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CONTENTS

Intelligent Manageability and the Desktop Management Interface

There is a great deal of customer and industry confusion regarding the Desktop Management Interface software, the PC Systems MIF, and the phrase "DMI compliant." This white paper discusses these issues and explains why management solutions today, not DMI compliance, should be the customer's and the industry's focus.

Note: This paper assumes that the reader is familiar with network management concepts, Compaq Intelligent Manageability, and the Compaq Desktop Management Solutions Partners Program.

> *Intelligent Manageability and the Compaq Desktop Management Solutions Partners Program enable customers to easily manage Compaq PCs using the customer's preferred PC LAN management products—and they can do so more confidently and cost effectively than with other PCs—and they can do this today.*

NOTICE

The information in this publication is subject to change without notice.

Intelligent Manageability and the Desktop Management Interface

First Edition (March 1995)

DESKTOP MANAGEMENT TASK FORCE

The Desktop Management Task Force (DMTF) was formed in 1992 to create standards for the management of desktop computers. The goal of the DMTF was to establish an open process for specifying methods for managing desktop hardware and software components. PC industry vendors and corporations can join the task force to guide its future direction. The current Steering Committee members include Apple, AST, Compaq, Dell, Digital Equipment, Intel, Hewlett-Packard, IBM, Microsoft, Novell, SunConnect and SynOptics.

The DMTF has defined two pieces of technology: the Desktop Management Interface software (DMI) and the Management Information Format (MIF) grammar. The DMI software is the set of application programming interfaces (APIs) that enable the management of all components in a PC (components are physical or logical entities in a PC, such as hardware, software or firmware). The MIF grammar is a language that allows component vendors (PC system manufacturers, operating system vendors, option board vendors, etc.) to create descriptions of their products so that they can be managed through the DMI software.

DMTF Infrastructure

DMI-manageable desktop PCs may contain several software components. These infrastructure components consist of management agents (called component agents), the Desktop Management Interface software (DMI), and the information that is made available through the MIF. A functional block diagram of the DMI infrastructure follows.
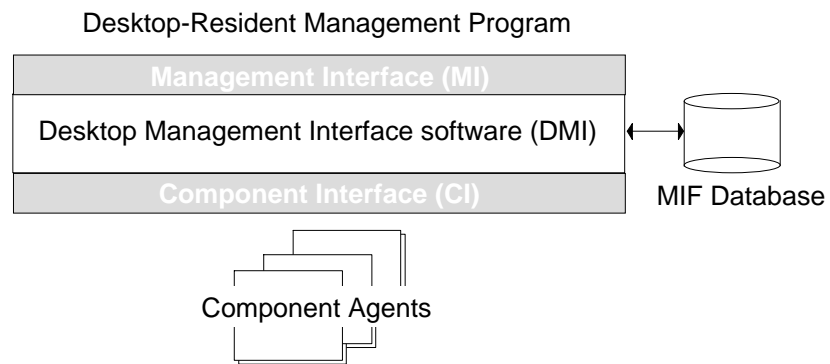

Figure 1. Functional Block Diagram of the DMI Infrastructure

Desktop Management Interface (DMI)

The DMI is a layer of *software* that serves as an intermediary between desktop-resident management programs and the manageable hardware and software desktop components. The DMI software provides two (APIs). One API (the component interface — CI) enables the manageable hardware and software desktop components to provide management information to management programs. The other API (the management interface — MI) enables desktop-resident management programs to read and write the management information. The information that is extractable from the manageable components is defined by the components' MIF file.

If provided by the vendor, component agents perform a similar task as the SNMP management agents except that they store the inventory/configuration, fault, security, and performance information in the MIF database. Component agents are required for the monitoring of dynamic information, such as sectors read from and written to a hard drive or impending and actual failure notifications. Access to purely static configuration data, such as amount of memory installed, manufacturer and model of computer, etc., can be enabled solely through static entries in the MIF file.

Management Information Format File

Conceptually, a MIF is similar to an SNMP MIB. However, a MIF can be implemented as a simple text file (for static configuration data) or implemented as a combination text file and component agents (executable software for dynamic fault and performance data). Vendors select the implementation manner that suits their engineering budget and meets their customer's needs. The MIF defines components and their associated attributes. Files that contain information structured to MIF guidelines are known as MIF files. Regardless of whether the MIF is implemented as a simple text file or as a combination text file and component agents, there are two types of MIFs:

- Standard MIFs — Standardized by the DMTF but developed by working committees of companies, these MIFs describe the static attributes of an industry-standard PC, network adapters, and printers. Leveraging our server management heritage, Compaq was the lead author of the PC Systems MIF. New working committees will be formed to develop standard MIFs for additional components such as server hardware, operating systems and application software.

- Vendor MIFs — These MIFs represent features that are unique to an individual vendor's product or product line.

When a manageable component is added to a DMI-manageable desktop PC, the component's MIF is installed into the MIF database (a set-up program provided by the component vendor makes a call to the CI API during the driver installation process). The DMI compiles the MIF file into a format that is more easily used by the DMI software to respond to requests for management information. This compiled form is stored in the MIF database.

MIF Grammar Overview

The MIF grammar is a language that allows component vendors (PC system manufacturers, operating system vendors, option board vendors, etc.) to create descriptions of their products. Components have one or more named attributes that collectively define the information available to a management application. Attributes are collected into named groups for ease of reference (logical sets of attributes). Groups may be unique or may be replicated, such as the set of attributes for each instance of a network interface table. Replicated groups are called tables, and a row (instance) of a table is referred to by a set of attributes that form a key. Within a PC, there can be many components with one or more groups. Each group has one or more attributes, and each group may be replicated as a table. Component agents present this component/group/key/attribute representation to the management application. The following table is an example of the MIF grammar for a serial number attribute:

MIF Content	Meaning
Name = "Serial Number"	A short name of the attribute being defined
ID = 4	A unique numeric identifier for this attribute
Description = "Serial number for this system"	Gives more information about the attribute being defined
Access = Read-Only	Specifies whether the attribute value can be read or written
Type = String(64)	Describes the storage and semantic characteristics of the attribute being defined (in this case, Serial Number is a string, 64 characters or shorter)
Value = "0123456789"	Provides a value or value access mechanism for the attribute. In this example, the serial number is hard coded in the MIF as "012456789"

Table 1. Serial Number Attribute Example

The Value statement is one of the most important MIF grammar statements because it defines the manner in which management information is extracted from the component. The syntax of the value statement follows:

Syntax	Meaning
Value = *v*	The value *v* is for read-only attributes that never change
Value = "*enumeration value*"	A text string that the DMI will map to an integer, similar to the "Value = *v*" syntax
Value = * "*Name*"	Indicates the symbolic name of the component agent to invoke to read or write the attribute at run time

Table 2. Value Statement Syntax

Vendors whose component (hardware or software) was not designed for manageability (in this case, not designed to provide the serial number) must use the "Value = *v*" statement. In this case, to make this information available (for example, serial number) to a management application, an end-user *must* enter the information (*v*) directly into the MIF file and reinstall the MIF. This delivers minimal customer benefits and increases the cost of ownership. *Vendors whose component was designed for manageability will use the* "Value = * "*Name*"" *statement to extract the information directly from the component, without any user-intervention and with maximum accuracy, thereby lowering the cost of ownership.*

PC Systems MIF

The goal of the PC Systems Working Committee was to define a standard set of attributes for a basic PC. The guidelines for group/attribute inclusion in the PC Systems MIF 1.0 specification was "The physical components that are needed to enclose a system and boot a system successfully." Based on this definition, the working committee defined 33 logical groups and 236 unique attributes that meet the criteria (see "Appendix - PC Systems MIF Attributes" on page 8 for the complete list).

The PC Systems MIF 1.0 specification defines the groups and attributes that *may* be maintained by a manageable PC (not *must* be maintained). Vendors delivering PCs that support the PC Systems MIF are free to support any set of the standardized groups and attributes. As a result, every industry-standard PC can be claimed to be DMI-compliant, since every PC supports some subset of the standardized PC Systems MIF groups and attributes. The DMTF has not, will not, and cannot, force vendors to support groups or attributes in standard MIFs, nor can they monitor the usage of the phrase DMI compliant.

Many of the groups and attributes can be supported by accessing industry-standard BIOS APIs, the BIOS data area, industry-standard memory and I/O ports, as well as standard operating system APIs. These attributes include, but are not limited to System Date Time, Operating System Name and Version, BIOS Manufacturer, Type of Processor, Physical Memory Location, Base Memory Size, Extended Memory Size, Parallel and Serial Port Base I/O address, Current Video Mode, Video BIOS Manufacturer, Number of Physical Cylinders, Number of Physical Sectors per Track, Number of Physical Heads, Disk Partition Name and Size and Free Space, Logical Drive Name, etc. **Therefore, the Desktop Management Solutions Partners' products can access this information from Compaq PCs today, even without the DMI.**

The PC Systems MIF 1.0 specification *does not define* how manufacturers enhance their components (for manageability) to support those groups and attributes not found by accessing industry-standard BIOS APIs, the BIOS data area, industry-standard memory and I/O ports, or operating system APIs. **The PC Systems MIF specification is not a hardware implementation specification.** Attributes defined by the PC Systems MIF, but not found in many of today's PCs include, but are not limited to System Manufacturer and Product Name, System Serial Number, Number of Expansion Slots, Number of SIMM Slots, System Asset Tag Number, System Power State, System Thermal State, Power Supply and Cooling Device Operational Status, System Board Revision Level, Monitor Manufacturer and Model Name, Monitor Serial Number, etc. The new Compaq Deskpro has been designed to provide many of these attributes. The proactive nature of Compaq's relationship with the Solutions Partners (Compaq provided them with detailed technical information for the new Deskpro) means that **the Desktop Management Solutions Partners' products can access this information from the new Deskpro today, even without the DMI.**

Remote DMI

Unlike SNMP, the DMI software was designed to be a local management infrastructure. The DMI software does not comprehend a network protocol because management programs are expected to use the MI API to obtain management information (read the PC Systems MIF). Some proponents of the technology label this protocol independence. In the short run, management tools that support the DMI software must provide the DMI software integrated with the management tool vendor's proprietary protocol to remotely (over the network) call the MI API. Those customers desiring to use more than one management tool (each with a unique protocol) would be forced to (1) sacrifice desktop PC RAM to load multiple protocols, and (2) become the integration test bed for the compatibility of multiple protocols. In the future, the DMTF should define a standard management protocol to integrate with the DMI software. This move could spur widespread adoption of the DMI software by allowing PC manufacturers to preinstall the operating system with an integrated DMI software, the remote management protocol, and component agents—in essence creating a manageable desktop PC out of the box. Until this event occurs, the DMI technology is not appropriate for widespread adoption by customers.

DMI Compliance

As mentioned earlier, the PC Systems MIF specification does not mandate which standardized groups and attributes must be supported. Also, the DMTF has not, will not, and cannot, force vendors to support groups or attributes in standard MIFs, nor can they monitor the usage of the phrase DMI compliant. Therefore, the term DMI compliant can mean any of the following:

1. The vendor is marketing an industry-standard PC. DMI compliance places no group/attribute support requirement on the claiming vendor, so all industry-standard PCs, including the original IBM PC, can be labeled DMI compliant.

2. The vendor preinstalled the DOS/Windows DMI service layer (available from the DMTF) and may have also preinstalled a basic MIF (uses "Value = *v*" statements). However, the PC hardware has not been enhanced for manageability.

3. The vendor preinstalled the DOS/Windows DMI service layer and preinstalled an "advanced" MIF (one that supports more groups/attributes than a basic MIF, but using primarily "Value = *v*" statements). However, the PC hardware has not been enhanced for manageability.

4. The vendor preinstalled the DOS/Windows DMI service layer and preinstalled an advanced MIF with component agents (adds the support for dynamic attributes, using some "Value = * "*Name*"" statements). However, the PC hardware has not been enhanced for manageability.

5. The vendor preinstalled the DOS/Windows DMI service layer and preinstalled an advanced MIF with component agents (adds the support for dynamic attributes, using primarily "Value = * "*Name*"" statements). However, the PC hardware has not been enhanced for manageability.

6. The vendor enhanced its hardware for manageability (to ease inventory, troubleshooting, and protection) and plans to support the DMI when roadblocks to the technology's deployment (see "DMTF Summary" on page 6 for list of roadblocks) have been overcome.

Compaq falls into category six. DMI compliance, in and of itself, does not enhance the manageability of the desktop PC. A broad selection of management tools, well integrated and compatible with a PC whose hardware has been enhanced for manageability, delivers customer benefits.

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DMTF Summary

The Desktop Management Task Force has made great strides to develop technology that provides a standard framework to manage desktop PCs. However, several key requirements for success still need to be met. These are as follows:

1. Broad support by operating system vendors. Without such integrated support, the management information available through the DMI software will not materially enhance the configuration, installation, or troubleshooting capabilities of desktop PCs. In addition, lack of integrated support means that the DMI software, currently implemented as a DOS Terminate and Stay Resident (TSR) program, will inefficiently use precious system memory.

2. Standardization on remote management protocol(s). While SNMP is the defacto standard network management protocol, there is room in the marketplace for a PC LAN or workgroup management standard protocol. The standardization of such a protocol would allow system vendors to provide an out-of-the-box manageable desktop PC.

3. Broad support by management tool vendors. Without broad support, DMI-enabled desktop PCs cannot be managed in the customer's preferred environment.

COMPAQ INTELLIGENT MANAGEABILITY

Intelligent Manageability is Compaq's industry-leading desktop management strategy to make networked PCs easier to manage today and tomorrow. With this strategy, Compaq is making enhancements to the basic PC hardware to ensure that the PC is easier to inventory, easier to troubleshoot, and easier to protect. The AssetControl and IntelliSafe hard drive features are examples of these innovative enhancements.

AssetControl is the design principal that guides Compaq engineers to design inventory information into PC hardware components to make these components easy to inventory. The inventory information includes manufacturer, model, serial number and revision of a PC component such as the monitor, chassis, system board, hard drive, etc. This information is available to PC LAN management products through firmware, such as the ROM BIOS, thus eliminating any possibility of incorrect data being entered by the end user.

COMPAQ DESKTOP MANAGEMENT SOLUTIONS PARTNERS PROGRAM

The program is a Compaq initiative to *proactively* ensure compatibility and integration of Intelligent Manageability with the leading vendors of PC LAN management products. This program delivers customer

benefits today since customers can easily manage Compaq PCs using the customer's preferred PC LAN management products—and they can do so more confidently and cost effectively than with other PCs.

This program delivers customer benefits in the future too, even when today's DMI technology roadblocks are overcome. The need for the leading PC manufacturer to work with the leading vendors of PC LAN management products to ensure compatibility and integration does not disappear with a mature DMI.

COMPAQ'S DMI TRANSITION PLANS

Compaq is not sitting idle during this period of confusion. Compaq will

1. Continue to enhance the Intelligent Manageability features to make Compaq PCs even easier to inventory, troubleshoot, and protect.

2. Continue to work *proactively* with the Compaq Desktop Management Solutions Partners to ensure that future generations of Intelligent Manageability are well integrated and compatible with the Partners' products.

3. Work with the DMTF to tackle the roadblocks that keep the DMI technology from evolving into a foundation on which standardized PC LAN management solutions can be deployed.

Until the roadblocks are tackled, the DMI technology is not appropriate for widespread adoption by customers. When these requirements are met, Compaq will

1. Add value to the DMI through the development of robust component agents. This ensures that Intelligent Manageability will be accessible through the DMI.

2. Continue to work *proactively* with the Desktop Management Solutions Partners to ensure that future generations of Intelligent Manageability are well integrated and compatible with the Partners' products.

APPENDIX - PC SYSTEMS MIF ATTRIBUTES

This appendix contains a brief description of all PC Systems MIF groups and attributes. For greater detail, see the "Desktop Management Task Force: PC Systems Standard MIF Definition," Release Version 1.0, (Internet address: ftp.dmtf.org).

Component ID Group
This group offers base-level identification of the component and represents the minimum amount of information that a component should provide. The attributes are Manufacturer, Product, Version, Serial Number, Installation, Verify.

General Information Group
This group defines general information about this system. The attributes are System Name, System Location, System Primary User Name, System Primary User Phone, System Bootup Time, System Date Time.

Operating System Group
This group defines general information about operating systems installed on this system. The attributes are Operating System Index, Name, Version, Primary O/S, Boot Device Storage Type, Boot Device Index, Boot Partition Index, Operating System Description.

System BIOS Group
This group defines attributes for the System BIOS only. This does not address option ROMs, or others' ROMs on ISA or EISA cards. The attributes are BIOS Index, BIOS Manufacturer, BIOS Version, BIOS ROM Size, BIOS Starting Address, BIOS Ending Address, BIOS Loader Version Number, BIOS Release Date, Primary BIOS.

System BIOS Characteristics Group
This group defines the characteristics for the System BIOS. The attributes are: BIOS Characteristic Index, BIOS Number, BIOS Characteristics, BIOS Characteristics Description.

Processor Group
This group defines attributes for the processor(s) and coprocessor(s). This group can have multiple instances (for a multiprocessor system). The attributes are Processor Index, Type of Processor, Processor Family, Version Information of Processor, Maximum Speed, Current Speed, Processor Upgrade, FRU Index, Operational Index.

System Motherboard Group
This group defines attributes for the motherboard. The attributes are Number of Expansion Slots, FRU Index, Operational Index.

Physical Memory Description Group
The physical attributes for system memory and any add-on memory installed in this system. The attributes are Physical Memory Index, Physical Memory Location, Physical Memory Starting Address, Physical Memory Ending Address, Memory Usage, Maximum Memory Capacity, Number of SIMM Slots, Number of SIMM Slots Used, Memory Speed, Memory Error Correction, FRU Index, Operational Index.

Logical Memory Description Group
This group defines the logical memory attributes for system memory and any add-on memory installed in this system. The attributes are Base Memory Size, Free Base Memory Size, Extended Memory Size, Free Extended Memory Size, Extended Memory Manager Name, Extended Memory Manager Version, Expanded Memory Size, Free Expanded Memory Size, Expanded Memory Manager Name, Expanded Memory Manager Version, Expanded Memory Page Frame Address, Expanded Memory Page Frame Size, Expanded Memory Page Size.

System Cache Group
This group defines the attributes for different System Caches installed in this system. The attributes are System Cache Index, System Cache Level, System Cache Speed, System Cache Size, System Cache Write Policy, System Cache Error Correction, FRU Index, Operational Index.

Parallel Ports Group
This group defines the attributes for parallel ports in this system. The attributes are Parallel Port Index, Base I/O address, IRQ Used, Logical Name, Connector type, Connector Pinout, DMA Support, Parallel Port Capabilities, Operational Index.

Serial Ports Group
This group defines the attributes for serial ports in this system. The attributes are Serial Port Index, Serial Base I/O address, IRQ Used, Logical Name, Connector type, Maximum Speed, Serial Port Capabilities, Operational Index.

IRQ Resources Group
This groups defines attributes for IRQs in this system. The attributes are IRQ Number, IRQ Availability, IRQ Trigger Type, IRQ Shareable, IRQ Description, MA Resources, DMA Number, DMA Channel Availability, DMA Burst Mode Supported, DMA Description.

Memory Mapped I/O Group
This group defines attributes for all different regions of system memory mapped I/O. This group defines various attributes for the various DMA channels in this system. The attributes are Memory Mapped I/O Starting Address, Memory Mapped I/O Ending Address, Memory Mapped I/O Description.

System Enclosure Group
This group defines the mechanical characteristics of certain components of a personal computer. The attributes are Enclosure or Chassis Type, System Asset Tag Number, Chassis Lock Present, Bootup State, Power State, Thermal State, FRU Index, Operational Index.

Power Supply Group
This group defines various attributes for power supplies in this system. The attributes are Power Supply Index, FRU Index, Operational Index.

Cooling Device Group
This group defines attributes for installed cooling devices in this system. The attributes are Cooling devices index, FRU Index, Operational Index.

System Slots Group
This group defines the attributes for the different system expansion slots supported in this system. The attributes are Slot Index, Slot Type, Slot Width, Current Usage, Slot Description.

Video Group
This group defines the attributes of video devices in this system. The attributes are Video Index, Video Type, Current Video Mode, Minimum Refresh Rate, Maximum Refresh Rate, Video Memory Type, Video Memory Size, Scan Mode, Video Physical Location, Current Vertical Resolution, Current Horizontal Resolution, Current Number of bits per pixel, Current Number of Rows, Current Number of Columns, Current Refresh rate, FRU Index, Operational Index.

Video BIOS Group
This group defines the attributes for the Video BIOS. The attributes are Video BIOS Index, Video BIOS Manufacturer, Video BIOS Version, Video BIOS Release Date, Video BIOS Shadowing State.

Video BIOS Characteristics Group
This group defines the characteristics for the Video BIOS. The attributes are Video BIOS Characteristic Index, Video BIOS Number, Video BIOS Characteristics, Video BIOS Characteristics Description.

Disks Group
This group defines the physical attributes of disk mass storage devices in this system. The attributes are Storage Type, Disk Index, Storage Interface Type, Interface Description, Media Loaded, Removable Drive, Removable Media, Device ID, Logical Unit Number, Number of Physical Cylinders, Number of Physical Sectors per Track, Number of Physical Heads, Physical Cylinder for Write Precompensation, Physical Cylinder for Landing Zone, Sector Size, Total Physical Size, Number of Current Bad Blocks or Sectors, Partitions, Disk Physical Location, FRU Index, Operational Index.

Disk Mapping Table Group
A table relating disks to partitions. May have an instance of a disk or partition more than once. The attributes are Storage Type, Disk Index, Partition Index.

Partition Group
This group describes the partitions on particular disks. The attributes are Partition Index, Partition Name, Partition Size, Free Space, Partition Label, File System, Compressed, Encrypted, Number of Disks.

Disk Controller Group
This group defines the disk controller in this system. The attributes are Disk Controller Index, FRU Index, Operational Index.

Logical Drives Group
This group defines the logical drives in this system. The attributes are Logical Drive Index, Logical Drive Name, Logical Drive Type, Logical Drive Size, Free Logical Drive Size, Logical Drive Path.

Mouse Group
This group defines the mouse in this system. The attributes are Mouse Interface, Mouse IRQ, Mouse Buttons, Mouse Port Name, Mouse Driver Name, Mouse Driver Version, FRU Index, Operational Index. These attributes are *not* commonly embedded into PC hardware.

Keyboard Group
This group defines the keyboard in this system. The attributes are Keyboard Layout, Keyboard Type, Keyboard Connector Type, FRU Index, Operational Index.

Field Replaceable Unit Group
A Field Replaceable Unit (FRU), is defined as a hardware component that is designed to be separately removable for replacement or repair. A motherboard and a fixed hard disk are FRUs, whereas a fixed hard disk platter or a chip fixed in place on the motherboard are not FRUs since they are not designed to be separately removable. Each instance within the FRU table should contain the device group and instance data for the associated hardware component. The attributes are FRU Index, Device Group Index, Description, Manufacturer, Model, Part Number, Serial Number, Revision Level, Warranty Start Date, Warranty Duration, Support Phone Number.

Operational State Group
This group provides the operational state, usage, and availability status, and administrative state indicators for specific Device Group instances. The attributes are Operational State Instance Index, Device Group Index, Operational Status, Usage State, Availability Status, Administrative State, Fatal Error Count, Major Error Count, Warning Error Count.

System Resources Description Group
This group, used in conjunction with the System Resources Group, describes the system hardware resources which are commonly used in PCs. This group describes the number of entries in the System Resources Group, which is organized as a table. The attributes are Device Count, System Resource Count.

System Resources Group
This group describes the system hardware resources that are commonly used in PCs. This group is organized as a table where each entry contains a different type of resource. This group contains a core set of attributes which are common to Plug and Play resources. The attributes are Resource Instance, Resource Parent Group Index, Resource Type, Resource Base, Resource Size, Resource Flags, Group ID.

QUESTIONS AND ANSWERS

Management

Q1.   What is Intelligent Manageability?

A1.   Intelligent Manageability is Compaq's industry-leading desktop management strategy to make networked PCs *easier to manage today and tomorrow*. With this strategy Compaq is making enhancements to the basic PC hardware to ensure that the PC is easier to inventory, easier to troubleshoot, and easier to protect. These hardware enhancements are then complemented by a wide range of PC LAN management software, integrated and compatible with Intelligent Manageability, to ensure that customers can easily manage Compaq PCs using the customer's preferred PC LAN management products—and they can do so more confidently and cost effectively than with other PCs.

Q2.   What is the Compaq Desktop Management Solutions Partners Program?

A.   Compaq's reputation is built upon compatibility and quality. The Compaq Desktop Management Solutions Partners Program moves those elements of our success into the management domain. The program is a Compaq initiative to *proactively* ensure compatibility and integration of Intelligent Manageability with the leading vendors of PC LAN management products. Now, the benefits of Compaq's Intelligent Manageability are accessible to our entire customer base. The broad vendor support ensures that our customers can easily manage Compaq PCs using the customer's preferred PC LAN management products—and they can do so more confidently and cost effectively than with other PCs.

Q3.   What vendors are participating in the Compaq Desktop Management Solutions Partners Program?

A3.   Currently, the participating vendors are Cheyenne Software Inc., Frye Computer Systems Inc., Intel Corp., McAfee Associates Inc., Microsoft Corp., Network Computing Inc., Novell Inc., Saber Software Corp., Symantec Corp., and Tally Systems Corp. These vendors products are integrated and compatible with Intelligent Manageability.

Q4.   Why is the Compaq Desktop Management Solutions Partners Program necessary?

A4.   There is a lot of confusion in the marketplace today. Too many management technologies are vying for the customer's mindshare (for example, SNMP, DMI, Plug and Play, Windows Registry, etc.). Unfortunately, too few PC LAN management products that are well integrated with PC hardware are available today. Rather than market immature technologies that do not provide any useful benefits at this time, Compaq has chosen to work proactively with PC LAN management vendors to provide customers with viable *solutions today*. The Compaq Desktop Management Solutions Partners Program lets customers focus on using their networks to solve business problems, thereby reaping the benefits of lower cost of ownership with these well-integrated products. The program is also likely to make it unnecessary for customers to change the tools they're using today since many currently shipping products have been integrated into our plan. Without the program, customers would be spending the majority of their time making technology decisions.

Desktop Management Task Force

Q5.   What is Compaq's position on the DMTF?

A5.   Compaq, as a DMTF Steering Committee member, fully supports the DMTF's efforts to create standards for the management of networked PCs. However, Compaq believes that the Desktop Management Interface software (DMI)—the technology defined by the DMTF—is an emerging technology, not yet included as a standard feature in today's desktop PC operating systems nor network operating systems. Therefore, the Partners Program is a pragmatic step that allows our customers to deploy well-integrated solutions without the need to worry about technology decisions.

The Desktop Management Task Force has made great strides to develop technology that provides a standard framework to manage desktop PCs. However, several key requirements for success still need to be met. These include broad support by operating system vendors, standardization on a remote management protocol, and broad support by management tool providers. Until these events occur, the DMI technology is not appropriate for widespread adoption by customers.

However, when these requirements are met, Compaq will add value to the DMI and continue to work with the members of the Compaq Desktop Management Solutions Partners Program to ensure tight integration and compatibility of Intelligent Manageability with these vendors' products.

Q6. **What is Compaq's role in the DMTF?**

A6. Compaq is a DMTF Steering Committee member, as well as a member of the PC Systems and Server working committees. Compaq led the authoring of the standard PC Systems MIF that describes basic industry-standard desktop computers and intends to do likewise in the Server working committee.

Q7. **Will there be a material change to PC LAN management products after those products support the DMI?**

A7. No. The feature set provided by our Solutions Partners' products will not change because of the DMI. Instead, the DMI provides an alternate manner to extract information from PCs. Nonetheless, our Solutions Partners are constantly striving to enhance their product to meet customer's needs.