System Management for Servers

Business Solution Brief

Today's IT environments can be very complex. End users are so dependent on their systems that they are increasingly frustrated by system outages, print problems, anything that keeps them from being productive. And they expect immediate assistance from the help desk or support center to fix a problem or even just to show them how to use an application. IT personnel are challenged to keep system availability high, and also handle end-user requests quickly and efficiently. Yet their environments are more complex today than ever with diverse manageability tools that have no common characteristics and little to no integration.

All you want is to be able to spend more time managing your business and less time managing your IT assets.

The systems management industry recognizes these challenges and is developing standards to help move toward consolidating management applications with the goal to reduce complexity. Until these standards are solidified, they actually introduce a level of confusion. Who do I align myself with? Which protocols should I implement? Which level of protocol provides me with the greatest interoperability?

The IBM PC Company's goal is to provide a systems management solution that will provide you with comprehensive control of your IBM systems in this complex environment, thereby enabling you to spend more time on your business. Our systems management strategy is threefold:

- Provide a standards-based foundation that removes the confusion and complexity as technology evolves. The foundation of this strategy is to help remove the guesswork from the industry confusion—because the foundation will be based on existing standards, and allied with other industry leaders such as Tivoli, Microsoft® and Intel® to help ensure that customers have access to the cutting edge of technology.

- Provide industry-leading control of IBM PC-based systems in heterogeneous environments. We can accomplish this by developing value-add tools that allow you unparalleled control of your IBM systems during their life cycle—from procurement through retirement or disposal. Tools targeted at helping you reduc your total cost of ownership.

- Provide seamless integration with leading enterprise and workgroup managers, for a comprehensive solution and clear, comprehensive systems management foundation that fits with your existing assets and grows with your business. Our strategy can initially support any management strategy that you choose because our foundation and value-add tools integrate with Tivoli TME 10, Microsoft System Management Server (SMS) and Intel LANDesk.®

The bottom line is the system management solution from IBM for servers allows you to run your business-critical applications with the confidence that they will be there when your end users need them. When this happens, you can spend less time running your networked systems and more time running your business, which is exactly what you want.

Today IBM has made great strides toward this systems management strategy. Netfinity Manager is central to this strategy, providing a suite of tools designed to help you reduce the total cost of owning your IBM server, desktop and mobile systems. Other products that are key to managing your IBM Netfinity and IBM PC Server systems during their life cycle are the Advanced System Management Adapter for remote monitoring and problem management, and ServerGuide to simplify installation and set up. This business solution brief will concentrate on these products, identifying how they support this overall strategy.

IBM Netfinity Manager

IBM Netfinity Manager is a powerful suite of tools and utilities designed to manage networked PC-based servers, desktop and notebook systems in the environment you currently have, including OS/2, Windows 3.1,® Windows 95,® Windows NT® and Novell® NetWare, operating on both IBM and non-IBM systems. And, because it supports industry standards, such as the Desktop Management Interface (DMI), Simple Network Management Protocol (SNMP), and the Multi-Platform Management (MPM) API, IBM Netfinity Manager can integrate with robust enterprise and workgroup management systems, such as Tivoli , Microsoft and Novell.

IBM Netfinity Manager LAN management software can help you manage your networked PCs with ease and efficiency. And, most importantly, it can help you control many of the hidden costs of operation. For example, instead of physically traveling to each LAN-connected system to perform asset management, noting serial numbers and configuration information, the Netfinity Manager auto-discovery feature lets you collect this data remotely, right from your Netfinity Manager system. You can perform capacity planning proactively, knowing in advance which systems will require additional resources, such as more memory, larger disk capacity or faster processors. Maintenance scheduling for Netfinity Manager-enabled systems can be automated as well. You can also access and take control of remote Netfinity Manager-enabled systems to identify and resolve problems.

Throughout this brief, we'll be telling you what IBM Netfinity Manager can do and how it can help network system administrators and the people they support. To help demonstrate some of the concepts, we will provide throughout the text some "real life" examples of Netfinity Manager at work. One example will show how Netfinity Manager helps a system administrator recover data from a failed hard disk drive on a server at her place of business and bring the server back online—all without leaving her home. Another will show how a help desk product expert helps a customer with a problem from a remote location. These and other examples will demonstrate the many ways IBM Netfinity Manager can be the foundation of your system management solution.

Features of IBM Netfinity Manager

- Award-winning LAN management software that can help you manage your distributed desktop, notebook and server PCs as well as professional workstations with ease and efficiency, while helping you control many of the hidden costs of operating in a networked environment.
- Netfinity Manager functions can manage systems on multiple network segments running different protocols with its pass-through management capability.

- Netfinity Manager functions can help you with capacity management, problem detection, maintenance, remote management and help desk features.
- Netfinity Manager operates in a peer-to-peer mode so your management console can run on a server, desktop or notebook system, thus minimizing the need for expensive systems management hardware.
- Netfinity Manager is a Web-enabled, cross-platform PC management solution. The Netfinity Web Manager, which can be installed as an option on any Netfinity managing system, acts as a mini-Web server so you can manage your systems from a Web browsers, accessing Netfinity Manager information and commands.
- IBM Wake on LAN adapter card together with Netfinity Manager's Event Scheduler can turn on networked computers so that Netfinity Manager can handle remote network management and asset tracking after hours and on weekends.
- Enhanced integration with workgroup and enterprise managers makes it simple to incorporate Netfinity Manager into your business's overall management strategies including Tivoli TME 10, Microsoft SMS, HP OpenView and Novell ManageWise.
- Netfinity Manager supports system administrators, both at work and at home, as well as office "road warriors." Just load Netfinity Manager on your mobile system, and manage your systems over a serial connection.
- The Advanced System Management Adapter extends Netfinity Manager remote management capabilities, adding two-way remote access that enables administrators to perform a variety of diagnostic and server management activities from across town or around the world.

Netfinity Manager internals

Netfinity Manager operates in a peer-to-peer mode that minimizes the need for expensive system management hardware. What's more, Netfinity Manager does not require a database or network operating system server to be installed on the network. All that is required is the presence of a physical network and the network protocol of your choice.

Netfinity Manager has its own interprocess communication (IPC) system that is used for communication between Netfinity Manager modules and services, locally and when operating remotely over a network. Each Netfinity Manager service has two parts: an executable for the graphical interface and an executable for the base function. Communication between the GUI and base executables is handled by the Netfinity Manager IPC. This makes it simple to run a base function either remotely or locally, using the same graphical interface on the managing system.

Client Services for Netfinity Manager

Client Services for Netfinity Manager is the base code, or agent code, that runs on the server, desktop or notebook systems you want to manage. It enables these systems to participate in Netfinity Manager configurations.

Client Services for Netfinity Manager provides the base function required for a stand-alone or LAN-connected PC to participate in Netfinity Manager systems management. Client Services for Netfinity Manager software can be configured in any of the following modes of operation:

- *Stand-alone operation* is for use on an individual system that has no network connectivity. It allows you to manage your own PC and supports IBM OS/2, Microsoft Windows 3.1x, Windows 95, Windows for Workgroups® and Windows NT environments.

- *Passive client operation* for LAN-attached systems allows Netfinity Manager to remotely access and manage servers and workstations, but does not enable local systems management tasks on the managed PC. This mode is attractive to LAN administrators who prefer to retain responsibility for all systems management. Passive operation is available for IBM OS/2,

Microsoft Windows 3.1x, Windows 95, Windows NT, Windows for Workgroups and Novell NetWare environments.

- *Active client operation* for LAN-attached systems enables the server or workstation system to perform some systems management tasks locally. It also enables the client system to be accessed and managed by Netfinity Manager software, but only to perform services authorized by the system owner. Active client operation is available in systems running IBM OS/2, Microsoft Windows 3.1x, Windows 95, Windows for Workgroups and Windows NT.

Netfinity Manager

Netfinity Manager is the management code that runs on your LAN administrators' PCs or management console. It enables them to remotely access and manage LAN-attached systems enabled with Client Services for Netfinity Manager. Netfinity Manager is installed on a LAN- or serial-attached system that will be used as a management console. Netfinity Manager enhances the local systems management capabilities to enable you to remotely access other LAN-attached systems on which Netfinity Client Services Manager is installed.

Netfinity Manager supports some of the industry's most popular LAN communication protocols, including NetBIOS, IPX, SNA (LU. 6.2) and TCP/IP. Netfinity Manager supports OS/2, Microsoft Windows 95 and Windows NT 3.51 and 4.0. Netfinity Manager can be installed with an optional Web manager that allows the systems to be managed from a Web browser.

- Multiprotocol management

The Netfinity Manager can manage multiple network segments running on different protocols by having multiple protocol stacks installed in the management console or by using the Netfinity Manager pass-through management capability.

Pass-through management is the ability of a managing system to access the functions of another managing system on a different LAN segment. The central network manager can access remotely located network managers and perform all of the required functions through the remote managers. The workload can now be split between multiple managing systems and LAN administrators, providing excellent scalability.

Let's look at a very simple example of how Netfinity Manager can help with day-to-day activities.

For example . . . Netfinity Manager supports office "road warriors"

Charles is traveling to meet with the executive board of a major customer. But when Charles arrives at his hotel the night before his presentation, he discovers that he forgot to load his presentation on his IBM ThinkPad. His only copy is back on his desktop PC.

Charles places a frantic telephone call to Jim, his system administrator. He asks, "How fast can you print another copy of the presentation and ship it to me by express mail?"

Jim tells him, "Don't worry. You carried your IBM ThinkPad with you on the plane, didn't you?" Jim knows that Client Services for Netfinity Manager is preloaded on Charles's IBM ThinkPad. Jim asks Charles to activate Netfinity Manager on his ThinkPad and plug the modem into the phone socket.

From *Remote System Manager* on his Netfinity Manager console at the office, Jim then performs a presence check to make sure Charles' office workstation is up and running, otherwise he would use Wake on LAN to start it. Using the Netfinity Manager *File Transfer*, Jim copies the file from Charles' workstation in the office to his own. Next he starts *serial control* providing the secure

password to *Security Manager* to access the laptop, and sends the file to Charles' ThinkPad through the serial link.

Charles relaxes because now his presentation can be shown with full color and graphics, for maximum impact, on his ThinkPad.

Icon	Function Description	Type
	*Remote session* provides access to a remote systems command prompt.	Manager
	System partition *access* allows you to update, back up and delete your system partition—all without using your reference diskette (available for IBM systems with built-in system partition).	Services
	Remote system manager enables you to access and control all Netfinity services installed on remote systems within your network. Systems are organized into logical system groups for simplified management. This icon is also used to represent NetFinity Service Manager.	Manager
	Serial control enables remote managers to access your system through your modem.	Services
	Web manager enables the Netfinity Web management feature and provides access security.	Services

To accomplish all of these tasks on a laptop without Netfinity Manager would require a significant investment of time and money to purchase and then integrate an array of software tools. IBM now includes Client Services for Netfinity Manager with selected ThinkPads models at no additional charge.

x Netfinity Manager Web Management

The Netfinity Manager Web Manager, which can be installed as an option on any Netfinity Manager managing system, acts as a mini-Web server. The use of Hypertext Markup Language (HTML) scripts provides a way for Web browsers to access the Netfinity Manager information and commands on the remote Netfinity Manager. A TCP/IP-based Internet or intranet link between the Web browser and the Netfinity Manager with the Web manager installed is all that is needed. Access to all other managed systems is gained in a similar way to the pass-through management described previously—through the Netfinity Manager managing system.

The Netfinity Manager Web capability now lets you manage your networked PCs from virtually any system that can run a Web browser. This lets you take advantage of existing network infrastructures and allows you to manage from the platform of your choice. You don't even need Netfinity Manager code running on your Web management console.

x IBM Capacity Management

IBM Capacity Management is a newly added service available with Netfinity Manager. Capacity Management consists of a pair of components, CMGUI and CMBASE, which are responsible for collecting server performance data and displaying this data graphically gathered over time from 30 minutes to one year. With Capacity Management, system administrators can easily determine how every server on their network is performing. Capacity Management can:

x identify potential bottlenecks before they turn into problems that cost time and money

- optimize server resource use
- provide custom graphs and reports of capacity usage data
- maximize server performance with performance guidelines
- help you plan future system upgrade requirements needed to prevent network slowdowns *before* they occur by reviewing past trends of any parameter that you choose (e.g., CPU utilization, memory, free drive space).

For example . . . Netfinity helps to optimize resources

Jane, a system administrator and Tom, an end user, are talking about Tom's need for more memory for an IBM PC Server 330 in the engineering department. Jane uses the *Capacity Management* function of Netfinity Manager to verify Tom's need. Budgets are tight, so Jane can't order additional memory immediately, so she uses the *Capacity Management* to peruse the usage trends of other IBM PC Server 330s at the site. Finding a server in another department where usage has been low for the past several months, Jane reallocates the memory to Tom and adds a capital expense note to next year's budget to upgrade Tom's memory.

Icon	Function Description	Type
	Software inventory allows you to create and manage software dictionaries, which can be used to inventory application programs.	Services
	System profile allows you to customize user and system information into an easy-to-use notebook format.	Services
	System information detects and reports detailed information on a wide variety of systems.	Services
	System monitor displays line graphs and real-time monitors for a variety of system resources, and alerts the user or network manager when user-defined thresholds are exceeded.	Services
	Desktop Management Interface (DMI) *browser* enables you to examine information about the DMI-compliant hardware and software products installed on the system or attached to it.	Services
	Capacity Management collects server performance data and displays it graphically gathered over time from 30 minutes to one year.	Manager
	Cluster Systems Management is integrated into Netfinity Manager to allow the user to view clustered resource components.	Manager

- IBM Cluster Systems Management

IBM Cluster Systems Management—a service for Microsoft Cluster Servers—is integrated into Netfinity Manager, but can also integrate smoothly with Intel LANDesk® and Microsoft System Management Server for a clear view of clustered resource components. IBM Netfinity and IBM PC Server products running Microsoft Cluster Server will provide additional features that promote ease-of-use and increased productivity, as well as event/problem notification for a clustered server configuration, all from a single console.

IBM Netfinity Cluster Systems Management allows system administrators to:

- Discover and display individual clusters, and using a GUI, set up and manage those clusters
- Schedule manual load-balancing of Microsoft Cluster Server resources
- Set up and manage alerts from one GUI

Scheduling tasks

One of the key features of IBM system management for servers is the powerful combination of Netfinity Manager *Event Scheduler* and Wake on LAN. These tools work together to help lower your computing costs by automating time-consuming, tedious tasks and by performing those tasks at a time that is the least disruptive to users. Most often, these tasks need to be done after hours or on weekends—times when computers are typically turned off or locked behind office doors. Wake on LAN turns on the networked computers so that Netfinity Manager can handle remote network management, routine maintenance tasks such as file transfer, and hardware and software inventory during these times.

Integration with other management solutions

Netfinity Manager can be used as stand-alone robust, yet cost-effective PC management solution. However, most corporate networks today are growing in size and diversity as are the number and criticality of the applications running on them. Not only are there multiple systems and protocols, but many customers implement more than one management solution. IBM Netfinity Manager provides integration with workgroup and enterprise managers so that Netfinity Manager can be incorporated into overall management strategies including Tivoli TME 10, Microsoft SMS and HP OpenView. Customers can grow naturally into an overall solution that meets their system management needs while preserving their financial and skill investments.

- Tivoli TME 10

Netfinity Manager is a *Tivoli Ready* product because it tightly integrates with Tivoli TME 10. Through TME 10 LAN Access, Netfinity Manager can participate in TME 10 Inventory, Software Distribution and Enterprise Console—without the need for a Tivoli agent on the Netfinity Manager-enabled systems. This is accomplished through the Multi-platform Manager (MPM) API, an open and published API developed by Tivoli, Intel and other major systems management providers to establish an unparalleled level of integration and interoperability between enterprise and PC management products. This solution also provides a convenient upgrade path from Netfinity Manager to Tivoli TME 10, which helps to protect your investment in systems management technologies.

- Microsoft System Management Server (SMS)

Netfinity Manager also integrates with SMS to provide consolidated operations in three areas:

1. Netfinity Manager inventory data can be integrated into the SMS database, thereby enhancing the SMS inventory functions by adding IBM-specific data to its query capability and—consolidating the SMS and Netfinity Manager inventory functions.
2. Netfinity Manager can send any alert to SMS in the form of an SNMP trap. Therefore the system administrator can be notified of potential problems from both SMS and Netfinity Manager on the SMS console.
3. Netfinity Manager can be launched for a particular system from the SMS topology map, so when an alert is received from a Netfinity Manager system on the SMS console. The administrator can drill down through the SMS topology map to the “problem” system, then launch Netfinity Manager on that system to identify and correct the problem—all from within the SMS console.

- Novell ManageWise

Because a high percentage of IBM hardware is being used in Novell NetWare networks, Netfinity Manager operates with Novell’s ManageWise. Netfinity Manager can be launched on a remote system from within the ManageWise Internet map. Netfinity Manager can also export the hardware information it collects with the system information tool and some of the system profile information to the ManageWise internal database. This allows ManageWise and Netfinity

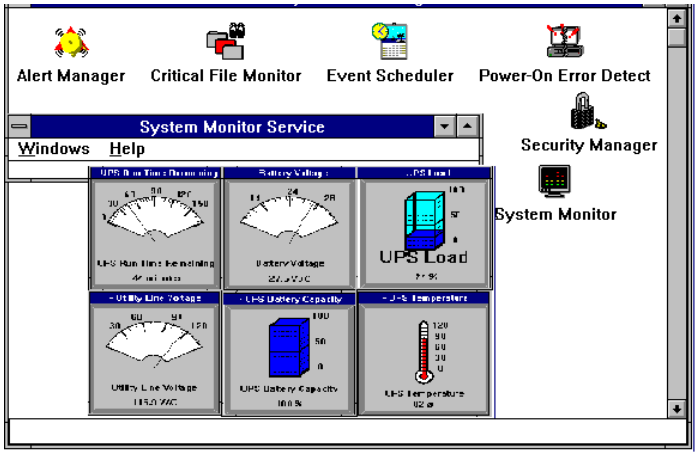
Manager users to seamlessly switch between the two applications for higher productivity and better usability.

x SNMP

Netfinity Manager now provides more extensive integration with SNMP managers. It generates unique SNMP traps for each Netfinity Manager alert and can forward these traps to any SNMP management platform such as HP OpenView or CA Unicenter. Then the SNMP manager may issue commands to any Netfinity Manager to take an action in response to these alerts through Netfinity Manager's command line interface. Netfinity Manager also ships with MIBs for monitor, inventory and alert data, which are installed on the SNMP management platform, so the SNMP manager may "get" this information whenever it needs it.

Netfinity extendability

Several third-party suppliers have integrated their products with Netfinity Manager for a more robust system management solution. American Power Conversion has developed a Netfinity Manager service to monitor their uninterruptible power supplies (UPS). This interface between Netfinity Manager and PowerChute *plus* Measure-UPS II provides easy-to-read graphical diagnostics for Humidity, Ambient Temperature, UPS Load, UPS Run Time Remaining, Utility Line Voltage, UPS Temperature, Battery Voltage and UPS Battery Capacity. Optional diagnostic outputs are accessible via System Monitor on IBM Netfinity Manager using the IBM Advanced System Management Adapter.



APC PowerChute *plus* is also shipped at no additional charge on ServerGuide with each IBM Netfinity or PC Server.

Vinca Corporation ships Netfinity Manager with its StandbyServer32 for LAN Server (monitors servers' condition and issues alerts if needed), and Lexmark uses Netfinity Manager to manage network LAN printer resources.

System Management physical features

IBM continues to enhance the systems management of our servers with physical attributes such as an array of LED status lights. These lights provided vary and are determined by the general use of each server model. The lights help provide a visual queue to the operator concerning important system activities such as: individual processor activity in multi-processor systems, integrated Ethernet activity, SCSI hard drive activity, and even an unattended status which identifies the server was powered up in an unattended mode. Couple these LED's with ease of use

features like hinged DASD cage and split covers for easy access in certain models and hot-swap DASD in others—it's easy to see that IBM is serious about all aspects of systems management.

IBM PC Server Advanced System Management Adapter

The IBM PC Server Advanced System Management Adapter complements IBM Netfinity Manager to provide the system administrator with complete remote management of a system even when the system has been turned off or when it has failed. Whether you are in the office, at home or almost anywhere else, you can now be confident that if a problem occurs with your IBM Netfinity or PC Server system, you can be made aware of it and can take action to minimize disruption of your business functions. The Advanced System Management Adapter is a full-length ISA adapter card and service processor that provides remote systems management function independent of the server status. Functions include automatic restart of the server if the server boot up fails or if the operating system is not responding anymore—*Watchdog Timer*, automatic alerting capabilities through dial-out and interoperation with Netfinity Manager, and remote access through dial-in.

You can call your server . . .

You can dial into the Advanced System Management Adapter from a remote Netfinity Manager even when the system is down to:

- View the server state of operation
- Browse and clear a log of events and errors detected by the service processor
- Monitor voltages and temperature
- Reset the system
- Control system power (turn system on or off)
- Reconfigure the adapter to alert another source for problem resolution
- View the server boot up during POST on IBM PC Server 325, 330 and IBM Netfinity 7000
- Access the server configuration utility remotely by pressing F1 during POST while using the *Remote POST Console* feature on supported servers
- Run remote diagnostics on selected IBM PC Server 325 and 330 that feature ROM-based diagnostics

Security features like password protection, user profiles (up to six profiles with the ability to define the level of access rights), log of last login time and dial-back configuration protect the server from unauthorized access.

Remote dial-in is also supported from an ANSI Terminal if you don't have Netfinity Manager for viewing the server state of operation, browse and clear the error log, resetting the server, controlling power-on and -off, and invoking the Remote POST console.

. . . and your server can call you

The IBM PC Server Advanced System Management Adapter can automatically restart the system and alert the administrator in case of problems by dialing-out to a pager or to a Netfinity Manager through the use of an external modem. Alerts or errors being forwarded include:

- A time out of the Watchdog Timer, which monitors POST completion during boot-up and operating system response during operation, will cause the Advanced System Management Adapter to automatically restart the system and alert the administrator of the problem

- Exceeded temperature or voltage thresholds, will cause the Server Advanced System Management Adapter to automatically shut the system down and alert the administrator of the problem
- Errors detected by the Advanced System Management Adapter like fan failure, power supply failure and DASD failure on IBM Netfinity 7000

The power stays on, even when the system's off

Because systems management is a full-time job, the Advanced System Management Adapter can still do its job even when you have manually switched the system off or if the system has failed. Continuous power is supplied to the adapter through a connection to the system board on IBM PC Server 325, IBM PC Server 330 and IBM Netfinity 7000. The external PC Server Advanced System Management Adapter power provides continuous power even if the system is powered off or is down due to a mechanical malfunction for PC Server 310, 315 and 704 models.

Standard on IBM Netfinity 7000

The IBM Advanced System Management Adapter is standard on the IBM Netfinity 7000 to provide you with one of the most manageable servers in the industry and is available as a very affordable option for all other IBM PC Servers.

For example . . . Sam does it all—remotely!

Sam is a systems administrator for a large corporation. He receives an alphanumeric page from a remote site "PC Server 330 in Orlando—operating system watchdog expired—system restarted." Sam ignores the page because he knows that the Advanced System Management Adapter will notify him again if the system continues to fail. A few minutes later Sam receives a second page "PC Server 330 in Orlando—POST BIOS watchdog expired—system restarted." Now he goes to his Netfinity Manager console, dials into the Advanced System Management Adapter and uses the Remote POST Console to reboot the server and view the POST sequence. He finds out that POST did not complete because it has detected a memory error that requires manual intervention to correct. So he runs remote diagnostics to determine which memory module failed and, with Remote POST, bypasses the failing module to get the system up and running with reduced memory. He then calls his support group and schedules maintenance for the server and also informs them of exactly what memory module is required to fix the server. Sam sits back and smiles: He has kept the server up and running even though temporarily in a sub-optimal state, and saved the maintenance personnel from possibly having to make several trips to diagnose the problem and have the correct part to fix the it.

Icon	Function Description	Type
	Alert manager receives and processes application-generated alerts. You can examine, edit and print reports from the alert log, and customize actions in response to received alerts.	Services
	Predictive failure analysis alerts you if one of your PFA-enabled drives is predicted to fail, letting you identify and replace that drive before it becomes a problem.	Services
	Redundant array of independent disks (RAID) manager lets you view and configure a variety of RAID disk subsystems.	Services
	Process manager enables you to view detailed information about all processes that are active on a system; you can start or stop a process and generate alerts if a process is started, stops or fails.	Manager

	Error correcting code (ECC) memory setup enables you to control ECC memory features on many IBM personal computers.	Services

Compatible with your server

The IBM PC Server Advanced System Management Adapter contains a full-length industry standard architecture (ISA) adapter. All of the adapter's features run on the IBM PC Server 330, and all features except system BIOS update are available with the IBM PC Server 325. With an optional external power source, all features—including remote power management, but excluding system BIOS update—are available for any PC server that has an extended industry-standard architecture (EISA) or ISA slot. And, the Advanced System Management Adapter is standard on the IBM Netfinity 7000 , to provide you with one of the most manageable servers in the industry.

IBM Advanced System Management Adapter Functional Overview

		PC Server							Netfinity
		310[1]	315	320[2]	325	330	520[2]	704[3]	7000
Power Brick required	(94G5571)	X	X	X			X	X	
Netfinity Manager Terminal									
Configuration information	Service processor RAM, ROM, device driver level	X	X	X	X	X	X	X	X
Configuration settings	Service processor clock	X	X	X	X	X	X	X	X
new	Dial-in settings								
	6 user profiles	X	X	X	X	X	X	X	X
new	Password	X	X	X	X	X	X	X	X
new	R/W or R/O	X	X	X	X	X	X	X	X
new	Dial-back	X	X	X	X	X	X	X	X
new	Last login	X	X	X	X	X	X	X	X
Automatic dialout settings	Dialout entry information: phone no., type, text	X	X	X	X	X	X	X	X
	Temperature	X	X	X	X	X	X	X	X
	Voltage	X	X	X	X	X	X	X	X
	Post timeout				X	X			
	Loader timeout				X	X			
	O/S timeout	X	X	X	X	X	X	X	X
	Power on/off	X	X	X	X	X	X	X	X
	Application (NF alert)	X	X	X	X	X	X	X	X
new	Power supply failure								X
new	Fan failure								X
new	Hard drive failure								X
new	non-critical Temperature								X
System power control	Power-on, off, reset	X	X	X	X	X	X	X	X
Event log	View, clear, refresh	X	X	X	X	X	X	X	X

		PC Server							Netfinity
		310[1]	315	320[2]	325	330	520[2]	704[3]	7000
Remote POST console (specific System BIOS level required) new	Remote POST console (echo keyboard/video)				X	X			X
new	Remote POST replay				X	X			X
new	Remote diagnostics (limited to specific Mdls)				PT0, PTW, PBO, RB0	PT0, PTW, PB0			
Operational parameters	View parameters:								
	Power supply voltage	X	X	X	X	X	X	X	X
	Temperature								
	Service processor	X	X	X	X	X	X	X	X
	Planar				X	X			
	CPU Area				X	X			(X)
	CPU 1				X	X			
	CPU 2				X	X			
	System state	X	X	X	X	X	X	X	X
	System power status	X	X	X	X	X	X	X	X
	Power on hours	X	X	X	X	X	X	X	X
ANSI Terminal new	View server operational parameters	X	X	X	X	X	X	X	X
new	View and clear service processor error log	X	X	X	X	X	X	X	X
new	Control server power-on and off, reset	X	X	X	X	X	X	X	X
new	Remote POST console				X	X			X

[1] all ISA models
[2] all EISA models
[3] requires PC Server System Management Cable (94G6970)

System management at work

For example . . . the help desk

Jim, a productivity tool expert at the help desk, gets a call from Susan, a new member of the graphics department. Susan is frantic because her department installed a new printer last night and she can't get it to print. She needs a copy of a financial presentation completed for the company vice president in twenty minutes. Jim tells her, "Don't worry. We've installed Netfinity on your workstation. I'll check into the problem. Just wait on the line. I'll take over control of your workstation and see if I can determine why you can't print."

Jim uses the Netfinity *Remote Workstation Control* to take over Susan's workstation. Of course, for security, Susan first grants Jim permission to control her workstation remotely. Jim learns that Susan has not installed the correct device driver for the new printer. Using *File Transfer*, Jim copies and installs the correct device driver from his workstation to Susan's system. Next Jim returns to the *Remote Workstation Control* tool to add the printer correctly to Susan's workstation. Since he has asked Susan to stay on the line, he explains to her the steps he is taking as she watches so the next time her department adds a new printer, she will be able to configure it herself. Jim then sends a sample print job to the new printer to make sure that everything is operating properly. Susan can now finish her job and be confident that she will have it printed within her deadline. And Jim feels good knowing that he has a happy customer. Another mission accomplished.

Icon	Function Description	Type
	Remote workstation control enables you to monitor or control the screen, keyboard and mouse of a remote Netfinity system.	Manager
	Power-on error detect immediately warns you when a remote system has start-up problems, letting you minimize down time.	Manager
	Critical file monitor warns you whenever it detects that critical system files have been altered or deleted.	Services
	Security manager helps prevent unauthorized access to your Netfinity services.	Services

For example . . . Netfinity saves the night

Mary, a system administrator, is asleep at home on a Friday night. She is awakened by the sound of her pager. She wonders, "Who could be calling at this time of night?" The pager shows that Netfinity Manager at the office placed the call. It issued an alert because a disk drive on the server failed. The bad news is that the office is at least a 90-minute drive from Mary's home. The good news is that Mary installed a RAID controller in the main server weeks ago. The data on the failed disk can be automatically recovered and written to a spare disk and the night shift can continue working. Mary starts up her PC at home and, with Netfinity Manager *Serial Control* dial-in support, dials her Netfinity Manager workstation back in the office. Using Netfinity Manager pass-through management capability, she accesses the *Remote System Manager* on her desktop workstation. From here, she connects to the failing server and accesses the *RAID Manager* to take the failing drive off-line and automatically rebuild the data onto a standby disk already in the server. In a matter of minutes, Mary brings the server back online. She knows the failed drive won't need to be replaced until Monday morning because the data is recovered and the network load will be light over the weekend. Best of all, thanks to her RAID-enabled server,

IBM Netfinity Manager, and the Advanced System Management Adapter she avoids a three-hour round trip and can go back to sleep.

Icon	Function Description	Type

- System management is a primary emphasis for the new IBM Netfinity 7000
- Comprehensive control—it's built into each IBM Netfinity 7000 to give you high availability to help ensure your business-critical applications are there when you need them
- The IBM Netfinity 7000 monitors its critical components and warns you when:
  - Thresholds have been exceeded
  - A component is about to fail or has failed
  - Even when a process has stopped or a critical file changed
- Its powerful alert management functions automatically take control when a warning is received to:
  - Execute a command to, for instance, restart a failed application
  - Send a page to the system administrator when there is a serious problem
  - Just log an event so you can take care of it at a convenient time
- The IBM Netfinity 7000 can even page your system administrator after it shuts itself down because its critical temperature threshold was exceeded
- IBM Netfinity 7000 remote console capabilities help your service personnel to quickly determine the source of problems. Even if the IBM Netfinity 7000 is down, you can remotely access it and view the error log or reboot it. You can even view the IBM Netfinity 7000 POST remotely and replay POST at varying speeds to pinpoint a problem. When IBM Netfinity 7000 is operational, its remote console function simplifies help desk and support functions to remotely monitor or take over its operations to determine the cause and correct problems—as if you were sitting right there.
- IBM Netfinity 7000 provides a host of other remote administration and management functions including asset management and routine maintenance tasks to keep its life cycle management costs low. Following are two of its key functions that should not be overlooked:
  - The IBM Netfinity 7000 Capacity Management functions keep statistics on component utilization trends to help you plan for upgrades and to ensure it is performing optimally
  - The IBM Netfinity 7000 provides a Cluster Management function focused exclusively on Microsoft Cluster Server to allow administrators to quickly discover and display individual clusters and to manage and setup these clusters
- With all these remote management functions, the IBM Netfinity 7000 minimizes the time and resources you normally spend on systems management, allowing you to concentrate on running your business.

	Event scheduler lets you start and stop key Netfinity services automatically on your system or on remote systems.	Manager
	System configuration manager lets you configure a single Netfinity system exactly the way you want to manage it and then copy the configuration to other systems making it easy to administer many NetFinity-enabled systems.	Manager
	File transfer enables you to easily send, receive or delete files and directories, locally and remotely.	Manager

Netfinity Manager on IBM products

Netfinity Manager is now available with IBM Netfinity and PC Server systems, client system PCs, IntelliStation professional workstations and IBM ThinkPads.

As another indication of the emphasis IBM places on system management, our IBM Netfinity and PC Server systems come with IBM ServerGuide—a CD-ROM library that includes Netfinity Manager at no additional charge—to make quick work of installing, configuring and tuning new systems. The two main components of IBM Netfinity Manager—Netfinity Services and Netfinity Manager—are easy to install with ServerGuide.

Get up and running fast

ServerGuide

IBM ServerGuide, provided with every IBM server, has been updated and expanded to address most configuration and on-site requirements during installation and system tune-up. IBM ServerGuide[4] v4.0 ships with each IBM Netfinity and PC Server system and provides easier initial setup with click-of-the-mouse access to the following built-in ease-of-use features:

- *Hardware Guide*—a bootable CD that allows customers to run hardware configuration and setup programs
- *Update Connector for Windows NT*—software that allows customers to download the latest available drivers, firmware and software over the Internet from an IBM HelpCenter server (see the *Update Connector Information Brief* for further details)
- *NOS Installation*—ServerGuide can help you install a network operating system from a retail package, with support for the latest releases of Novell IntranetWare, Microsoft Windows NT, SCO OpenServer, OS/2 WARP Server and OS/2 WARP Server SMP
- *CoPilot Application Guide*—a set of CDs for use after the network operating system is installed, which contain the following software:
  - *Lotus® Domino 4.6*, a complete solution to help make the Web work for businesses
  - *IBM Netfinity Manager v5.1*, a system management program for LAN administrators
  - *APC PowerChute plus for Netfinity Manager*, comprehensive power management
  - *IBM AntiVirus*, protects servers from more than 8,000 viruses
  - *IBM Update Connector*, a simple way to update servers running Windows NT
  - *IBM Netfinity Rack Configurator*, configures and updates IBM Netfinity Rack systems
  - *IBM Network Station Manager for Windows NT Server 4.0*, provides central client management for designated IBM Network Stations
- *Diskette Factory*—allows you to quickly create diskettes containing device drivers, configuration programs and additional utilities stored on ServerGuide CDs
- *Book Factory*—includes the following documentation to view on a display or to print (PostScript printer required):

- Hardware manuals for IBM Netfinity and IBM PC Server systems
- Integration guides for Windows NT (+) and Novell NetWare
- Documentation for IBM Netfinity Manager
- PC Server Selection Guide

Premier service and support

With its open architecture and industry-wide teaming and service emphasis, you can look to IBM as your one-stop service provider. IBM and its business partners provide a superior level of service to help ensure the best and latest information is available to you. With IBM's PC Server Start Up Support, three year on-site warranty[5] and TechConnect and ServerProven programs, the support is unsurpassed.

IBM PC Server Start Up Support

IBM continues to build on its acclaimed PC HelpCenter organization and bring many new services to its customers. IBM's Server Start Up Support provides added value with its 90-day, 24-hour toll-free access (U.S. only) to IBM technical experts who assist customers with network operating systems, configuration options, installation and setup, and diagnostic routines for IBM products as well as ServerProven accredited third-party participants. Easy-to-use electronic access to IBM experts is available by phone, fax, bulletin board, commercial on-line services and the Internet. IBM is also introducing interactive Web-based forums, monitored around the clock by IBM specialists, complementing its support on all the major Internet service providers. All IBM Netfinity and PC Server systems come with the unmatched service and support of IBM, including a three-year warranty with on-site repair. And, customers can purchase extended services at any time during their IBM hardware warranty period.

TechConnect

Through the industry-leading worldwide IBM TechConnect program, customers can become more self-sufficient by training and certifying their specialists in all facets of IBM server technology. Simply put, TechConnect is the direct connection between IBM technical resources and technical professionals working on IBM Netfinity and PC Server system LANs. IBM awards the Professional Server Specialist designation to technical professionals who successfully complete the IBM Server Technical Training Course and pass a comprehensive certification exam. The course covers the operation and support of IBM Netfinity and PC Server systems as well as other computer networking hardware and software products.

ServerProven

The IBM ServerProven program is a commitment by IBM to work with Independent Software Vendors (ISVs), leading network operating system vendors and industry-leading hardware manufacturers to provide our customers with fully integrated solutions to meet their business needs. The comprehensive testing of both the software applications with network operating systems and hardware products during the development cycle of IBM server systems can provide customers with improved performance, simplified installation and configuration guidelines to meet their business requirements. The ServerProven program provides potential benefits to all IBM Netfinity and PC Server system customers, whether small, mid-range or enterprise.

MoST Connect . . . A direct communication link to the experts

Leveraging the latest technology advancements in IBM Netfinity and PC Server systems and Netfinity Manager, IBM increases its on-site support by enhancing the Mobile Solution Terminal (MoST), carried by our server field-service representatives. The latest enhancement, MoST Connect, provides a direct communication link between the IBM field-service specialist at your location and the experts at the IBM HelpCenter. Continuing to improve on-site support, IBM delivers remote-console capability with both voice and data communications through an IBM Netfinity or PC Server system's serial port.

MoST Connect allows the HelpCenter support specialist to perform remote problem determination and launch additional resources, including product engineering if required, to solve a server

problem. MoST Connect enables the HelpCenter to assemble a pool of skills and be virtually on-site to address the most complex problems without delay.[6]

Remote Connect . . . "Call Home" remote support

IBM announces a major enhancement to its service and support for IBM Netfinity servers. Using the latest technology advances delivered by the IBM Netfinity 7000 product line, IBM offers a "Call Home" remote support feature in an Intel processor-based server. If your server experiences a problem, it will dial IBM and set in motion the right level of support to keep your system up and running. And, you can select options to have IBM contact you or your approved warranty service provider.

Using the multiple technologies in the IBM newest Netfinity server, Netfinity Manager software and the Advanced System Management Adapter, our new support capability allows us to remotely deliver hardware problem determination, launch on-site resources if needed and invoke any level of support, including product engineering, within minutes. Included in this new offering is a comprehensive problem-management system that provides tracking, management, escalation and transfer of problem ownership to the appropriate skills required to resolve an issue.[7] For additional information about "Remote Connect" visit www3.pc.ibm.com/support.

IBM system management for servers

IBM System Management for servers brings to the administrator a complete set of tools that he or she can use to address the cost of ownership through the effective management, maintenance and optimization of LAN-attached PC servers and clients. As a result, the technical and administrative support factors that contribute to most network business system failures can be anticipated, assessed and dealt with well before they can become a problem. It is widely reputed that most organizations spend as much as six times more than the purchase price of their systems in the installation and support of those systems. This is the infamous *total cost of ownership*, which is exactly the cost burden IBM System Management for servers, with IBM Netfinity Manager at its core, was designed to tackle**.** And the powerful tools we offer in this management solution gives administrators the opportunity to truly *manage* their systems.

For more information

For information via the World Wide Web	www.us.pc.ibm.com
For product and dealer location information	1 800 426-7255, ext. 4752
To access the IBM PC Company Bulletin Board	1 919 517-0001
For product information sent directly to your fax machine	1 800 IBM-3395 (1 800 426-3395)
IBM PC Product Guide Directory	FaxDoc #12745
IBM ThinkPad Information Directory	FaxDoc #11078
Wake on LAN Information Brief	FaxDoc #14941
Server Options Guide	FaxDoc #11098

[4] IBM Netfinity and PC Server systems must be equipped with at least 16MB of RAM and a CD-ROM drive to take advantage of Server-Guide features.
[5] For information regarding the terms and conditions of IBM limited warranty, please call 1 800 772-2227 in the U.S. Copies of the IBM statement of limited warranty are available upon request. Limited Warranty includes: International Warranty Service in those countries where this product is sold by IBM Business Partners (registration required).
[6] MoST Connect is not yet available in all countries. MoST Connect is offered exclusively through IBM Global Services.
[7] Remote Connect availability will be limited to IBM Netfinity 7000 servers (U.S. only) and will support selected network operating systems at announce. Remote Connect is offered exclusively through IBM Global Services.

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