IBM

IBM Netfinity System Management Processor

Systems management solution for the IT community

Executive Summary

As large enterprises continue to decentralize their IT assets but consolidate their IT skills, they need a remote software management solution along with hardware that can enable remote problem determination, diagnosis and resolution. IBM recognizes this and provides leading-edge remote management solutions through a combination of hardware instrumentation and software.

The IBM Netfinity® systems management solution represents IBM's continuing commitment to fulfill the needs of the IT community, concentrating on local and extensive remote management of your Netfinity servers. The integrated system management processor and associated system management software are standards-based tools that help you have maximum control of your servers in a distributed environment. IBM's systems management solution is an integrated solution that is designed to help you reduce the costs associated with the operation and support of your Netfinity servers by providing you with the maximum remote monitoring and management capabilities.

For system administrators, the system management processor will help them maximize the use of existing resources, reduce costs throughout the system life cycle and simplify operation in an increasingly complex environment. These remote capabilities help to dramatically reduce the amount of travel your IT experts do. It is no longer necessary to have an expert on-site every time a server fails. Many times, problems can be corrected remotely, saving you time and money. Whether you are in the office, at home, or almost anywhere, you can now be confident that if a problem occurs with your Netfinity server, you can be made aware of the problem and take immediate action to minimize disruption to your business. IBM's systems management solution will help you enhance productivity, increase system availability and reliability, and provide better support center response and assistance.

This paper addresses IBM's Remote Management solutions through the system management processor, which is integrated on the Netfinity 5500, and the IBM Advanced System Management Adapter, which is standard on some IBM servers and available as a low-cost option on others. With the IBM system management processor, IBM leverages its existing technology to provide enhanced hardware instrumentation and system manageability from the day that you purchase an IBM Netfinity server. Again, it emphasizes IBM's commitment to be the leading Intel-processor-based server and management solution of choice. This paper provides an overview of the processor and the management solutions it offers—clearly defined, industry-leading solutions for the system management challenges that administrators face today and will face in the future.

IBM's Netfinity Management Solutions Tools

IBM has listened to our customers who have distributed environments and want management solutions for their server assets even when the server is switched off or otherwise unavailable. The demands for availability and reliability, application uptime and decentralization of resources continue to increase, and IBM is dedicated to meeting those demands because we understand customers' needs to have their business applications available when they need them, 24 hours a day, 7 days a week, 365 days a year.

IBM has designed its Netfinity servers to provide management solutions through a variety of options and hardware instrumentation. From entry to high-end servers, IBM has a solution with varying degrees of manageability depending on the server. These solutions include the integrated system management processor, the Advanced System Management Adapter, IBM Netfinity Manager and the server mechanical design.

IBM System Management Processors

The IBM system management processor family is composed of two products—the Advanced System Management Adapter and the IBM Netfinity system management processor. The Advanced System Management Adapter is a full-length ISA adapter that provides remote system management function independent of the server status. This adapter is included as standard on selected mainstream and high-end servers and is available as a low-cost option for entry-level servers. The IBM Netfinity system management processor is a PCI chip that is integrated on the planar of the Netfinity 5500.

These processors also provide the system administrator with extensive remote management of your IBM Netfinity server even when the system has been switched off or when it has failed. They are integrated subsystem solutions independent of the hardware and operating system, complementing the server hardware instrumentation by monitoring, logging events, reporting on many conditions and providing full remote access independent of the server status.

Continuous power is supplied to the system management processor on the Netfinity 5500 and, on some other Netfinity models, to the IBM Advanced System Management Adapter through a system board connection to the system power supply, also referred to as *continuous power*. On models that do not support continuous power, an external power supply can be used to provide independent power to the IBM Advanced System Management Adapter. Independent power is required to allow you access to the server in the event that the system is powered off or is otherwise unavailable.

The IBM system management processor provides extensive remote management of your Netfinity servers:

You can call your server . . .
You can dial into IBM system management processors from a remote Netfinity Manager even when the system is down. This function lets you:

- View the operational state of the server

- Browse and clear a log of events and errors detected by the processor

- Monitor environmental conditions, operating system status and critical components to alert you to potential problems before they occur

- Reset the system and control system power (power system on or off)

- Reconfigure the adapter to alert another source for problem resolution

- View the server boot-up during POST to identify problems*

- Access the server configuration utility remotely by pressing F1 during POST*

- Run remote diagnostics*

- Perform remote BIOS updates of the system to maintain the system at recommended levels*

Note: * Supported on selected models; some functional limitations might apply to some entry server models.

. . . and your server can call you

The IBM system management processors 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 to take advantage of its sophisticated alert manager. Alerts or errors being forwarded include the following:

- A monitor for POST completion during boot-up and operating system response during operation that will cause the system management processors to automatically restart the system and alert the administrator of the problem

- Warnings when environmental thresholds are outside the normal range

- Critical alerts when environmental monitor thresholds are exceeded and would cause damage to the server

- Predictive failure analysis (PFA) errors on disk, memory, processors, fans and power supplies**

Note: **Limitations on some models.

The alert functions provided by the system management processors are very robust. They range from warning that an event is reaching an unacceptable level to shutting down the server before a fatal event occurs. For example, the Netfinity server will warn you that a temperature is out of a normal range, but then will shut itself down before it reaches a critical temperature that could destroy its components or your data. Non-fatal alerts are generated and logged in the system management processor event logs; non-fatal alerts can also generate pages and be forwarded to Netfinity Manager for action. Netfinity Manager's powerful and extensive alert management function can take many different actions to alert the system administrator through pop-ups, e-mail and pagers, can forward alerts to other management systems through SNMP traps, or can automatically execute a command to fix a problem without the need for human intervention.

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: "Netfinity 5500 in Orlando—operating system watchdog expired—system restarted." Sam ignores the page because he knows that the system management processor will notify him again if the system continues to fail. A few minutes later Sam receives a second page: "Netfinity 5500 in Orlando—POST BIOS watchdog expired—system restarted." Now he goes to his Netfinity Manager console, dials in to the system management processor and uses the Remote POST Console to reboot the server and view the POST sequence. He finds out that the POST was not completed because it detected a memory error that requires manual intervention to correct. So Sam 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; he also tells them 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 it.

Imagine the time and money you might save by not having to send your server expert to remote locations every time a server fails. Just utilize the remote management features of the system management processors to identify problems. If maintenance is required, simply schedule it, instead of having your server crash in the middle of a busy day.

With all these powerful remote management functions, security is essential. The system management processors include security features such as 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 to protect the server from unauthorized access.

In addition, remote dial-in is also supported from an ANSI terminal if you do not have Netfinity Manager for viewing the server state of operation, browsing and clearing the error log, resetting the server, controlling power-on and -off, and invoking the Remote POST Console.

The IBM Netfinity integrated system management processor is the latest addition to the system management processor family and provides some features that are not available on the IBM Advanced System Management Adapter. It gives you the ability to:

- Remotely flash update not only your system, but also the system management processor itself

- Define your own warning thresholds

- Create more extensive PFA alerts to include disks, ECC memory, processors, voltage regulator modules, fans and power supplies

- Access vital product data with serial numbers of key components

IBM Netfinity Manager Software

To complement the system management processor and instrumentation of the Netfinity servers, IBM Netfinity Manager software is shipped at no additional charge with every IBM Netfinity server. Netfinity Manager complements the hardware instrumentation by collecting, analyzing, storing and forwarding information from the system management features.

A graphical user interface for easy local and remote access, control over these features and the processor, as well as seamless integration into higher levels of workgroup or enterprise management tools such as Microsoft® System Management Server (SMS), Intel® LANDesk® or Tivoli™ Management Software, are just some of the advantages of IBM Netfinity Manager software.

IBM Netfinity Manager is a powerful suite of tools and utilities designed to manage networked Intel-processor-based servers, desktop and notebook systems in the environment you currently have, including Windows NT®, Microsoft Windows® 3.1, Windows 95, IBM OS/2®, Novell NetWare, Citrix WinFrame and NCD WinCenterPro operating on both IBM and non-IBM systems. And 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 LAN management software can help you manage your networked PCs with ease and efficiency. And, most important, it can help you control many of the hidden costs of operation. Concentrating on PC administration and hardware management, Netfinity Manager performs four main functions:

- Asset and capacity management– With Netfinity Manager, you can obtain comprehensive and detailed information about your system hardware and software and export this information to a variety of popular databases. In addition, the Capacity Management service collects server performance data and displays this data graphically to help system administrators easily determine how every server on their network is performing. 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.

- Problem detection and notification–Netfinity Manager has an extensive range of monitoring functions that in conjunction with the system management processor provide advanced warning of potential and critical failures. A sophisticated and powerful Alert Manager function can notify the system administrator through a variety of methods, or automatically take action in response to events.

- Help desk support–Being able to assist users with usability problems or system errors remotely can save a huge amount of time and effort in travel. In addition to the remote functions provided by the system management processor, Netfinity Manager provides a suite of tools such as remote workstation takeover and file transfer to help troubleshoot and resolve users' problems.

- Server management tools–Netfinity Manager allows network administrators to perform many routine tasks and mass configuration over a network connection or over a serial dial-in connection. Many tasks such as system backup, file updates, inventory and system reboots can be automated and scheduled outside normal working hours. Netfinity Manager also integrates valuable tools to give you remote support for some server-unique functions such as RAID and cluster management.

Netfinity Manager delivers IBM's Universal Management initiative today with:

- Multiple operating system support (Microsoft Windows 95 and Windows NT, Novell NetWare and IBM OS/2)

- Multiple network protocol support (TCP/IP, NetBIOS, IPX/SPX, SNA and serial)

- Multiple user interface options (GUI, command line and Web)

- Management from a Web browser

- Support of the Universal Management Agent

Netfinity System Design

Comprehensive control—it's built into each IBM Netfinity server. Our servers have been architected and designed to provide industry-leading manageability during the entire IT life cycle—from installation and operations to problem management. This gives you control even if your server is down or powered off. Features such as the following are designed into many Netfinity models:

- Mechanicals to allow easy access to components with a limited set of tools

- Extensive use of hot-plug and -swap components to allow replacement without taking your server offline

- LEDs and panels to provide you with at-a-glance problem identification

- Components utilizing PFAs to alert you before component failure

- Redundant components on high-availability models for greater reliability, availability and serviceability

- Room for expansion on key components like disks and memory

- ROM-based diagnostics for remote access

- Instrumented BIOS to allow for the maximum amount of system information to be provided for inventory and problem resolution

Moreover, the Netfinity 5500 uses a balanced system design so that your system is running at high performance for the environment.   With this system we also introduced an innovative light-path service panel in conjunction with component-level LEDS on the failing component within your Netfinity 5500 to make the identification and replacement of failing components a snap.

The light-path service panel directs you to the problem area, and the component-level LEDs tell you which component is the problem. This feature helps you minimize downtime and save spare parts for when you might need them.

Conclusion

The IBM Netfinity system management processor has been designed as a remote software management solution that provides remote problem diagnosis. A standards-based, leading-edge technology tool, it integrates with various system management tools to protect your IT investment while maximizing returns to your business.

Independent of the hardware and operating system in your server system, the IBM Netfinity system management processor leverages existing technology with enhanced hardware instrumentation and system manageability to help you reduce service and support costs, enhance productivity and increase system availability and reliability.

Working with the proven, reliable IBM Netfinity Manager systems management software, the processor simplifies server management for proactive control of your business systems. The processor provides the same level of control, service and support as is found in large systems to reduce downtime. It provides comprehensive local and remote control for improved responsiveness and improved availability.

The IBM Netfinity integrated system management processor is the newest addition to the Netfinity family of server products, reaffirming IBM's leadership position as the Intel-processor-based server and management solution of choice. Our commitment to Netfinity customers is also evident in the Netfinity warranty and in the range and availability of service and support programs worldwide, with 2,500 specialists in 10 call centers expertly trained and ready to help customers through the IBM HelpCenter[®].

We understand that it is vital for your servers to be available for your business-critical applications when you need them—24 hours a day, 7 days a week, 365 days a year. Our Netfinity family of products continue to help make that requirement a reality, now and in the future.

Additional Information

For more information on IBM Netfinity directions, products and services, refer to the following white papers, available from our Web site at **www.ibm.com/netfinity**.

IBM Netfinity Technology Trends and Directions
IBM Netfinity Servers and Intel Architecture
IBM Netfinity 8-Way SMP Directions
IBM Netfinity Cluster Directions
IBM Netfinity Fibre Channel Directions
IBM Netfinity Ultra2 SCSI Directions
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IBM Netfinity ServerGuide
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