



AA-R8JJA-TE

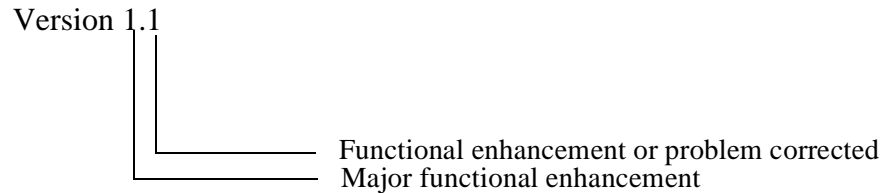
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**DIGITAL GIGAswitch GS2000 Line Card**  
**Version 2.0**  
**Release Notes**  
**November 1997**

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As warranted, DIGITAL changes the firmware of this device to make functional enhancements or to correct reported problems. These release notes identify enhancements and changes to the firmware that impact end-user operations. They also contain firmware and software requirements, and list updates in this release as well as known conditions and restrictions that apply to the operation of the DIGITAL GIGAswitch GS2000 module.

The following example describes the firmware version number:



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## Hardware and Firmware Support

The DIGITAL GIGAswitch GS2000 line card (DEFGC-AA) can be used in the following GIGAswitch systems:

- GIGAswitch/ATM 5-slot system
- GIGAswitch/ATM system (14-slot)
- GIGAswitch/FDDI system (14-slot)

Version 2.0 of the GIGAswitch GS2000 firmware release is used to manage the DIGITAL GIGAswitch GS2000 line card (GS2000) module. However, check the firmware release notes for your GIGAswitch system to make sure that you have the appropriate versions of the required firmware for your GIGAswitch system to use the GS2000 module.

New versions of software images are available from the DIGITAL Network Product Business Web Site. Refer to “Accessing On-line Information” on page 11 for more information about accessing the Web Site.

## Special Features in This Release

Special features in this release include:

- IP Routing

The IP-Routing for GS2000 modules is based on the standard Comet-Distributed Routing Software (DRS) code with certain changes to fit the GS2000 architecture. With the 2.0 release, routing is only possible over a Virtual-Interface (VI). A VI is associated with a VLAN, so indirectly, routing is only possible over VLANs. By default, all the IP-Routing functions are disabled. Once routing is enabled, the majority of IP routing configuration is dynamic, that is, IP addresses can be added to or deleted from interfaces without having to restart the module.

Enhanced Proxy Arp: The standard Proxy-Arp function of DRS is enhanced to work with end nodes that are configured to “ARP for everything.” This allows these nodes to effectively perform 'IP Packet Switching' to other nodes, even if those other nodes are in different IP subnets.

- RMON Alarms and Events

This feature is an implementation of the Alarm and Event groups of RFC-1757. This allows the GS2000 module to monitor any of its own MIB variables, and when the value of a MIB variable crosses a threshold value, an SNMP trap message can be sent, or a log message generated, or both.

- BootP Client

A standard BootP client function is implemented. At power on (or restart) the BootP client will send out broadcast packets on all active ports attempting to query any BootP server for the IP address of the module.

- Digital Trace Facility (DTF)

This release of the firmware supports DTF. DTF allows a workstation to instruct the module to capture certain types of control traffic (i.e., SNMP, ARP, BPDU, etc.) and send the packet to the workstation for display and analysis.

## Firmware Conditions and Restrictions

The following known conditions and restrictions apply to this release of the GS2000 firmware.

### No Frame Interval Functionality

The “No Frame Interval” functionality is not supported in this firmware release.

### Clearing SNMP Configuration

When clearing SNMP configuration (using Clear all or Clear SNMP commands), you must restart the module for the clear to take affect.

### Ping Packets Greater Than 1500 Bytes

The GS2000 module does not reply to ping packets that are greater than 1500 bytes.

### Displaying Event Log Messages

When you display events using the `Main>events` command or indirectly via the `Config>set output console`, be aware that you can retrieve Event log messages only once. That is, once an Event Log message is displayed, it cannot be viewed again. Therefore, if you want to save Event log messages for later analysis, save the display output using an appropriate method, such as logging or saving a terminal session.

## GS2000 Module Conditions and Restrictions

The following known conditions and restrictions apply to the GS2000 module in this firmware release.

### Non-Zero Virtual Path Values in ATM

Non-zero virtual path (VP) values are not supported for Asynchronous Transfer Mode (ATM) in this release.

### No FLOWmaster Flow Control for ATM

FLOWmaster flow control for ATM networks is not supported in this release.

### T3/E3 and T1/E1 Modular PHYs Not Supported

T3/E3 and T1/E1 modular PHYs are not supported in this release.

### Configuring Link Parameters

- Auto-negotiation of link parameters sets the SONET clock to LOOP timing if the module is attached to the GIGAswitch/ATM system. The default setting, if no connection to the a GIGAswitch/ATM system is discovered, is LOCAL. You can ensure proper operation of the link and reduce auto-negotiation workload by setting the timing to the following when configuring the physical interface:

- LOOP: if attached to an ATM switch
- LOCAL: if attached to a VNswitch 900EA or GS2000 module
- If a GS2000 module is attached to an ATM switch and the error rate is high on the link check, set the Physical layer timing parameter to LOOP.

### **No Hotswapping of ATM Modular PHY Card**

The ATM modular PHY (modPHY) card cannot be hotswapped in this release. You must restart the GS2000 module after the installation of an ATM modPHY card to initialize the card.

### **GIGAswitch/ATM and ATMswitch 900 BUS Limits**

GIGAswitch/ATM firmware has a Broadcast and Unknown Server (BUS) rate limit. When the rate exceeds this limit, the effective throughput of the GIGAswitch/ATM system can start to decline and cause connections with the GIGAswitch/ATM system to be lost. DIGITAL recommends that the GS2000 module limit broadcast activity to an aggregate of 100 packets per second.

If you are using the LAN Emulation services provided by GIGAswitch/ATM firmware V2.4 or earlier, DIGITAL recommends that you limit broadcast activity to an aggregate rate of 300 packets per second. For example, if the same GIGAswitch/ATM system provides a BUS for six modules, each module should limit their broadcast activity to 50 packets per second.

### **ATM Config Interface Command Menu**

Dynamic support to disable and enable an ATM interface is available through the ATM Config interface command menu. The `disable interface`, `enable interface`, and `list interface` commands at the top level of the Config Process (at the `Config>` prompt) do not affect the ATM interfaces. To reach the ATM Config interface command menu, enter the Config process and issue the interface command for a particular ATM interface. The prompt changes from `Config>` to `ATM/xx Config>`. From here, you can use the `disable-interface`, `enable-interface`, and `list` commands to disable, enable, or list the information for that ATM interface. Here is a sample session:

```

MOS Operator Control
Main>config
Config>int 16
ATM/16 Config>?
LIST
CHANGE-INTERFACE
DISABLE-INTERFACE
ENABLE-INTERFACE
PHYSICAL
EXIT
ATM/16 Config>list
Interface      :16
Interface Type :Fddi Bridge Tunnel
Bridge Tunnel Status :Down
PVC(vpi,vci)   :0,255

```

## ATM Bridge Tunnels and LECs

If the default LEC or Bridge Tunnel does not come up, one of the ATM logical interfaces might already be configured. Reset to factory settings (or clear all records at the `Config>` prompt) to use the default configuration.

## Configuration Problems Using clearVISN MCM

When you configure the module using the clearVISN MultiChassis Manager (MCM), you might encounter the following problems and their solutions.

- Problem: MCM's RESET button on the CONFIGURE LOGICAL INTERFACES view, which configures bridge tunnels and LECs, does not restart the module. Typically, a restart is needed when creating a new FDDI Bridge Tunnel. When RESET is selected, a warning message is displayed stating that it will cause loss of module communication. However, this action never occurs and the module does not restart.

Solution: To restart the module, use MCM's RESET button in the module's Switch Summary view or use the `Restart` command from the configuration menu.

- Problem: Enabling a configured LEC does not result in the LEC being moved to the enable window. No error or warning indication is given.

Solution: Verify that no `Lan Name` conflict exists. The module does not allow more than one LEC with the same `Lan Name` to be enabled. This restriction includes multiple LECs with blank (that is, default) `Lan Names`.

- Problem: Enabling a configured FDDI Bridge Tunnel does not result in the tunnel being moved to the enable window. No error or warning indication is given.

Solution: The FDDI Bridge Tunnel might have been configured recently without performing a required restart of the module. To restart the module, use MCM's RESET button in the module's Switch Summary view or use the `Restart` command from the configuration menu.

- Problem: VCI=1023 can be configured on the module for an Ethernet or FDDI bridge tunnel. This action is illegal.

Solution: Use values between 62-1022.

## ATM FDDI Bridge Tunnel to ATM Ethernet Bridge Tunnel Connection Not Recommended

You can manually configure an ATM FDDI Bridge Tunnel on one module connected to an ATM Ethernet Bridge Tunnel on another module. While this configuration does allow the bridge tunnel to come up, the mismatch in tunnel types causes unwanted and unpredictable results. It is recommended that you do not attempt to use this configuration.

## GS2000 Module Defaults to ATM Ethernet Bridge Tunnel

The plug-and-play values for the module default to an ATM Ethernet Bridge Tunnel, even if two modules are connected together. If an ATM FDDI Bridge Tunnel is desired, this must be manually configured.

## Firmware Upgrades

Refer to the *DIGITAL GIGAswitch GS2000 Line Card Management* manual for instructions about how to perform firmware upgrades. During a firmware upgrade, do not log out from the `Main>` prompt. Doing so renders the console inaccessible until the module is power cycled.

You can perform firmware upgrades for the module using the `reload` or `load remote` commands. Note that these commands rely on IP Host Services or IP Routing being configured.

If you are using an OpenVMS system and VMS UCX (V4.0 or earlier) as the TFTP load server for the firmware upgrade, the TFTP load might fail. As a workaround, convert the firmware image file format from Fixed-512 to Stream\_LF record format.

### **LED Sequences on Reload**

During firmware upgrade, the module LEDs provide information regarding the progress of the upgrade. The upgrade process begins when the user enters one of these commands:

- `reload` at the `Main>` prompt, assuming that the boot information is preconfigured.
- `load remote` at the `Boot config>` prompt.

After the user confirms, the module restarts in Host-only mode and issues a TFTP GET request using the image file location provided by the user. Once the connection with the TFTP server is established, the TFTP image file transfer begins. If a console is connected to the module or if you establish a Telnet session to the module at this point, a message indicates that the upgrade is proceeding. If the TFTP transfer completes successfully, a status ok message is displayed. If a TFTP error occurs, an error status is displayed and the module restarts, with the original image. Assuming that the TFTP transfer is successful, a CRC check of the image received at the module is performed. During the CRC check, the Load Status 1 and Load Status 2 LEDs display the following:

- Load Status 1 LED: Amber
- Load Status 2 LED: Green

In the case of an error during the CRC check, the Load Status 1 and Load Status 2 LEDs display the following:

- Load Status 1 LED: Green
- Load Status 2 LED: Amber

If the CRC check succeeds, the new image is written into flash program memory. During the flash write sequence, the Load Status 1 and Load Status 2 LEDs display the following:

- Load Status 1 LED: Green
- Load Status 2 LED: Green

Upon completion of the flash write sequence (which might take several minutes), the Load Status 1 and Load Status 2 LED pair flash alternating green and amber for approximately 10 seconds. Then, the Load Status 1 and Load Status 2 LED pair remain lit (either green or amber) for another 10 seconds and the module restarts running the new firmware.

## Documentation

The following documentation supports the GIGAswitch GS2000 Version 2.0 firmware release:

- *DIGITAL GIGAswitch GS2000 Line Card Installation*
- *DIGITAL GIGAswitch GS2000 Line Card Management*
- *DIGITAL GIGAswitch GS2000 Line Card Router Management*

These documents exist in Adobe Acrobat online readable and printable (PDF) format on the documentation CD-ROM that ships with the module.

### **Documentation Errata**

#### **Duplicate MAC Addresses Not Supported**

Note that the duplicate MAC addresses functions described in the *DIGITAL GIGAswitch GS2000 Line Card Management* book are not supported in this release.

#### **FDDI Single-Mode Fiber modPMD SC Not Supported**

The FDDI single-mode fiber (SMF) modPMD SC (DEFXS-SC) that is listed in the *DIGITAL GIGAswitch GS2000 Line Card Installation* is not supported.

## MIB Support

The GS2000 module supports the following MIBs. If a MIB is defined in more than one RFC, the supported RFC is listed first and the other RFCs are listed on a separate line. The MIB handlers do not support SNMP set requests unless otherwise noted.

MIB	RFC/GROUP
<b>mib-2</b>	iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1)
	rfc-1213
	rfc-1158 -> rfc-1213
	system(1) (set)
	interfaces(2)
	ifAdminStatus(7) (set)
	at(3)
	ip(4)
	ipDefaultTTL(2) (set)
	icmp(5)
	tcp(6)
	udp(7)
	egp(8)
	transmission(10) (interface mibs)
	snmp(11)

<b>MIB</b>	<b>RFC/GROUP</b>
<b>ethernet</b>	.mib-2(1).transmission(10).dot3(7) rfc-1643 rfc-1284 -> rfc-1398 -> rfc-1623 -> rfc-1643 dot3StatsTable(2) dot3CollEntry(5) dot3Tests(6) <oid pointers> dot3Errors(7) <oid pointers> dot3ChipSets(8) <oid pointers>
<b>fddi</b>	.mib-2(1).transmission(10).fddi(15).fddimib(73) rfc-1512 rfc-1285 -> rfc-1512 fddimibSMT(1) fddimibMAC(2) fddimibPATH(3) fddimibPORT(4)
<b>ds3</b>	.mib-2(1).transmission(10).ds3(30) rfc-1407 dsx3ConfigTable(5) (set) dsx3CurrentTable(6) dsx3IntervalTable(7) dsx3TotalTable(8) dsx3FarEndConfigTable(9) Not supported dsx3FracTable(13) Not supported
<b>sonet</b>	.mib-2(1).transmission(10).sonetMIB(39) rfc-1595 sonetObjects(1) sonetMedium(1) sonetSection(2) sonetSectionIntervalTable(2) sonetLine(3) sonetLineIntervalTable(2) sonetFarEndLine(4) Not supported sonetObjectsPath(2) sonetPath(1) sonetPathCurrentTable sonetPathIntervalTable sonetFarEndPath(2) Not supported sonetObjectsVT(3) Not supported sonetVT(1) Not supported sonetFarEndVT(2) Not supported
<b>mau</b>	.mib-2(1).snmpDot3MauMgt(26) draft-ietf-hubmib-mau-mib-03.txt dot3RpMauBasicGroup(1) Not applicable dot3IfMauBasicGroup(2) dot3BroadMauBasicGroup(3) Not applicable dot3IfMauAutoNegGroup(5)



<b>MIB</b>	<b>RFC/GROUP</b>
<b>bridge</b>	.mib-2(1).dot1dBridge(17) (multiple spanning tree support) rfc-1493 rfc-1286 -> rfc-1493 & rfc-1525 dot1dBase(1) dot1dStp(2) (set) dot1dSr(3) Not applicable dot1dTp(4) (set) not implemented: dot1dStatic destination address filtering dot1dStaticTable(1) traps
<b>interfaces</b>	.mib-2(1).ifMIB(31).ifMIBObjects(1) rfc-1573 ifStackTable(2)
<b>digital</b>	.private(4).enterprises(1).dec(36).ema(2) mib-extensions-1(18)
<b>elan</b>	elanext(1).efddi(1) (set) elanext(1).ebridge(4) (set) ebrIfSpanTable Not supported ebrTwoPortStatic Not supported ebrTwoProtoFilt Not supported ebrNTP Not supported
<b>hub</b>	dec_elan_vendor_mib_v30.mib decHub900(11).pubCommon(2) pcomHub(2) pcomLed(3) (set) pcomLoad(4) (set)
<b>atm</b>	.mib-2(1).atmMIB(37) rfc-1695 atmInterfaceConfTable(2) (set) atmInterfaceDs3PlcpTable(3) atmInterfaceTCtable(4) atmTrafficDescrParamTable(5) atmVplTable(6) atmVclTable(7) atmVpCrossConnectIndexNext(8) Not supported atmVpCrossConnectTable(9) Not supported atmVcCrossConnectTable Not supported aal5VccTable
<b>comet</b>	comet-mib(2) cinterface(1)

<b>MIB</b>	<b>RFC/GROUP</b>
<b>vlan</b>	vlan_v1.mib pe2000(33).bridgeGroup(1) (set) bridgeGroupPortTable(4) bridgeGroupNameTable(5) bridgeGroupPeBusTagTable(7) bridgeGroup atomics
<b>proteon</b>	.private(4).enterprises(1).dec(36).ema(2). mib-extensions-1(18).cometBROUTERS(20).proteon-mib(1) no rfc - proteon mib text fully supported including sets admin(1).oid(1) admin(1).status(2) admin(1).els(3) admin(1).xface(4) admin(1).private(5) (no documentation) nvrAm(1) reset(2) xface(2) proto(3)
<b>atm</b>	dec_atm.mib atmExpand(17) ad(1) dxatm(2)                      Not supported
<b>atm bridge tunnel</b>	decAtmBridgeTunnel.mib decAtmBridgeTunnel.mib(28)
<b>atm lec</b>	.private(4).enterprises(1).atmForum(353) .atmForumNetworkManagement(5) .atmLanEmulation(3) .leClientMIB(1) .leClientMIBObjects atmLecClient.mib lecConfigTable(1)                      (set) lecStatusTable(2)                      Not supported lecMappingTable(3)                      Not supported lecStatisticsTable(4)                      Not supported lecServerVccTable(5)                      Not supported lecAtmAddressTable(6)                      Not supported lecMacAddressTable(7)                      Not supported lecRouteDescrTable(8)                      Not supported leArpTable(9)                      Not supported leRDArpTable(10)                      Not supported

MIB	RFC/GROUP
<b>icom</b>	internal(0).intCommon(1) int-common.mib
	The icom MIB objects are normally only visible to the MAM on the chassis backplane serial line
	icomHlap(1)
	icomRoot(2)                      Table not populated
	icomHub(3)
	icomStatus(4)
	icomTrap(5)                      Not supported
	icomIps(6)
	icomEnviron(7)
	icomPower(8)
	icomIntProtInstrumentation(9)                      Not supported
	icomBp(10)
	icomBpTotalConfigChanges(1)
	icomBpIfNumEntries(2)
	icomBpIfTable(3)
icomBpPortDescrTable(4)                      Missing in walk	
icomBpIfSubtypeNumEntries(5)	
icomBpIfSubtypeTable(6)	
icomBpSignalSetNumEntries(7)	
icomBpSignalSetTable(8)	
icomBpConnNumEntries(9)	
icomBpConnTable(10)	
icomSlot(11)	
icomEntity(12)	
icomRemotePoll(14)                      Not supported	
icomLigo(15)	
icomLast    Not supported	

## Accessing On-line Information

Further information on this network product or topic is available on the DIGITAL Network Product Business Web Site. The Web Site can be reached from different geographic locations via the following URLs:

Americas	<a href="http://www.networks.digital.com/">http://www.networks.digital.com/</a>
Europe	<a href="http://www.networks.europe.digital.com/">http://www.networks.europe.digital.com/</a>
Asia Pacific	<a href="http://www.networks.digital.com.au/">http://www.networks.digital.com.au/</a>

To get firmware and management information base (MIB) information, please choose the “Technical Information” link, and from there choose the “Technical Information (Drivers, Manuals, Tech Tips, etc.)” link. You will see a listing of all the products available on the NPB Web Site.

## Using Electronic Mail

The DDN Network Information Center (NIC) of SRI International provides automated access to NIC documents and information through electronic mail. This is especially useful for users who do not have access to the NIC from a direct Internet link, such as BITNET, CSNET, or UUCP sites.

To use the mail service, follow these instructions:

- 1 Send a mail message to **SERVICE@NIC.DDN.MIL**.
- 2 In the SUBJECT field, request the type of service that you want followed by any needed arguments.

Normally the message body is ignored, but if the SUBJECT field is empty, the first line of the message body is taken as the request. Requests are processed automatically once a day. Large files are broken into separate messages.

The following example shows the SUBJECT lines you use to obtain DDN NIC documents:

```
HELP
RFC 822
RFC INDEX
RFC 1119.PS
FYI 1
IETF 1IETF-DESCRIPTION.TXT
INTERNET-DRAFTS IID-ABSTRACTS.TXT
NETINFO DOMAIN-TEMPLATE.TXT
SEND RFC: RFC-BY-AUTHOR.TXT
SEND IETF/IWG-SUMMARY.TXT
SEND INTERNET-DRAFTS/DRAFT-IETF-NETDATA-NETDATA-00.TXT
HOST DIIS
```

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