HUBwatch

Use

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This manual explains how to use the HUBwatch network management software.

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Preface

Introduction   This book tells you how to use HUBwatch™ network management software. You use this software to manage:

- A DEChub™ 90 and its network modules.

- A DEChub 900 MultiSwitch and its network modules.

- Individual standalone modules (like the DECrepeater 90FS and 90TS).

- Standalone modules installed in a DEChub ONE.

- A GIGAswitch™.

Intended Audience   This book is intended for network managers using HUBwatch software to manage the GIGAswitch, the DEChub 90, DEChub 900 MultiSwitch, and any configured network modules.

You should have a basic understanding of the OpenVMS™ VAX or DEC OSF/1 operating systems and Motif™ Windows. It would also be helpful if you know how to use an editor like EDT or EMACS (for OpenVMS) or vi and xedit (for DEC OSF/1).

What Is in This Book   This book contains conceptual information you need to use HUBwatch. It also tells you how to use the HUBwatch Graphical User Interface (GUI). Additionally, this book gives you an overview of some management tasks and describes the windows you use to do them. This book does not contain the step-by-step procedural instructions you need to do a particular task. You can find those instructions in the HUBwatch online help. This book and the online help complement each other and provide all the information you need to use HUBwatch.

Structure of This Book

This book is structured as follows:

- Part I contains information that applies to hubs and modules as well as to GIGAswitch

  - Chapter 1 introduces HUBwatch software and describes its features.

  - Chapter 2 describes in-band and out-of-band management.

  - Chapter 3 describes how HUBwatch uses Simple Network Management Protocol (SNMP). It tells you how communities are used and managed in configurations with multiple hubs and SNMP agents. This chapter also describes the tasks associated with managing SNMP agents.

  - Chapter 4 tells you how to use traps. It also explains how to run the poller and view the alarm message log file. This feature is currently available only in the OpenVMS release of HUBwatch software.

  - Chapter 5 describes how to start the HUBwatch software.

- Part II contains information that applies only to hubs and modules.

  - Chapter 6 provides an overview of the interconnect functionality and presents some typical LAN segment configurations available when using the DEChub 900 MultiSwitch.

  - Chapter 7 describes how to use the HUBwatch GUI for hubs and network modules.

  - Chapter 8 describes the tasks associated with managing hubs and modules.

- Part III contains information that applies only to GIGAswitch.

  - Chapter 9 describes how to use the HUBwatch GUI for GIGAswitch.

  - Chapter 10 describes the tasks associated with managing a GIGAswitch.

- Appendix A provides troubleshooting information in the form of possible solutions to potential problems.

- Appendix B contains example figures of the summary windows you use to manage hubs and their modules.

- A Glossary provides definitions of HUBwatch terms.

Conventions   The following conventions are used in this manual:

Convention	Meaning
Special type	Indicates a literal example of system output or user input.
lowercase italics	Indicate a variable.
Monospaced type	Indicates the names of commands, utilities, files, directories, node names, and specific terms to be defined.
[ ]	Brackets contain default responses to the installation procedure prompts. To accept the default response to a prompt, simply press Return.
Return	Indicates that you press the Return key.
Click *button*	Indicates that you use the mouse to point to the HUBwatch window button named in the box and click MB1. MB1 is to be used to perform all clicking functions unless MB2 is specified.
Ctrl/*x*	Indicates that you press the Control key while you type the key denoted by *x*.
Ethernet	The term *Ethernet* is used in this manual to refer to the IEEE 802.3 standard.
Token Ring	The term *Token Ring* is used in this manual to refer to the IEEE 802.5 standard.
HUBwatch	The term *HUBwatch* is used in this manual to refer to the HUBwatch software.
Hub Manager	The term *Hub Manager* is used in this manual to refer to the DEChub 900MS Manager.
00.00.00.00	Represents an Internet Protocol (IP) address in examples and figures.
08-00-2B-00-00-00	Represents a Media Access Control (MAC) address in examples and figures.

Firmware Updates

Because Digital continuously improves the quality of DEChub products, periodic releases of firmware will become available. To ensure that you have the latest functionality and quality of firmware, always use the most current versions of firmware.

You can get information about the latest firmware releases from your local Digital Reseller or your local Digital Sales Office. You can also get this information by reading the `README.txt` file found in the `/pub/DEC/hub900` directory at `ftp.digital.com`.

Firmware updates are customer installable. To register for automatic notification of new firmware releases, return the Business Reply Card supplied with this product. Or, you can use the Internet by sending your Name, Title, and Mailing Address to `dechub_notice@lkg.dec.com`.

Documentation Comments

If you have comments or suggestions for this book or any of the HUBwatch documents, you can submit them in two ways:

- Mail the Reader's Comment form on the last page of this document to the address on the reverse side of the form.

- If you have access to the Internet, you may mail your comments electronically to the HUBwatch writing group within Digital at `doc_quality@lkg.mts.dec.com`.

Part I

HUBwatch Concepts

Part I describes HUBwatch, its management methods, SNMP
features, and HUBwatch startup. This information is common to
all devices managed with HUBwatch.

1
HUBwatch Introduction

What Is HUBwatch?

Introduction   HUBwatch software is a flexible, network management
application with a GUI. It manages network modules installed in
a hub as well as the hub itself. HUBwatch also manages other
network devices like GIGAswitch.

To communicate management commands to the network
modules, HUBwatch sends Simple Network Management
Protocol (SNMP) commands to SNMP management agents on
the network modules or on the hub itself.

Definitions   A **hub** is a central device, usually in a star topology local
area network (LAN), in which network modules are installed.
When you install Digital's network modules in a DEChub 90 or
DEChub 900 MultiSwitch chassis, the chassis becomes a hub.

A **network module** is a hardware device that occupies a slot
in the hub. It provides network infrastructure services by
connecting other devices like terminals, workstations, and host
systems to the hub. A network module may include front panel
status, diagnostic LEDs, connections to the hub, a serial service
port, and a MAC interface.

A **GIGAswitch** is an intelligent multiport FDDI bridge that
forwards packets among a set of connected data links.

Who Uses HUBwatch?

Network managers responsible for maintaining a hub and its installed modules use the HUBwatch product. Additionally, the graphic presentation of SNMP information and the extensive online information allow nontechnical personnel to use the product.

What You Can Do with HUBwatch

You use HUBwatch software to:

- View the status and activity of the network modules and ports.

- Configure LANs internal to the hub.

- Monitor the flow and accuracy of network data.

- Configure network modules.

HUBwatch Software Environment

The current releases of the HUBwatch network management application run on the MS–DOS® operating system in an MS-Windows environment and on the OSF/1® and OpenVMS ™ VAX ™ operating systems in a Motif® windows environment. A separate *HUBwatch Use* manual is available for the MS-Windows version.

The HUBwatch functionality described in this manual assumes that you have installed the latest versions of DEChub and module firmware.

Related Manuals

The following related information may be useful.

For Information About...	See...
HUBwatch software	*HUBwatch Installation and Configuration* manual.
	HUBwatch Tutorial.
HUBwatch's use of SNMP	Chapter 3 of this book.

How You Use HUBwatch

Introduction   You can configure HUBwatch software to run as a standalone
application on a network management station or as an add-on
application to the POLYCENTER network management software.

**Using
HUBwatch**   This is the way you use HUBwatch software to manage network
modules.

Step	Action	Result
1	Run the application.	The software displays the Hub Front Panel window. This window shows you the hub configuration and status of each module and module port.
2	Select pulldown menu options.	Provides access to non-module hub windows and value-added applications.
3	Select modules or module ports.	A summary window for the selected module or module port appears.
4	Select icons on the summary window.	The software displays module management windows. These windows let you manage the selected object.

Related Information

The following information may be useful.

For Information About...	See...
Configuring the HUBwatch application	*HUBwatch Installation and Configuration* manual.
Starting the HUBwatch software	Chapter 5 of this book.
Using the GUI for hubs and modules	Chapter 7 of this book.
Managing hubs and network modules	Chapter 8 of this book.
Using the GUI for GIGAswitch	Chapter 9of this book.
Managing a GIGAswitch	Chapter 10 of this book.

Firmware Revision Levels

New Firmware   Because Digital continuously improves the quality of DEChub products, periodic releases of firmware will become available. To ensure that you have the latest functionality and quality of firmware, always use the most current versions of firmware.

FTP Location   You can get information about the latest firmware releases from your local Digital Reseller or your local Digital Sales Office. You can also get this Information by reading the `README` file found in the `/pub/DEC/hub900` **directory** at `ftp.digital.com`.

How to Register Firmware updates are customer installable. To register for automatic notification of new firmware releases, return the Business Reply Card supplied with this product. Or, you can use the Internet by sending your Name, Title, and Mailing Address to `dechub_notice@lkg.dec.com`.

Products That HUBwatch Manages

Introduction

The HUBwatch software can manage:

- Network modules installed in a DEChub 90 or in a DEChub 900 MultiSwitch (MS) chassis.

- Standalone modules without a docking station.

- Standalone modules installed in a DEChub ONE product.

- A GIGAswitch

DEChub 90 Description

The DEChub 90 hub provides mounting, power, and ThinWire ™ Ethernet connections for up to eight network modules, plus the power supply. The chassis provides all the power and signals to each module through a DIN-style connector. You can install and remove network modules with the power on (a procedure called "hot-swapping"). This feature allows for updates, modifications, or replacement of modules without interrupting the use of other modules in the hub.

DEChub 900 MultiSwitch Description

The DEChub 900 MultiSwitch hub complements Digital's DEChub ONE family of products. It uses advanced hub technology to provide complete backward compatibility with the DEChub 90 network modules.

The DEChub 900 MultiSwitch, referred to as the DEChub 900MS, with either 90- or 900-series modules installed, becomes an integral part of any distribution subsystem within a structured wiring environment. It is a higher density hub that is capable of supporting multiple network technologies. It has a flexible channel architecture that can be extended to support Ethernet, Token Ring, and Fiber Distributed Data Interface (FDDI) technologies, as well as high-speed emerging technologies such as Asynchronous Transfer Mode (ATM).

GIGAswitch Description

The GIGAswitch is an intelligent FDDI bridge consisting of a 14-slot passive backplane mounted in a 19-inch rack-mountable cabinet. The GIGAswitch currently supports up to 22 ports, each of which can form connections independently and forward data at speeds of 290,000 packets per second. This allows for total throughput of up to 3.4 Gbit/sec and 6.25 million dynamic connections per second.

The GIGAswitch conforms to ISO/ANSI FDDI and IEEE 802.1 Bridging standards, enabling it to be used in any FDDI environment. It supports up to 11 FDDI line cards and is designed to support seamless integration of future line cards, such as T3/E3 and ATM. Conformance to SNMP standards allows the switch to be managed by any SNMP-compliant network management station.

Supported Modules List

HUBwatch software manages the following network modules:

- DECagent ™ 90
- Brouter modules
  - DECbrouter 90T1
  - DECbrouter 90T2
  - DECbrouter 90T2A
- Bridge modules
  - DECbridge ™ 90
  - DECbridge 90FL
  - DECbridge 900MX
- Switch modules
  - DECswitch 900EE
  - DECswitch 900EF
  - PEswitch 900TX
- RoamAbout Access Point module
- GIGAswitch
- DECconcentrator 900MX

- Repeater modules
  - DECrepeater ™ 90C
  - DECrepeater 90FA
  - DECrepeater 90FL
  - DECrepeater 90FS
  - DECrepeater 90T
  - DECrepeater 90T+
  - DECrepeater 90TS
  - DECrepeater 900TM
  - DECrepeater 900GM
  - DECrepeater 900FP
- Terminal server modules
  - DECserver ™ 90L
  - DECserver 90L+
  - DECserver 90M
  - DECserver 90TL
  - DECserver 900TM

More Modules   You can also use HUBwatch to display the DECmau 900TL, DECrepeater 900SL and 900TL, DECpacketprobe, and WANrouter 90 modules. HUBwatch recognizes and displays these modules in the Hub Front Panel window, but it does not allow you to manage them.

Related Information   For more complete product information about the DECagent 90, the DEChub 900, the GIGAswitch, or the network modules, see the online Help topic for that device. The following related information also may be useful.

For Information About...	See...
DEChub Firmware Updates	`/pub/DEC/hub900/README` at `ftp.digital.com`
DECagent 90	*DECagent 90 User's Information*
Hub Manager	*DEChub 900 Owner's Manual* *DEChub 900 MultiSwitch Owner's Manual*
GIGAswitch	*GIGAswitch User's Manual*
DECbridges	*DECbridge 90 Owner's Manual* *DECbridge 90FL Owner's Manual* *DECbridge 900MX Owner's Manual*
DECswitches	*DECswitch 900EE Installation* *PEswitch 900TX Installation* *RoamAbout Access Point Installation*
DECrepeaters	*DECrepeater 90C Owner's Manual* *DECrepeater 90T Owner's Manual* *DECrepeater 90TS Installation and Configuration Guide* *DECrepeater 90FA Owner's Manual* *DECrepeater 90FS Installation and Configuration Guide* *DECrepeater 90FL Owner's Manual* *DECrepeater 900FP Installation and Configuration Guide* *DECrepeater 900GM Installation and Configuration Guide* *DECrepeater 900TM Installation and Configuration Guide*
DECservers	*DECserver 90L+ Owner's Manual* *DECserver 90L Owner's Manual* *DECserver 90TL and 90M Owner's Manual* *DECserver 900TM Owner's Manual*
DEC WANrouters	*DEC WANrouter 90/150/250 Management*
Miscellaneous	*OPEN DECconnect Applications Guide* *DECconnect System Planning and Configuration Guide*

2
Management Methods

Types of Management Methods

Introduction

You can use the same graphic user interface to manage network modules both in-band and out-of-band.

Definitions

The **DECagent 90** is a 90-series network management agent. The DECagent 90 is a self-contained module. It uses a Motorola ™ 68000 CPU and has two ports: a ThinWire port for 10Base2 networks and an asynchronous RS-232 standard port.

The **Hub Manager** is a microprocessor-based controller used to monitor, configure, and control the DEChub 900MS (MultiSwitch). It is built into the DEChub 900MS backplane.

In-band management is the normal network-based method of accessing the hub. Access is available over a LAN or WAN.

Out-of-band management (OBM) is typically used for hub management when the network is not available. This method allows local or remote access to the hub using Serial Line IP (SLIP) through a terminal server port or direct connection to the OBM port on a DECagent 90 V2.0 module or DEChub 900MS.

SLIP is the Serial Line Internet Protocol, used for transmitting IP packets across serial lines.

In-Band Management

Introduction   You can manage both 90-series and 900-series modules in-band
running in the DEChub 900 MultiSwitch. You generally perform
in-band management with the HUBwatch network management
application; however, you can manage the DEChub 90 and
900 MS and their modules in-band with any other network
management system that supports native SNMP.

Management   There are three methods for managing network modules in-band:
Options

* **Using the in-band address of a DEChub 900MS
  Manager**

  This is the preferred method for managing a DEChub 900MS
  that contains either 90-series network modules or 900-series
  network modules. This method requires the presence of an
  IP services module like the DECrepeater 900TM. There are
  several 90-series modules that you cannot manage this way,
  including the DECbridge 90 and 90FL, the DECserver 90L
  and 90L+, and the DECwanrouter 90.

* **Using the in-band address of a DECagent 90**

  This is the preferred method for managing a DEChub 90 and
  its modules. It is the required method if you want to manage
  a DEChub 900MS populated with 90-series modules and you
  do not have an IP services module.

* **Using the in-band address of a standalone module**

  Some modules are standalone: that is, they have their
  own built-in SNMP agents. You can manage these modules
  directly by supplying the IP address of that agent.

The differences in management methods are reflected in the
HUBwatch windows you see and in the MIB objects that you can
access.

Using IP Addresses

DEChub 900MS Manager IP Address

The DEChub 900MS Manager does not have an in-band connection for communicating with a network management system. Instead, you use a network module that supports IP Services, such as the DECrepeater 900TM, as the primary path for in-band management. To do this, install a module that provides IP services into a slot of the DEChub 900MS chassis. The Hub Manager uses this IP address to communicate with the other installed modules. This IP address is assigned to the hub using Hub Setup and must be different from the module's IP address.

The combination of the IP address and slot location establishes the primary path for in-band management. If you move the module to another slot, you must reconfigure the hub to utilize the new slot.

Important Reference—For more information about setting up IP services, see the *DEChub 900 MultiSwitch Owner's Manual.*

DECagent 90 IP Address

With this management method, you manage a DEChub 90 and its 90-series modules. You can also manage 90-series modules in a DEChub 900MS so they can take advantage of DEChub 900MS features such as redundant power and Hub Status Display messages. However, you cannot use other features like backplane LAN segments with this method. If you also have 900-series modules installed in the hub, you must manage them as standalone modules.

Standalone Module IP Address

You can directly access modules that have their own built-in SNMP agents. You manage these modules by supplying the IP address of the agent. When you use this method, the module that you access appears to be the only one in the hub even if there are other modules physically present.

Proxy SNMP Agents

Note that a proxy agent (such as the DECagent 90) is still required for 90-series devices that do not support the SNMP protocol (for example, the DECbridge 90, the DECbridge 90FL, the DECserver 90L, and the DECserver 90L+). However, you can directly manage all the DECrepeaters with the Hub Manager using the IETF repeater MIB.

Out-of-Band Management

Overview

You manage the DEChub 900MS and 90- and 900-series network modules with out-of-band management (OBM) through the OBM port.

This method is similar to in-band management, except that you assign an OBM IP address and an OBM port speed from the setup port Hub Installation menu. The IP address and the port speed at each end of the communications link must be identical. If you want to switch from managing your DEChub 900MS or standalone network modules in-band to managing them out-of-band, select the OBM IP address in HUBwatch.

OBM Port and SLIP

The OBM port allows you to manage network modules with HUBwatch over a Serial Line Internet Protocol (SLIP) using a modem, or a direct connection to the OBM port. If your network management application supports PING echo, you can use it to verify the SLIP connection.

You can also manage DEChubs by establishing a connection from HUBwatch to a terminal server that supports SLIP . If you have a DECserver 900TM, DECserver 90TL, or a DECserver 90M installed in your hub, you can establish a SLIP connection between one of the terminal server ports and the Hub Manager OBM port. Full size network modules (except the DECserver 900TM) also have an OBM port.

References

Refer to your terminal server documentation for instructions on setting up SLIP connections and to the *DEChub 900 MultiSwitch Owner's Manual* for cable and adapter information.

3

SNMP Concepts

How HUBwatch Uses SNMP Agents

Introduction   HUBwatch software uses the Simple Network Management
Protocol (SNMP) to perform GET NEXTs and SETs on the MIB
values of network modules. HUBwatch sends these SNMP
commands to the DECagent 90, the DEChub 900MS Hub
Manager, the GIGAswitch, or directly to network modules with
built-in agents.

Definitions   **Simple Network Management Protocol** (SNMP) is a
standards-based protocol for network management, usually
used in TCP/IP networks. SNMP communicates management
information between a manager and an agent.

An **SNMP agent** is an entity in a hardware device that executes
SNMP requests. The agent responds to requests for information
by the network management stations. The agent performs GET
NEXT and SET operations, generates appropriate traps, and
oversees access control.

**Types of SNMP
Agents**   HUBwatch software communicates with the following types of
SNMP agents:

- The DECagent 90.

- The DEChub 900MS Hub Manager.

- The GIGAswitch.

- SNMP agents built into the modules.

Managing the DECagent 90

The DECagent 90 is a 90-series network management agent. You use it to manage 90-series network modules that do not have their own SNMP agents. You can install and use it either standalone in the DEChub 90 chassis or the DEChub 900MS chassis.

Acting as a proxy SNMP agent, the DECagent 90 accepts SNMP messages on behalf of the 90-series modules, sends an appropriate command to the queried module, and waits for a response. When it receives a response from the module, it sends an SNMP packet to the querying HUBwatch software.

The DECagent 90 has a single Internet Protocol (IP) address and implements the protocols required for SNMP-based access. The protocols used are ARP, IP, UDP, SNMP, and BootP.

Managing the DEChub 900MS

The Hub Manager is a microprocessor-based controller used to monitor, configure, and control the DEChub 900MS (MultiSwitch). It is built into the DEChub 900MS backplane. Using either remote management control or default local control, it provides a central point of control for DEChubs and installed modules, and for allocation of hub resources to installed modules.

For more information about the Hub Manager, refer to the *DEChub 900 MultiSwitch Owner's Manual.*

Managing GIGAswitch

The GIGAswitch has its own SNMP agent and must be managed directly.

Managing Modules with Built-In Agents

These network modules have their own SNMP agents and can be managed directly:

- DECbridge 900MX.
- DECconcentrator 900MX.
- DECrepeater 90FS.
- DECrepeater 90TS.
- DECrepeater 900TM, 900FP, and 900GM.
- DECswitch 900EE.
- DECswitch 900EF.
- PEswitch 900TX.

- RoamAbout Access Point.

These network modules have their own SNMP agents and must be managed directly:

- DECbrouter 90T1.

- DECbrouter 90T2.

- DECbrouter 90T2A.

- DECserver 90M.

- DECserver 90TL.

- DECserver 900TM.

Using the Agent File

The Agent file contains a list of SNMP agents that you can use to manage hubs and network modules. When you use an Agent file you can display a specific hub or module by selecting the agent and making it current. With an Agent file, you can also start HUBwatch by specifying an Agent name for a specific hub or module instead of using its IP address.

To manage an SNMP agent with HUBwatch, add an entry for the agent in the Agents file. You can add an agent by using a pulldown option on the Community Table window. See the *Agent List Box* section in this chapter and the *SNMP Communities and Agents* section in Chapter 8 for more information.

Agents Must Have an IP Address

Each SNMP agent you want to use must have an associated IP address. You typically assign this address when you configure the hub or the module using a console connected directly to the module or with remote assignment using a boot-tab file. Once you associate an Agent name with an IP address, you can start HUBwatch using just that Agent name.

See *HUBwatch Installation and Configuration* or the module's installation manual for more information.

Agent File Location (OpenVMS)

You can find the agent file in this location:

`HUBWATCH$LIBRARY:HUBWATCH_AGENTS.DAT`

You can change the location of this file by setting the HUBWATCH$LIBRARY logical. By default, HUBWATCH$STARTUP.COM defines HUBWATCH$LIBRARY as SYS$LOGIN but the installation program prompts asks you where you want to define it.

Agent File Location (DEC OSF/1)

You can find the agent file in this location:

`$HUBWATCH_LIBRARY/hubwatch_agents`

You can change the location of this file by setting the $HUBWATCH_LIBRARY environment variable. This environment variable is not set by the installation procedure but by the user as part of the installation instructions. The installation procedure does provide an informational file describing the contents of the Agent file. This file is located at `/usr/kits/HUBwatch/hubwatch_agents`.

HUBwatch SNMP Communities

Definition

A **community** is one or more modules that you manage as a group. Each community is uniquely identified on the network by an IP address and a community name.

The structure of an SNMP community and how you manage that community differ depending on whether you are using a DECagent 90, the Hub Manager, GIGAswitch, or built-in agents as the SNMP agent.

Community Names Control Access

You use community names to control access. Each software request contains a community name that the agent uses, like a password, to verify that this requester is authorized to access that agent's management information base (MIB) or a subset of that MIB.

Each agent generally has three community names: a read name, a read-write name, and, possibly, a trap name. This allows you to provide wide access to module status information and limited access to actual module management. For example, for a GET NEXT operation, the agent accepts either the read-only or the read-write name. For a SET operation, the agent accepts only the read-write name.

DECagent 90 Community Description

When you manage communities with the DECagent 90, a community can consist of:

- A single hub.
- A double hub (two DEChub 90 hubs daisy-chained together that you manage as one hub community with 16 slots).
- A standalone module (like the DECbridge 90 or the DECserver 90L+).
- A single LAN segment on the DEChub 900MS.

At least one community always exists in a DECagent 90, the community to which the agent itself belongs. This entry is always in the first row of the Communities list box as the Index 1 entry.

Management Recommendations—A single DECagent 90 can manage from 1 to 64 communities; however, practical limits are much lower and are performance dependent. For hubs that contain only bridge and repeater modules, Digital recommends that there be one DECagent 90 for every eight single hubs or every four double hubs. For hubs that contain terminal servers, the maximum number of modules managed by one DECagent 90 should not exceed 64.

DEChub 900MS Manager Community Description

When you manage communities with the DEChub 900MS Manager, a community cannot extend beyond the hub backplane.

A single hub can have up to nine communities. The DEChub 900 assigns a community to each slot in the backplane and also a community for the Hub Manager. For example, a DEChub 900MS that contains eight DECrepeater 900TM modules must have nine communities—one for each DECserver module and one for the Hub Manager. HUBwatch handles the translation of agent assignment from the backplane to the Hub Front Panel transparently.

DECagent 90 Community in a DEChub 900MS

There are some important community considerations you should be familiar with when you use a DECagent 90 in a DEChub 900MS. For example, If you want to manage a DECbridge 90 with a DECagent 90 in a DEChub 900MS, you must first create a standalone community on the DECagent 90 and then add the DECbridge 90 to it. For more information on this and other important community tasks, see the *HUBwatch Installation and Configuration* manual.

GIGAswitch Community Description

The GIGAswitch has its own built-in SNMP agent that can manage only itself. So the only community this agent knows about is its own community.

Built-In Agent Community Description

If a module has a built-in SNMP agent, it can manage only itself. The only community this agent knows about is its own.

Autodiscovery

Definition

Autodiscovery is the capability of the DEChub 900MS and the DECagent 90 to detect, identify, and configure certain network modules when they are installed in a hub. Autodiscovered modules automatically appear in the HUBwatch Front Panel window.

Rules

You must manually add any modules that cannot be autodiscovered. You use either the hub's console setup port or the HUBwatch Add Module window to do this task.

If you physically remove a configured module and substitute a new module, the new module will not be autodiscovered until you delete the old module from the configuration (using the Community Table Delete option).

DEChub 900 Autodiscovery

The DEChub 900MS autodiscovers most network modules. These are the modules that it does not autodiscover:

- DECserver 90L.
- DECserver 90L+.
- DECbridge 90.
- DECbridge 90FL.

DECagent 90 Autodiscovery

Autodiscovery requires Bus Master services like those found in a DECagent 90 with V2.0 firmware. If you are using a previous version of DECagent 90 firmware, you need the assistance of a DECbridge 90 to use this feature. The DECagent 90 is capable of autodiscovering these modules:

- DECagent 90.
- DECrepeater 90T.
- DECrepeater 90C.
- DECrepeater 90FA.
- DECrepeater 90FL.

- DECrepeater 90FS.

- DECrepeater 90T+.

- DECrepeater 90TS.

- DECserver 90L+2.

- DECserver 90M.

- DECserver 90TL (running the DECserver Network Access Software).

Hint
To assist network management applications that feature autotopology or autodiscovery, leave the agent's read-only community string as public.

The HUBwatch Community Table Window

Introduction   You use the Community Table window to manage SNMP agents and their associated SNMP communities.

**Community
Table Window**

Community Table

Identification

CMNTY	Current Agent: hub2
	Current Community: public

Agent

Agent Type	Agent Name	IP Address	Community	Select	
DECagent90	hub1.com	00.00.00.00	public	▢	Make Current
DECagent90	hub2.com	00.00.00.00	private	▢	Agent Options
DECagent90	hub3.com	00.00.00.00	public	▢	Add
					Delete

Communities

Index	Hub Type	Read-only Community	Read-write Community	Select	
1		public	public		Make Current
2		smv	smv		Add
3		wgh	wgh		Delete
4		brl	brl		

OK	Apply	Refresh	Cancel	Help

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3–10 SNMP Concepts

Parts of the Community Table Window

Introduction

The Community Table window has three main sections:

- Identification list box.
- Agent list box.
- Communities list box.

Identification List Box

There are two items in the Identification list box:

- Current Agent

  This entry is the agent that you are using to manage a particular community. The entry for the current agent is highlighted in the Agent list box.

- Current Community

  This entry is the community string (name) of the community that you are managing. If the current agent is a DECagent 90, the current community entry is highlighted in the Communities list box. If the current agent is either a DEChub 900 Hub Manager or a module with its own SNMP agent, such as a DECserver 90TL or GIGAswitch, the Communities list box is grayed out on the Community Table window.

Agent List Box

This list box reflects the contents of the Agent file. You build this list as you add agents to or delete agents from your network.

The Agent list box contains the following information about each agent:

- The type of agent (for example, DECagent 90 or DECserver 900MX).
- The name of the agent.
- The IP address of the agent.

- The agent's community string, or password, for the particular community being managed by the agent. HUBwatch software uses this community string in all SNMP requests generated while this community is current. Therefore, access control will vary depending on the type of string you use.

Communities List Box

DEChub 900MS Manager—If the DEChub 900MS Manager is the current SNMP management agent, the Communities list is grayed out to indicate that it is not functioning. The Hub Manager cannot manage multiple communities; so there is no need to switch from one community to another. As a result, you can do all the community management tasks in the Agent list box by selecting and modifying the agent.

DECagent 90—If a DECagent 90 is the current SNMP management agent, this list shows the communities that you can manage. You can see the following information about each community:

- An index entry for each community—a managed hub or standalone module.

- A Hub Type icon that defines the type of hub being managed by the agent. Three hub configurations are supported:
  - Standalone—A standalone module.
  - Single—An 8-slot hub. (Unique icons are provided for the DEChub 90 and DEChub 900MS hubs.)
  - Double—Two 8-slot hubs daisy-chained together to create a 16-slot hub. (Only the DEChub 90 supports this configuration.)

- The read-only community string used for GET NEXT type operations.

- The read-write community string used for SET type operations.

The list of SNMP communities appears only if you selected the default community for the DECagent 90 from the Agent list box. For the DECagent 90, all communities are contained within the default community.

Standalone Modules—If a standalone module is the current SNMP management agent, the Current Agent list box is grayed out to indicate that it does not apply. The standalone modules can manage only their own community; so there is no need to switch from one community to another. Therefore, you can do all the community management tasks in the Agent list box by selecting and modifying the agent.

How You Use the Community Table Window

Introduction   You use the Community Table window to manage SNMP agents and communities.

Management Tasks   You can perform the following management tasks from the Community Table window:

- Adding or deleting agents.

- Adding or deleting communities.

- Modifying agents or community information.

- Changing the current agent or current community.

Reference   Please see *Opening Hub Management Windows* in Chapter 7 for instructions about opening this window. See the *SNMP Communities and Agents* section in Chapter 8 to learn how to do these tasks.

Related Information   The following related information may be useful.

For Information About...	See...
SNMP management concepts	*The Simple Book—An Introduction to Management of TCP/IP-Based Internets* by Marshall Rose

4
Using Alarms

Alarms

Restrictions
The alarms features are currently available on OpenVMS only.

Introduction
HUBwatch allows you to specify alarmed agents that can be monitored by the alarm software. You can turn the alarm software on and off for each of these agents. For each alarmed agent, you can enable or disable the trap functions.

Definitions
A **trap** is a message generated by firmware in the SNMP agent hardware.

Why Use Alarms?
The alarm software allows you to monitor traps that occur on the hub.

What Gets Alarmed
You can alarm agents for the following devices:

- DECagent 90.
- DECbridge 900MX.
- DECconcentrator 900MX.
- DEChub 900MS Manager.
- DECrepeater 90FS and 90TS.
- DECrepeater 900-series modules.
- DECserver 90M, 90TL, and 900TM.
- DECswitch 900EE.
- DECswitch 900EF.

- GIGAswitch.

How Traps Work

Traps occur when the firmware monitors the hardware for faults and sends messages to monitoring HUBwatch software. Cold start and warm start are examples of traps monitored by the alarm software.

What Gets Trapped

Trap conditions are either generic to all hardware devices or are device specific. These are the generic traps that HUBwatch supports:

- ColdStart.

- WarmStart.

- LinkUp.

- LinkDown.

- AuthenticationFailure.

- egpNeighborLoss.

- EnterpriseSpecific.

See RFC 1157 for details about these trap conditions. For information about vendor-specific trap conditions for a particular device, see the MIB for that device.

**Alarm Setup
Window Figure**


```
┌─────────────────────────────────────────────────────────────────────────────┐
│ ▭              HUBwatch: Alarms Setup                          ▫   □          │
├─────────────────────────────────────────────────────────────────────────────┤
│ Identification                                                                │
│  ┌────────────────────────────────────────────────────────────────────────┐  │
│  │  ┌─────────┐                                                            │  │
│  │  │ ⏰      │      Alarm Agents File:      hubwatch_alarmed_agents.dat   │  │
│  │  └─────────┘                                                            │  │
│  └────────────────────────────────────────────────────────────────────────┘  │
│                                                                               │
│ Alarmed Agents                                                                │
│  ┌──────────────────────────────────────────────────────────────┐  ┌───────┐ │
│  │ Agent Name  IP Address  Community  Poll interval Config Traps Alarms Select│
│  │ [algash]  [00.00.00.00] [public]  [2:10.00]  [OFF][OFF][OFF] [ ]  │ Add...│ │
│  │ [penobs]  [00.00.00.00] [public]  [1:00.00]   [OFF][OFF][OFF] [ ] │ Delete│ │
│  │ [kenbec]  [00.00.00.00] [public]  [10:00.00]  [OFF][OFF][OFF] [ ] │       │ │
│  └──────────────────────────────────────────────────────────────┘  └───────┘ │
├─────────────────────────────────────────────────────────────────────────────┤
│ [ OK ] [Apply] [Refresh] [Viewer] [Start Poller] [Stop Poller] [Cancel] [Help]│
└─────────────────────────────────────────────────────────────────────────────┘
```
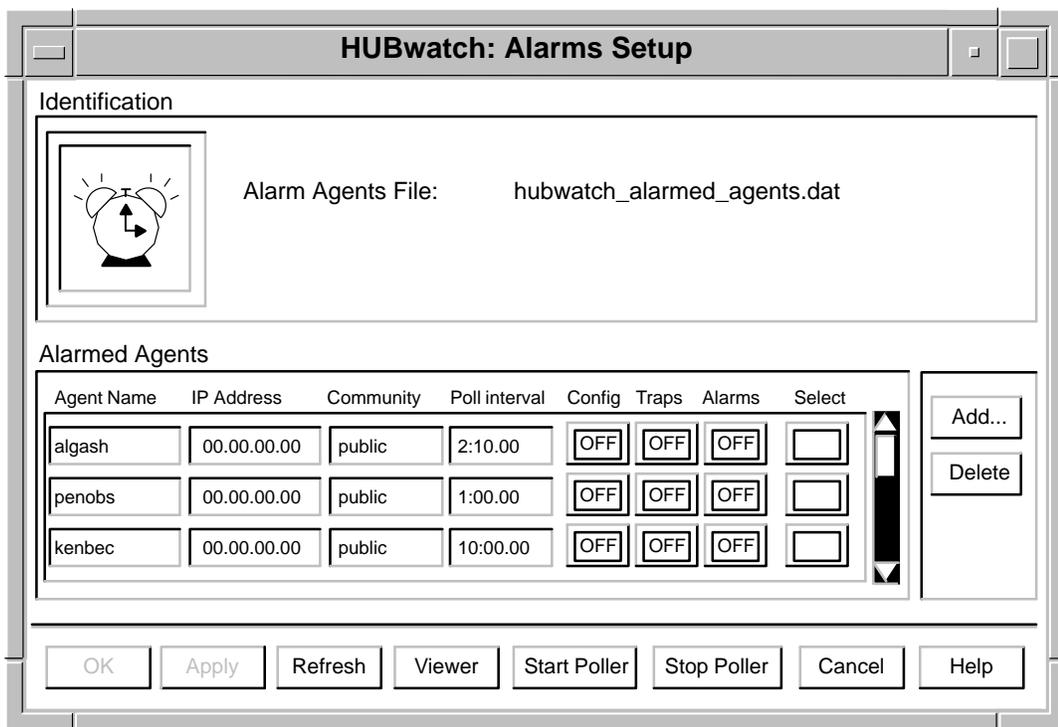
LKG–8953–94I

**Using the
Alarm Poller**

You start the alarm poller by using the Alarm Setup window, by selecting an option from the Hub Front Panel window's pulldown menu, or by using an OpenVMS command. For information about using these methods, see the *Starting the Viewer and Poller* section in this chapter.

The alarm poller sets up traps on the agents. When you turn the poller, it communicates with the SNMP agents in a hub or a community and sends notification of network events to the network management station running HUBwatch.

You can run only one instance of the poller on a network management system. When polling traps, a module remains set to send traps until traps are explicitly turned off. You cannot turn traps off through the HUBwatch application, they are turned off through a particular module's console.

Selecting Traps

To monitor traps from network modules, use the Alarm Setup window. From this window, you select the agent for a device and toggle its Traps button by clicking on it. If the agent you want is not displayed in the Alarmed Agent box, use the Add button to add it. When you do this, the agent is added to the Alarmed Agent file. After you turn on one of these options, you must start the poller, if it is not already running, to begin recording any events.

Alarm Viewer

The alarm viewer lets you see the messages generated by traps as they occur. You can also use it to search the log file for a historical record of traps. The HUBwatch start-up command does not start the viewer. You must execute a separate command from OpenVMS to start the viewer.

Starting the Viewer and Poller

You can start and stop the view and poller from the Alarm Setup window by clicking on the appropriate buttons. You can also start them from the Hub Front Panel window by choosing the Applications pulldown and then selecting the appropriate option from the Alarm menu. Additionally, you can run the viewer and poller as separate applications from the OpenVMS command line.

- Start viewer command:

  ```
  $ WATCH/VIEWER
  ```

- Start poller command:

  ```
  $ WATCH/POLLER START
  ```

- Start poller and save data to file command:

  ```
  $ WATCH/POLLER/FILE=hubwatch_alarmed_agents.dat START
  ```

  The traps are logged to HUBWATCH_ALARMED_ AGENTS.DAT by default. You can modify the name of this file.

  You must stop the viewer and the poller from the OpenVMS command line.

- Stop poller command:

  ```
  $ WATCH/POLLER STOP
  ```

- Stop viewer command:

```
$ WATCH/VIEWER STOP
```

Poller Log File Locations

The location of HUBWATCH$ALARMS_FILES defaults to the value of SYS$MANAGER. This value is defined during the HUBwatch installation.

HUBwatch Library Location

The location of HUBWATCH$LIBRARY defaults to the value of SYS$LOGIN. This value is defined during the HUBwatch installation.

Alarmed Agents File

This file contains the agent name, IP address, and community name of each SNMP agent entry in the Alarmed Agent list of the Alarm Setup window. Each time you add, delete, or modify these entries and apply the change, this file gets updated. When you refresh the Alarm Setup window, this file is used to restore entries to their last saved condition.

The Alarmed Agents file is called

```
HUBWATCH$LIBRARY:HUBWATCH_ALARMED_AGENTS.DAT
```

_____ **Note** _____

Agents that appear in the HUBWATCH$LIBRARY:HUBWATCH_AGENTS.DAT file but not in the Alarmed Agent file are added to this file automatically whenever you open the Alarm Setup window but traps are set to off. If you do not want the HUBWATCH_AGENTS.DAT read, define the logical HUBWATCH$AGENTS_NOREAD.

_____

Managing Alarms

Alarm management tasks include:

- Enabling and disabling traps.

- Enabling and disabling reporting of configuration changes.

- Adding alarmed agents.

- Deleting alarmed agents.

- Modifying alarmed agent information.

- Starting the alarm viewer.

- Viewing traps.

- Reviewing the alarm log file.

- Starting the alarm poller.

- Stopping the alarm poller.

See the *Alarms* section in Chapter 8 of this manual to learn how to do these tasks.

5

Starting HUBwatch

HUBwatch Startup

Introduction

This section tells you how to start the HUBwatch software. You can start HUBwatch in either of two ways:

- As a standalone Windows application.

- As an add-on application to network management software like POLYCENTER.

Before You Start

The first time you start HUBwatch, you must supply an IP address for the agent you want to use. You can just accept the remaining default parameters. However, the default community name is *public*. If the community name of the agent you want is different from the default name, you must enter the correct community name.

Adding Agents

Once you run HUBwatch, you should add entries for the agents you want to use to the Agent File list of the Community Table window. Afterwards, you can run HUBwatch using the name of the agent instead of its IP address. If you added agents to the Agent File list in a previous version of HUBwatch, you can run HUBwatch using the name of one of those agents.

Agent File Compatibility

HUBwatch V3.1 uses a different Agent file format than previous versions. HUBwatch V2.0 Agent files are compatible and are converted to the new format automatically. However, V3.1 Agent files will not work with HUBwatch V2.0.

Reference   Use this table to find more information about adding agents.

Section	Chapter
Community Table Window	Chapter 3 in this book.
How You Open Them	Chapter 7 in this book.
SNMP Communities and Agents	Chapter 8 in this book.

Starting HUBwatch Standalone

Starting Standalone (OpenVMS Version)

Steps

To start HUBwatch as a standalone application, follow these steps.

Step	Action

1	Enter the start command.
	Examples:
	`$ WATCH\AGENT Agent1`
	`$ WATCH\AGENT 20.40.32.00`

Start Command Syntax

Use the following command syntax to start HUBwatch.

```
$ WATCH/AGENT <agent_name or ip_address>-
_$ /IP_ADDRESS=nn.nn.nn.nn-
_$ /COMMUNITY=<community_string>-
_$ /RETRIES=n-
_$ /TIMEOUT=n-
_$ /VIEW=<view_type> Return
$ WATCH/VIEWER Return
$ WATCH/POLLER Return
```

Start Command Variables

Use the following command variables for the start command.

Variable	Value
agent_name	The name assigned to the agent module. **Example:** agent1
ip-address	The Internet address in the form *d.d.d.d*, *d* being a decimal less than 256.

Variable	Value
comm-string	The name assigned to the community. When you enter the community name, use quotation marks. **Example:** `"public"`

Start Command Qualifiers

Use the following command qualifiers for the start command.

Variable	Value
COMMUNITY	The read-write community string.
RETRIES	An integer that sets the number of retries allowed.
TIMEOUT	The timeout period in seconds.
VIEW	The type of display HUBwatch presents. The values can be either PHYSICAL or LOGICAL

Starting Standalone (OSF/1 Version)

Steps

To start HUBwatch as a standalone application, follow these steps.

Step	Action
1	Define the environment variable `HUBWATCH_LIBRARY` as the directory that contains the Agent file named `hubwatch_agents`.
2	Enter the start command. **Example:** `# hubwatch -x 20.40.32.00`

Start Command Syntax

Use the following command syntax to start HUBwatch.

```
# hubwatch -x ip-address -c comm-string \
> -a agent-name -r retry-count -t timeout
```

Start Command Variables

Use the following command variables for the start command.

Variable	Value
ip-address	The Internet address in the form *d.d.d.d*, *d* being a decimal less than 256.
comm-string	The name assigned to the community. When you enter the community name, use quotation marks. **Example:** `"public"`
comm-string	The name assigned to the agent module. **Example:** `agent1`
retry-count	An integer that sets the number of retries allowed.
timeout	The timeout period in seconds.

Starting HUBwatch from POLYCENTER

Introduction

You can start HUBwatch as a POLYCENTER application from the following platforms.

- POLYCENTER SNMP Manager 300
- POLYCENTER Manager on NetView for DEC OSF/1 AXP

Starting from SNMP Manager

Do the following to start HUBwatch from POLYCENTER SNMP Manager 300.

Step	Action
1	Select the hub from the POLYCENTER Map window.
2	Click on the HUBwatch option on the POLYCENTER Map menu bar and click on Manage.
	Result: The Hub Front Panel view appears.

Starting from Network Manager

Do the following to start HUBwatch from the POLYCENTER Manager on NetView for DEC OSF/1 AXP.

Step	Action
1	Start the POLYCENTER Manager on NetView software by entering the appropriate command. **Example:** `$ MANAGE/ENTERPRISE/INTERFACE=DECWINDOWS` `Return` **Result:** The POLYCENTER Map window appears.
2	Click on the File menu and choose an existing domain or open a new domain. (The following instructions assume you have opened a new domain.) **Result:** The New Domain window appears.
3	Enter the domain name in the New Domain window and click on `OK`.
4	Return to the POLYCENTER Map window and click on the Lock icon in the menu bar to unlock the window.
5	Click on the Edit menu and choose Toolbox. **Result:** The POLYCENTER Toolbox window appears.
6	Click on the SNMP icon. **Result:** The Add Entity - Enter Entity Information window appears.
7	Click on the desired Hub icon. **Result:** The Hub icon is highlighted.
8	At the SNMP entry box, enter the IP name of the hub and click on `Apply`. **Result:** A more detailed version of the Add Entity - Enter Entity Information window appears.

Step	Action
9	In the Add Entity window:
	a. Enter the IP address (for example, 12.14.213.56).
	b. Enter the Read Community Name (for example, public).
	c. Enter the Write Community Name (for example, public).
	d. Click on OK to apply the information.
10	Move the pointer to the POLYCENTER Map window and click MB2 to populate the map.
11	Click on the Hub icon in the POLYCENTER Map window.
12	Click on the Applications menu and choose HUBwatch.
	Result: The Hub Front Panel window appears. (This may take several seconds.)

Related Information

These instructions also apply to DECmcc V1.2 and V1.3. To run HUBwatch from DECmcc V1.2, all DECmcc users need to modify their own MCC_RESOURCE.DAT files according to the instructions in MCC_SYSTEM:MCC_HUBWATCH.COM.

Adding HUBwatch

For information about adding the HUBwatch application to POLYCENTER, see *HUBwatch Installation and Configuration*.

Starting HUBwatch Using SLIP

SLIP Connection

For instructions about starting HUBwatch while using a SLIP connection, see the *HUBwatch Installation and Configuration* manual.

_____ **Note** _____

OpenVMS does not support a direct SLIP connection from a management station to the DEChub OMB port. You need another device, like a terminal server, to run SLIP for you.

_____

Part II
Managing Hubs and Modules

Part II describes the HUBwatch GUI and how you use it to manage network devices. This information applies only to modules and hubs managed with HUBwatch.

6

Using Backplane LAN Segments

LAN Segments

Introduction The DEChub 900MS backplane has multiple, flexible channels that you can use to create internal LAN segments within the hub. You connect network modules to these segments so they can exchange data as if they were on external LANs. You can use HUBwatch software to create and delete segments and create and delete connections to the segments. You can do all these tasks remotely without manipulating hardware.

Hardware Overview The DEChub 900MS backplane contains:

- **One dedicated Ethernet ThinWire segment**

  The dedicated Ethernet ThinWire segment provides backward compatibility for the DEChub 90 modules. The dedicated Ethernet ThinWire segment always exists in the hub configuration; you cannot delete it.

- **Two dedicated Token Ring segments**

  The Token Ring segments provide support for token ring network modules. You cannot currently display or manage the Token Ring segments with Version 3.1 of HUBwatch.

- **Multiple flexible LAN segments**

  These are the internal Ethernet, FDDI, or Token Ring LAN segments that modules use to share data.

Interconnect Functionality

Hubwatch uses SNMP to direct the DEChub 900MS Hub Manager to create or delete LAN segments on the backplane. You use the interconnect functionality just as you would use cables to connect module ports to different backplane LAN segments. However, now you can perform configurations and connections without manipulating hardware.

You can organize the backplane resources for either Ethernet, Token Ring, or FDDI configurations depending on the type of LAN segment you need. You access all the interconnect functionality from the LAN Interconnect window.

Important Information—You cannot currently display or manage the Token Ring segments with Version 3.1 of HUBwatch.

How You Manage LAN Segments

Introduction　　　　The DEChub 900MS Hub Manager displays the backplane
port-to-segment connections in the LAN Interconnect window.

**LAN
Interconnect
Window Figure**
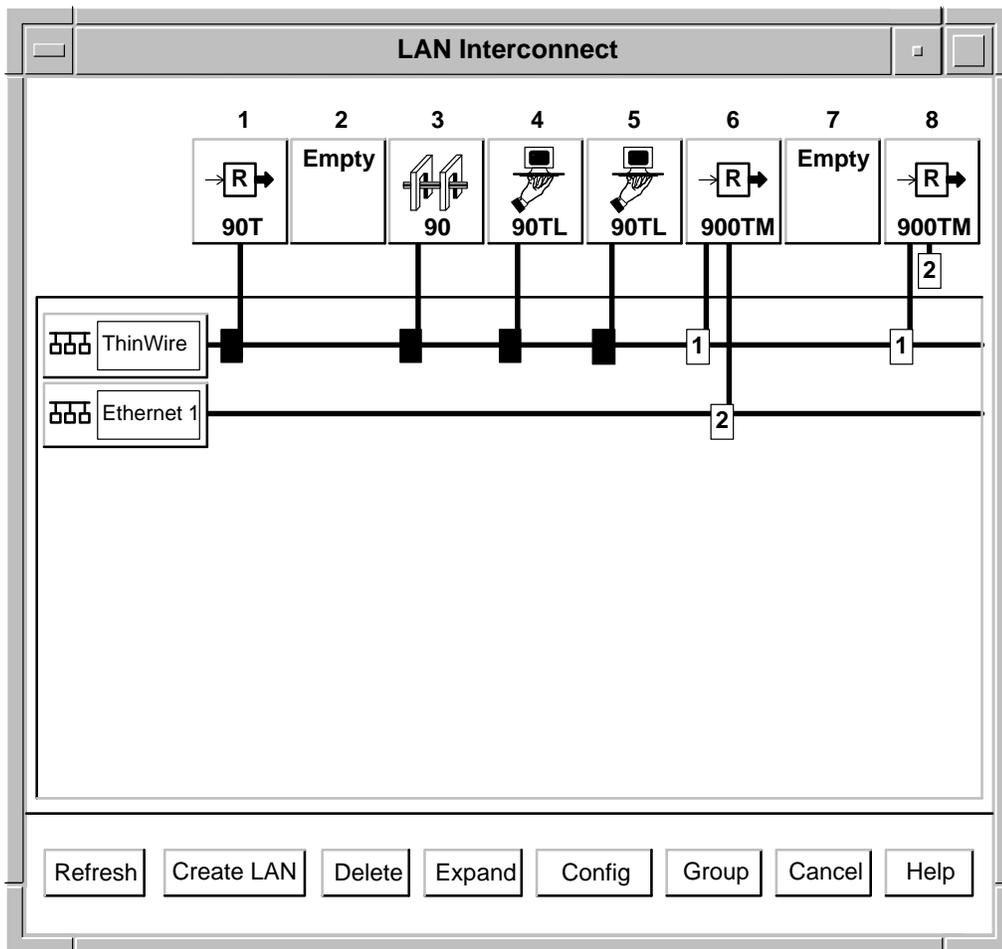
LKG-8388-94I

LAN Interconnect Window Parts

Introduction   The following sections describe the different features of the LAN
Interconnect window and how you use them.

LAN Segments   The LAN segments appear along the left side of the window.
An icon and a name identify each segment. When you display
the LAN Interconnect window for a hub that uses the factory
defaults, only the default dedicated Ethernet ThinWire segment
appears. You cannot delete this segment. Additional segments
appear below the ThinWire segment as you create them.

**Network
Modules**   The network modules appear across the top of the LAN
Interconnect window. A slot position in the hub and a module
icon identify each module. You can access a management
summary window for a particular module by double clicking on
its icon.

For most network modules, connection pulldowns identify the
backplane ports. There is one connection pulldown for each
backplane port. For FDDI modules (for example, the DECbridge
900MX), one common pulldown represents either the one or
two backplane ports actually in use when one or both the A
and B ports are on the backplane. This common pulldown lets
you make one logical connection to an FDDI backplane LAN
segment.

Port Colors   On all modules, different colors identify different types of
backplane ports. When a port is not connected, the port color
shows the type of LAN segment to which you can connect it.

This table lists the colors.

Port Color	LAN Segment Type
Blue	ThinWire Ethernet
Green	Flexible Ethernet
Purple	FDDI
Yellow	Multiple Types

When you connect a port to a LAN segment, the port takes on the color of that segment.

Port Connector Stars   Ports that have stars in their connection pulldowns are parts of a port group.

Additional LAN Interconnect Buttons

Introduction   Some modules, like the DECbridge 900MX and the DECconcentrator 900MX, have features that are available from the [Expand], [Config], and [Group] buttons.

Expanded View   Some modules have more than four backplane ports (for example, the DECbridge 900MX and the DECrepeater 900FP). However, the LAN Interconnect window can display, at most, only four ports per module. To perform LAN interconnect functions on modules with more than four ports, you must open the Expanded View window. You open this window by selecting a module with more than four ports and clicking on the [Expand] button.

Station Configuration   Some modules, like the DECbridge 900MX and the DECconcentrator 900MX, have ports that you can configure between the front panel and the backplane. By default, these ports are active on the front panel; so you do not see them on the LAN Interconnect window until you move them to the backplane. To move these ports to the backplane, you need to open the Station Configuration window. You open the window by selecting a module and clicking on the [Config] button.

The LAN Interconnect window does not display any unusable backplane ports.

Grouping Ports   You can group ports on the DECrepeater 900FP, which supports switching ports onto different internal LAN segments. Grouping ports allows you to connect multiple backplane ports using a single connection pulldown rail.

You access this function through the Port Grouping window. To open the window, select a repeater module and click on the [Group] button. The LAN Interconnect window does not display any unusable repeater backplane ports.

Grouping Hint   The Port Grouping window displays the state of the module's
                           backplane ports. The LAN Interconnect window displays the
                           state of the hub's backplane ports. If you group a port connector
                           and then disconnect it using the Port Grouping window, the
                           connector will appear in the LAN Interconnect window as though
                           it were available for use. However, the module that controls
                           the port for that connector will not enable that connection. As
                           a result, you can hook up the connector, but it will not function
                           until you use the Port Grouping window to enable the connector's
                           port group.

Connecting Modules

Introduction

This section provides some information about connecting module backplane ports to LAN segments. You can find additional instructions in the online help.

How to Connect a Module

To connect a module to a segment, click on the backplane port and drag the connection pulldown to the desired segment. When you click on a backplane port, all inappropriate LAN segments are grayed out. HUBwatch will not let you connect to an inappropriate LAN segment.

90-Series Modules

Most 90-series network modules have only one backplane port. By default, most 90-series network modules are always connected to the DEChub 900MS dedicated Ethernet ThinWire segment. You cannot use the HUBwatch LAN Interconnect window to change these connections.

Newer 90-series modules, like the DECrepeater 90FS and 90TS, do not have this restriction. They can connect to the ThinWire and to the top segment of the same LAN type.

900-Series Modules

All 900-series network modules have one or more backplane ports. You can connect 900-series modules to backplane LANs of the same LAN type as that of the module's backplane port (Ethernet, FDDI, and so forth).

Interconnect Tasks

Using the LAN Interconnect Window

You can do the following management tasks from the LAN Interconnect (or Expanded View) window:

- Create a LAN segment.

- Connect a module to a LAN segment.

- Disconnect a module from a LAN segment.

- Delete a LAN segment.

- Modify some of a network segment's characteristics.

- Expand the LAN Interconnect window.

- Configure a module's ports between the front panel and the backplane.

- Logically group some of a module's backplane ports and treat them as a single connection.

Reference

Please see *Backplane LAN Segments* in Chapter 8 for instructions about accessing this window. Chapter 1 also explains how to use the HUBwatch Help to get step-by-step instructions for any of these tasks.

Configuration Example 1

Introduction   The following example configuration shows you how you might
use HUBwatch to create LAN segments and connect repeater
modules to them.

Configuration 1   This figure shows how you configure repeaters on the LAN
Figure   segments.
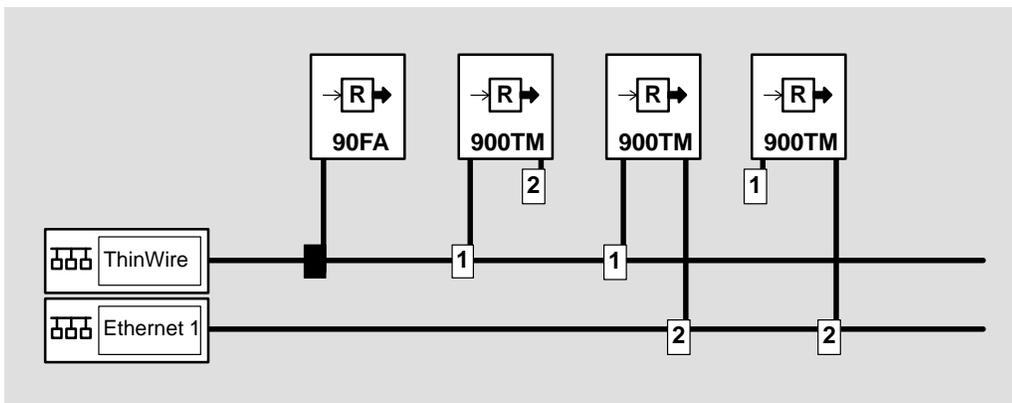
LKG-8412–93I

Configuration 1   This figure shows a mix of 90-series and 900-series repeaters.
Description   This configuration shows how you can integrate 90-series
repeaters into the DEChub 900MS network environment. By
default, this hub connects 90-series repeaters to its dedicated
ThinWire Ethernet LAN segment. You cannot change these
connections (as denoted by the solid black connector).

In a similar way, the DEChub 900MS connects backplane
port 1 of 900-series repeaters to the dedicated Ethernet LAN
segment. You can, however, use the LAN Interconnect window
to disconnect port 1, but you cannot connect it to any of the
flexible Ethernet LAN segments. The remaining backplane ports
of 900-series repeaters are flexible channel ports. They are not
connected by default and you can connect them to any of the

flexible Ethernet LAN segments (also referred to as "backplane Ethernet LAN segments"). You cannot connect these ports to the dedicated ThinWire Ethernet LAN segment. HUBwatch does not let you connect repeater ports 1 and 2 to the same type of LAN segments because each port supports a different network technology. When you use the flexible channel port over port 1 for network communications you reduce the number of hops by 50 percent, minimizing the number of repeater hops in the network configuration.

Extended LAN Notice that by connecting port 1 of a DECrepeater 900TM to the dedicated ThinWire Ethernet LAN segment, all 90-series repeaters installed in the hub gain access to the flexible LAN segment to which repeater port 2 is connected. In effect, the two LAN segments become an extended LAN.

Caution Do not disconnect the IP services from a LAN segment if the Network Management Station uses that segment to reach the IP services module. For more information on IP services, see *DEChub 900MS Manager IP Address* in Chapter 2.

Configuration Example 2

Introduction   This configuration is an example of an external FDDI backbone connected to bridged Ethernet Workgroups.

Configuration 2 Figure
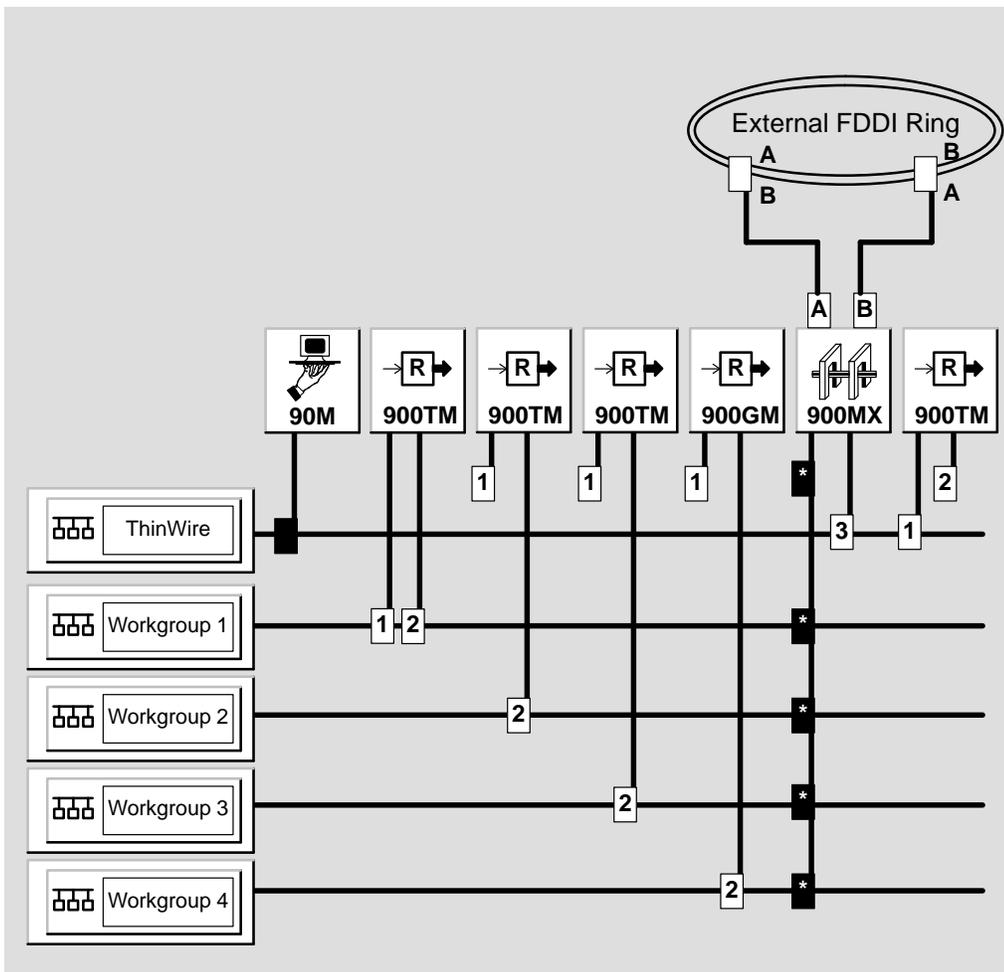
LKG-9457–94I

Configuration 2 Description

Configuration 2 presents an FDDI ring that is external to the hub. The ring represents the backbone of the network. The hub is used to connect the ring to end stations. Each repeater or terminal server connects end users to their own LAN segment to form a Workgroup. These LANS, or Workgroups, are then connected to one another through the DECbridge 900MX. The bridge not only provides connectivity, but also allows you to filter user defined traffic if a Workgroup is not interested in it.

Single Rail

Note that the DECbridge 900MX shows multiple connections on a single rail. Each of these connections is black with a star in the box. This single rail notation indicates that you cannot display or move the individual connections from this particular window.

Moving Connections

To view or move the individual connections, select the DECbridge 900MX and click on the ⌷Expand⌷ button. This action opens the Expanded LAN Interconnect window for the DECbridge 900 MX (see the following *Expanded LAN Interconnect Window Figure* for an example).

**Expanded LAN
Interconnect
Window Figure**

You use this window with modules that have more than four
ports.
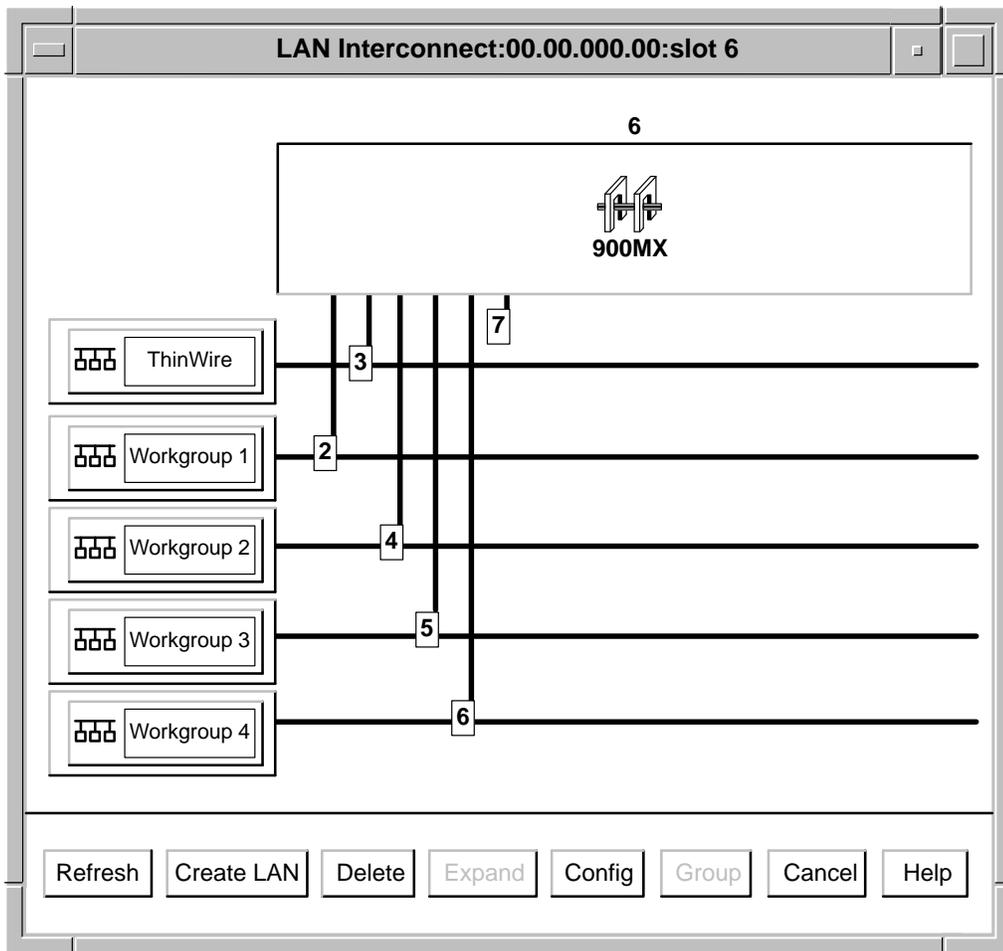
LKG-9110-94I

Steps for Building Configuration 2

You build this configuration in two stages. In the first stage, you create LAN segments. In the second stage, you connect modules to them.

Create LAN Segments

Do the following to create LAN segments.

Step	Action
1	Select the [Create LAN] button on the LAN Interconnect window. **Result:** An Ethernet workgroup LAN appears (like Workgroup 1 in the figure).
2	Repeat this step for the other 3 LAN segments.

Any 90-series modules automatically come up on the ThinWire. You can not move these modules. However, you must configure the remaining modules as follows.

Connect Modules

Do the following to connect the modules.

Step	Action
1	Disconnect the first port of the DECrepeater 900TMs and 900GM ThinWire. **Result:** This action isolates these Workgroups from traffic on the ThinWire LAN segment. Drag the second port connection down to the appropriate Workgroup.
2	Drag both port connections of the DECserver 900TMs down to the appropriate Workgroup.
3	Select the DECbridge 900MX icon.
4	Click on the [Config] button to open the Station Configuration window.
5	Configure ports 2 through 6 to the backplane.
6	Return to the LAN Interconnect window.
7	Click on the [Expand] button to go into the Expanded LAN Interconnect window.

Step	Action
8	Drag connector 3 down to the ThinWire connection.
9	Drag connectors 2, 4, 5, and 6 down to Workgroups 1-4.

Finishing—The backplane connections are now complete and the hub is ready for cables to be connected to the front panel.

Connecting FDDI Devices—You must physically connect the A port from the hub neighbor on the external FDDI ring to the B port of the DECbridge 900MX. You must physically connect the B port from hub neighbor on the external FDDI ring to the A port of the DECbridge 900MX. See *fddiconfig* in this chapter for more information.

Configuration Example 3

Introduction   This configuration is an example of an FDDI backbone ring as
part of a HUB backplane.

**Configuration 3
Figure**
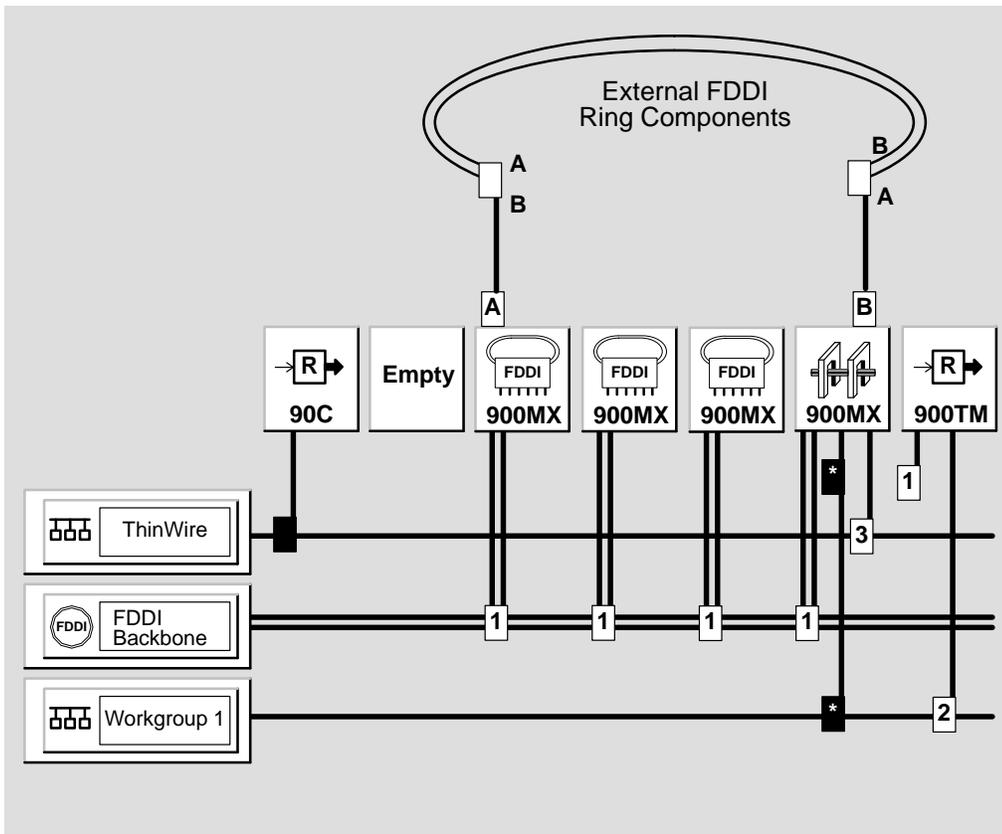
LKG-9111–94I

Configuration 3 Description

Configuration 3 presents an external FDDI dual (trunk) ring that is connecting hub concentrator and bridge modules using the backplane FDDI segment. The primary ring enters the hub using the front panel A port of the concentrator in slot 3. The ring exits the hub using the front panel B port of the bridge in slot 6.

Steps for Building Configuration 3

You create this configuration in two stages. The first stage involves hardware steps. The second stage consists of software steps.

Hardware Steps—When you insert an FDDI module into the hub, both A and B ports in the module are on the front panel, meaning the backplane FDDI ports are unused. Hubwatch does not display such ports in the LAN Interconnect window. The front panel A/B ports blink green, indicating a disconnect from the ring.

Step	Action
1	Insert the FDDI connectors from the external ring into port A in slot 3 and port B in slot 6.

Hint—To keep the external trunk ring closed, you may want to close the external ring on the outside of the hub by connecting port B in slot 3 with port A in slot 6 using a temporary external fiber cable.

The dual ring is now closed and FDDI port LEDs on both modules should be solid green, provided that the hub neighbors on the ring are operational.

Software Steps—You use HUBwatch for all the subsequent interconnect operations.

Step	Action
1	Create a backplane FDDI segment.
2	Select the Slot 3 Concentrator icon and click on the `Config` button to go into the Station Configuration window (see the following *Station Configuration Window Figure* for an example).
3	Change the station type to A-front/B-back. **Result:** The dual ring is now wrapped in both slot 3 and 6 modules. The backplane FDDI port (port B) for slot 3 now appears on the LAN Interconnect window.
4	Go into the Station Configuration window for slot 6 and change the station type to B-front/A-back. **Result:** The backplane FDDI port (port A) for slot 6 now appears on the LAN Interconnect window.
5	Connect the FDDI backplane ports for slots 3 and 6 to the backplane FDDI segment by dragging the FDDI pulldowns to the segment. **Result:** The FDDI ring is now closed using the hub backplane. **Hint**—You can now disconnect the temporary fiber cable if you used it.
6	Insert any other FDDI modules into the ring. Before you do this, you have to change the module's station configuration so that both A and B ports are on the backplane. After you change the station configuration, you can connect the modules to the ring in the usual way.

**Station
Configuration
Window Figure**

You use this window to change the station type by clicking on the network building block and selecting a different station type from the menu.

Station Configuration:00.00.000.00:slot 5

Identification

Module Desc: DECconcentrator 900MX

FDDI

900MX

Slot 5

Port Configuration

Port Numbers	LAN Type	Network Building Block
DECconcentrator BP1 and BP2	FDDI	A B

OK	Apply	Refresh	Cancel	Help
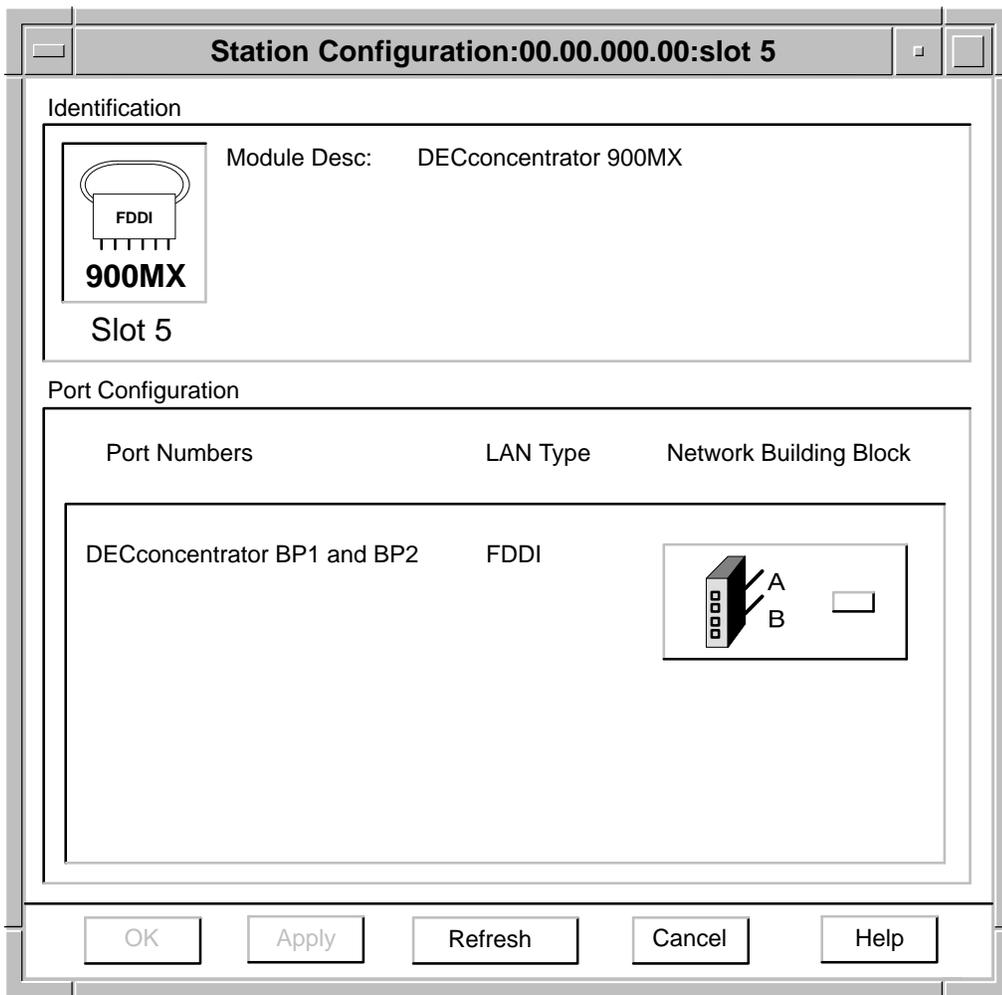
LKG-9112-94I

Unlit LEDs   Note that in this configuration, a module is logically isolated
                        from any external FDDI ring connected to its front panel FDDI
                        A/B ports. The LEDs for these ports will be unlit.

Other   Configuration 3 shows a Workgroup 1 connected to the FDDI
Connection   backbone using a repeater in slot 7 and the DECbridge 900MX
Options   bridge in slot 6. You can also connect other Workgroups to the
                        FDDI backbone using either the bridge front panel Ethernet
                        ports or slave (M) ports on the FDDI concentrator front panels.

Configuration Example 4

Introduction   This configuration is an example of a collapsed Ethernet backbone connecting hubs in a star configuration.

Configuration 4 Figure

LKG-9462–94I
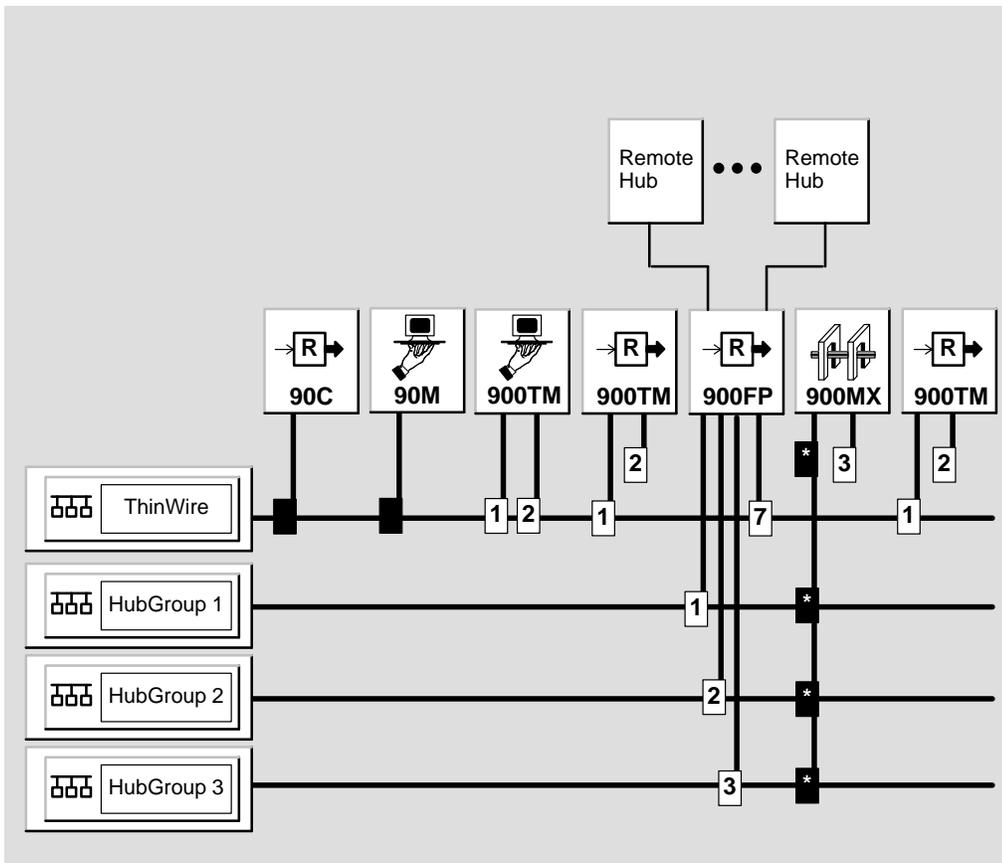
Configuration 4 Description

Configuration 4 presents a collapsed Ethernet backbone in a central DEChub 900MS backplane. Its purpose is to connect multiple hubs around a campus into a star configuration. The hubs connect to the star using a DECrepeater 900FP fiber repeater in the central DEChub 900.

The DECrepeater 900FP ports are segmented or grouped onto three different LANs in the DEChub 900MS backplane, thus isolating the hubs into different Ethernet segments. These segments are then bridged together by a DECbridge 900MX, also located in the central DEChub 900MS backplane.

Steps for Building Configuration 4

You build this configuration in two stages. In the first stage, you create LAN segments. In the second stage, you connect modules to them.

Create LAN Segments

Do the following to create LAN segments.

Step	Action
1	Open the LAN Interconnect window from the HUBwatch front panel.
2	Click on the Create LAN button to create an Ethernet hub group LAN. Repeat this step for the other two hub group Ethernet segments.

Important Information—Any older 90-series modules automatically come up on the ThinWire. You can not move these. However, you must configure the remaining modules using the following steps.

Connect Modules

Do the following to connect modules.

Step	Action
1	Select the DECrepeater 900FP module and click on the [Group] button to open the Group window (see the following *Port Grouping Window Figure* for an example).
2	Follow these instructions: a. Put ports 1-2 into a group labeled *1*. b. Put ports 3-8 into a group labeled *2*. c. Put ports 9-12 into a group labeled *3*.
3	Group the ThinWire port with ports 1 and 2 to provide connectivity for the 90 modules in the DEChub 900MS that connect only to the ThinWire port. You must group one of the six pairs of front panel ports with the ThinWire segment.
4	Go back to the LAN Interconnect window. Drag down backplane connectors 1 through 3 on the DECrepeater 900FP to HubGroup Ethernet LANs 1 through 3 respectively. **Result:** These connectors represent repeater port groups 1 through 3 created in steps 1 through 3. Leave connector 7 (the ThinWire connector) on the ThinWire segment. This action provides connectivity for the older 90-series modules in the hub that connect only to the ThinWire segment. (Table continued after figure)

Port Grouping Window Figure

You use this window to put the ports into different port groups.

Port Grouping:00.00.000.00:slot 5

Ports:

	1-2	3-4	5-6	7-8	9-10	11-12	MAC
ThinWire	✓						
1	✓						
2		✓	✓	✓			
Group 3					✓	✓	✓
4							
5							
6							

Refresh   Cancel   Help
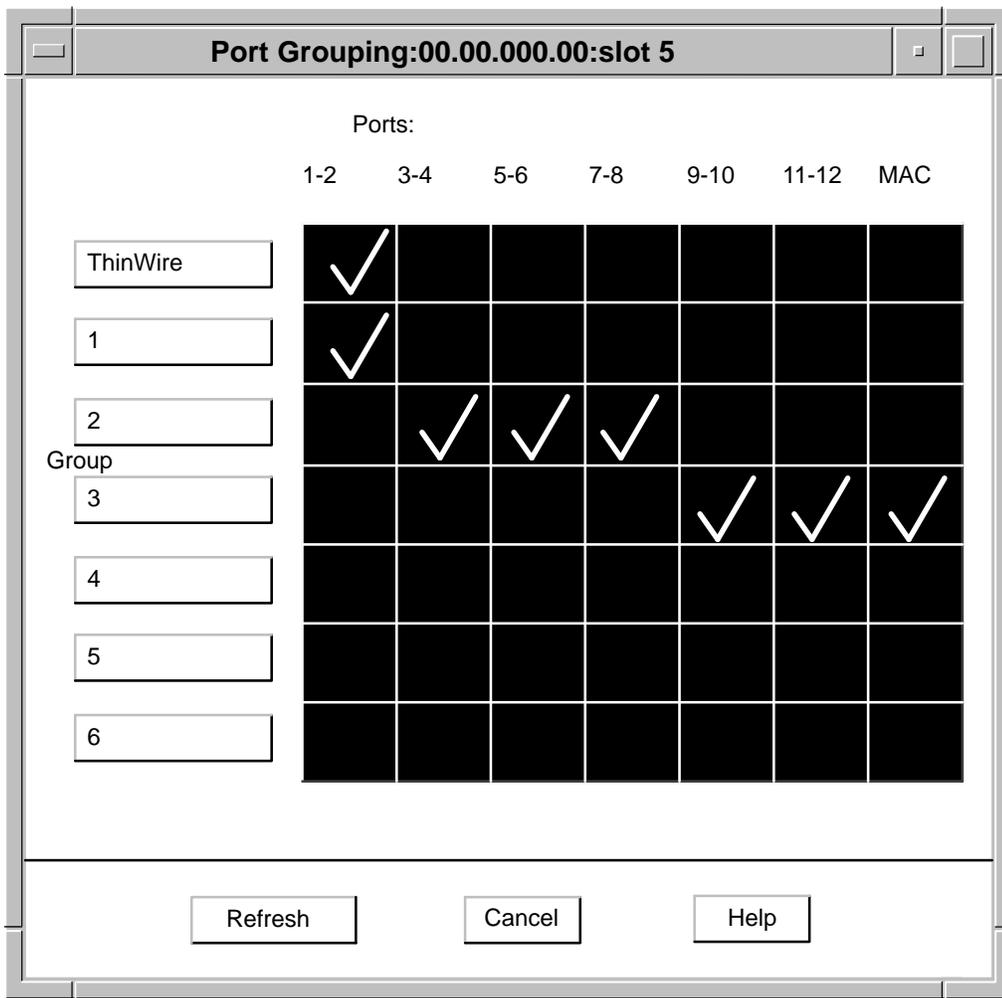
LKG-9114-94I

Step (Cont.)	Action
5	Select the DECbridge 900MX icon.
6	Click on the `Config` button and go into the Station Configuration window.
7	From this window, configure ports 2 through 4 to the backplane.
8	Return to the LAN Interconnect window.
9	From this window, click on the `Expand` button and go into the Expanded LAN Interconnect window.
10	Drag connectors 2 through 4 down to HubGroup Ethernet LANs 1 through 3, respectively.

The backplane connections are now complete and the hub is now ready for the external wiring of hubs to the DECrepeater 900FP front panel ports.

Backplane LAN Segment Configuration Guidelines

Introduction

Follow these guidelines when using the LAN Interconnect window to configure LAN segments within the hub backplane.

Low Numbered Slot

When you connect ports on FDDI modules to an FDDI flexible LAN segment, start with the module in the lowest numbered slot (for example, slot 1) and connect the modules in ascending order. This ensures that the Hub Manager will allocate backplane channels in the most efficient manner.

Six Segments Only

Do not create more than six Ethernet LAN segments. Repeaters cannot be connected to more than six Ethernet LAN segments in the hub backplane.

DECrepeater 90FS/TS Restrictions

If you have two or more DECrepeater 90FS or 90TS modules in your hub and you want to connect them to a flexible LAN segment, you must connect port 2 on all of them to the same Ethernet flexible LAN segment. DECrepeater 90FS and 90TS modules are half-height modules; therefore, the Hub Manager can connect only port 2 of these modules to a single flexible LAN segment.

Rule

If you connect port 2 of one DECrepeater 90FS or 90TS module to a backplane flexible LAN segment and you attempt to connect port 2 of a different DECrepeater 90FS or 90TS to a different backplane flexible LAN segment, the Hub Manager rejects the connection.

DECrepeater Configuration Guidelines

Introduction

This section describes some DECrepeater configuration issues.

Repeater Restrictions

DECrepeater 900FP, 900GM, and 900TM — You cannot connect these repeaters to more than six flexible LAN segments.

DECrepeater 90FS Restrictions — The DECrepeater 90FS and 90TS can connect only on the ThinWire or the top Ethernet flexible channel. If you try to connect a different DECrepeater 90FS to a different flexible channel than another 90FS in the same hub, the Hub Manager attempts to reconfigure backplane connections to accommodate the connection but it will fail.

DECrepeater 90T, 90C, 90FA, and 90FL Restrictions — You can connect these repeaters only to the ThinWire segment.

DECrepeater 900FP Restrictions —You must group one of the six pairs of front panel ports with the ThinWire segment (or the AUI in a DEChub ONE).

Preventing Repeater Loops

Introduction

This section describes repeater loops and suggests how you can avoid forming them.

What Are Repeater Loops?

On the DEChub 900MS backplane, a repeater loop forms when both backplane ports on two 900-series repeaters are connected to the same extended LAN. A repeater loop can cripple the network on which it forms. The *Prohibited Repeater Loop Figure* shows this type of loop connection.

Exception

The DECrepeater 900FP is an exceptional case where you can connect multiple backplane ports of the same type to the same LAN segment. See *Preventing 900FP Repeater Loops*.

Prohibited Repeater Loop Figure

This is an example of a typical repeater loop.
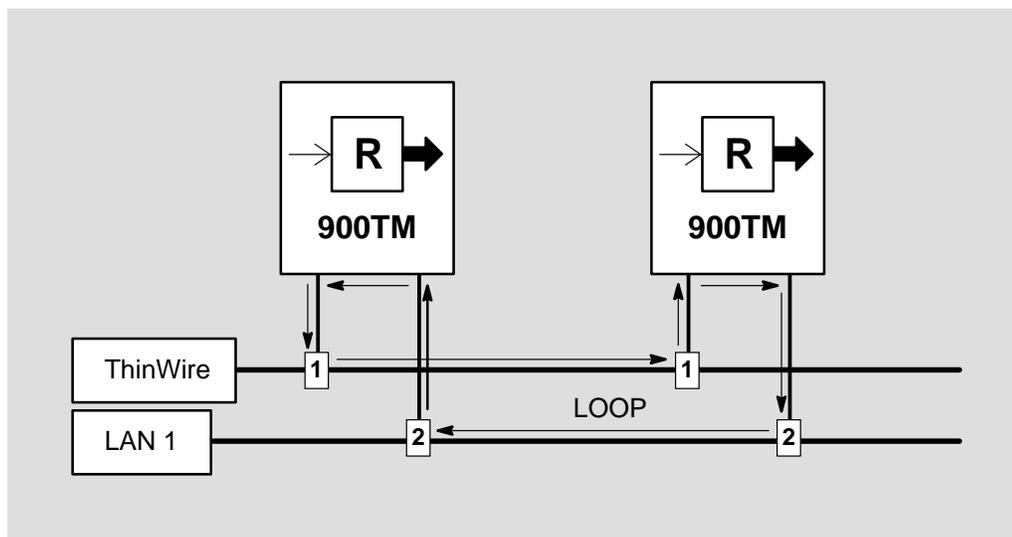
LKG-9108-94I

Kinds of Repeater Loops

For most repeaters, the DEChub 900MS firmware and HUBwatch software prevent repeater loops by applying these restrictions to repeater connections:

Loops Within a Single Repeater Module — HUBwatch software usually does not allow you to connect both the ThinWire port and a flexible channel port of the same repeater to the same type of LAN segment.

For example, DECrepeater 900TM modules have two backplane ports: a ThinWire port and the flexible channel port. You cannot connect these two ports to the same LAN segment because each one is compatible with a different type of LAN segment.

Loops Between Multiple Repeater Modules — The DEChub 900MS firmware does not allow you to connect the flexible channel ports of multiple repeaters to the same flexible LAN segments if the ThinWire ports of these repeaters are currently connected to the ThinWire LAN segment.

What Happens

If you attempt to make a connection that forms a prohibited loop and you answer OK to the Confirmation box, the DEChub 900MS firmware simply refuses to make the connection on the hub backplane and notifies HUBwatch software of the connection request refusal. The HUBwatch software notifies you of the failed connection attempt by redisplaying the actual interconnect.

Preventing 900FP Repeater Loops

You can group the DECrepeater 900FP backplane ports so that they act as if they were on separate virtual repeaters. This port grouping feature overrides any firmware and software repeater loop safeguards. Therefore, you have to be careful when connecting DECrepeater 900FP backplane port groups to LAN segments so as not to form a repeater loop.

The key to preventing this type of repeater loop is to keep track of the port group to which the ThinWire port belongs. This port group is configurable; so you may have to open both the LAN Interconnect Expanded View and the Port Group windows in order to keep track of which port group includes the ThinWire port.

Loop Example

In the *DECrepeater 900FP Loop Figure* for example, the ThinWire port (connection pulldown 7) is connected to port group 1 (connection pulldown 1) on both repeaters. Therefore, the configuration shown forms a loop. If the ThinWire port on the first repeater, 900FP-1, were connected with port group 2, no repeater loop would be formed.

ThinWire Port Group

To determine the port group to which the ThinWire port is connected, open the LAN Interconnect Port Grouping window for the DECrepeater 900FP module in question. For example, in the *Port Grouping Window Figure*, the ThinWire port is connected to port pair 1-2 which is part of port group 1. So, in effect, the ThinWire port is connected to port group 1.

DECrepeater 900FP Loop Figure

This is an example of a DECrepeater 900FP repeater loop.

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DECserver Configuration Guidelines

Introduction   This section describes some DECserver configuration issues.

DECserver   By default, both ports on DECserver 900TM terminal servers
900TM Ports   connect to the Ethernet ThinWire segment. Port 1 (the
operations port) handles normal data traffic between the
terminal server and connected terminals. You use port 2 (the
maintenance port) for maintenance functions like downline
loading software, setting operating parameters, and checking
counters. You may want to connect port 2 to a different
LAN segment than port 1. This action isolates maintenance
operations from user services.

DECserver   A DECserver 900TM can operate only one channel at a time.
Restrictions   The distinction between maintenance and operational channels
is a logical one only. You cannot connect the DECserver 900TM
to more than one Ethernet LAN segment.

Within the DECserver 900TM, there are no restrictions on
channel assignment between the maintenance channel and the
operational channel. They can be the same channel or different
channels depending on the network manager's preference.

All DECserver 90 modules can connect only to the ThinWire
LAN segment.

DECserver   When you initially turn power on to the hub, all repeater
Load Host   and terminal server modules are by default connected to the
dedicated ThinWire LAN segment. Therefore, if the DECserver
900TM needs to access a remote load host, it does so by way of
port 2 through the ThinWire LAN segment. Once the software is
loaded, port 2 is deactivated and port 1 becomes operational.

Rule   If you want to connect the DECserver 900TM to a flexible LAN
                  segment, you must move the port 1 connection pulldown to that
                  segment. The only reason ever to move port 2 to a flexible LAN
                  segment would be to keep it on a segment that has access to the
                  remote load host in the event the hub reboots. Upon rebooting,
                  the DEChub 900MS Hub Manager saves the configuration of
                  the backplane LAN segments and ensures that port 2 on the
                  DECserver 900TM connects to the same LAN segment.

DECbridge Configuration Guidelines

Introduction

This section describes some DECbridge and DECswitch configuration issues.

DECbridge 900MX Port 3

You can connect port 3 of the DECbridge 900MX to the ThinWire or any of the Ethernet flexible channels. You can connect the other Ethernet ports only to the Ethernet flexible channels.

FDDI Configuration Guidelines

Introduction   This section describes some FDDI configuration issues.

Types of FDDI Configurations   The way you configure a backplane FDDI ring depends on the FDDI topology restrictions of the module's station configuration type. FDDI dual ring configurations must be one of two types:

Type 1 – A closed backplane ring (a collapsed ring) with no external A/B connections.

Type 2 – A backplane ring closed using external A/B connections.

Types Figure
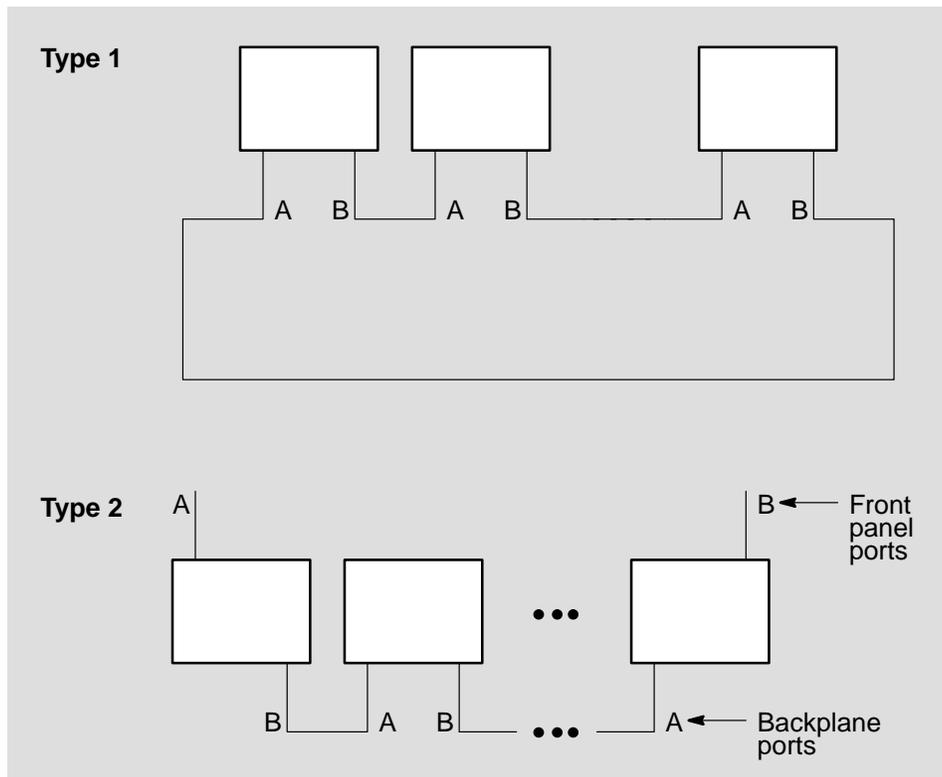
LKG–9508-94I

FDDI Ring Grayed Out   HUBwatch, on each user connection request, automatically generates or updates the appropriate backplane ring configuration unless the current module Station Configuration type prevents the module from joining the ring. In such a case, the ring is grayed out when you select the module's FDDI pulldown.

Trunk Rings   HUBwatch V3.1 supports only Trunk Rings for FDDI backplane configurations. Backplane Tree configurations are not supported.

7

The HUBwatch GUI for Hubs and Modules

Using the GUI

Introduction   HUBwatch software is designed to make managing the hub and its installed modules easy. The graphic user interface (GUI) reflects this approach. When you run HUBwatch, the software displays a window containing a realistic diagram of the hub configuration. This window is called the Hub Front Panel window.

The menu bar on the Hub Front Panel window lets you get to other windows that you use to manage the hub configuration, SNMP communities, backplane configurations, polling, and other applications. You use a set of standard buttons to select options on a particular window.

You access summary windows for the network modules and their ports from the Hub Front Panel window by double clicking on a module or its ports.

Hub Front Panel Window

Introduction

This window provides a graphic representation of your hub configuration. You get to all other HUBwatch windows from the Hub Front Panel window. From this window, You select pulldown menu options or you double click on modules and module ports to access module management windows.

How to Open It

You see the Hub Front Panel window when you first start up HUBwatch. See Chapter 5 for instructions.

**Hub Front
Panel Window
Figure**

This is the Hub Front Panel view.

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Types of Views

Introduction HUBwatch provides both a physical view and a logical view of the hub chassis from the Hub Front Panel window. Both views, physical and logical, allow you to double click on modules and module ports to access module management windows.

Physical View The physical view depicts an exact representation of the hub's front panel, which can be useful in circumstances where a close correlation to the hub is needed. This view is particularly useful for troubleshooting the hub over the network.

Logical View The logical view displays the same technical data as the physical view, but it uses a standard module template with labels and icons to distinguish module types. The logical view repaints the screen faster (because it has less fine detail). It is also easier to use to select individual ports because they appear larger.

Physical View Figure

This is a Front Panel physical view.
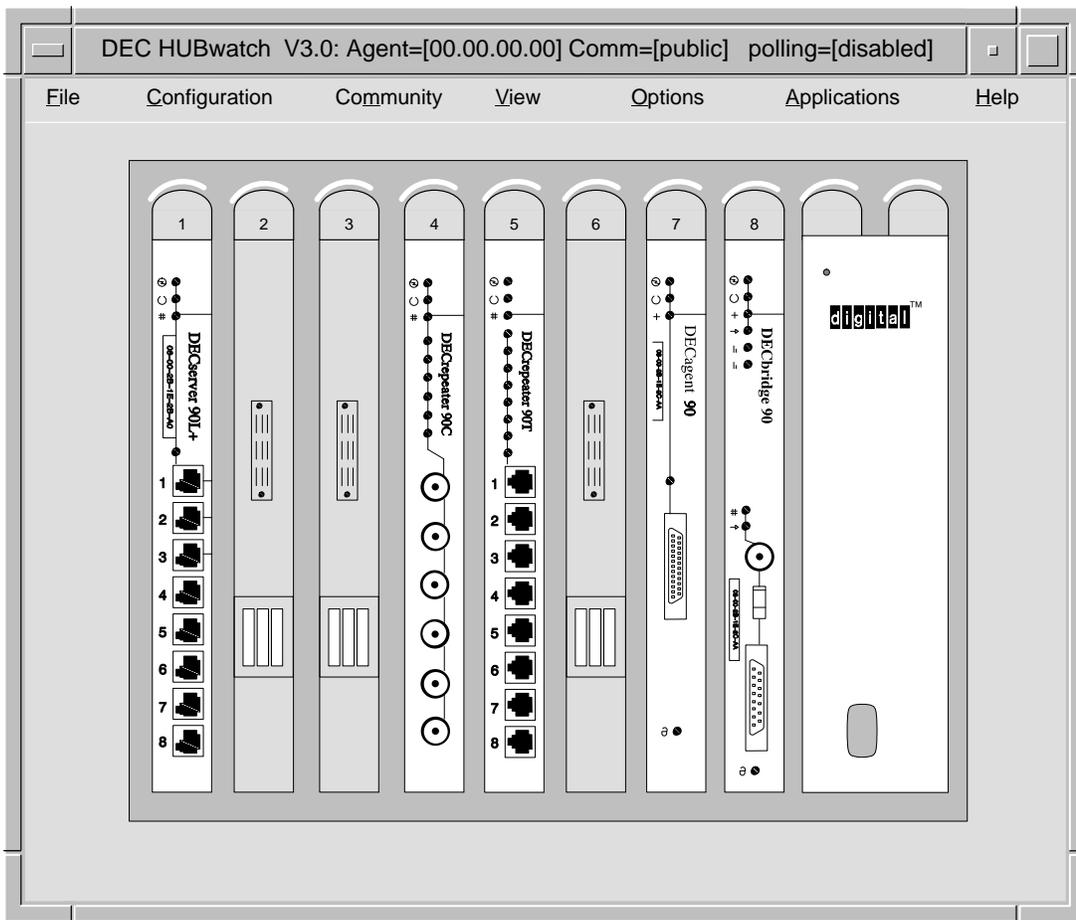
LKG-7413-93I

Logical View Figure

This is a Front Panel logical view.
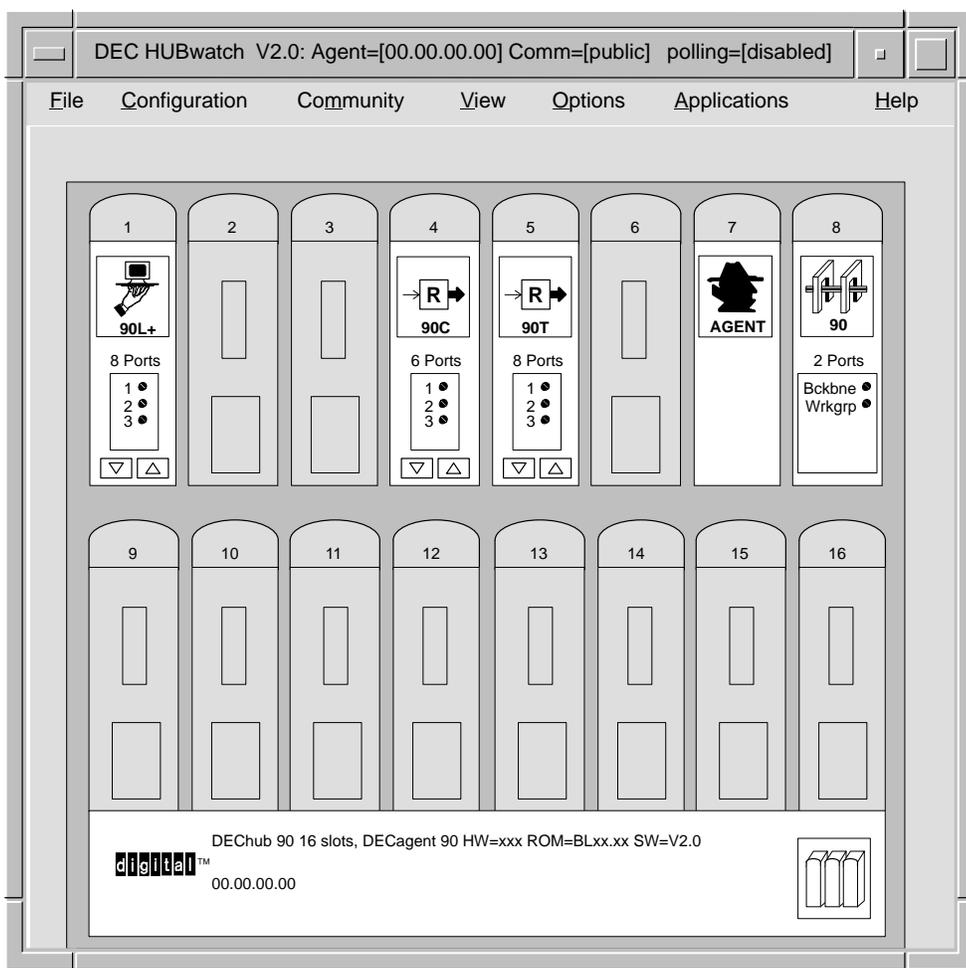
LKG-7417-92I

Hub Management Windows

When You Use Them

You use hub management windows to:

- Exit HUBwatch.
- Add modules to or delete modules from the configuration.
- Manage SNMP agents and community information.
- Change the view of the Hub Front Panel window.
- Create or delete backplane LAN segments and their connections.
- Monitor the physical environment of the hub.
- View and manage the message log.
- Set polling.
- Manage alarms
- Find Ethernet stations (including duplicate addresses).
- Get Help.

Hub Management Window Figure

This figure shows you the hierarchy of hub management windows.
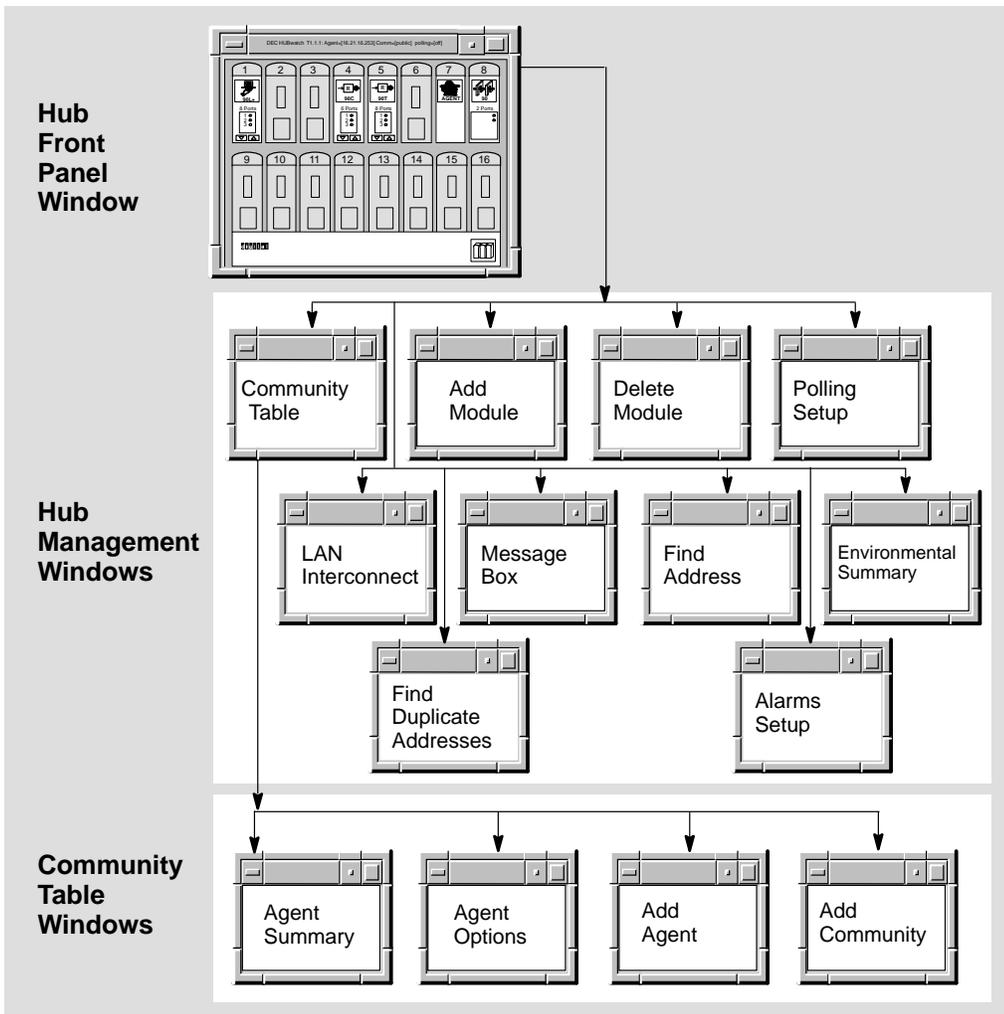
LKG-9083-94I

How You Open Them

You open hub management windows by pulling down options from the menu bar of the Hub Front Panel window. Some of the menu options have keyboard accelerators.

Menu Options

The following table describes the menus, their options, and keyboard accelerators.

Menu	Option	Keyboard Accelerator	Function
File	Exit	Ctrl/x	Dismisses HUBwatch.
Configuration	Add	Ctrl/a	Adds a module.
	Delete	Ctrl/d	Deletes a module.
Community	Manage Table	None	Displays the list of available SNMP agents and their communities. Used to add, delete, and modify agents and communities.
	Manage Current	None	Allows access to a summary window for the current agent.
View	Logical	None	Displays a logical representation of the DEChub and its installed modules. The view is displayed in the Hub Front Panel window.
	Physical	None	Displays a physical representation of the DEChub and its installed modules. The view is displayed in the Hub Front Panel window.
	LAN Interconnect	None	Displays the LAN Interconnect window. You use this window to create LAN segments and connect modules to them. Options include Expanded View, Station Configuration, and Group View.
	Message Box	None	Displays a log file of error, warning, and informational messages.

Menu	Option	Keyboard Accelerator	Function
	Environmental Summary	None	Displays chassis power and status information (DEChub 900 only).
Options	Polling	None	Offers four options: Refresh, Enable, Disable, and Set Up.
	Message Setup	None	Allows you to modify message log file parameters.
Applications	Find Address	Ctrl/f	Searches the SNMP agent's database for a particular Ethernet station.
	Find Duplicates	None	Searches the SNMP agent's database for duplicate Ethernet addresses.
	Alarms	None	Options include Alarm Setup, Start Polling, Stop Polling, and Viewer.**These options are only supported on OpenVMS.**
Help		None	Accesses online help.

Lowercase   You must type the keyboard accelerator as a lowercase letter.

Help Menu

This table shows you which Help options you have and tells you about those options:

Option	Keyboard Accelerator	Function
Context Sensitive	Ctrl/c	Provides context-sensitive Help for various objects in a HUBwatch open window or dialog box (such as menus, window objects, and dialog box fields).
Window Info	Ctrl/w	Provides information about the HUBwatch windows and a description of tasks performed at each window. This topic also explains how the HUBwatch application is organized.
Index	Ctrl/e	Provides a list of Help topics similar to index entries in a book. Also provides a table of contents through the View option on the Help Index window menu bar.
Glossary	Ctrl/l	Provides a list of terms and definitions related to the HUBwatch software.
Tutorial	Ctrl/i	Describes key features of the HUBwatch application.
Management	Ctrl/n	Describes the GUI and the management tasks performed with HUBwatch.
Troubleshooting	Ctrl/t	Lists the product's error messages and suggests recovery procedures.

Option	Keyboard Accelerator	Function
Product Info	Ctrl/p	Provides a product overview, the software version and its date, copyright information, the release notes, information about new features, and a list of management Help topics.
Using Help	Ctrl/u	Provides Help information.
Glossary	Ctrl/l	Lists terms and definitions related to HUBwatch software.

Context Sensitive Help

You can get context sensitive Help for any window object by positioning the cursor on the object and pressing F1.

Reference

See *Chapter 8* in this manual for instructions about using hub management windows. See Chapter 1 for a detailed description of the HUBwatch online Help options and how to use them.

Module Management Windows

When You Use Them

You use module management windows to:

- Manage the DECagent 90 or the DEChub 900MS Manager.

- Manage bridges.

- Manage brouters.

- Manage FDDI concentrators.

- Manage repeaters.

- Manage switches.

- Manage terminal servers.

How to Open Them

To open a particular module management window, double click on the module or one of its ports in the Hub Front Panel window.

To open the management window for the Hub Manager, select the Manage Current option from the Community menu on the Hub Front Panel window.

**Module
Management
Window Figure**

This figure shows the types of modules you can manage.

Hub Front Panel Window

DECagent 90
Module
Window

Repeater
Windows

Terminal
Server
Windows

Bridge
Windows

Brouter
Windows

Concentrator
Windows

Switch
Windows

AGENT

R

FDDI
900MX

PEswitch
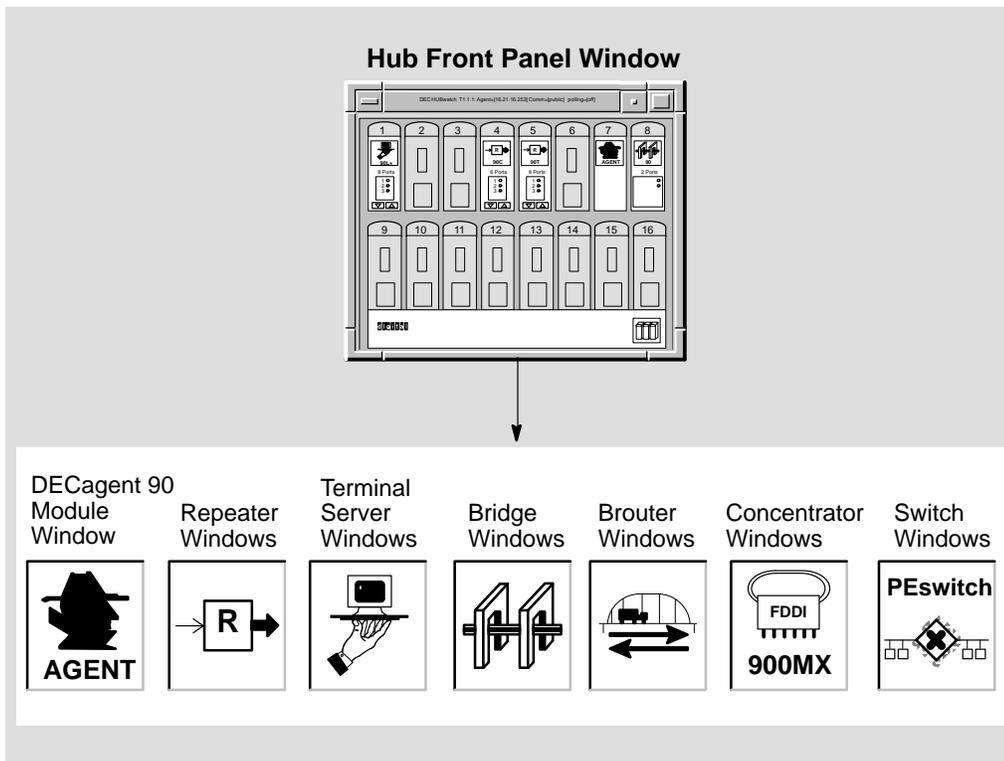
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Reference

See Chapter **8** for instructions about using the module
management windows.

**Network
Module Icons**

Each module management window has its own icon that shows the network module that the window manages. These are the network module icons.

AGENT	Agent Icon—Designates the Agent Summary window, which is used to display and manage the agent module.
R	Repeater Icon—Designates all windows used to display or manage repeater modules.
	Terminal Server Icon—Designates all windows used to display or manage terminal server modules.
	Bridge Icon—Designates all windows used to display or manage bridge modules and the RoamAbout Access Point.
	Brouter Icon—Designates all windows used to display or manage brouter modules.
FDDI **900MX**	Concentrator Icon—Designates all windows used to display or manage concentrator modules.
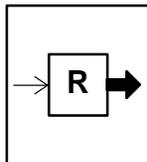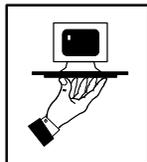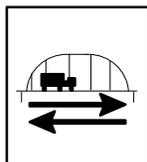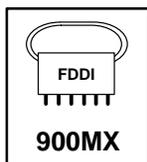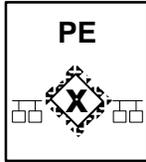
Switch Icon—Designates all windows used to display or manage switch modules.

Standard Buttons

HUBwatch windows have a series of standard push buttons along the bottom. The following table lists the buttons and their functions.

Button	Function
OK	Executes requested changes and closes the current window.
Apply	Executes requested changes.
Refresh	Causes the HUBwatch software to poll the network modules for updated information. Some information is continuously updated if polling is on. See the Help text for the individual items to determine which items need to be refreshed.
Cancel	Dismisses the current window and ignores requested changes.
Help	Opens an online Help window that provides a brief description of major areas on the current window with crossreference hotspots to the context-sensitive help. The help information also includes a list of management tasks that you can performed using the window with crossreference hotspots to detailed descriptions of each task.

8

Managing DEChubs and Modules

Using HUBwatch Windows

Chapter Structure

This chapter describes hub and module management tasks as concepts. It also tells you how to navigate the management windows. This chapter does not include detailed information about performing a specific task.

Task Instructions

You can find all the step-by-step instructions for doing management tasks in the *How to* section of the HUBwatch online Help. You access that help from one of the HUBwatch windows.

Reference

You can find more information about using online Help in Chapter 1.

HUBwatch Management Windows

Introduction   HUBwatch management windows let you manage:

- The hub and its configuration.
- SNMP communities and agents.
- Configuration changes and traps
- Backplane LAN segments.
- Brouters.
- DECconcentrator 900MX.
- DECserver 90L and 90L+ terminal servers.
- DECserver 90TL, 90TS, 90M, and 900TM terminal servers.
- Hub environmental sensors.
- HUBwatch messages.
- 90-series repeaters (except the 90FS and 90TS).
- 900-series repeaters (including the 90FS and 90TS).
- 90-series bridges.
- 900-series bridges and switches (including RoamAbout Access Point).

Refer to the following tables for more information about accessing the different types of management windows.

Hub Management

Opening Hub Management Windows

You access the Hub Front Panel window when you start HUBwatch. You can get to the remaining hub management windows by clicking on the following menus in the Hub Front Panel window menu bar:

Menu	Task
Configuration	Add and delete modules.
Community	Add or delete communities or agents
	View current agent information.
View	Select physical view or logical view.
	Use backplane LAN segments.
	Display the HUBwatch Messages window.
	Display chassis environmental information.
Options	Enable or disable polling. Set the polling interval.
Applications	Find Ethernet Address or Duplicate Addresses windows.
	Modify the message log file defaults.
	Set up, poll, and view alarms (OpenVMS only).

Reference

The following table tells you how to find more information about each hub management task.

Task	See
Add and delete modules.	Online Help.
Add, delete, and modify communities or agents. View agent information.	Online Help. Chapter 8 in this book.
Select physical or logical views.	Chapter 7 in this book.

Task	See
Use backplane LAN segments.	Online Help. Chapter 6 in this book.
Display HUBwatch messages.	Online Help.
Display environmental information.	Online Help.
Enable or disable polling. Set the polling interval.	Online Help.
Modify message file defaults.	Online Help.
Use configuration changes and traps.	Online Help. Chapter 4 in this book.
Find Ethernet address. Find duplicate addresses.	Online Help.

SNMP Communities and Agents

Introduction

You manage SNMP communities and agents with the Community Table and Manage Current windows. The following table lists the available tasks and the windows you use to perform them.

Window-Task Table

Window	Task
Manage Current	Display agent information for the current agent.
	Modify the agent's location and contact.
Community Table	Add or delete an agent.
	Add or delete a community.
	Modify agents.
	Change the current agent or community.
	Modify the community information.
	Change the agent's hub type.
	Access remote agents.

For instructions about performing any of the agent or community tasks, see the Help topic for that task.

Opening Agent Summary Windows

The way you access an Agent Summary window depends on the type of SNMP agent. There are two agent types:

- Modules with built-in SNMP agents, such as the DECagent 90 module or the DECserver 90TL module.

- The DEChub 900MS Hub Manager.

Do the following to open the Agent Summary window.

Type of Agent	Steps
Built-in agent	From the Hub Front Panel window, click on the module you want. Then, choose Manage Current from the Community menu.
Hub Manager	From the Hub Front Panel window, choose Manage Current from the Community menu.
	To open the Agent Summary window for the Hub Manager itself, choose Manage Current from the Community menu when *no* modules are selected. For example, click on the blue background to deselect any selected module.

Alarms

Introduction

The following tables list the available tasks and the windows you use to perform them. (This information applies only to OpenVMS.)

Window-Task Table

Window	Task
Alarm Setup	Enabling and disabling alarms.
	Enabling and disabling traps.
	Enabling and disabling reporting of configuration changes.
	Adding alarmed agents.
	Deleting alarmed agents.
	Modifying alarmed agent information.
	Starting the alarm viewer.
	Viewing alarms, traps, and configuration changes.
	Reviewing the alarm log file.
	Starting the alarm poller.
	Stopping the alarm poller.

Window-Task Table

Window	Task
Alarms Setup	Enabling and disabling traps.
	Adding and deleting alarmed agents.
	Modifying alarmed agent information.
	Starting the alarm viewer.
	Viewing traps.
	Reviewing the alarm log file.
	Starting the alarm poller.
	Stopping the alarm poller.

For instructions about performing any of the alarm tasks, see the Help topic for that task.

Opening the Alarm Management Windows

These instructions tell you how to open the alarm management windows.

Window	Steps
Alarm Setup	From the Hub Front Panel window, select the Applications pulldown menu. From that menu, click on the Alarms option, then click on the Alarm Setup choice.

Backplane LAN Segments

Introduction

You use the LAN Interconnect window to manage backplane LAN segments. The following table lists the available tasks and the windows you use to perform them.

Window-Task Table

Window	Task
LAN Interconnect	Create a LAN segment.
	Connect a module to a LAN segment.
	Disconnect a module from a LAN segment.
	Delete a LAN segment.
	Modify a network segment's characteristics.
LAN Interconnect Expanded View	Same options as for the LAN Interconnect window but used for modules with more than four backplane ports.
Station Configuration	Configure module ports between the front panel and the backplane.
Group View	Group module ports on 900-series repeaters. (V3.1 supports only the DECrepeater 900FP.)

For instructions about performing any of the interconnect tasks, see the Help topic for that task.

**Opening the
Backplane
Management
Windows**

Do the following to open the LAN Interconnect window.

Window	Steps
LAN Interconnect	Click on the View menu from the Hub Front Panel window. Next click on the LAN Interconnect option.
Station Configuration	Open the LAN Interconnect window. Select a DECswitch 900EF, DECswitch 900EE, or DECconcentrator 900MX, then click on the Config button.
	You can also reach this window by clicking on the Station Configuration icon on the DECswitch 900EF, DECswitch 900EE, or the DECconcentrator 900MX Summary windows.
Expanded View	Open the LAN Interconnect window. Click on the module you want to expand, then click on the Expand button.
	You can also reach this window by clicking on the LAN Interconnect icon on the DECswitch 900EF, DECswitch 900EE, or the DECrepeater 900FP Summary windows.
Group View	Open the LAN Interconnect window. Click on the DECrepeater 900FP, then click on the Group button.
	You can also reach this window by clicking on the Group icon on the DECrepeater 900FP Summary window.

DECconcentrator 900MX

Introduction

You use these windows to manage the DECconcentrator 900MX. The following table describes these windows and the tasks associated with them. For instructions about performing any of the concentrator management tasks, see the Help topic for that task.

Window-Task Table

Window	Task
Hub Front Panel	Interpret concentrator LEDs.
Concentrator Summary	Display or assign the concentrator description.
	Configure the concentrator.
	Disable the concentrator.
	Display configuration information.
	Enable or disable concentrator ports.
	Display port information.
	Display network utilization.
	Display station information.
	Display MAC information.
	Reset the concentrator.
	Reset the concentrator to factory defaults.
Concentrator MAC Summary	Display MAC status.
	Configure token timer.
	Enable and disable the ring purger.
	Display port information.
	Display MAC information.
Concentrator MAC Counters	Display MAC counter information.
Concentrator Port Details	Display port information.
	Enable and disable ports.

Window	Task
Station Configuration	Configure ports between the backplane and the front panel.

Opening Concentrator Windows

Do the following to open the concentrator windows.

Window	Steps
Concentrator Summary	Double click on the concentrator module in the Hub Front Panel window.
Concentrator MAC Summary	Click on Summary in the Concentrator Summary window.
Concentrator MAC Counters	Click on Counters in the Concentrator Summary window.
Concentrator Port Details	Double click on the port PMD you want from the Port table in the Concentrator Summary window.
	Another method is to double click on a port on a Concentrator module from the Hub Front Panel window.
Station Configuration	Click on the Station Configuration icon in the DECconcentrator 900MX Summary window.

90-Series Repeaters

Introduction

You use these windows to manage 90-series repeaters (except the DECrepeater 90FS and 90TS). The following table lists the available tasks and the windows you use to perform them.

Hint

You use these windows for DECrepeater 90 modules that are managed by the DECagent 90.

Window-Task Table

Window	Task
Hub Front Panel	Interpret repeater LEDs.
Repeater Summary	Interpret repeater port connections.
	Display repeater summary information.
	Display port information.
	Assign the repeater description.
	Name repeater ports.
	Enable and disable repeater ports.
Repeater Port Summary	Display port information.
	Name repeater ports.
	Enable and disable repeater ports.

For instructions about performing any of the repeater tasks, see the Help topic for that task.

**Opening
90-Series
Repeater
Windows**

Do the following to open the 90-series repeater windows.

Window	Steps
Repeater Summary	From the Hub Front Panel window, double click on a Repeater module.
Repeater Port Summary	From the Hub Front Panel window, double click on a port on the Repeater module.
	Another method is to open the Repeater Summary window and double click on a Port icon in the Port table.

900-Series Repeaters

Introduction

You use these windows to manage the 900-series repeaters (Including the DECrepeater 90FS and 90TS.) The following table describes these windows and the tasks associated with them.

Window-Task Table

Window	Task
Hub Front Panel	Interpret repeater LEDs.
Repeater Summary	Interpret repeater port connections.
	Display port information.
	Display repeater summary information.
	Assign the repeater description.
	Name repeater ports.
	Enable and disable repeater ports.
	Enable and disable repeater modules.
	Reset repeater modules.
	Configure repeater modules.
Repeater Port Summary	Display port information.
	Name repeater ports.
	Enable and disable repeater ports.
	Display repeater port performance statistics.
Repeater Port Details	Enable and disable repeater ports.
	Enable or disable link test administration status.
	Display Repeater Port counters.
Dual Port Redundancy (DECrepeater 90FS, 90TS, and 900FP only)	Set up redundant master and responder links.
	Display redundant link status.
	Modify redundant links.
	Remove redundant links.

Window	Task
Repeater Security Summary	Set up repeater port security.
	Display repeater port security.
	Add or remove port authorization stations.
Repeater Security Intrusions Log	Display security intrusions for the Repeater module.
	Display security intrusions for a single repeater port.
Expanded View	Create a LAN segment.
	Connect a module to a LAN segment.
	Disconnect a module from a LAN segment.
	Delete a LAN segment.
	Modify a network segment's characteristics.
Port Grouping	Group module ports. (HUBwatch V3.1 supports only the DECrepeater 900FP.)

For instructions about performing any of the 900-series repeater tasks, see the Help topic for that task.

900-Series Repeater Window Push Button Icons

The 900-series repeater windows include the following push button icons.
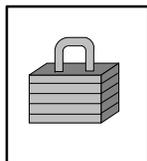
Security—click on this push button to open the Repeater Security Summary window. The Repeater Summary window and the Repeater Port Summary window have this push button.
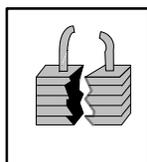
Security Intrusions—click on this push button to open the Repeater Security Intrusions Log window. The Repeater Summary window and the Repeater Port Summary window have this push button.
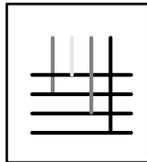
LAN Interconnect—click on this push button to open the LAN Interconnect window. The Repeater Summary window has this push button.
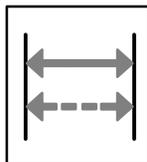
Dual-Port Redundancy—click on this push button to open the Dual-Port Redundancy window. The Repeater Summary window and the Repeater Port Summary window have this push button.
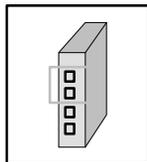
Port Grouping—click on this push button to open the repeater's Port Grouping window. The Repeater Summary window has this push button.

Opening 900-Series Repeater Windows

Do the following to open the 900-series repeater windows.

Window	Steps
Repeater Summary	From the Hub Front Panel window, double click on a Repeater module.
Repeater Port Summary	From the Hub Front Panel window, double click on a port on the Repeater module.
	Another method is to open the Repeater Summary window and click on a Port icon in the Port table.
Repeater Port Details	Open the Repeater Port Summary window and click on Details.

Window	Steps
Repeater Security Summary	Open the Repeater Summary window and click on the Security icon either in the Port table or in the Configuration list.
	Another method is to open the Repeater Port Summary window and click on the Security icon in the Security box.
Repeater Security Intrusions Log	Open the Repeater Summary or Repeater Ports Summary window and click on the Security Intrusions Log icon in the Configuration list box.
	Another method is to open the Repeater Security Summary window and click on the Security Intrusions Log icon in the Security Functions box.
Dual Port Redundancy	Open the Repeater Summary or Repeater Port Summary window and click on the DPR icon.
LAN Interconnect Expanded View	Open the Repeater Summary or Repeater Ports Summary window and click on the Expand icon.
Port Grouping	Open the Repeater Summary or Repeater Ports Summary window and click on the Group icon.

DECserver 90L and 90L+ Terminal Servers

Introduction

You use these windows to manage the 90L and 90L+ terminal servers. The following table describes these windows and their associated tasks.

Window-Task Table

Window	Task
Hub Front Panel	Interpret LEDs.
Terminal Server Summary	Interpret port connector colors.
	Display port information.
	Assign the terminal server's description.
	Modify the 90L+ session prompt.
	Select a port.
	Select the device type.
	Name the port.
	Set the port speed.
Terminal Server Port Summary	Select a port.
	Select the device type.
	Name the port.
	Enable and disable autoconfigure.
	Modify <Break> Passthru.
	Enable and disable remote modify.
	Enable and disable 90L+ on-demand load.
	Display Port counters.
Terminal Server Counter	Display Terminal Server counters.

For instructions about performing any of the terminal server tasks, see the Help topic for that task.

Opening the Terminal Server Windows

Do the following to open the terminal server windows.

Window	Steps
Terminal Server Summary	From the Hub Front Panel window, double click on the terminal server module you want to use.
Terminal Server Counters	Open the Terminal Server Summary window and click on the $\boxed{\text{Counters}}$ push button.
Terminal Server Port Summary	From the Hub Front Panel window, double click on the terminal server port you want to use.
	Another method is to open the Terminal Server Summary window and click on the MMJ connector of the port you want to use.

DECserver 90TL, 90M, and 900TM Terminal Servers

Introduction

You use these windows to manage the 90TL, 90M, and 900TM terminal servers. The following table describes these windows and their associated tasks.

Window-Task Table

Window	Task
Hub Front Panel	Interpret LEDs.
Terminal Server Summary	Interpret port connector colors.
	Display port information.
	Display session summary information.
	Enable and disable ports.
	Set IP forwarding.
	Assign the terminal server's description.
	Select a port.
	Select the admin origin.
	Name the port.
	Set the port speed.
	View maximum number of sessions.
	View input and output flow control.
Terminal Server Port Summary	Display port counters.
	Select the admin origin.
	Name the port.
	Set the port speed, with split speeds.
	Set maximum number of sessions.
	Set input and output flow control type.
	Set bits per character.
	Select parity.
Terminal Server Session	Display terminal server session information.
	Disconnect a session.

Window	Task
Terminal Server Counters	Display Terminal Server counters.

For instructions about performing any of the terminal server tasks, see the Help topic for that task.

Opening the Terminal Server Windows

Do the following to open the terminal server windows.

Window	Steps
Terminal Server Summary	From the Hub Front Panel window, double click on the terminal server module you want to use.
Terminal Server Counters	Open the Terminal Server Summary window and click on the Counters push button.
Terminal Server Port Summary	From the Hub Front Panel window, double click on the terminal server port you want to use.
	Another method is to open the Terminal Server Summary window and click on the RJ45 connector of the port you want to use.
Terminal Server Session Detail	From the Terminal Server Summary window, click on a port's Session Information push button in the Port table.

90-Series Bridges

Introduction

You use these windows to manage 90-series bridges. The following table describes these windows and their associated tasks.

Window-Task Table

Window	Task
Bridge Summary	Display port information.
	Assign the bridge description.
	Disable bridge ports.
	Display spanning tree attributes.
Bridge Port Summary	Show status.
	Disable bridge ports.
	Display spanning tree attributes.
Bridge Port Detail	Show traffic statistics and Error counters.
	Disable bridge ports.
Bridge Filtering	Set protocol filtering.
	Add Ethernet protocols.
	Delete protocols.
Bridge Spanning Tree	Display spanning tree attributes.
Bridge Forwarding	Display forwarding database.
	Set forwarding database.
Bridge Traffic	Display traffic statistics in bar graph format.

For instructions about performing any of the bridge management tasks, see the Help topic for that task.

Bridge Summary Window Icons

The Bridge Summary window uses icons to label push buttons in the More Information box. Clicking on these push buttons activates other bridge management windows. These are the Bridge Summary icons.

Bridge Forwarding—click on this icon in the Bridge Summary window to open the Bridge Forwarding window.

Bridge Protocol Filter—click on this icon in the Bridge Summary window to open the Bridge Protocol Filter window.

Bridge Spanning Tree—click on this icon in the Bridge Summary window to open the Bridge Spanning Tree window.
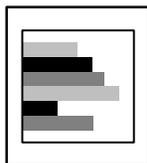
Bridge Traffic—click on this icon in the Bridge Summary window to open the Bridge Traffic window.

Opening Bridge Windows

Do the following to open the bridge windows.

Window	Steps
Bridge Summary	From the Hub Front Panel window, double click on a Bridge module.
Bridge Forwarding	From the Bridge Summary window, click on the Forwarding icon in the More Information box.
Bridge Filtering	From the Bridge Summary window, click on the Protocol Filter icon in the More Information box.
Bridge Spanning Tree	From the Bridge Summary window, click on the Spanning Tree icon in the More Information box.
Bridge Traffic	From the Bridge Summary window, click on the Traffic Detail icon in the More Information box.
Bridge Port Summary	From the Hub Front Panel window, double click on a bridge port.
	Another method is to open the Bridge Summary window and click on a port in the Port Information box.
Bridge Port Detail	Open the Bridge Port Summary window and click on Details .

900-Series Bridges and Switches (Including RoamAbout Access Point)

Introduction

You use these windows to manage 900-series bridges and switches including the RoamAbout Access Point. The following table describes these windows and their associated tasks. For instructions about performing any of the bridge management tasks, see the Help topic for that task.

Window-Task Table

Window	Task
Hub Front Panel	Interpret bridge LEDs.
Bridge Summary	Display or assign the bridge description.
	Display bridge status information.
	Display management agent information.
	Display spanning tree attributes.
	Display port attributes and status.
	Enable or disable forwarding on a port.
	Reset the bridge.
	Reset the bridge to factory defaults.
Bridge Port Information	Display Port counters.
	Display bridge configuration changes.
Address Filter	Create address filters.
	Modify address filters.
	Delete address filters.
	Create a default filter.
	Write a list of filters to a file.
	Display the last port seen for each filter.

Window	Task
Protocol Filter	Create protocol filters.
	Modify protocol filters.
	Delete protocol filters.
	Create default protocol filters.
	Write a list of filters to a file.
Forwarding Database	Display forwarding database status information.
	Locate specific database entries.
	Write the contents of the forwarding database to a file.
LAN Interconnect Expanded View	Create a LAN segment.
	Connect bridge ports to LAN segments.
	Disconnect bridge ports from LAN segments.
	Delete a LAN segment.
	Modify a network segment's characteristics.
Station Configuration	Configure bridge and FDDI concentrator ports between the front panel and the backplane (DECswitch 900EF and DECswitch 900EE only).
Bridge Configuration	Set bridge configuration parameters
	Add and remove entries from the Bridge Trap Address table.
FDDI Summary	Access any of the FDDI windows (DECbridge 900MX, DECswitch 900EF, and PEswitch 900TX only).

Bridge and Switch Summary Window Icons

The Bridge Summary window uses icons to label push buttons in the More Information box. Clicking on these push buttons activates other bridge and switch management windows. These are the Bridge and Switch Summary icons.

Forwarding—click on this icon in the Bridge Summary window to open the Forwarding window.
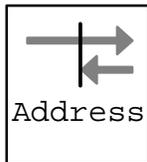
Address Filtering—click on this icon in the Bridge Summary window to open the Address Filtering window.
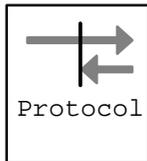
Protocol Filtering—click on this icon in the Bridge Summary window to open the Protocol Filtering window.
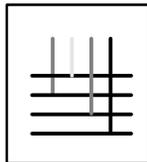
LAN Interconnect Expanded View—click on this icon in the Bridge Summary window to open the LAN Interconnect Expanded View window.
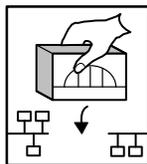
Configuration—click on this icon in the Bridge Summary window to open the Bridge Configuration window.
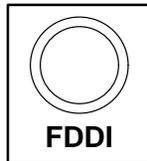
FDDI Summary—click on this icon in the Bridge Summary window to open the FDDI Summary window.
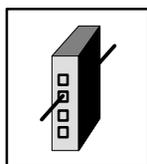
Station Configuration—click on this icon in the Bridge Summary window to open the Station Configuration window.

Opening Bridge Windows

Do the following to open the bridge windows.

Window	Steps
Bridge Summary	From the Hub Front Panel window, click on a Bridge module.
Bridge Port Information	From the Bridge Summary window, click on a port connector.
	Also, from the Hub Front Panel physical view, double click on a port connector. From the Hub Front Panel logical view, click on the Port button.
Bridge Forwarding	From the Bridge Summary window, click on the Forwarding icon in the More Information box.
Bridge Address Filtering	From the Bridge Summary window, click on the Address Filtering icon in the More Information box.
Bridge Protocol Filtering	From the Bridge Summary window, click on the Protocol Filtering icon in the More Information box.
Bridge Configuration	From the Bridge Summary window, click on the Bridge Configuration icon in the More Information box.
LAN Interconnect Expanded View	From the Bridge Summary window, click on the LAN Interconnect icon in the More Information box.
Station Configuration	From the Bridge Summary window, click on the Station Configuration icon in the More Information box.
Any FDDI Window	From the Bridge Summary window, double click on the FDDI icon. The FDDI Summary window allows you to reach the other FDDI windows.

Brouters

Introduction

You use these windows to manage brouters. The following table describes these windows and their associated tasks.

Window-Task Table

Window	Task
Hub Front Panel	Interpret brouter LEDs.
Brouter Console	Configure the brouter.
Brouter Summary	Display port status.
	Assign brouter name.
	Select port.
	Name a brouter port.
Brouter Port Summary	Display port status.
	Display port protocol information.
	Name a brouter port.
Brouter Health Counters	Display brouter counters.
TELNET Console Window	Access Brouter Console Control functions.

For instructions about performing any of the brouter management tasks, see the Help topic for that task.

Brouter Icons

Brouter icons label push buttons in the More Information box on the Brouter Summary window. Clicking on these push buttons activates other brouter windows. These are the Brouter icons.
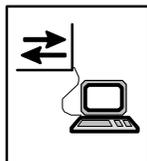
Brouter Console—click on this icon in the Brouter Summary window to open the Brouter TELNET Console window.

Brouter Counters—click on this icon in the Brouter Summary window to open the Brouter Counters window.

Opening Brouter Windows

Do the following to open the brouter windows.

Window	Steps
Brouter Summary	From the Hub Front Panel window, double click on a Brouter module.
Brouter Port Summary	From the Hub Front Panel window, double click on a brouter port. Another method is to open the Brouter Summary window and double click on a Port icon in the Port table.
Brouter Console	From the Brouter Summary window, click on the Console icon in the More Information box.
Brouter Health Counters	From the Brouter Summary window, click on the Counters icon in the More Information box.

Part III

Managing the GIGAswitch

Part III describes the HUBwatch GUI and how you use it to manage GIGAswitch network devices.

9

The HUBwatch GUI for the GIGAswitch

Using the GUI

Introduction

When you start up HUBwatch to manage the GIGAswitch, the software displays a window containing a representation of the GIGAswitch configuration called the GIGAswitch Front Panel window.

The HUBwatch graphic user interface (GUI) for the GIGAswitch differs from the interface you use to manage hubs and modules. The GIGAswitch Front Panel window looks like the GIGAswitch backplane and the management options available are different.

The menu bar on the GIGAswitch Front Panel window provides access to other windows that you use to manage the GIGAswitch configuration and its SNMP agent and communities. You use a set of standard buttons to select options in a particular window. You access summary windows for the system cards or the line cards and their ports from the GIGAswitch by double clicking on parts of the Front Panel window.

GIGAswitch Front Panel Window

Introduction   This window provides a graphic representation of your
GIGAswitch configuration and all the other HUBwatch windows.
The GIGAswitch displays a physical view only.

How to Open It   You see the Hub Front Panel window when you first start up
HUBwatch. See Chapter 5 in this manual for instructions about
starting up.

GIGAswitch Front Panel Window Figure

This figure shows you the GIGAswitch Front Panel window.
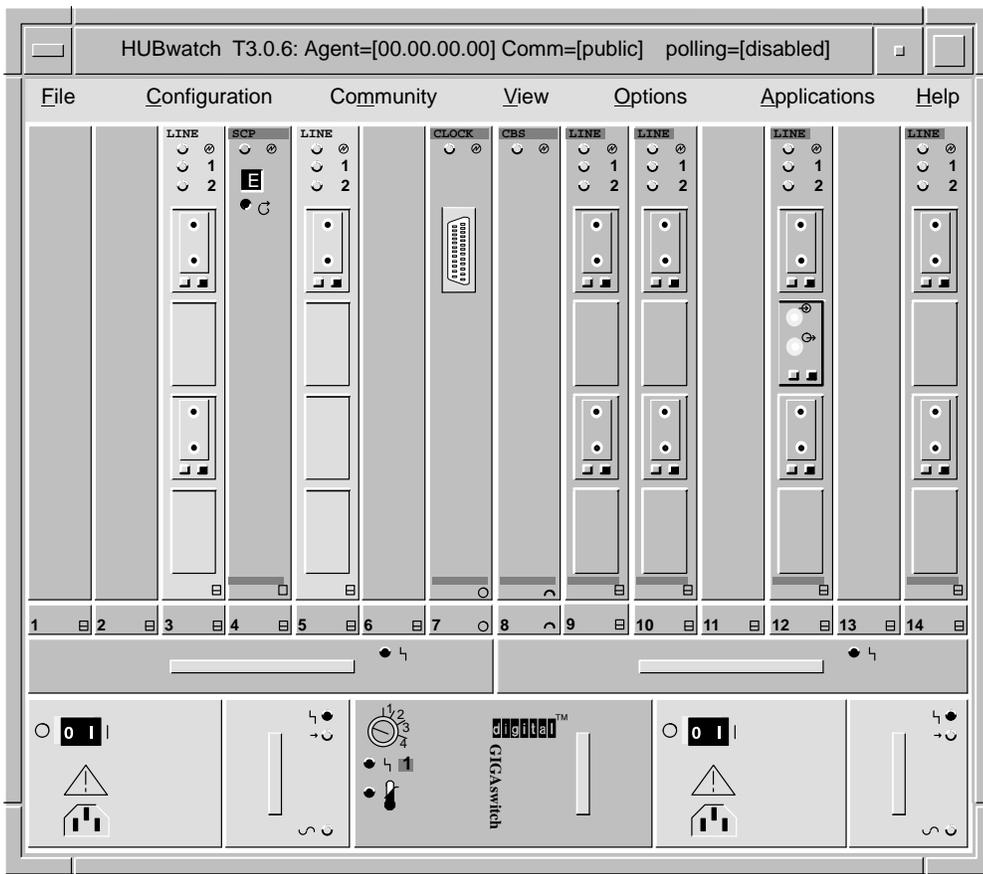
LKG-9081-94I

HUBwatch Management Windows

When You Use Them

You use HUBwatch management windows to:

- Exit HUBwatch.
- Manage an SNMP agent and community information.
- View and manage the message log.
- Set polling.
- Manage alarms (for OpenVMS only).
- Get Help.

HUBwatch Management Window Figure

This figure shows you the hierarchy of HUBwatch management windows.
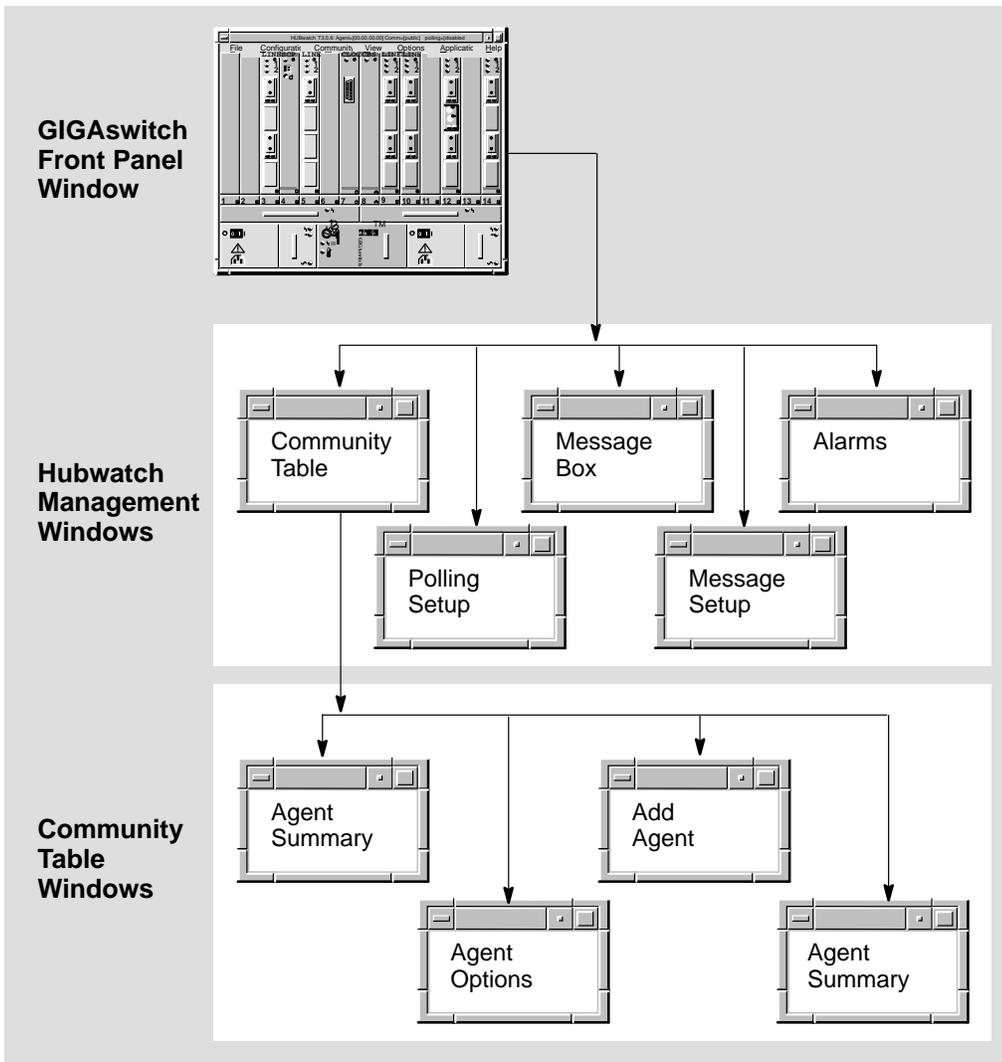
LKG-9082-94I

**How You Open Them** You open HUBwatch management windows by pulling down options from the menu bar of the Hub Front Panel window. Some of the menu options have keyboard accelerators. The following table describes the menus, their options, and keyboard accelerators.

Menu	Option	Keyboard Accelerator	Function
File	Exit	Ctrl/x	Dismisses HUBwatch.
Community	Manage Table	None	Displays the list of available SNMP agents and their communities. Used to add, delete and modify agents and communities.
	Manage Current	None	Allows access to a system summary window for the current agent.
View	Message Box	None	Displays a log file of error, warning, and informational messages.
Options	Polling	ALT/o	Polling offers four options: Refresh, Enable, Disable, and Set Up.
	Message Setup	None	Allows you to modify message log file parameters. (OpenVMS only)
Applications	Alarms (OpenVMS only)	ALT/a	Options include Alarm Setup (OpenVMS only), Start Polling, Stop Polling, and Viewer.
Help		None	Accesses online Help.

_____ **Note** _____

You must type the keyboard accelerator as a lowercase letter.

Help Menu

The following table explains Help options:

Option	Keyboard Accelerator	Function
Context Sensitive	Ctrl/c	Provides context-sensitive Help for various objects in a HUBwatch open window or dialog box (such as menus, window objects, and dialog box fields.)
Window Info	Ctrl/w	Provides information about the HUBwatch windows and a description of tasks performed at each window. This topic also explains how the HUBwatch application is organized.
Index	Ctrl/e	Provides a list of Help topics similar to index entries in a book. Also provides a table of contents through the View option on the Help Index window menu bar.
Glossary	Ctrl/l	Provides a list of terms and definitions related to the HUBwatch software.
Tutorial	Ctrl/i	Describes some key functions of the HUBwatch application.
Management	Ctrl/n	Describes the GUI and the management tasks performed with HUBwatch.
Troubleshooting	Ctrl/t	Lists the product's error messages and provides suggested recovery procedures.

Option	Keyboard Accelerator	Function
Product Info	Ctrl/p	Provides a product overview, the software version and its date, copyright information, the release notes, information about new features, and a list of management Help topics.
Using Help	Ctrl/u	Provides Help information.

Reference   See *GIGAswitch Management Windows* in Chapter 10 in this manual for information about the GIGAswitch management windows.

GIGAswitch Management Windows

When You Use Them

You use GIGAswitch management windows to:

- Manage the GIGAswitch, including:
  - Displaying management information.
  - Displaying system card information.
  - Displaying system security and status information.
  - Displaying bridging information.
- Manage line cards, including:
  - Displaying line card information.
  - Displaying station and port information.
  - Displaying MAC information.
  - Enabling or disabling a port.
  - Setting connection policy for a port.
  - Setting trace time.
- Manage the bridging function, including:
  - Displaying spanning tree information.
  - Displaying port information.
  - Enabling or disabling forwarding on a port.
- Manage the forwarding database, including:
  - Displaying forwarding database status information.
  - Locating specific database entries.
  - Writing the contents of the forwarding database to a file.
- Manage MAC information, including:
  - Configuring the token timer.
  - Enabling and disabling the ring purger.

- Manage MAC counters, including:
  - Displaying MAC counter information.
- Manage port details, including:
  - Displaying information about a port.
  - Enabling or disabling a port.
- Manage main filtering, including:
  - Creating a filter.
  - Modifying a filter.

GIGAswitch Management Windows Figure

This figure shows you the hierarchy of GIGAswitch management windows.

GIGAswitch Front Panel Window

System Summary

LineCard Summary

Bridge Summary

Port Details

MAC Information

Forwarding Database

MAC Counters

Filtering
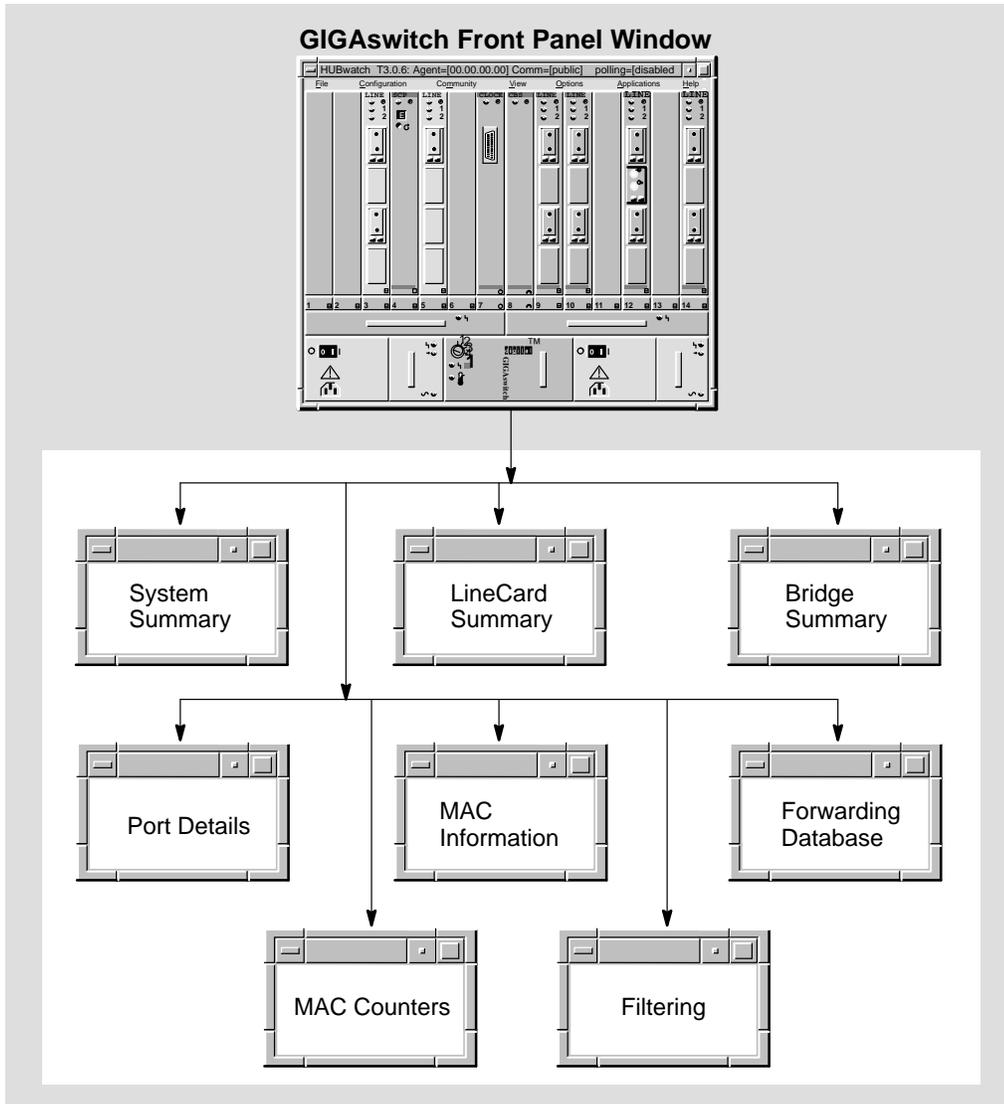
LKG-9036-94I

How to Open Them

To open a system summary window, double click on the power supplies, the fans, or the clock or SCP cards.

To open a particular line card Management Window, double click on either the line card.

Reference

See Chapter 10 in this manual for instructions about using the GIGAswitch Management windows. You can find detailed instructions about performing a specific task in the online Help for that task.

Standard Buttons

HUBwatch windows have a series of standard push buttons along the bottom. The following table lists the buttons and their functions.

Button	Function
OK	Executes requested changes and closes the current window.
Apply	Executes requested changes.
Refresh	Causes the HUBwatch software to poll the network modules for updated information. Some information is continuously updated if polling is on. See the Help text for the individual items to determine which items need to be refreshed.
Cancel	Closes the current window and ignores requested changes.
Help	Opens an online Help window that provides a brief description of major areas on the current window with cross-reference hotspots to the context-sensitive Help. The Help information also includes a list of management tasks that you can performed using the window with cross-reference hotspots to detailed descriptions of each task.

10

Managing the GIGAswitch

GIGAswitch Management Windows

Introduction

You use eight windows to manage the GIGAswitch. The following table describes these windows and the related tasks you use them for. For instructions about performing any of these management tasks, see the Help topic for that task.

Window-Task Table

Window	Task
System Summary	Display management information.
	Display system card information.
	Display system security and status information.
	Provide access to bridging information.
Line Card Summary	Display line card information.
	Display station and port information.
	Display MAC information.
	Enable or disable a port.
	Set connection policy for a port.
	Set trace time.
Bridge Summary	Display port information.
	Enable or disable forwarding on a port.
Bridge Port Information	Display port information.
	Display bridge configuration changes.

Window	Task
Forwarding Database	Display forwarding database status information.
	Locate specific database entries.
	Write the contents of the forwarding database to a file.
MAC Information	Configure the token timer.
	Enable and disable the ring purger.
MAC Counters	Display MAC counter information.
Port Details	Display information about a port.
	Enable or disable a port.
Main Filtering	Create a filter.
	Modify a filter.

GIGAswitch Bridging Window Icons

The GIGAswitch uses icons to label push buttons in the More Information box. Clicking on these push buttons activates bridge management windows. These are the GIGAswitch bridge management icons:
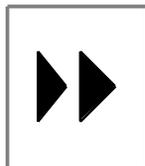
Forwarding Icon—Click on this icon in the Bridge Summary window to open the Bridge Forwarding Database window.
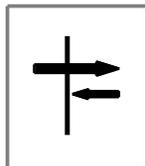
Filtering Icon—Click on this icon in the Bridge Summary window to open the Bridge Filtering window.

Opening GIGAswitch Windows

These instructions tell you how to open the GIGAswitch windows.

Window	Steps
System Summary	From the GIGAswitch Front Panel window, double click on: • The right or left power supply. • The right or left fan tray. • The SCP, CBS, or Clock card.
Line Card Summary	From the GIGAswitch Front Panel window, double click on a line card.
Bridge Summary	Open the GIGAswitch System Summary window and click on `Bridging`. Another method is to open the GIGAswitch Line Card Summary window and click on `Bridging`.
Bridge Port Information	From a Line Card Summary window, click on `Bridging`. From the Bridge Summary window, double click on a port icon in the Port Information box.
Port Details	From the GIGAswitch Front Panel window, double click on a GIGAswitch port. Another method is to open the GIGAswitch Line Card Summary window and double click on a port icon.
MAC Details	Open the GIGAswitch Line Card Summary window and click on `Summary`.
MAC Counters	Open the GIGAswitch Line Card Summary window and click on `Counters`.

Window	Steps
Forwarding Database	From the Bridge Summary window, click on the Forwarding icon in the More Information box.
Main Filtering	From the Bridge Summary window, click on the Filtering icon in the More Information box.

A
Troubleshooting Tips

Troubleshooting

In This Appendix

This appendix contains some solutions to the following types of problems:

- General display problems.
- Terminal server problems.
- Community problems.
- Agent problems.
- Performance problems.

Other Troubleshooting Information

Refer to your hub or module owner's manuals for additional information.

General Display Problems

Incorrect Displays with New Hub Installation

Problem:

You installed a new hub, but when you start the HUBwatch software and display the Hub Front Panel window, one or more of the modules installed in the hub are either not displayed or not manageable.

Solution:

Refer to the *HUBwatch Installation and Configuration* manual and follow the instructions to ensure that you perform all required configuration procedures correctly.

Display Problems with New Module Installation

Problem:

You installed additional modules standalone or in an existing hub, but when you start the HUBwatch software and display the Hub Front Panel window, one or more of the modules installed in the hub are either not displayed or not manageable.

Solution:

Refer to the *HUBwatch Installation and Configuration* manual and follow the instructions to ensure that you perform all required configuration procedures correctly.

Terminal Server Problems

Incorrect Display with New Terminal Server

Problem #1:

You added a terminal server to your hub configuration, but when you access the Terminal Server Summary window, the connectors are shown in black. (The ports are enabled, but no devices are attached to the port.)

Problem #2:

You added a terminal server, but when you try to access the Terminal Server Summary window, you get a pop-up warning that the module is being polled or managed by another user.

Solution:

You need to verify the MAC address of the terminal server. An incorrect MAC address can cause either of these conditions. If the MAC address is correct, reload or update the device firmware.

Terminal Server Display Disappears

Problem:

You added a DECserver 90TL to the hub configuration and, at first, it appeared on the screen as though it were in the hub, but then it disappeared.

Solution:

When a DECserver 90TL first boots, it operates using its own PROMs, and it responds to DECagent 90 backplane identification commands. The PROMs then receive a downline load image, and control is transferred to the new image. The new image does not respond to the backplane identification commands, making it seem to the DECagent 90 that the DECserver 90TL has been removed.

Although the DECserver is removed from the screen, it is functional. You must add the 90TL module to the hub manually using the Add Module window and being sure to set Polling status to Disabled. Refer to *Opening Hub Management Windows* in Chapter 8 for instructions about using the Add Module window. Additionally, you must add the DECserver 90TL to the

Agents file. See *SNMP Communities and Agents* in Chapter **8** for instructions for adding an agent.

Disconnecting Ports Causes Warning

Problem:

You added a terminal server, but when you attempt to disconnect a port, you keep getting a pop-up warning about the server being polled or managed by another user.

Solution:

1. Be sure the DECserver 90L or 90L+ module is not in the Authorized/Manager mode.

2. You may not have the correct module installed. Make sure that the module is a DECserver 90L or 90L+.

Terminal Server Parameters Not Taking Effect

Problem:

Sometimes when you set parameters on a terminal server, they do not take effect.

Solution:

It is possible to issue a SET request followed closely by a GET request. When using terminal servers, these two commands generate a large amount of communications activity. The GET requests may happen faster than the SET requests in the terminal server, giving the appearance of a SET request failure. If you wait a few seconds and click on Refresh or Apply, you will probably find that your SET has worked.

Also, remember to click either on Apply to execute any change or on OK to execute the change and close the window.

Community Problems

Community Strings Not Displayed

Problem:

When you access the Community Table window and select an agent, you do not see any community strings.

Solution:

Check the following:

- Your agent may be unreachable. Check the network connections.

- You may have set a filter on the bridge that prevents access to the agent.

- Another hub could be using that agent for management.

- You could have accidentally deleted the agent from the community.

- The name of the default community could be entered incorrectly. Check the Community Name field of the agent. (The default community is usually named "public.") Try using public as the community name.

If none of these conditions apply, and you still do not have any community strings, try the following:

1. Try a soft reset of the DECagent 90.

   Turn off power to the agent, then turn it on again.

2. Try a factory reset.

   Attach a terminal to the agent console port. From the Console menu, select the [21] Restore Factory Settings option. This reset makes the agent forget everything it knows about any communities except for itself in the community "public."

New Community Strings Discarded

Problem:

You can access the Community Table window, but when you attempt to add a new community, the new community string is discarded.

Solution:

Be sure you are entering a unique community string. If you attempt to create a new community using a name that already exists in another community, HUBwatch ignores your request.

Agent Problems

New Agent Does Not Appear in Community Table

Problem:

You added a new agent to the Agent list on the Community Table window. You exited the window and when you opened the Community Table window again, the new agent was gone.

Solution:

Remember to click on either Apply to execute any change or on OK to execute the change and close the window.

Agents Not Remembered

Problem:

The HUBwatch software does not remember all of its agents automatically.

Solution:

HUBwatch stores the agent list in the Agent file. Currently, there is no way to add an agent automatically to the file and to the Agent table in the Communities Table window. Therefore, this information must be added manually to the HUBwatch software.

Performance Problems

HUBwatch Runs Slowly

Problem:

The HUBwatch software seems to be running slowly.

Solution:

The following conditions can cause poor HUBwatch performance:

- Heavy network traffic can cause a slowdown. HUBwatch needs to use the network to communicate with each module. To improve performance, keep the station running HUBwatch in the same bridge Workgroup as the agent and use the bridge to filter all unnecessary traffic from the Workgroup side.

- Make sure that you configure your management station with the appropriate system parameters. See *HUBwatch Installation and Configuration* for system configuration information.

Hint

Managing a hub full of repeaters can slow down the network. Every time you poll the hub, HUBwatch must ask for and receive many variables. This is especially true if there are many stations connected to the repeaters.

HUBwatch Shows An Empty Hub

Problem:

When the network is busy, sometimes the HUBwatch software shows you a view of an empty hub, even though a short time before a populated hub was displayed.

Solution:

When your network is very busy, you may want to increase the agent's Retry or Timeout values. The agent will be more persistent in its attempts to get the information that you need, but HUBwatch performance may suffer.

B

HUBwatch Summary Windows

Summary Window Figures

In This Appendix

This appendix contains example figures of the summary windows you use to manage hubs and their modules.

Figure B–1 90—Series Repeater Summary Window

Repeater Summary

Identification

R
→ R →
90FL

Slot 6

Reg Name:
Description: | DECrepeater 90FL |
Type: DECrepeater 90FL
Revision: VERSION1
Ports: 4

Management Information

Agent Slot: 7
IP Address: 00.00.00.00
Community: public
Access: read-write
Up Time: 619:07:03

Status

Status On-line

Connected Stations List

1

| 0 |
| gee1 |

No Connected Stations

2

| 0 |
| gee2 |

No Connected Stations

3

| 2 |
| gee3 |

| 64.246 ANDERS | 64.833 SKUNK |

4

| 0 |
| gee4 |

No Connected Stations

| OK | | Apply | | Refresh | | Cancel | | Help |

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Figure B–2 900—Series Repeater Summary Window

Repeater Summary

Identification

R→ 900TM Slot 8	Reg Name:
	Description:
	Type: DECrepeater 900
	Revision: 1,SW=v0.0b1.7
	Ports: 32

Management Information

Agent Slot: 0
IP Address: 00.00.00.00
Community: public
Access: read–write
Up Time: 0 2:36:01

Status

Status: Enabled
Health Text: 3 ports are disable
Health Text Changes: 0
Partitioned Ports: 0
Media Unavail. Ports: 31
Transmit Collisions: 318

Configuration

Auto–Partition Algorithm:
◇ Standard
◇ Enhanced

Auto–Partition Reconnect Alg:
◇ Standard
◇ On Successful Transmit

Jam Bits:
◇ 96
◇ 126

Port Table

LAN / Group   Offered Load %   Collisions %   Invalid Frames %

NA	A5				10 0 100 0	10 0 100 0	10 0 100 0
NA	A6				10 0 100 0	10 0 100 0	10 0 100 0
NA	A7				10 0 100 0	10 0 100 0	10 0 100 0

| OK | Apply | Enable | Disable | Reset | Factory | Enet Reset | Refresh | Cancel | Help |

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Figure B–3 90L and 90L+ Terminal Server Summary Window
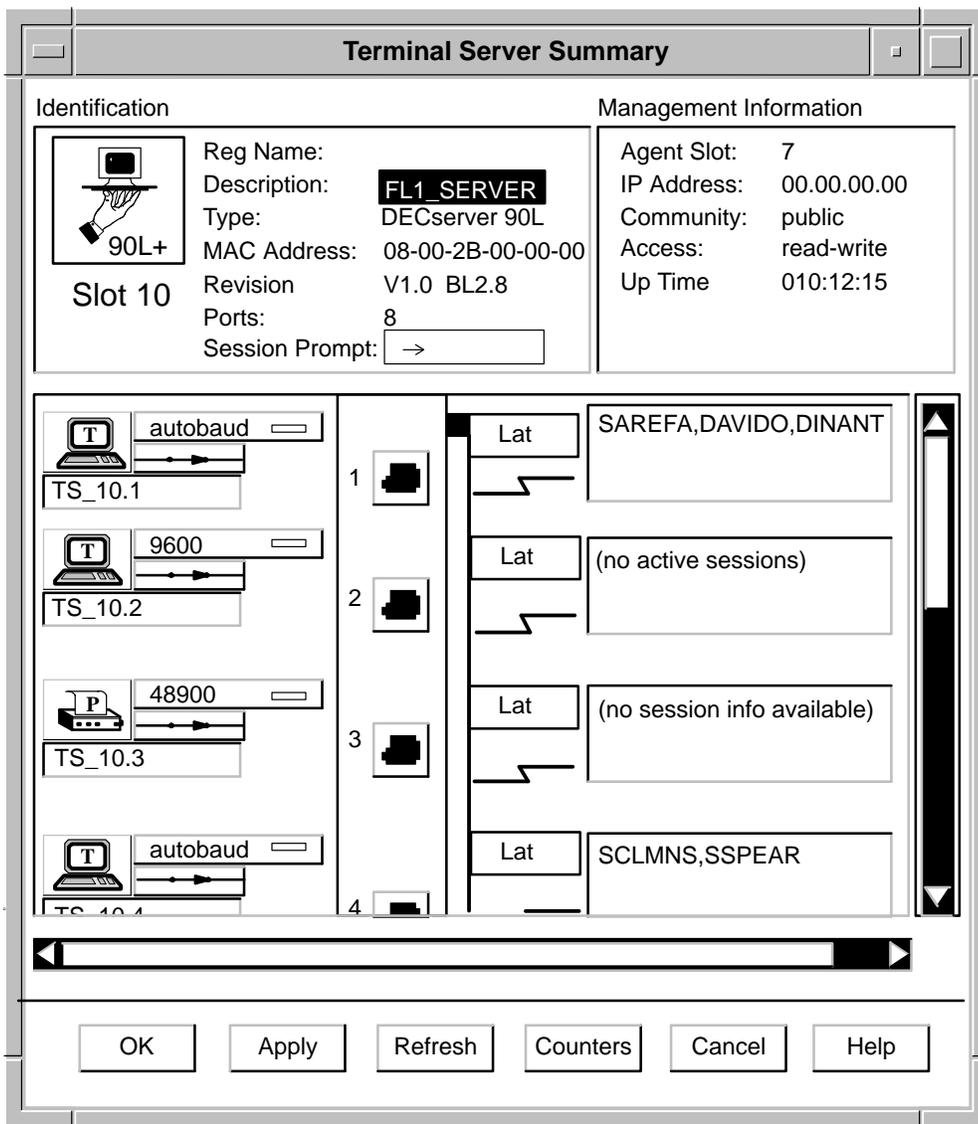
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Figure B–4 90—Series Bridge Summary Window

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Figure B–5 Brouter Summary Window

Brouter Summary

Identification

Reg Name: Brouter1

Description: DECbrouter 90

90T2   Type:

Revision: HW=V2.0, ROM=

Slot 1   Interfaces: 3

Management Information

IP Address: 00.00.00.00

Community: public

Access: read–write

Up Time: 117:10:31

Contact: Tom Hood

Location: BLD2, FL3

More Information

Brouter

Port Table

Port ID	Name	Admin Status	Oper Status	In Pkts/Sec	Out Pkts/Sec
Ethernet0	Ethernet			13	0
Serial0	Sync Po			0	0
Serial1	Sync Po			0	0

| OK | Apply | Reset | Refresh | Cancel | Help |

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Figure B–6   900-Series Bridge Summary Window

DB900 Summary:fbroad: fbroad

Identification

900MX

Slot 0

Reg Name:	fbroad
Description:	fbroad.lkg.dec.c
Type:	DECbridge 900MX
Revision:	idge 900MX,6-Ethernet/FDDI
Interfaces:	7

Management Information

IP Address:	16.20.224.5
Community:	public

Status

Module State:	
Up Time:	21 23:29:29
Rate Limiting:	Disable, 400pkts./sec.

Spanning Tree Information

Root:	001/08-00-2B-2B-29-41
Root Cost:	30
Priority:	10
Topology Changes:	1074
Protocol:	IEEE 802.1D
Mode Changes:	2
Hello Time:(sec.)	1
Max. Age Time(sec.):	15
Forward Delay Timer(sec.):	30

More Information

Address   Protocol

Port Information

Time Interval(sec.): 1

Port ID	Fwding Enable	State	Path Cost	Frames In Pkts/Sec	Frames Out Pkts/Sec	Filtered %
08–00–2b–a3–4a–db			10	0	126	
08–00–2b–a3–4a–dc			10	0	0	
08–00–2b–a3–4a–dd			10	0	0	

OK	Apply	Refresh	Reset	Factory	Cancel	Help

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Figure B–7 DECconcentrator 900MX Summary Window

Concentrator Summary:16.20.224.4:slot 1

Identification

FDDI
900MX
Slot 1

Reg Name:
Description:
Type: DECconcentrator 900MX
Revision: HW=v0,RO=v1.0,SW=hazel_f

Management Information

Agent Slot: 1
IP Address: 16.20.224.4
Community: public
Access: read–write

Status

OperState: Enabled
CF State: CWrapA
ECM State: In
Resets: 2011791475
Up Time: 205 9:53:16

Station Information

Station ID: 00–00–08–0–2b–a1–ea–08
Station Type: DAC
Optical Bypass: Present
Master Cut: 5
Non-Master Cut: 2
Report Policy:
                   ◇ Report
                   ◇ Do not Report

Connection Policy

Timers

MAC Information

MAC State: On-Ring Run
Current Path: Primary
MAC Address: 08–00–2b–a1–ea–08
UNA: 08–00–2b–a1–ea–02
DNA: 08–00–2b–a3–86–c5

Network Utilization

10
0 100
0

Summary   Counters

Configuration

S₀
A 1
P I
M₂
M₃
M₄
M₅
P₀
B 6
S I
BP 2
MAC
M BP 1
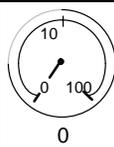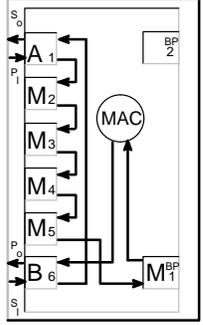
Root Primary

Port Information

Neighbor Type   Reject Reason

M   A

             1

No Reason

OK   Apply   Refresh   Disconnect   Reset   Factory   Cancel   Help

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Figure B–8 GIGAswitch System Summary Window

GIGAswitch System Summary:16.20.36.100:jig7

Identification

GIGA	Reg Name: jig7
	SysObjectID: 1.3.6.1.4.1.36.2.15.3.3
	Contact: Mike Smith
	Location: West Lab–II

Management Information

IP Address: fbroad
Community: public
Access: read-write
Up Time: 420:14:55

Status

Num of Resets: 0
Power Ups: 1

World-Access   Okay   Normal

System Cards

Slot Number	Module Type	Slot Number	Slot Number	Slot Number
3	FGL–2	Online	B	1.72
4	SCP	Online/Elected	H	0.02DLL.00BB1.00
5	FGL–2	Online	B	1.72
7	Clock	Online	B03	1.00
8	CBS	Online	Not available	Not apply

| OK | | Apply | | Refresh | | Bridging | | Cancel | | Help |

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Figure B–9 GIGAswitch Line Card Summary Window

GIGAswitch LineCard Summary:16.20.36.100:jig7:slot 12

Identification

FGL2
Slot 12

Reg Name:	jig7
Type:	FGL2
REV/SMT Version:	HW=B;FW=1.72

Management Information

IP Address:	IP Address:
Community:	public
Access:	read-write
Up Time:	420:32:06

Status

| OperState: | Power Up |
| Num of Resets: | 0 |

Station & Port Summary

Station Information

Station #:	1
Station ID:	00–00–08–00–2b–a0–01–64
Station Type:	DAS
Optical Bypass:	Absent
CF State:	Isolated
ECM State:	In
Report Policy:	True

Connection Policy   Timer Setup

◇ Connect   ◇ Disconnect

MAC Information

MAC State	Off–Ready
Current Path:	Unknown
UNA:	00–00–f6–00–00–00
Error Frames:	0
Lost Frames:	0
Total Frames:	0

Counters   Details

Port Information

Reject Reason: No Reason

Port Information

Reject Reason: No Reason

OK   Apply   Refresh   Bridging   Cancel   Help

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Figure B–10 GIGAswitch Bridge Summary Window

GIGAswitch Bridge Summary:16:20.36.100:slot 8

Identification

GIGA

Reg Name:
Description:
Type:
Revision: GIGAswitch Network
Interfaces: 36

Management Information

IP Address: 0.0.0.0
Community:

Status

Module State:
Up Time: 421:00:45
Rate Limiting:

Spanning Tree Information

Root:	0001/08–00–2B–2B–29–41
Root Cost:	30
Priority:	128
Topology Changes:	470
Protocol:	IEEE 802.1D
Mode Changes:	N/A
Hello Time:(sec.)	1
Max. Age Time(sec.):	15
Forward Delay Timer(sec.):	30
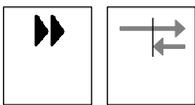
More Information

Port Information

Time Interval(sec.): 1

Port ID	Fwding Enable	State	Path Cost	Frames In Pkts/Sec	Frames Out Pkts/Sec	Filtered %
00–00–00–00–00			0	0	0	
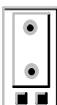
| OK | Apply | Refresh | Reset | Factory | Cancel | Help |

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Glossary

This glossary is a comprehensive source of definitions for
HUBwatch terms and acronyms.

active port

A redundant repeater port over which communication is
currently taking place. An active port is enabled and handles
any communication between the connected repeater ports.

administration status

The desired state. In contrast, the operational state is the
current state.

agent

A background task running on the object being managed. The
agent responds to requests for information by the network
management stations (NMS). The agent is responsible for
performing GET and SET operations, for generating the
appropriate traps, and for performing access control.

Agent file

A file that contains a list of Simple Network Management
Protocol (SNMP) agents that can be used to manage hubs and
network modules.

Aging Time

A spanning tree parameter that controls how long a bridge keeps
each learned entry in the forwarding database. If an entry is
stored longer than the aging time, the bridge marks that entry
as Inactive and allows it to be overwritten.

alarms

Conditions in a hub or a community for which the alarms software monitors. The conditions are detected by polling a predetermined list of MIBs on each type of network module. When a MIB value changes, the alarms software generates an alarm. For example, topology changes, security violations, and frames discarded are considered alarm conditions.

Alarmed Agent file

Contains a list of Simple Network Management Protocol (SNMP) agents that are polled for alarm events. For each agent, the file contains the agent name, IP address, community name, polling interval, and the types of events (configuration changes, traps, and alarms) that are enabled. Each time you add, delete, or modify entries in the Alarms Agents list box and apply the change, this file is updated. Each time you refresh the Alarms Setup window by clicking on the $\boxed{\text{Refresh}}$ push button, this file is used to restore entries in your Alarms Setup window to their last saved conditions.

algorithm

A computational design that determines how values for a particular object are obtained.

authorized station

An addressable node on a local area network (LAN) capable of transmitting, repeating, and receiving data.

Always Forward

Always Forward is the second of the three priority states assigned to GIGAswitch filters. The priorities for GIGAswitch filtering states are, in order of precedence:

1. Always Filter

2. Always Forward

3. Filter

A state of Always Forward applies, explicitly, only to the white cells in a filter. The state means: "Always allow packets to pass through the input/output pattern indicated by white cells– unless another filter with a state of Always Filter overrides this instruction."

Always Filter

Always Filter is the highest of the three priority states assigned to GIGAswitch filters. The priorities for GIGAswitch filtering states are, in order of precedence:

1. Always Filter

2. Always Forward

3. Filter

A state of Always Filter applies, explicitly, only to the black cells in a filter. The state means: "Always and unconditionally block packets exhibiting the input/output pattern indicated by black cells." Since Always Filter is the highest state, no other filter can override this instruction.

attachment unit interface (AUI)

An Ethernet station is sometimes connected to the network through an AUI, which is a 15-pin Ethernet or DIX connector.

autodiscovery

The capability of the hub chassis and its associated firmware to detect, identify, and configure certain network modules when they are installed in the hub. Modules that the hub cannot autodiscover must be added manually to the hub's configuration using either the hub's Console Setup port or the HUBwatch Add Module window.

autopartition

To disable a repeater port automatically.

The autopartition algorithm protects the network from certain fault conditions that would halt all LAN communications (for example, a media short or break, a faulty connector, or faulty or missing media termination). If it detects such faults on any of its ports, the repeater isolates the faulty segment from the network.

A repeater does not respond to input received from an autopartitioned port, except to determine whether or not the fault condition has been removed. However, a repeater continues to transmit data to an autopartitioned port.

backbone

A core network (usually high speed) to which multiple local area networks (LANs) are connected using bridges or brouters and over which internetwork traffic can pass.

Bad Hello

If a designated bridge receives a Hello message on the port on which it is designated, and the message contains worse root information, the message is called a Bad Hello message.

bandwidth

A measure of the amount of traffic the media can handle at one time. In digital communications, describes the amount of data that can be transmitted over the line in bits per second.

BootP

A protocol that is used by a network node to determine the Internet Protocol (IP) address of its Ethernet interfaces in order to use network booting.

Break character

A character that switches you from a service node session to the terminal server local mode. If you are using a modem to connect to a service node through a terminal server, and the modem interprets the Break signal as a command to end a dial-in connection to the terminal server, you must specify a local switch character, or Break character to use in place of your terminal's Break key when you want to return to the terminal server local mode.

<Break> Passthru

A terminal server port characteristic that determines whether or not the port responds to a local or remote break.

bridge

An intelligent, protocol-independent, store-and-forward device that operates as a Data Link layer relay. Used to connect similar or dissimilar local area networks (LANs). LANs connected by bridges are referred to as extended LANs.

brouter

A bridge with minimal routing capabilities. In general, a brouter can deliver least-cost routing; some can also deliver minimal load balancing.

chassis

The physical housing of the hub.

click

The action of pressing and releasing the mouse button while the cursor is pointing at an object on the user interface.

Clock card

The Clock card provides the clock signals for the GIGAswitch System. It also performs these functions:

- Provides central arbitration of the backplane bus.

- Identifies the presence, model number, and type of modules in slots 1-6 and 9-14.

- Stores management parameters.

The Clock card contains the out-of-band management port. This card is always installed in slot 7 of the GIGAswitch.

community

A set of attributes that are managed as a group. Community names are used to control access. Each software request contains a community name that is used by the agent like a password to verify that the requester is authorized to access the agent's management information base (MIB) or a subset of that MIB.

Community names indicate whether or not the requester has read-only or read-write authority.

In Digital's implementation, MIBs are defined by the agent and include:

- Community name.

- Internet address of the hardware from which the agent accepts requests.

- Community type (read-only, read-write).

- The MIB variables to be accessed.

community string

A text string, also referred to as a community name, that is used as a password by an SNMP agent to authenticate or verify that the network management station (NMS) making the request is allowed access to the contents of the agent's management information base (MIB).

concentrator

The FDDI concentrator is a Physical layer repeater that allows the attachment of multiple single attachment stations, dual attachment stations, or other concentrators to the FDDI network.

Config(uration) Changes

Changes to SNMP agents within a hub or a community. A community can consist of one module or one to eight hubs. The following are a few examples of configuration changes:

- A module is removed from or installed in a hub.

- One or more ports on a module are disabled.

- The module's operating status MIB changes state.

Configuration Management

Configuration Management is that portion of connection management that provides for configuration of PHY and MAC entities within a station.

context-sensitive help

A form of user information in which a program shows the user information about the current command or operation being attempted. Because it provides details about the work at hand without requiring the user to leave the program, context-sensitive help is particularly useful when the user is either learning a new program or using an unfamiliar program feature.

CRC

A Cyclic Redundancy Check. A method of detecting errors in a frame by performing a mathematical calculation of the number of bits in the frame and appending the result to the end of the frame. The receiving station performs the same calculation on the frame and then checks that the result matches the CRC at the end of the frame.

Crossbar Switch card

The Crossbar Switch card provides interconnection between the ports on the GIGAswitch, enabling multiple connections to exist simultaneously. This card is always installed in slot 8 of the GIGAswitch.

datagram

A unit of data passed between the transport and the Network Services layer.

DECnet

The Digital networking software that runs on nodes in both local and wide-area networks.

DECnet address

A series of numbers that identifies a device's location in the DECnet network.

DECnet name

A unique alphanumeric string that identifies a device on the DECnet network.

DECwindows Motif

The environment used to run HUBwatch windows.

destination address

The field in a frame that contains the address of the station to which the frame is being sent.

device

A network element external to the hub.

Can also refer to computer equipment (for example, a printer, terminal, or personal computer) that is attached to a terminal server port.

Data In circuit (DI)

Sourced by the MAU, the DI is a differential pair consisting of DI-A (Data In circuit A) and DI-B (Data In circuit B). A data receive circuit from the MAU to the DTE (for example, a repeater). For a complete description, refer to ISO 8802-3 ANSI/IEEE Standard 802.3.

Data Out circuit (DO)

Sourced by the DTE, the DO is a differential pair consisting of DO-A (Data Out circuit A) and DO-B (Data Out circuit B). A data transmit circuit from the DTE (for example, a repeater) to the media access unit (MAU). For a complete description, refer to standard ISO 8802-3 ANSI/IEEE Standard 802.3.

dialog box

The windows in which you enter or view information.

double click

The action of quickly pressing and releasing a mouse button twice.

double hub

Two eight-slot hubs daisy-chained together. A double hub is treated as a single hardware device and is represented by a single community.

downline load

The process of sending a software image from a load host to the bridge.

downstream neighbor address

The terms "upstream" and "downstream" refer to the relative position of stations on the FDDI ring.

The downstream neighbor address is the MAC address of an FDDI station's downstream neighbor. A station is "downstream" from its neighbor if it receives the token *after* the neighbor receives it (that is, if the station *receives* the token from its neighbor).

drag

The action of pressing and holding down the mouse button, then moving the mouse across a surface, carrying the cursor across the work area.

DSAP

A Destination Service Access Point.

DSR

A Data Set Ready.

DTR

A Data Terminal Ready is a control signal that enters a modem from the data terminal or communications device that is using the modem. When the signal is set, it informs the modem that the data terminal equipment is ready to receive and transmit data.

dual attachment station

An FDDI station that offers two connections to the FDDI dual counter-rotating ring. FGL2 cards can accommodate up to 2 dual attachment stations; FGL4 cards accommodate only single attachment stations.

Entity Coordination Management (ECM) state

The ECM controls the optical bypass switch of the Physical Media Dependent (PMD) layer and signals the physical control management (PCM) when media is available. The ECM starts the PCMs for the A and B ports in the station when the optical bypass is complete. In concentrators, ECM also starts the PCMs associated with M ports.

Ethernet

A network communications system developed and standardized by Digital, Intel ™, and Xerox ®, using baseband transmission, CSMA/CD access, logical bus topology, and coaxial cable.

Ethernet station

An addressable node on an Ethernet network capable of transmitting, repeating, and receiving data.

exit

The action of ending a session by clicking on the Exit push button.

fan tray

The GIGAswitch system houses two fan trays. Each fan tray assembly contains two fans. Their purpose is to cool the system. Like the power supply units, the fan tray units can be hot-swapped.

FDDI

The Fiber Distributed Data Interface. A set of ANSI/ISO standards that defines a high-bandwidth (100-Mb/s), general-purpose, local area network (LAN) connection between computers and peripheral equipment in a timed-passing, dual ring of trees configuration.

FDDI station

A node on an FDDI ring capable of transmitting, receiving, and repeating data. A station has one instance of SMT, at least one instance of PHY and PMD, and an optional MAC entity.

FGL2 card

A type of line card containing 4 ports and 2 FDDI stations. FGL2 cards can support both SAS (single attachment stations) and DAS (dual attachment stations) and PMD daughter cards. On an FGL2 card, each station has one A and one B port.

FGL4 card

A type of line card containing a maximum 4 ports and 4 FDDI stations. FGL4 cards can support only SAS (single attachment stations) and PMD daughter cards. On an FGL4 card, each SAS is normally connected to a different FDDI ring. Each station has one S port associated with it.

Filter

Filter is the lowest of the three priority states assigned to GIGAswitch filters. The priorities for GIGAswitch filtering states are, in order of precedence:

1. Always Filter

2. Always Forward

3. Filter

A state of Filter applies, explicitly, only to the black cells in a filter. The state means: "Always block packets exhibiting the input/output pattern indicated by black cells–unless another filter with a state of Always Forward overrides this instruction."

filter state

Every GIGAswitch filter has a state associated with it. Filter states determine how they will be applied by the switch, and ultimately determine how individual filters will work together to produce a combined result. The priorities for GIGAswitch filtering states are, in order of precedence:

1. Always Filter

2. Always Forward

3. Filter

flow control

A terminal server port characteristic that allows a terminal server to start and stop data transfer between the terminal server port and the attached device.

FOIRL

Fiber-optic inter-repeater link.

forwarding database

Maintained by a bridge, a table that contains a list of addresses and the bridge line number on which the address can be reached. The bridge creates its forwarding database through learning (noting the source line and source address of each incoming frame).

frame

A group of digits transmitted as a unit, over which a coding procedure is applied for synchronization.

Front Panel view

A graphic of the hub chassis (either the DEChub 90 or DEChub 900) and its installed network modules. The Front Panel view comes in two varieties:

- **The physical view**: Displays an exact representation of the hub chassis, the installed modules, and all the physical characteristics of the modules.

- **The logical view**: Displays a graphic representation of the modules. It offers a consistent look for modules from different vendors.

FRU

A Field Replaceable Unit.

GET

A Simple Network Management Protocol (SNMP) request in which the named instance is retrieved if the community string matches. If the community string does not match, an error is returned.

GIGAswitch

An intelligent multiport FDDI bridge that forwards packets among a set of connected data links. The GIGAswitch is a standalone modular device that uses both distributed and centralized processing algorithms to perform these ANSI and IEEE 802.1d bridging functions:

- Forwarding.

- Filtering.

- Learning.
- Aging.
- Spanning tree.

GIGAswitch filters

GIGAswitch filters are based on the source address, destination address, or protocol ID of packets passing through the switch. The switch uses user-designed filters to determine whether to block or forward packets passing through it. In cases when the switch determines that a packet may be forwarded, the process determines what ports it may forward them through.

GIGAswitch slot

The physical slot in the GIGAswitch chassis. The GIGAswitch contains 14 slots, 11 of which can accommodate FGL2 or FGL4 line cards. The remaining 3 slots are reserved for the Clock card, the Crossbar Switch card, and the Switch Control Processor card.

GUI

The graphic user interface. A type of display format that allows the user to choose commands, start programs, and see lists of files and other options by pointing to icons and lists of menu items on the screen. Generally, choices can be activated either with the keyboard or with a mouse. Graphic user interfaces are used by the HUBwatch application.

grayed out

A field or option that is not available in a particular instance.

Hello interval

A spanning tree parameter that controls how often a bridge sends a Hello message.

Hello messages

A Hello message determines which bridges are elected as designated bridges and which bridge becomes the root bridge. When the spanning tree computation is complete, the root bridge originates the Hello message and the other bridges propagate it down the spanning tree.

hot-swap

To "hot-swap" a component means to remove and replace it while the system is in operation. Any of the GIGAswitch line cards, the fan trays, and the power units can be hot-swapped without affecting operation of the switch. Modules that cannot be hot-swapped are the:

- Crossbar Switch card.

- Switch Control Processor card.

- Clock card.

hub

A central device, usually in a star topology local area network (LAN), to which each network module is attached.

Hub Manager

A microprocessor-based controller used to monitor, configure, and control the hub. Under either remote management control or default local control, the Hub Manager provides a central point for allocation of hub resources to hub-mounted network modules.

ICMP

The Internet Control Message Protocol. A simple reporting protocol for Internet Protocol (IP).

icon

A pictorial representation on a user interface used to indicate an object (for example, a network module).

Idle signal (IDL)

The media access unit (MAU) sends an input_idle message to the data terminal equipment (DTE) on the Data In circuit when the MAU does not have data to send. The physical realization of the input_idle message is the Idle signal. Thus, the Idle signal lets the DTE know that the MAU is functioning properly. For a complete description, refer to standard ISO 8802-3 ANSI/IEEE Standard 802.3.

IEEE

The Institute of Electrical and Electronics Engineers.

in-band management

The managing of a device over a network.

IP

The Internet Protocol. The network protocol offering a connectionless-mode network service in the Internet suite of protocols.

IP address

The Internet Protocol address. The address is a series of numbers that identifies a device's location on the Internet.

IP forwarding

The forwarding of IP packets between interfaces (ports) on a DECserver 90TL, 90M, or 900TM.

IP name

The Internet Protocol name. A unique, alphanumeric string that identifies a device on the Internet.

label

An inactive Windows symbol that identifies a control.

LAN

The local area network. A data communications network that spans a limited geographical area. The network provides high-bandwidth communication over coaxial cable, twisted-pair, fiber, or microwave media.

LAN segment

The portions of the DEChub 900MS backplane that are organized in either a bus, ring, or point-to-point configuration.

LAT

The local area transport. A communications protocol used in a local area network.

LB100

The LANbridge 100.

LED

A light emitting diode. A source of status on a network module.

listening mode

The state in which a bridge identifies the addresses of messages received from the network.

link loss

A link-loss condition occurs when the Keep-Alive signals are no longer received between two media access units (MAUs).

Line card

GIGAswitch Line cards provide the packet input/output ports for the GIGAswitch system. These cards forward packets with known destination addresses. Packets with unknown destinations are forwarded to the SCP for further consideration.

list box

A Windows object that displays a list, such as available modules, from which a user can select. List boxes can include scroll bars to allow users to move through lists that are too long to be displayed in the list box.

loopback

When it receives data on the Data Out circuit (DO), the media access unit (MAU) returns that data to the data terminal equipment (DTE) on the Data In circuit (DI). This action constitutes a loopback function.

low light

Low light refers to the intensity of the light detected by a fiber-optic media access unit (MAU). When the intensity of the light drops to such a low level that the error rate reaches an unacceptable level, the low-light condition is said to exist.

MAC address

A unique, 48-bit, binary number (usually represented as a twelve digit hexadecimal number) encoded in a device's circuitry to identify it on a local area network.

management agent

See SNMP agent.

map

The file that contains all the pictures for one network.

manual mode

The condition in which a bridge does not learn addresses but uses only addresses you specify because you have created a filter for all unspecified addresses.

master mode

Master mode designates a pair of repeater ports (primary and secondary) that control a redundant link. Because the remote ports, or responder ports, to which the master ports are connected must be on the same LAN or are otherwise bridged together, only one of the master ports may be enabled at a time.

matrix

A user-designed, storable pattern of inputs and outputs that maps to GIGAswitch ports. Each GIGAswitch filter is based on one and only one matrix.

MAU

A media access unit. Applies to connections to a token ring.

Media Access Control layer

In FDDI (and other types of shared-medium LANs) the Data Link layer sublayer responsible for scheduling, transmitting, and receiving data.

menu

The list of options in a window.

menu item

The list of options available under each menu from which you can make a selection.

MIB

A Management Information Base. A dynamic, virtual collection of data about a managed object. The managed object provides the data to the network management station (NMS), which gathers the values from the managed object and loads them into the MIB representing the object.

MJ8 connector

A port on a DECserver 90TL, 90M, and 900TM.

MMJ connector

A port a DECserver 90L or 90L+.

module

An interchangeable unit that provides functionality and interconnection to a local area network (LAN) through the hub.

See also network modules.

MOP Session

A logical connection using the Maintenance Operation Protocol (MOP).

mouse

The device used to move the cursor around the HUBwatch windows.

mouse button

On the mouse device, a button used for selecting, dragging, and pointing at objects.

multicast

A type of network addressing that enables a node to send messages or data packets to an address that represents a group of stations rather than a single station.

multiswitch backplane

A backplane that allows flexible allocation of its signals so that multiple local area network (LAN) segments can be managed. The DEChub 900 has a multiswitch backplane.

network

A collection of computers, terminals, and other devices together with hardware and software that enables the exchange of data and sharing of resources over short or long distances.

Network layer

Layer 3 of the OSI model, which permits communications between network nodes in an open network.

network management

In the OSI model, the five functional application areas of accounting management, configuration management, fault management, performance management, and security management.

network management application

A collection of software tools that provides information about the network by communicating with agent software in the managed objects.

network modules

The hardware devices that gather data to be reported to the hub. Modules include front panel status and diagnostic LEDs, connections to the hub, a serial service port, and a MAC interface.

NMS

The network management station. An OpenVMS ™, UNIX®, or ULTRIX ™ workstation, or an IBM® PC, or IBM PC-compatible workstation supplied with an Ethernet, FDDI, or token ring network module and HUBwatch software, which enables it to communicate with and manage network modules.

no loopback

See Loop.

node

Any intelligent device that communicates with other devices in the network.

NVRAM

The nonvolatile random access memory.

OBM

The out-of-band management. Management of a network module or the DEChub 900MS backplane over a telephone line or direct line to a console port rather than over the network.

ODL

The On-Demand Load. An Asian terminal's use, through a DECserver 90L+, of the On-Demand Loading (ODL) font protocol to override flow control, while fonts are being down loaded to the terminal.

OID

The registered Object ID (OID) of the device.

option button

The small circular area within a dialog box that represents a choice. Click on an option button to select your choice. You can select only one option button from a group of option buttons.

partition

A repeater port is said to be partitioned when it is management disabled or autopartitioned.

PC

A personal computer.

PC Type

A variable that specifies the type of downstream port being managed by the GIGAswitch port's physical connection management facility. The four different Port connector types are:

- A - The port is a dual attachment station or concentrator that attaches to the primary in and secondary out when attaching to the dual ring.

- B - The port is a dual attachment station or concentrator that attaches to the secondary in and the primary out when attaching to the dual ring.

- S - Either one port in a single attachment station or one port in a single attachment concentrator.

- M - A port in a concentrator that serves as a master to a connected station or concentrator.

physical connection management

That portion of connection management that manages the physical connection between adjacent PHYs. This includes the signaling of connection type, link confidence testing, and enforcement of connection rules.

PDU

A Protocol Data Unit. A data object exchanged by protocol layers that contains both protocol control information and user data.

Physical Layer Protocol

A Fiber Distributed Data Interface (FDDI) standard that defines symbols, line states, clocking requirements, and the encoding of data for transmission.

physical topology

The actual arrangement of cables and hardware that make up the network.

Physical Layer Medium Dependent

FDDI standards that define the media and protocols to transfer symbols between adjacent PHYs.

power supply

The power supply uses regulated 48 Vdc power to energize the discrete power modules located on each logic card, and 12 to 26 Vdc power to energize the fans. The GIGAswitch can also accommodate a redundant power supply unit.

Like the fan trays, GIGAswitch power supply units can be hot-swapped.

protocol

A formal set of rules governing the format, timing, sequencing, and error control of exchanged messages on a data network. May also include facilities for managing a communications link or contention resolution.

A protocol may relate to data transfer over an interface, between two logical units directly connected, or on an end-to-end basis between two end users over a large and complex network. There are hardware protocols and software protocols.

protocol filtering

A feature in which some bridges can be programmed to always forward or always reject transmissions that are originated under specified protocols.

proxy access

The way a proxy Simple Network Management Protocol (SNMP) agent provides requests to the network management station (NMS). A proxy agent acts on behalf of network devices that do not support SNMP. When such a network module is to be managed, the NMS contacts the proxy agent and indicates the identity of the network module. The proxy agent translates the protocol interactions it receives from the NMS into interactions that are supported by the network module.

pulldown menu

A menu that is displayed when a user presses a mouse button and the pointer is positioned on a menu name in the menu bar.

push button

A round box containing text. By clicking the mouse on the text, you select the function. For example, clicking on the Help push button takes you to the help for the current window.

radio button

A diamond shape that precedes text and allows you to make a choice. By clicking on the radio button, you select the option.

rate limit

The total number of frames on all ports allowed by a bridge per second.

registered name

The name by which the network management application (for example, POLYCENTER SNMP Manager) recognizes a node.

release

An action used in conjunction with drag. After dragging the mouse, you release the mouse button.

repeat

A station receives a frame or token from an upstream station, retimes it, and places it on the ring for its downstream neighbor. The repeating station can examine the frame, copy it to a buffer, or modify control bits in the frame as appropriate.

repeater

A level 1 hardware device that performs the basic actions of restoring signal amplitude, wave form, and timing of signals, before transmission on another network segment.

responder port

A redundant repeater port that connects to either a master primary or a secondary port. Because responder ports are always enabled, no action is taken to switch ports in case of link failure. However, a responder port does detect and report link failures to its partner (master primary or master secondary) port by continuously pulsing its fiber transmit LED on and off. If the master port connected to the responder port is active, the responder port treats this event as a link failure and causes a link failover. Link failures include the following conditions:

- Autopartitioning.

- Management disable.

- Carrier loss.

responder mode

This mode designates ports that connect to master mode ports. Responder ports are always enabled but are active only when their master port is active. A key function of the responder port, other than receiving and transmitting data, is to report link failures to the master port. When the master port detects a link failure, it causes the link to failover to the standby link.

If the standby link is not available when the active link fails, the failover process waits until it is available. If the previously active link becomes available during this waiting period, the master returns to using it. Otherwise, the failover to the standby link takes place as soon as the standby link is good. Thus, the highest utilization possible on a dual-port redundant link is achieved.

ring

The connection of two or more stations in a circular logical topology. Information is passed sequentially between active stations, where each one in turn, examines or copies the data, and returns it to the originating station, which removes the data from the network.

root bridge

The bridge in an extended local area network that controls the network configuration by originating Hello messages.

The spanning tree algorithm determines the root bridge by comparing the bridge IDs for all bridges in the extended LAN. The root bridge is the bridge with the lowest bridge ID (root priority and hardware address).

root priority

A spanning tree parameter that determines a bridge's priority for becoming the root of the logical spanning tree. The Root Priority parameter value is used as a prefix to the bridge's address to form the bridge's identification (for example, 128/08-00-2B-2C-08-21).

secondary port

A redundant master repeater port that is placed in the standby state when redundant ports are configured.

scroll bar

The bar used to move from left to right and up and down within a window or dialog box.

scroll box

The rectangular portion of the scroll bar that moves either up or down or right or left to indicate the direction you are scrolling.

select

The action of choosing a menu item or symbol by clicking on it.

server

A network node or specialized device that provides and manages access to shared network resources, such as hard disks, printers, and software.

service node

A node with which a terminal is able to establish a session through a terminal server port.

session

A logical connection between a terminal and a service node.

session origin

The port characteristic on a DECserver 90TL, 90M, or 900TM that determines where a session on a port can originate.

SET

A Simple Network Management Protocol (SNMP) request in which the named instance is modified if the community string matches.

shielded twisted-pair

A cable composed of two insulated wires, twisted together and surrounded by a braided metal shield or foil under the outer insulation.

single attachment station

An FDDI station that offers one S port for attachment to the FDDI ring. FGL4 cards can accommodate up to 4 single attachment stations. On an FGL4 card, each station maps to a single port.

single hub

An eight-slot hub (as opposed to a double hub, which is two eight-slot hubs daisy-chained together).

SLIP

The Serial Line Internet Protocol, used for transmitting IP packets across serial lines.

SNMP

The Simple Network Management Protocol. A high-level, standards-based protocol for network management, usually used in TCP/IP networks.

SNMP agent

An entity in a hardware device that executes SNMP requests.

SNMP MIB II

The Simple Network Management Protocol Management Specification for managers of 802.5/Token Ring systems. Uses TCP/IP as the transport stack.

source address

The network address of the station that transmitted the data to the network.

spanning tree

A method of creating a loop-free logical topology on an extended local area network (LAN). Formation of a spanning tree topology for transmission of messages across bridges is based on the industry-standard spanning tree algorithm defined in IEEE 802.1d.

spanning tree algorithm

A computation that determines how a spanning tree topology is formed.

spanning tree mode

Determines whether or not a bridge is using a loop-free logical topology.

split speed

A DECserver 90TL, 90M, or 900TM port characteristic of having different input and output speeds.

SQE

Signal quality error.

standalone module

A network module in a single configuration.

standby port

A redundant repeater port that is configured as a backup port to an active port. A standby port is disabled and is held in readiness in case the active port fails.

Station Management

The entity within a station on the FDDI ring that monitors and exercises overall control of station activity.

Switch Control Processor card

The GIGAswitch Switch Control Processor card performs various management and spanning tree functions. In addition, the card forwards multicast packets and packets with unknown destination addresses.

TCP

The Transmission Control Protocol. The transport protocol offering a connection-oriented transport service in the Internet suite of protocols.

TELNET

A commercial wide-area network with thousands of local dial-up numbers. TELNET provides log-on services to a variety of commercial, online, computer services, such as Dialog Information Services and CompuServe.

terminal server

A module that allows a terminal to connect to a network node.

text entry box

A Windows dialog box control that allows you to enter text in a structured area.

title bar

An area at the top of a Windows display that contains the name of the application and sometimes additional information.

token ring

A network with a ring topology that passes data-bearing tokens from attached stations to the next. The original protocol developed by IBM was succeeded by the IEEE 802.5 standard for token ring network communications.

topology

The logical or physical arrangement of nodes on a network.

trap

Messages generated by firmware in Simple Network Management Protocol (SNMP) agent hardware. The firmware monitors the hardware for faults and sends messages to monitoring software. For the HUBwatch application, the Alarms Poller software communicates with the SNMP agents in a hub or a community and arranges for specific traps to be sent to the network management station running the HUBwatch application. The Trap table in the Alarms Definition file determines which traps to monitor. Cold start, warm start, and authentication failure are examples of traps monitored by the alarms software. The Alarms Poller software uses Internet Protocol (IP) addresses and community names to communicate with specific SNMP agents, such as the DECagent 90, the Hub Manager, and modules with built-in SNMP agents.

Unicast

A type of network addressing that enables a node to send messages or data packets to a single node on the network.

UDP

The User Datagram Protocol. The transport protocol offering a connectionless-mode transport service in the Internet suite of protocols.

upstream neighbor address

The terms "upstream" and "downstream" refer to the relative position of stations on the FDDI ring.

The upstream neighbor address is the MAC address of an FDDI station's upstream neighbor. A station is "upstream" from its neighbor if it receives the token *before* the neighbor receives it (that is, if the station *passes* the token to its neighbor).

window

A portion of the screen used for displaying information.

Workgroup

A group that consists of a relatively small of number devices attached to a LAN that is isolated from the extended LAN backbone by a bridge or a brouter.

XOFF

A transmission control character indicating transmission off.

XON

A transmission control character indicating transmission on.

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