control - Group Power Capping - Group Firmware Update - Group Configuration - Group Virtual Media - Group License Activation To learn more see the iLO Federation User Guide: http://www.hp.com/support/ilo4_federation_ug_en
Automatic and On-Demand Video Footage for HP ProLiant	HP ProLiant iLO Console Replay captures and stores for replay the console video during a server's last major fault or boot sequence. Server faults include an ASR, server boot sequence, Linux panic, or Windows® blue screen. Additionally users are able to manually record and save any console video sequence to their client hard drive for replay from the HP iLO Integrated Remote Console.
Directory Services Integration for HP ProLiant	HP Integrated Lights-Out (iLO) for ProLiant integrates with enterprise-class directory services to provide secure, scalable, and cost effective user management. Directory services, such as Microsoft® Active Directory and Novell eDirectory, can be used to authorize directory users with assigned user roles to Integrated Lights-Out processors. With Active Directory, customers have the flexibility to integrate with or without a schema extension. An easy and reliable installation program is available to install a management console snap-in and extend customer's existing directory schema to enable directory support for the HP lights-out management products. A directory migration tool is available to automate setup for both methods of integration. In addition, current versions of HP iLO firmware will support directory nested groups.
Global Team Collaboration for HP ProLiant	Up to six (via iLO 3 and iLO 4) and four (via iLO 2) HP ProLiant iLO users with remote console privileges in different locations can collaborate using the shared remote console to troubleshoot, maintain and administer remote servers. In iLO2, the session leader can allow either view only or full console control by individual participants. In iLO3 and iLO4 the session leader can allow full console control by individual participants. Shared remote console mode is supported from the Integrated Remote Console on clients using Microsoft® Internet Explorer browsers as well as Firefox via iLO 3.
Text Console via SSH for HP ProLiant	HP Integrated Lights-Out (iLO) text console (TextCons) is an HP only key innovation above and beyond what is offered as an Industry Standard through the Remote Virtual Serial Port. TextCons provides server access via a text console, similar to graphical remote console. The text console feature pulls text data from the server video chip and redirects it out over a secure shell (SSH) network. No configuration is required for the BIOS, the OS loader or the OS. This unique licensed feature supports up to five Secure Shell (SSH) sessions and provides a fast and easy way for server set up and deployment.
iLO Serial Port Record\ Playback for HP ProLiant	HP iLO takes the output data from the Remote Serial Console (Textcons) and saves it to iLO memory for so data can be later accessed. Very similar to "console replay ", but is text based data only from the serial port. This would be used to store logs of data and\or history of activity to be retrieved later to see exactly what activity was done - or actions occurred (Play back) but all text based.
Video Player for HP	HP iLO allows you to view automatically captured server video footage or on-demand captured

Additional Features

ProLiant	footage within an iLO session or separately through the new iLO Video Player.
Remote System logs	HP iLO keeps a log of everything being done, so it can later be used for troubleshooting or simply has a record. Syslog can be configured to receive logging from a remote client, or to send logging to a remote syslog server. Remote logging is sending a duplicate record of those events not only to the local machine but to a remote machine as well
Two-factor authentication via Kerberos for HP ProLiant	HP ProLiant Integrated Lights-Out (iLO) provides strong user authentication with two-factor authentication via Kerberos using digital certificates embedded on smartcards or USB -security tokens. Using this form of strong authentication, iLO access can be restricted only to IT individuals possessing a certificate bearing smartcard or USB security token and a PIN.
Power Regulator Reporting for HP ProLiant	iLO Advanced iLO Advanced for BladeSystem and iLO Scale-Out enable access to power related data from any of the three iLO interfaces (browser, script or command line) on supported server models. Available information includes time spent in Power Regulator Dynamic Savings mode and average, peak and minimum power consumption over 24 hour intervals. Check the server QuickSpecs to verify specific system support for Power Regulator and power monitoring.
Remote Kernel Debugger for Windows® for HP ProLiant	Integrated Lights-Out allows you to connect a Microsoft® Windows® debugger running on a remote PC to the iLO Virtual Serial Port (VSP) to diagnose and repair operating system kernel errors.
Single Sign-On for HP ProLiant	ProLiant users can automatically login to iLO from HP System Insight Manager (version 5.1 or greater) and the HP BladeSystem Onboard Administrator. In addition, to direct access and authentication using iLO Active Directory integration, the role based authentication in HP SIM and Onboard Administrator can be used to simplify user access and user account administration.
Virtual Key Video and Mouse graphic console for HP ProLiant	HP iLO graphical consoles provide Virtual KVM capabilities with KVM over IP performance. This gives system administrators a single console that is responsive and agile for routine administration and emergency situations. iLO Virtual KVM works with a standard browser and no additional software is required on the remote server or client system for iLO 2. HP iLO 3 and iLO 4 require the .NET Framework 3.5, which is already provided with Windows® 7.
Virtual Media for HP ProLiant	The USB-based Virtual Media feature allows an IT administrator to boot the remote server using a standard 1.44-MB diskette, CD ROM, DVD+R or USB flash drive on a client PC or from a floppy diskette, CD or DVD image stored on a virtual media server on the network. Virtual Media saves time and increases efficiency by eliminating the need to visit servers in datacenters and remote sites just to insert a diskette, CD-ROM, DVD-ROM or USB key.
Upgrade to HP iLO Advanced or HP iLO Advance for BladeSystem	HP iLO Advanced for ProLiant provides customers with an easy upgrade to full Lights-Out functionality on their HP iLO enabled HP ProLiant Servers. HP iLO Advanced enables the Virtual KVM / Graphical Remote Console, as well as a text based console, automatic video footage of last server boot and last server fault and on-demand video (viewable in an iLO session or with the iLO Video Player), intelligent global team collaboration, dynamic power capping, Microsoft® Terminal Services integration, Virtual Folders, Virtual Media (floppy, CD, USB flash drive and image), remote kernel debug, and directory services integration on HP iLO supported servers. Using iLO Advanced, IT managers can perform all the "in-front-of-the-server" hardware management and system administration without physically visiting the server. For more information visit http://www.hp.com/buy/ilo
iLO Advanced / Advanced for BladeSystem Evaluation License	A FREE license key is available to temporarily activate iLO Advanced and iLO Advanced for BladeSystem features for evaluation purposes. The evaluation key unlocks all of the industry leading remote management on supported HP ProLiant servers up to 60 days. Evaluation keys are available at: http://www.hp.com/go/TryiLO
Warranty	HP will replace defective delivery media replacement for a period of 90 days following the date of purchase.

Service and Support

HP Software Support

HP offers a number of software support services, many of which are provided to customers at no additional charge.

Software Technical Support and Update Service
All HP iLO licenses include one or three years of 24 x 7 HP Software Technical Support and Update Service. 24x7 HP Software Technical Support and Update Service Care can also be purchased on a standalone basis. This service provides access to HP technical resources for help in resolving software implementation or operational problems. The service also provides access to software updates and reference manuals either in electronic form or on physical media as they are made available from HP. (Customers who purchase an electronic license to use are eligible for electronic updates only.)

With the Software Technical Support and Update Services, HP iLO licensed customers will benefit from expedited problem resolution and proactive notification and delivery of iLO software updates. For more information about this service, see: http://www.hp.com/services/insight.

If you received a license entitlement certificate, registration for this service will automatically take place upon redemption of the license certificate/key online and a service contract will be created for you.

If the license information you received for your product instructs you to register for Software Technical Support and Update Service, please follow the instructions or you will not be eligible for telephone support or product updates.

Once registered for this service, you will receive a letter in the mail containing the Customer Service Phone number for your reference and your Service Agreement Identifier (SAID). After you have received your SAID, you can go to the Software Update Manager (SUM) web page to view your contract online and elect electronic delivery for your updates.

Related Options

HP Care Pack Services	HP 1 year 24x7 iLO Advanced Pack Non Blade Install Base Upgrade SW Support	UJ100E
	HP 1 year 24x7 iLO Select Pack Install Base Upgrade Software Suport	UJ098E
	HP 3 year 24x7 iLO Advanced Pack Non Blade SW Support	UJ101E
	HP 4 year 24x7 Integrated Lights-Out Advanced Pack Non Blade SW Support	UM039E
	HP 5 year 24x7 Integrated Lights-Out Advanced Pack Non Blade SW Support	UM040E
	HP 3 year 24x7 iLO Advanced Pack for Blade Software Suport	UJ099E
	HP 4 year 24x7 Integrated Lights-Out Advanced Pack for Blade System Software Suport	UM041E
	HP 5 year 24x7 Integrated Lights-Out Advanced Pack for Blade System Software Suport	UM042E
	HP 3 year 24x7 iLO Advanced Pack for Blade 8 Server Software Suport	UJ103E
	HP 4 year 24x7 Integrated Lights-Out Advanced Pack for Blade System 8 Server Software Suport	UM043E
	HP 5 year 24x7 Integrated Lights-Out Advanced Pack for Blade System 8 Server Software Suport	UM044E

Technical Specifications

HP iLO 4 On System Management	**Architecture**	PCI Express based health and remote management ASIC
	Processor	Embedded ARM processor core operating at 400MHz
	Upgradeability	Firmware upgradeable via Flash ROM
	Video Support	1920 x 1200 (16 bpp) DVR max resolution
	Interfaces	HP iLO Dedicated* Network connection (10/100/1000 Mb/s) on rack, tower and SL systems *Optional Module on some servers HP iLO Shared Network connection (10/100/1000 Mb/s) on rack, tower and SL systems HP iLO network connection to blades (100 Mb/s) to Onboard Administrator (with 10/100/1000 Mb/s uplink) on blade systems
	Memory	16 MB Flash 256 MB DDR 3 with ECC (112 MB after ECC and video) on 300 series and above 128 MB DDR 3 without ECC ((112 MB after video) on 100 series and below when configured with 2GB NAND
	Operating System Support	For information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase from HP, please visit our OS Support Site at: http://www.hp.com/go/ossupport
	Client System Support	For information on Client System Support, please visit the HP iLO Release notes at: http://h20000.www2.hp.com/bc/docs/support/SupportManual/c03334036/c03334036.pdf
	Client Browser Support	Microsoft Internet Explorer Firefox Extended Support Release (ESR) Google Chrome **NOTE:** Please refer to the iLO GUI login help page for supported browser versions.
	Command Line Support	Secure Shell and serial port access Secure Socket Layer Secure Shell version 2
	Security	Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface AES encryption of video RC4 encryption of video
	Directory Support Services	Active Directory v1.0 (Windows 2003)
	Driver Support	HP ProLiant iLO 4 Management Controller Driver Package
	Management protocols supported	SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML, and HP RESTful API Interface (Redfish 1.0 Spec conformance)

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Summary of Changes

Date	Version History	Action	Description of Change:
28-Sep-2015	From Version 12 to 13	Added	HP RESTful Application Program Interface (API) section was added to Standard Features. Redfish 1.0 Spec conformance was added to the management protocols supported in Technical Specifications.
		Changed	HP RESTful API was revised in the Overview section.
03-Mar-2015	From Version 11 to 12	Changed	Overview section was revised.
10-Oct-2014	From Version 10 to 11	Changed	Overview section was revised.
09-Sep-2014	From Version 9 to 10	Changed	Changes made throughout the QuickSpecs.
18-Feb-2014	From Version 7 to 8	Changed	Changes made in Step 2.
08-Nov-2013	From Version 6 to 7	Changed	Models and HP Care Pack Services were revised.
10-Sep-2013	From Version 5 to 6	Changed	Models and HP Care Pack Services were revised.
19-Aug-2013	From Version 4 to 5	Changed	Overview: change was made in HP Embedded Remote Support (iLO4) section only.
29-Mar-2013	From Version 3 to 4	Changed	Overview: Updated Product description at the beginning of the section and updated hyperlink Models section. Standard Features: Completely updated Remote Serial Console (Virtual Serial Port) for HP ProLiant section. Additional Features: Completely updated Text Console via SSH for HP ProLiant section.
19-Feb-2013	From Version 2 to 3	Changed	Overview and Models sections completely revised. The HP Care Pack descriptions were updated in the Related Options section.
		Added	Added iLO Serial Port Record\ Playback for HP ProLiant, and Remote System logs to the Additional Options section. HP iLO 4 On System Management was added to the Technical Specifications section.
31-Aug-2012	From Version 1 to 2	Changed	Changes made throughout the QuickSpecs.