hp netserver lp 1000r/2000r remote manageability

executive summary

The soaring proliferation of remote servers deployed by service providers and data center facilities is occurring as many of these same enterprises are centralizing and consolidating their IT staff. As a result, service provider and data center IT managers are seeking better tools and techniques for remotely managing their sprawling infrastructures. At the same time, cost-conscious service providers must also confront the manageability challenges inherent in supporting internal and external service level agreements (SLAs) that guarantee specific performance criteria. Regardless of an infrastructure's size, these converging trends continue to challenge those IT professionals responsible for managing far-flung computing networks while still trying to control operational and labor costs.

HP has an established expertise in the design and integration of intelligent manageability features for its Netserver product family. This technical paper describes how HP has incorporated a suite of remote manageability features into the HP Netserver LP 1000r and LP 2000r low-profile servers in order to give service providers better control over their distributed systems.

These manageability features include three choices for remote manageability:

- Alert On LAN (AOL) and Wake-On-LAN—Provides the ability to power cycle and gracefully shut the server down over the LAN
- HP Integrated Remote Assistant (IRA)—Serial port-based remote capabilities that can be accessed through the LAN using a terminal concentrator
- Optional HP Toptools Remote Control Card (TTRCC)—Provides comprehensive LAN-based management capabilities

And additional manageability software:

- pcAnywhere
- HP Toptools
- HP OpenView Managex Event Manager

This paper also provides information that can serve as a guide for those users who must make the right technology choices in order to support infrastructure growth.

what is remote manageability?

Operating a complex and geographically dispersed data center or service provider facility around-the-clock can be a time-consuming and expensive proposition. Until recently, IT managers have had to dispatch scarce service personnel to remote locations to perform simple, and often repetitive, system management tasks. As a result, one of the key challenges for resource-strapped IT managers has been to find and implement technologies that can provide a single point of control for remotely monitoring their off-site servers. In addition, these remote manageability tools needed to initiate action if a
failure did occur. With the explosive growth of remote server deployment, data centers and service provider facilities now require the ability to remotely manage such important administration functions as power on/off cycling as well as problem resolution.
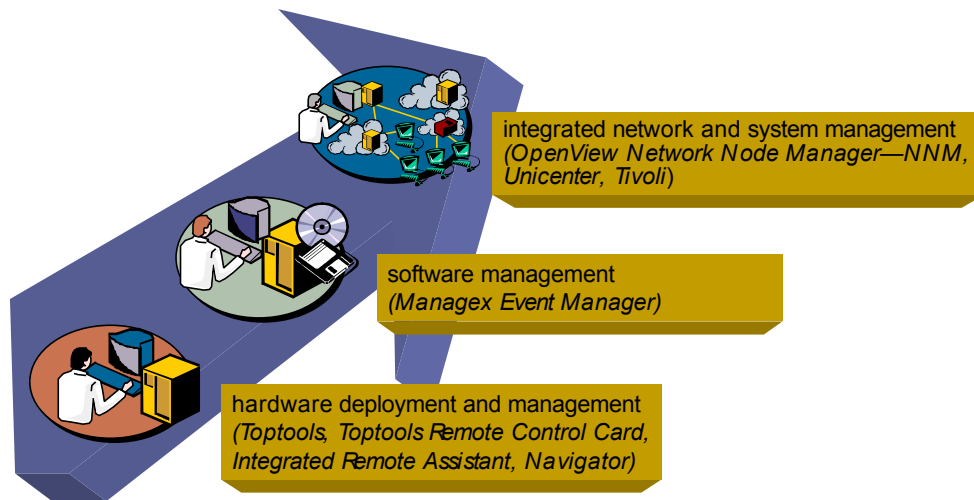
HP has a variety of solutions that address your remote management needs:

- Remote diagnostics
- Remote configuration
- Remote BIOS/firmware update
- System event log viewing
- OS/application monitoring
- Paging and e-mail notification

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managing hp netservers

integrated network and system management
*(OpenView Network Node Manager—NNM,
Unicenter, Tivoli)*

software management
(Managex Event Manager)

hardware deployment and management
*(Toptools, Toptools Remote Control Card,
Integrated Remote Assistant, Navigator)*

overall manageability picture

With its broad experience in systems management technology, HP is well positioned to help its customers remotely manage networks and system resources. As shown here, HP brings its manageability expertise to the HP Netserver family via a wide range of both software and dedicated system devices (see Appendix A for further details). This combination allows HP customers to perform remote server power on/off and power cycle functions, as well as to remotely run system diagnostics before initiating costly onsite visits.

The HP Netserver LP 1000r and LP 2000r come with standard applications and built-in hardware capabilities that allow network administrators and users to remotely diagnose problems, provide maximum recoverability, and minimize downtime. Manageability of both servers is particularly flexible because of their many embedded features.

alert on LAN and wake-on-LAN

Alert On LAN (AOL) is built into each HP Netserver LP 1000r and LP 2000r. This feature provides administrators with remote power management capabilities for powering down, power cycling, and/or resetting the HP Netserver whenever and wherever necessary. AOL also enables a user to gracefully shut down the Network Operating System (NOS) first before shutting down the server. This functionality is available for free simply by enabling it in the Netserver's Setup Utility (BIOS) feature. AOL client software is also included in the HP Netserver Navigator CD-ROM that ships with every Netserver product.

AOL works by sending a special network packet from a Windows® client to an AOL-enabled HP Netserver to perform power functions remotely. An HP Netserver can be used to perform remote power functions over the network, once a user first enables power on/off and Wake-On-LAN options on the server's LAN A port (LAN B doesn't support AOL). This is done through the server's BIOS set-up program. Once the LAN A port is enabled, the user should connect it to the network, preferably to a private network dedicated to management with limited access. The next step is to install the Netserver Agents, which include the services these servers will need to recognize AOL packets. Finally, a user would install the client software on a secure management console (a network-connected PC, running Windows). From the management console, the administrator would use a Windows program or MS-DOS® command to send AOL packets to the specified servers. These packets initiate
the specified power functions on the selected HP Netservers LP 1000r or LP 2000r.

Note: AOL must be implemented over a LAN that provides accurate security to ensure that packets do not come from unauthorized sources.

Wake-On-LAN is an open-standard technology that enables a user to remotely power on a server from a management console. Like the AOL feature, Wake-On-LAN must also be enabled through the server's BIOS set-up program.

alert on LAN and wake-on-LAN features

alert on LAN[1]	graceful (OS running)	immediate (OS hung)	system off
shutdown	yes	yes	—
reset	yes	yes	—
power cycle	yes	yes	—
power up	—	—	no

wake-on-LAN	graceful (OS running)	immediate (OS hung)	system off
power up	—	—	yes
wake up from sleep mode	—	—	yes

[1] Alert On LAN client software is included in the Navigator CD.
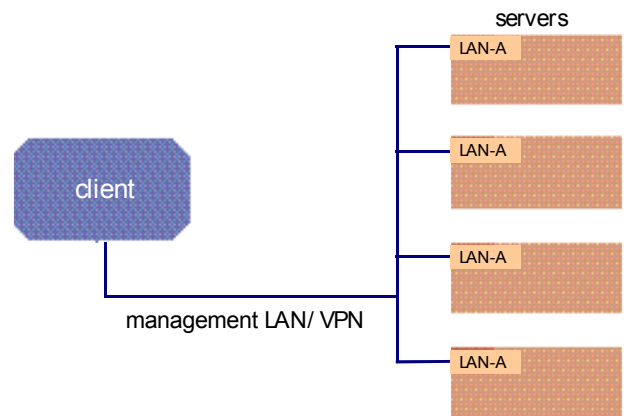
AOL/ WOL solution

Figure 1

hp integrated remote assistant

HP's Integrated Remote Assistant (IRA) provides remote access
to an HP Netserver regardless of its state, as long as standby power is available from the power supply. It can also alert users, via paging, to critical system hardware errors, as well as provide access to the Automatic Server Restart feature. In addition, IRA can reboot, power cycle, or totally shut down an HP Netserver (gracefully as well as abruptly), if necessary. The HP IRA is accessed via the server's serial/management port, which can be connected to a LAN using a terminal concentrator.
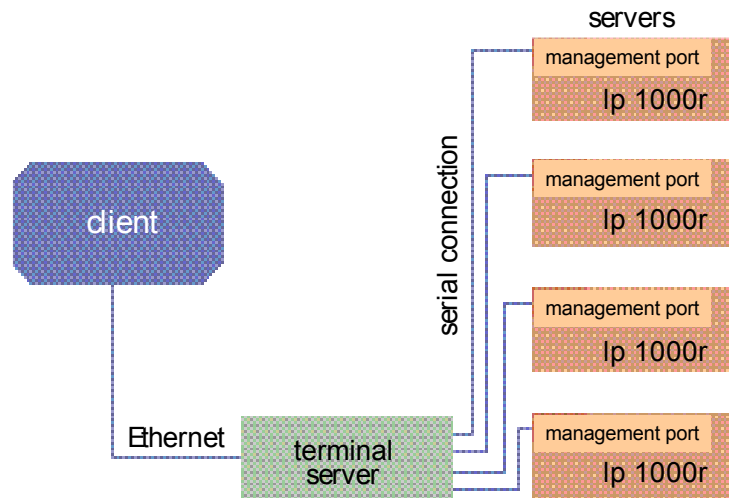
ira solution

servers

management port
lp 1000r

management port
lp 1000r

management port
lp 1000r

management port
lp 1000r

serial connection

client

Ethernet

terminal server

Figure 2

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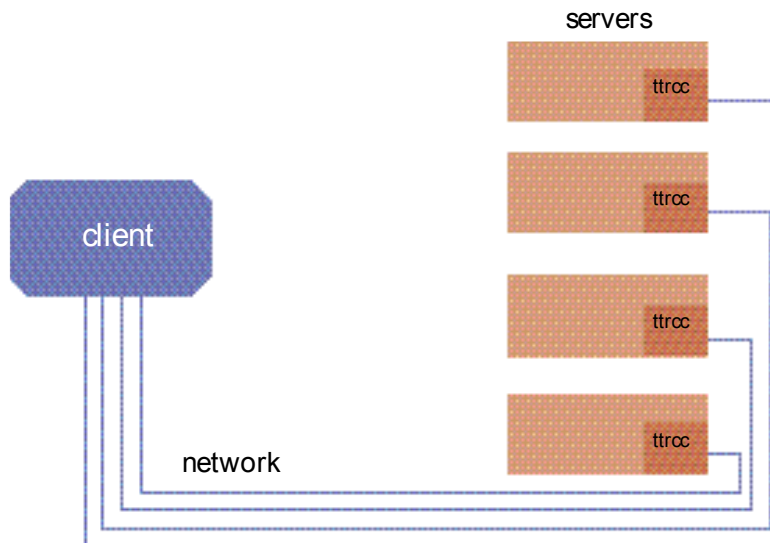lp 1000r/2000r
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hp toptools remote control card

An alternative to using the HP IRA with a terminal server is to use the HP Toptools Remote Control Card (TTRCC), which offers a battery backup and an optional external AC/DC adapter in case the server power is interrupted. The HP TTRCC has its own LAN connection for Web-based remote management and offers more comprehensive manageability.

When the HP Toptools Remote Control Card is used with HP Toptools, users can perform group actions, which allow the user to perform one action on many servers, such as updating user names and passwords on the TTRCC's Access Control list for a group of servers. The TTRCC also notifies the administrator of errors and allows the administrator to take complete remote control of the system. In addition, customers can perform updates to the BIOS and firmware and even power on or off one or several servers.

The HP Toptools Remote Control Card can be accessed by either network (browser interface) or modem (PPP over serial port), so that administrators have access from literally anywhere. Either access method is available, via its unique "Web-server-on-a-chip" design, even when the network operating system is down or the server powered off. In day-to-day administration, the TTRCC can be used to configure server hardware, as well as install new software. Security is assured with several levels of protection. Access to the card is screened and further protected by encrypted user names and passwords. The TTRCC also alerts the user to events by paging or sending e-mails.

ttrcc solution

servers

ttrcc

ttrcc

ttrcc

ttrcc

client

network

Microsoft® Windows graphical console
redirection with pcAnywhere

Figure 3

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manageability software

pcAnywhere

pcAnywhere, a client/server application licensed for use on HP Netservers, provides for both terminal emulation and text console redirection under several configurations. pcAnywhere also allows graphical console redirection in a Microsoft Windows environment. The console redirect capability allows you to view the server's screen as if you were in front of it.

In a configuration similar to that shown in Figure 1, the network interface card (NIC) provides the connection directly over the network between the server and the remote console, without the need for modems or terminal servers. This scenario can also be configured with the TTRCC, as shown in Figure 3, in which
case pcAnywhere on the client is provided by the TTRCC user interface. pcAnywhere software is distributed via the HP Netserver Navigator CD.

hp toptools

HP Toptools is a free, Web-based application for remotely managing HP devices from anywhere on the network. The browser-based HP Toptools allows users to manage computer assets, network devices, and HP printers, as well as keep track of network resources and performance. Some of the key features for HP Toptools are:

- Automatic server discovery and identification (IP, IPX)
- Support for management standards (SNMP, DMI, WMI, IPMI, HTTP)
- Automatic inventory collection and reporting
- Intelligent event logging, sorting, filtering, and actions

HP Toptools, which is part of the software provided with the HP Netserver LP 1000r and LP 2000r, consists of two components:

- HP Toptools Device Manager
- HP Toptools for Servers

HP Toptools gathers information from DMI, WMI, and SNMP agents installed on each hardware device and displays this information from within a browser. Device status can be dynamically obtained by selecting a single device or a group of devices, thus increasing the efficiency of the IT or helpdesk professionals. It makes all information from the network available via a Web browser on any connected machine with the appropriate access privileges. HP Toptools Agents feed status information to the HP Toptools management server.

To allow for easy integration with existing management solutions, HP Toptools has been integrated with HP OpenView Network Node Manager (NNM), CA Unicenter TNG, Tivoli, and Microsoft SMS. In addition, HP hardware is supported through customized open solutions such as HP OpenView Managex and NetIQ. For more information on HP Toptools, please visit the Web site at: www.hp.com/toptools.

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hp openview Managex event manager

The HP OpenView Managex Event Manager, which is a subset of the HP Managex software package, is bundled free of charge with the HP Netserver LP 1000r and LP 2000r. The HP OpenView Managex Event Manager will not only monitor and manage servers in cluster configurations but will also monitor the operating system software. And it can take corrective action as directed by predetermined criteria. For example, if an application stops running, Event Manager will alert the system administrator and, if so instructed, will automatically attempt to restart it.

The complete HP OpenView Managex package ensures the optimal availability and performance of Windows NT® and Windows 2000 environments by monitoring operating systems, applications, servers, and other devices. Managex automatically scouts out and displays server environments so users can manage multiple systems from a single console. It aggressively seeks out problems and identifies their causes. When an abnormal resource situation occurs, Managex dispatches alerts by pager, e-mail, color-coded messages, or other means. "Self-healing" software policies can even take automatic corrective action. And the Managex Web-based event browser, with its ability to publish reports to an IIS server, provides vital information anywhere that Internet access is available. For more information on both products, visit the Web site at:
www.managementsoftware.hp.com/products/managex/index.asp

conclusion

With the release of the feature-rich HP Netserver LP 1000r and LP 2000r server family, HP has further established its industry leadership for helping traffic-intensive IT organizations to realize greater competitive value from their computing technology investments. This is an important feature for those facilities where infrastructure managers must allocate scarce IT resources in order to control their ever expanding network of remote servers and other computing technologies. This versatility
reflects HP's commitment to "inventing the future" by providing a set of remote manageability tools that enable businesses to remain one step ahead on the technology curve. The result is a wealth of HP-powered server management functions that provide system administrators and users with an intelligent single point of control.

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appendix a. hp manageability features

features / hp products	hp alert on LAN and wake-on-LAN	hp toptools	hp integrated remote assistant with or without pcAnywhere	hp openview managex event manager	hp toptools remote control card
	standard	standard	standard	standard	optional
remote power management	yes		yes		yes
remote diagnostics			yes		yes
remote configuration (BIOS, NetRAID, etc.)			yes		yes
remote BIOS/firmware updates			yes		yes
system event log viewing			yes		yes
paging notification of hardware failure			yes		yes
e-mail notification of hardware failure					yes
OS/application monitoring				yes	
remote management of network devices (hubs, switches, routers, printers, etc.)		yes			
temperature and voltage monitoring		yes	yes		yes
automatic server restart		yes	yes		yes

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appendix b. glossary

- **DMI**—Desktop management interface, which is a system and network management protocol.
- **HTTP**—HyperText Transport Protocol.
- **IP**—Internet Protocol.
- **IPMI**—Intelligent platform management interface.
- **IPX**—Internetwork Packet Exchange.
- **PPP**—Point-to-point protocol, used in TCP/IP over serial.
- **SNMP**—Simple Network Management Protocol, which facilitates device management.
- **WBEM**—Web-based enterprise management, an on-going industry initiative to integrate current enterprise management technology.
- **WMI**—Windows Management Instrumentation, Microsoft's implementation of WBEM for the Windows platform.