CABLETRON systems

Software
Product
Information

PRODUCT NAME: clearVISN MultiChassis Manager
Version 6.3 - Windows Suite

9033099
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Description

clearVISN MultiChassis Manager is a network management application that has been designed to manage the DIGITAL DEChub 90, DIGITAL MultiSwitch 900 (formerly called DEChub 900), DIGITAL MultiSwitch 600, DIGITAL MultiStack System, and GIGAswitch product families. You can install the application on one of the following platforms:

- Microsoft® Windows 95®, Windows 98®

- Windows NT™ on an Intel® PC

- Windows NT v4.0 on a Digital Alpha PC

You can register with Computer Associates Unicenter TNG, Tivoli™ TME™ 10 NetView, or Cabletron Spectrum if you install the software on the same Windows NT platform.

MultiChassis Manager Version 6.3, is a flexible Simple Network Management Protocol (SNMP) tool that runs on Microsoft operating systems. The graphical user interface (GUI) allows you to configure DIGITAL MultiSwitch 900s, DIGITAL MultiSwitch 600s, and GIGAswitches; and to examine the status and activity of modules in these product families. To aid in understanding MultiChassis Manager, context-sensitive help can be displayed for every screen.

The Consolidated Firmware kit, Version 5.0.10, is required for MultiChassis Manager to operate properly with DIGITAL MultiSwitch hubs and modules. This kit is included with MultiChassis Manager on the clearVISN CD-ROM.

MultiChassis Manager supports:

- All DEChub 90, and DIGITAL MultiSwitch 900 modules, as detailed in this document

- DIGITAL MultiSwitch 600 and DIGITAL MultiStack System

- GIGAswitch/FDDI

- GIGAswitch/ATM

For the exact list of supported devices go to the Supported Devices section of this document.

Using MultiChassis Manager

You can invoke MultiChassis Manager from a network map in Cabletron SPECTRUM, Tivoli TME 10 Netview, Computer Associates Unicenter TNG, or from the Start button in Windows 95, Windows 98, and NT when used standalone. The initial window displays the front panel view of the selected device, stack, or chassis.

The front panel view reveals the hub, GIGAswitch, DIGITAL MultiSwitch 600, or DIGITAL MultiStack System configuration. MultiChassis Manager incorporates both physical and logical views. The physical view depicts a representation of the hub's physical appearance. The logical view provides the same technical data, but uses a standard module template with labels and icons to distinguish module types. Modules in a DIGITAL MultiSwitch 600 or in a DIGITAL MultiStack System are displayed with relative slot numbers; however, distance between DIGITAL MultiStack System 90 modules is not represented. Both views provide access to hub module management windows and options. Only the physical view is available for GIGAswitches.

To access module management windows, you double click on a module in the Front Panel window. Both the physical and logical views have "hot spots," such as the port connectors. When you click on hot spots, another window opens containing information and controls that are specific to that module or port.

Supported Devices

MultiChassis Manager uses SNMP to manage the DIGITAL MultiSwitch 900, DEChub 90, DEChub ONE, DIGITAL MultiSwitch 600, DIGITAL MultiStack system, and GIGAswitch products. These products include:

DECrepeater	90C, 90T, 90T+, 90FA, 90T-16, 90FL, 90FS, 90TS, 900GM, 900TM, 900FP, 900FL, 900TL, 900SL
PORTswitch	900CP, 900FP, 900TP, 900TP/12
DECserver	90L, 90L+, 90TL, 90M, 900TM, 900GM
DECbridge	90, 90FL, 900MX
DECswitch	900EE, 900EF, 900FO

DECbrouter	90T1, 90T2, 90T2A
DECconcentrator	900MX, 900TH, 900FH
RouteAbout	AccessTW, Access EI, Access EW, Central EW, Central EI, Central EP
VNswitch	900EA, 900EE, 900EF, 900EX, 900XX, 900LL, 900FF, 900FX
ATMswitch	900F, 900T
RoamAbout Access Point	
GIGAswitch/ATM	5-slot and 14-slot
GIGAswitch/FDDI	
GIGAswitch/2000	
PEswitch	900TX
DECmau	900TH, 900TL
DIGITAL MultiSwitch	900
DIGITAL MultiSwitch	612EX
MultiSwitch Hub	624T and 612TX
DECagent 90	

An SNMP agent is an entity in a hardware device that executes SNMP requests. The following hardware devices contain integral SNMP agents and can be managed directly by MultiChassis Manager:

DECrepeater:	90FS, 90TS, 900GM, 900TM, 900FP
PORTswitch:	900CP, 900FP, 900TP, 900TP/12
DECserver:	90TL, 90M, 900GM, 900TM
DECbridge:	900MX
DECswitch:	900EE, 900EF, 900FO
DECbrouter:	90T1, 90T2, 90T2A
DECconcentrator:	900MX, 900TH, 900FH
RouteAbout:	AccessTW, Access EI, Access EW, Central EW, Central EI, Central EP
VNswitch:	900EA, 900EE, 900EF, 900EX, 900XX, 900LL, 900FF, 900FX
ATMswitch	900F, 900T
RoamAbout Access Point	
GIGAswitch/ATM	5-slot and 14-slot
GIGAswitch/FDDI	

GIGAswtich/2000

PEswitch   900TX

DECmau   900TH

DIGITAL MultiSwitch   900

DECagent 90

MultiSwitch 600 Stack Director

MultiChassis Manager manages SNMP agents that are identified in the MultiChassis Manager agents file. The deletion and modification of SNMP agents and communities is accomplished in the Database Manager.

Database Manager

The Database Manager allows network managers to maintain a collection of data about manageable devices on the network. The data stored in the database is shared among Windows Suite applications.

The Database Manager application performs the following operations:

- **Add** lets you enter data about a new network device.

- **Modify** lets you modify data in the database for an existing device.

- **Delete** lets you delete an entry previously added to the database.

- **Discover** uses SNMP to obtain data directly from the device. For example, you can add a Hub Manager or Stack Director address, and Discover displays all of the devices that are in each slot or position in the stack. For this operation to work, the device must be network accessible. Discover is also useful for learning data about non-chassis network devices, such as the system object identifier.

The results of the add and discover are displayed as a hierarchical tree in the left view with detailed data about the selected device in the right view.

DIGITAL MultiStack System Management

Management of a DIGITAL MultiStack System requires a bus master services module in slot 15 of the stack. Using bus master services, slot information can be displayed through MultiChassis Manager. A bus master services module can be a DECagent 90 with V3.0 or later firmware, or a DECrepeater 90TS or 90FS running V2.0 or later firmware. The DECrepeater 90TS or 90FS can manage any DECrepeater 90 module in the stack, while a DECagent 90 is required to manage DECbridge 90s or 90FLs or DECserver 90Ls and 90L+s. Devices with their own IP address, such as the DECbrouter 90, can be managed directly from MultiChassis Manager; the bus master module provides only the slot information for the device's position in the stack.

To manage a DECrepeater 90TS or 90FS in a stack using its full Management Information Base (MIB), the module must have its own IP address. Only partial MIB support is available when the module is proxied by a bus master module.

DEChub 90 Management

Management of a DEChub 90 requires a bus master services module in the DEChub 90. Using bus master services, DEChub 90 slot information can be displayed through MultiChassis Manager. A bus master services module can be a DECagent 90, a DECbridge 90 or 90FL, or a DECrepeater 90TS or 90FS. DECbridge 90s and 90FLs are no longer being updated as bus master devices; therefore, it is recommended that DECbridge 90s or 90FLs be used only as bus master devices in hubs that contain older modules such as DECrepeaters 90C, 90T, 90T+, 90FA, 90FL and DECservers 90L, 90L+. The DECagent 90, V3.x, can manage 1 to 16 communities, consisting of not more than 48 modules.

One of the 16 communities always contains the DECagent 90. A community can consist of an 8-16 slot DEChub 90 configuration, a DIGITAL MultiStack System of up to 16 devices, or a standalone DECserver 90L, 90L+, DECbridge 90, or 90FL.

MultiChassis Manager manages the DECbrouter 90 and RouteAbout Access routers by displaying a Module Summary screen and giving you the ability to create a Telnet session to the device. MultiChassis Manager also supplements DECserver 90 SNMP management with Telnet access for the DECservers that support Telnet. These include the DECserver 90TL and the DECserver 90M.

DIGITAL MultiSwitch 600 Management

MultiChassis Manager can manage a stack of DIGITAL MultiSwitch 600 family devices including the Hub 624T, 612TX, and the Switch 612EX products. The device on the bottom of the stack must be powered by a DIGITAL MultiSwitch 600 Stack Director that provides an SNMP agent for the stack. The Stack Director 10Base2 (ThinWire) connector must have a terminator attached. The devices in the stack are displayed in MultiChassis Manager in the order that they appear in the stack. DIGITAL MultiSwitch 600 devices can also be managed in a DEChub 900 with certain differences as described in the DIGITAL MultiSwitch 600 product documentation. You can click on a module to see summary information for that module. As for the DEChub and GIGAswitch products, you can also click on an individual port to see port detail.

Like the DIGITAL MultiSwitch 900, the DIGITAL MultiSwitch 600 supports multiple internal LANs. To create and control these LANs, you select View/LAN Interconnect on the menu bar. The DIGITAL MultiSwitch Hub 624T allows ports, in groups of 12, to be attached to any one of seven internal LANs. Each port of the MultiSwitch 612EX can also be connected internally to any one of the seven LANs, adhering to the "high/low" port definitions in the module.

DIGITAL MultiSwitch 900 Management

Management of the DIGITAL MultiSwitch 900 and 900-4 requires an IP services module to be installed and identified in the DIGITAL MultiSwitch 900. Multiple IP services modules can be configured using the Hub Manager (DIGITAL MultiSwitch 900 integral SNMP agent).

Modules that currently provide IP services are as follows:

DECrepeater:	90FS, 90TS, 900GM, 900TM, 900FP
PORTswitch:	900CP, 900FP, 900TP, 900TP/12
DECbridge	900MX
DECswitch:	900EE, 900EF, 900FO
DECconcentrator:	900MX, 900TH, 900FH
VNswitch:	900EA, 900EE, 900EF, 900EX, 900XX, 900LL, 900FF, 900FX
PEswitch	900TX
RouteAbout Central	900EW, 900EI, 900EP
RouteAbout Access	90EW, 90EI, 90FP

You can manage DECrepeater 90, 90C, 90T, 90T+, 90T-16, 90FA, and 90FL modules either 90 style or 900 style when installed in a DIGITAL MultiSwitch 900. Use 900-style management unless you do not have a module that provides IP services. The 90-style management emulates a DEChub 90 and requires a DECagent 90 in the DIGITAL MultiSwitch 900. The 900-style management uses the Internet Engineering Task Force (IETF) repeater MIB and the DIGITAL MultiSwitch 900 Hub Manager, which requires an IP services module. MultiChassis Manager screens supporting the IETF-compliant MIBs are displayed, but the non-applicable functions for the particular DEChub 90 repeater module are disabled. No additional management features are available for the DEChub 90 repeater modules when managed 900 style.

DEChub ONE and standalone management are limited to those products with integral SNMP management agents; and to the DECbridge 90, 90FL and DECserver 90L, 90L+, providing there is a DECagent 90 on the same LAN.

The following modules are displayed with a front bezel only. No module management is available for these products:

DECwanrouter	90, 90EW
MUXserver 90	
DECpacketprobe	90, 900RR

MultiChassis Manager manages the RouteAbout routers by displaying a Module Summary screen and giving you the ability to create a Telnet session to the device. For DECswitch modules with routing software and RouteAbout Central modules, the backplane connections can be made in the LAN Interconnect window. MultiChassis Manager also supplements DECserver 900 SNMP management with Telnet access.

The Module Summary and associated detail level screens provide full management of modules. In general, DIGITAL MultiSwitch module management incorporates a Module Summary screen, and one or more detail level screens. The Summary screen displays administrative information and summary operational status of the module. You can enter some customized descriptive information, such as location. Some modules display summary operations data, such as traffic summary data. To access detail level screens, double click on the appropriate port or button. Full graphical management of the DIGITAL MultiSwitch 900 is also available through its out-of-band port.

The out-of-band management port on the DIGITAL MultiSwitch 900 requires SNMP to run over a SLIP connection. MultiChassis Manager can communicate out-of-band through a serial port on the MultiChassis Manager management system. Alternatively, a SLIP connection can be established by connecting an access server that supports SLIP, such as the DECserver 900TM, to the DIGITAL MultiSwitch 900. A SLIP connection from the access server port to the out-of-band port on the DIGITAL MultiSwitch 900 provides the necessary communications path.

The DIGITAL MultiSwitch 900 Hub Manager restricts communities to the local DIGITAL MultiSwitch 900 backplane. A single hub can have 1-9 communities. Each slot uses the Hub Manager's community name followed by the slot number.

The DIGITAL MultiSwitch 900 has multiple flexible channels that can be used to create independent LAN segments. MultiChassis Manager allows you to create and delete the LAN segments from the LAN Interconnect window. When you create LAN segments, you use a menu to assign a name and technology type. MultiChassis Manager supports the creation and deletion of additional Ethernet, Token Ring, and FDDI LAN segments. MultiChassis Manager supports up to 12 Ethernet segments on the backplane, and differentiates the six segments supported by all modules and the additional six supported by the VNswitch products. The three 400 Mbps VNbuses connecting VNswitch modules can also be created, after which VNswitch modules can be connected to them. MultiChassis Manager also supports the creation of up to four ATM channels on the backplane for connecting VNswitch 900EA modules to an ATMswitch 900 module.

Each port on a PORTswitch 900TP, 900FP, or 900CP can be assigned to any of six Ethernet LAN segments, while each port of a PortSwitch 900TP/12 can be assigned to any of 12 LANS. This feature provides software LAN configuration at the repeater port level.

Modules or ports can be connected to different LAN segments by dragging (using the mouse) the desired connection to the appropriate LAN segment. Safeguards are implemented to prevent inappropriate LAN connections. Modules with the capability to connect to more than four LANs (for example, VNswitches, DECswitches, and PORTswitches) have an associated LAN Interconnect Expanded View screen to display and connect all ports. The Station Configuration view can configure ports between the front panel and the DEChub backplane. The grouping view is used with the DECrepeater 900FP and PORTswitches to group ports onto different LANs.

Find Address and Find Duplicate Addresses are functions that search across all agents defined in the MultiChassis Manager agents file for stations connected to a managed Ethernet repeater. MultiChassis Manager interrogates hubs and standalone repeaters for the last source address seen on each port, in addition to looking in the address database table for each module.

DECrepeaters and PORTswitches implementing port level security functions are as follows:

DECrepeater	900TM, 900GM, 90TS, 90FS, 900FP
PORTswitch	900TP, 900CP, 900FP

On the PORTswitch 900FP, 900CP, and 900TP, MAC addresses of devices attached to ports are learned and can be entered into the authorized stations list.

VNswitch 900, DECbridge 900MX, DECswitch 900, and PEswitch 900TX MAC address and protocol filtering and forwarding management are performed on detail views available from the Bridge Summary screen. MultiChassis Manager also supports the Remote Monitoring (RMON) MIB Statistics and History groups on these modules. Two new views will run on the DECswitch and PEswitch modules, as well as on a DECpacketprobe 90. The Statistics view will display data from up to six ports at a time. The data can also be placed in a file for printing. The History view displays a single port's short- or long-term history.

MultiChassis Manager contains several screens for managing the VNswitch products. Most of these are extensions of DECswitch 900 management functions, but there are new screens, such as the Virtual Secure Domain (VSD) configuration screen. This provides a check box matrix of ports and VSDs. A check at the intersection of a port and a VSD name/number causes that port to be placed in that VSD. New screens also exist for setting up protocol filters and address filters on VNswitch devices.

FDDI configuration with MultiChassis Manager consists of the ability to manage the DECconcentrator 900MX, 900TH, 900FH and the FDDI port of the DECswitch 900EF, DECswitch 900FO, PEswitch 900TX, and VNswitch 900EF. FDDI management functions include FDDI ligo (FDDI building blocks as implemented by MultiChassis Manager) management, FDDI ring and tree network management on the DIGITAL MultiSwitch 900 backplane, and FDDI port assignment and operational management.

Token Ring management is available in the DIGITAL MultiSwitch 900 with a DECmau 900TH as the Token Ring management agent. In addition to the management of the following Token Ring devices, Token Ring network mapping and beaconing management features have been implemented. A ring map listing of connected lobes can be created. In the event of a beaconing condition, the offending port is isolated and partitioned. The DECmau 900TH has an integral SNMP agent. The module can be managed as a stackable standalone device.

The module also provides proxy management for the following devices, when all devices are installed in the same DIGITAL MultiSwitch 900:

- DECmau 900TL
- DECrepeater 900TL
- DECrepeater 900SL
- DECrepeater 900FL

GIGAswitch/FDDI

MultiChassis Manager manages the GIGAswitch/FDDI in a similar manner to DIGITAL MultiSwitch. From the community table, you select a GIGAswitch/FDDI agent to display the front panel. Note that there is only a physical front panel view for the GIGAswitch/FDDI. Multiple screens allow you to manage the switch. In addition to the summary front panel and new system summary views, detail screens let you manage line cards, MAC information, and port details.

Other screens enable filtering and management of line card and bridge functions. Using a MIB Browser, setting filters can be a complex and time-consuming task. Support for 1024 Source and Destination Address Filters is included. MultiChassis Manager simplifies many tasks through its special GUI. MultiChassis Manager supports configuration of FDDI port types and GIGAswitch/ FDDI Hunt Groups, including a new Hunt Group Summary View. The Hunt Group Summary View allows you to create Hunt Groups and to view their membership and status. Other GIGAswitch/FDDI features supported include setting up logical bridges in separate spanning tree learning domains, static load balancing, configuration of an AGL-2+ modules SONET links, and a utilization display of all ports.

The Switch Summary shows Hunt Group Ports and allows you to enter the Port Details View for those ports, which show further details on the Hunt Group port. Note that In Frames, Out Frames, and Filtered % Frames on the Switch Summary View are not supported for Hunt Groups. The GIGAswitch/FDDI Filter View allows you to view and create filters, which include Hunt Groups. This view has support for both Front Panel Port and Sequential numbering schemes.

Another GIGAswitch/FDDI Configuration View supports Unicast and Multicast Rate Limiting. In addition, it allows other bridging parameters, such as Bridge Hello Time, Bridge Max Age, Bridge Forward Delay, No Frame Interval, Aging Time, and Short Aging Time, to be set. This view is reachable via the Configuration Icon on the Switch Summary View.

The GIGAswitch/FDDI Line card Summary View includes M-Port Enable which allows you to set ports to be M-Ports. This view also allows you to set Full-Duplex Enable for a port, which enables FDDI Full Duplex Technology mode on point-to-point links between two cooperating GIGAswitch / FDDI systems.

MultiChassis Manager provides a GIGAswitch/FDDI Performance View that graphically displays port/switch utilization. This view is meant as a tool for gathering a rough approximation of bytes-in and bytes-out on a per-port basis. The view supports a snapshot and running average mode.

The Switched IP configuration screen allows you to configure IP Switching on the GIGAswitch/ FDDI. You can enable and disable IP Switching and define which ports are to be primary or dynamic ports. In addition, you can specify up to 127 IP Address ranges and how the 36 physical and 28 logical ports operate for each of these ranges. Possible states are static, dynamic, both, or none.

GIGAswitch/ATM

For the GIGAswitch/ATM, MultiChassis Manager displays a front panel view showing the line cards and their slot positions. You can click on a module to display the Switch Summary window. For each port on the switch, MultiChassis Manager displays the port status and allows you to enable or disable the port. The neighbor ID and port utilization are also shown. From the Switch Summary window, you can open a Telnet session with the GIGAswitch/ATM or display a PVC (Permanent Virtual Circuit) Summary window. The total PVC count is shown, and you can choose to list all of the PVCs, or just point-to-point or point-to-multipoint PVCs. For each PVC in the list, the virtual circuit status, port, virtual path identifier, and virtual channel identifier appear. You can also create, delete, and modify PVCs. You can view graphs of the busiest ports, the ports with the highest rate of errors, and the ports that are most congested, in the Traffic Summary View.

In the case of the busiest ports, the "Most Traffic" graph can be sorted by several different criteria, including incoming traffic, outgoing traffic, and the sum of both incoming and outgoing traffic, among others. MultiChassis Manager adds a screen for configuring and controlling the status of a virtual channel connection (VCC).

clearVISN Flash Loader

clearVISN Flash Loader can be run from MultiChassis Manager or directly from the Windows interface. Flash Loader is a utility with a graphical interface for upgrading device firmware over the network. Flash Loader provides for loading SNMP agents information from the clearVISN database, as well as a provision for manually specifying agents. Flash Loader retrieves the current firmware revision from a device and shows how it compares to the most recent firmware revision from the Consolidated Firmware kit.

You can choose to update devices one at a time or in batch mode using an edited list of devices. A log file indicating success or failure is kept for reference. Flash Loader uses the trivial file transfer protocol (TFTP) application to download devices. Flash Loader supports the devices in the Consolidated Firmware kit.

RMON Manager

The Remote Network Monitoring (RMON) feature incorporated into many of Cabletron's network management devices distributes network monitoring functions down through your network. RMON frees up both management station processing power and network bandwidth and improves the overall efficiency of your Local Area Network (LAN) or Wide Area Network (WAN). As part of MultiChassis Manager, the RMON utility allows you to configure and control these powerful capabilities, and to access the network data collected by the RMON device.

The RMON utility supports all ten RMON 1 MIB groups. The Statistics List window provides a list of all statistics screens available on the device. Click on the entry you want to highlight, then click on View. The Ethernet Statistics window is displayed. The RMON History List provides historical views of network segment performance by collecting snapshots of network statistics at user-defined intervals. These snapshots are then stored in separate history tables and can be displayed either numerically or in a user-defined graph for easy trend analysis.

The RMON Manager utility provides two means for configuring RMON alarms. Using the Basic Alarms window, you can define both rising and falling alarm thresholds for up to three pre-selected MIB-II variables per interface. Based on the options you select, the application automatically creates the necessary events (to log alarm occurrences, generate a trap, or both). Using the Advanced Alarms feature, you can define custom alarms for almost any MIB-II or RMON object as long as it is present in the device firmware and its value is defined as an integer (including counters, timeticks, and gauges). All aspects of these alarms are user-selectable thresholds and can be established on either the absolute or delta value for a variable. Events can be configured to create a log, generate a trap, or both. The Advanced Alarms feature also allows you to configure any events you want to use in conjunction with the Packet Capture function.

The RMON Host group provides a detailed host table that includes the MAC address of each host or node on the selected network segment including host traffic statistics. This table can be sorted in ascending address order or in the order that each address was discovered on the network segment. The MAC address of each host can be displayed with vendor names inserted or in literal hexadecimal format. The HostTopN function allows you to prepare reports that arrange a network's hosts (or a user-defined subset of those hosts) in order of a user-selected statistical variable. Using this function, you can discover which hosts are generating the most traffic, which are receiving the most traffic, which are generating the largest number of errors, and so forth. The statistical variables that are available for sorting are the same as those listed in the host table.

The RMON Filter and Packet Capture groups allow you to configure your RMON device so that it acts like a simple network analyzer on its network segment. Although they are defined separately, the Filter and Packet Capture groups work closely with both one another and with the Events group. The Filter group allows you to define which packets you want to capture, while the Packet Capture group performs the capturing and storage functions. The Events group allows you to start and/or stop a filter based on specific network conditions, while a successful packet capture can trigger its own event.

Hardware Requirements

- Intel Pentium 200MHz or higher performance IBM®-compatible PC

- Color monitor with a minimum 800 x 600 resolution. 1024 x 768 is recommended

- Minimum 64 MB RAM

- CD-ROM drive

- Minimum 100 MB of disk space

- Mouse or other pointing device supported by Windows

- 32-bit Ethernet Network Interface Card (NIC)

The following Alpha processors running Windows NT 4.0 are supported using FX!32:

AlphaStation	200, 250
AlphaServer	400, 1000, 2000, 2100
DECpc AXP 150	
DEC 2000 Server	

Other Hardware Required

- *For DEChub 90 and DIGITAL MultiStack System:* DECagent 90 or other bus master and proxy agent

- *For DIGITAL MultiSwitch 600:* MultiSwitch 600 Stack Director

- *For DIGITAL MultiSwitch 900*: One or more IP services modules

This list comprises the requirements for running the Windows Suite of applications standalone. The requirements may be greater if you are running the Windows Suite with other network applications. Refer to your documentation for the hardware requirements of those applications.

Software Requirements

One of the following operating systems:

- Microsoft Windows 95, Windows 98, or Windows NTV4.0 - Intel

- Windows NT 4.0-Alpha (with FX!32 translator)

Consolidated Firmware

Firmware in supported devices must be at the latest revision levels. Although the Consolidated Firmware Kit for the DIGITAL devices is included on the clearVISN CD-ROM, it can also be obtained through the Cabletron Web Page at the following address:

http://www.cabletron.com/dnpg/dr/hubs/firmware/

Optional Software

Other Cabletron applications include:

- Stack Manager
- Recovery Manager
- VLAN Manager
- Fault Policy Manager
- Traffic Policy Manager
- RMON Manager

Growth Considerations

The minimum hardware and software requirements for any future version of this product may be different from the requirements for the current version.

Distribution Media

CD-ROM

Ordering Information

Note: The clearVISN CD-ROM contains all the applications and documentation. You need to order only one copy of QA-5FVAB-X8. You must purchase additional QM licenses for each user of the application.

MultiChassis Manager license only:	QM-MQDAA-BA
MultiChassis Manager upgrade license:	QM-MQDAA-BB
CD-ROM and documentation:	QA-5FVAB-X8

Software Product Services

Provided by Compaq Computer Corporation, and available through Compaq:

New Version License Service:	QT-MQDAA-TA
Media and Documentation Delivery Service:	QT-5FVAB-E8
Installation:	QT-MQDAA-I9
Telephone Support:	QT-MQDAA-ZA

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You may print the electronic software documentation accompanying the software as reasonably necessary to exercise your license to use the software.

Year 2000 Information

For Year 2000 information, refer to the Cabletron web page:

http://www.cabletron.com/year-2000

Software Warranty

Warranty for this software product is provided by Compaq with the purchase of a license for the product as defined in the license agreement.

The previous information is valid at the time of release. Contact your local Cabletron office for the most up-to-date information.

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