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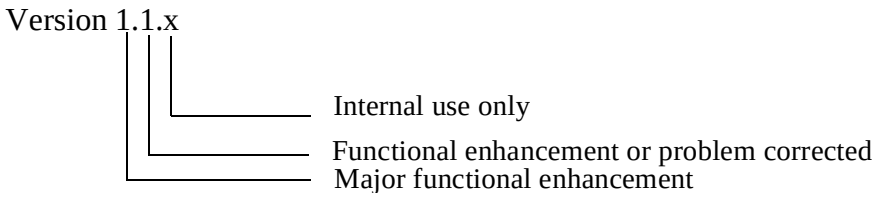
DIGITAL GIGAswitch GS2000 Line Card Version 3.0 Release Notes September 1998

As warranted, the firmware of this device is changed 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 line cards.

The following example describes the firmware version number:



Note: The GS2000 firmware is currently at Version 3.0.1. However, the product documentation reflects the major functional release of the product, Version 3.0.

Contents

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 3.0 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 Products Web Sites:

Americas:	http://www.networks.digital.com
Europe:	http://www.networks.europe.digital.com
Asia Pacific:	http://www.networks.digital.com.au

clearVISN Support

To manage the GS2000 line cards using the clearVISN application, you must use clearVISN V2.1 or higher.

Features in This Release

GS2000 V3.0 firmware is the first release of the software that supports web-based management of GS2000 line cards. The following new features are included in this release. Refer to *DIGITAL GIGAswitch GS2000 Management* for further information.

- **Web-Based Management**
  The GS2000 line card, with V3.0 firmware, includes a built-in web server and management application that allows you to configure, monitor, and upgrade the line card over the Internet. For web access, you must first assign an IP address to the line card using the Command Line Interface (CLI). You can use either of the following web browsers: Netscape V4.0 or Internet Explorer V4.0. Following are the web management features supported in this release:

  — **System**
  General
  Reset
  Error Log (Crash Log and Diagnostic Log)
  Memory
  IP Host
  Upgrade Device
  Save/Restore Configuration
  SNMP (Communities)

— **Interfaces**
Configuration
Packet Counters
Error Counters

— **Bridging**
General
By Port
Spanning Tree by VSD
Address Filters
Protocol Filters
Forward Bridging Database
VSD Configuration General

— **IP Routing**
General
Enable/Disable Routing
Addresses
IP Counters
Static Routers
Access Control
Filtered Routes
Enhanced Proxy ARP

— **Telnet to Module**

- **BGP4 Interface**
  This feature is an implementation of the latest version of the Border Gateway Protocol (BGP), BGP4, which is defined in RFC 1654. BGP is an exterior gateway routing protocol that allows the exchange of network reachability information among autonomous systems (AS). Routing information within each AS is shared using interior gateway protocols, such as RIP, OSPF, or Integrated IS-IS. For more information, refer to *DIGITAL GIGAswitch GS2000 Line Card Router Management*.

- **T3/E3 and T1/E1 ATM ModPHYs**
  This release supports T3/E3 and T1/E1 ModPHYs for GS2000 line cards.

- **New Command Line Interface (CLI) Functionality**

  — **New ATM physical (ATM Phy Config>) commands for T3/E3 and T1/E1 ModPHY support**
  These commands include ENABLE/DISABLE commands, LIST commands, and SET commands.

  — **New counters for the ATM Phy>LIST STATUS command:**

    - Net up count
    - Net down count
    - Data direct and Bridge Tunnel VC count
    - Number of times the PHY went into loopback because the PHY was down

— Additional ATM enhancements
These enhancements include new LIST SUMMARY commands for ATM> and ATM Config> and improvements for the Config>CLEAR ATM command.

- **Duplicate MAC**
This release of the firmware adds duplicate MAC support.
- **RMON History and Statistics**
- **Byte Counters**
This release of the firmware adds support for byte counters ifInOctets and ifOutOctets (MIB-2).
- **Year 2000 Compliance**
This release of the firmware is Year 2000 compliant.
- **Command Line Editing and Command Line Completion**
This release allows you to edit commands on the command line, recall previously entered commands, and complete partially entered commands automatically.

Special Considerations for This Release

Read this section for special considerations regarding the operation of your GS2000 Line Cards.

Upgrading to GS2000 Version 3.0

You can use the Command Line Interface (CLI) or the web-based management application to upgrade the module.

The GS2000 3.0 images can be upgraded from a V2.0.6 image only. If an attempt is made to upgrade a module that is running a version earlier than V2.0.6 with either the clearVISN Flash Loader or the CLI **load remote** or **reload** commands, the update will fail with either a **timeout** or **out of memory** error message.

Default DEC ATM MIB Values Changed

In this release, the default values for the following DEC ATM MIB values are changed:

- adpReceiveBuffers = 0 (used to be 20)
- adpMaxReceiveBufferCounter = 20 (used to be 0)

CLI Incompatibilities

Some improvements to the command line interface (CLI) for GS2000 V3.0 firmware may cause minor incompatibilities. Please refer to *DIGITAL GIGAswitch GS2000 Line Card Management* for the new commands. Alternatively, enter the '?' help command at any CLI command for a display of the available commands.

For example, the **config** command at the Monitor prompt, which had a shortcut of **c**, has a new meaning. The new equivalent of the **config** command is **list all**.

Momentary Routing Performance Impact for Large IP Networks

It is possible that certain customers with large IP networks that have also enabled **IP Access Controls** on the GS2000 may observe a momentary performance impact for routed traffic. If this performance impact does occur, it is most likely to happen during a Spanning Tree topology change in the network. This momentary slow down will affect routing only and does **not** affect the bridging performance of the GS2000. The most noticeable symptom is that a CLI session to the GS2000 will be slower than normal.

Clearing the ARP Cache When Routing Enable/Disable Is Changed

If you change your routing configuration from enabled to disabled, or from disabled to enabled, you must clear your ARP cache (`Config>` **clear arp**) and reconfigure the ARP configuration data.

GS2000 Firmware Conditions and Restrictions

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

Setting Line Attenuation and Transmission Power for DS3 Interfaces

The **set line-building-out** command, which sets the line attenuation, and the s*et transmission-power* command are specific to DIGITAL modPMD implementations. They are required for the E3/T3 physical media specifications.

It is strongly recommended that you use the factory default for the transmission power. If the transmission power is not properly set, the physical media will not conform to the T3 or E3 specifications. The factory default for T3 lines is low, and for E3 lines, the default is high.

No Hot Swapping of ATM Modular PHY Card

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

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 line card for the clear to take effect.

Diagnostic Failures

If a hardware problem is detected during diagnostics, an entry is made in the diagnostic log. You can view this log from the web-based application (System Error Log window), from the CLI using Monitor> **err-log list diag**, or using Option 7 from the GS2000 INSTALLATION MENU. If any diagnostic entries are present, it is a hardware failure and the line card should be replaced.

Displaying Event Log Messages

When you display events using the Main> **events** command or indirectly using the Config>**set output console** command, 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/saving a terminal session.

Duplicate MAC Address

For networks in which the same MAC address appears within more than one VSD (Duplicate MAC), it is necessary to configure the duplicated addresses as static duplicate MAC addresses using the command BRIDGE config>set duplicated-address <duplicate MAC address>.

BGP and RIP Route Limitations

You cannot import subnetted routes (routes with a mask that is not the natural mask for a Class A, B, or C network) learned from the BGP protocol into RIP. Note that non-subnetted BGP routes can be imported into RIP without any problem.

Incorrect False Carrier Sense Counter Values

The false carrier sense counter (FCSR) is incorrectly incrementing and, therefore, the counter value may not be valid.

RMON Statistics Counter Differences

RMON statistics conform to the RMON RFC, except for the following counter differences:

- The octet (etherStatsOctets) and packet (etherStatsPkts) counters will not include all error packets.
- The number of collisions in the collision counter (etherStatsCollisions) will be understated.
- The undersized packet (etherStatsUndersizePkts) value is always listed as 0 and included as part of the fragment counter (etherStatsFragments).
- The oversize packet (etherStatsOversizePkts) value is always listed as 0 and included as part of the jabbers counter (etherStatsJabbers).
- The broadcast packet (etherStatsBroadcastPkts) value is always listed as 0 and included as part of the multicast counter (etherStatsMulticastPkts).

To display RMON statistics for interface 7 using the CLI, for example, perform the following command:
`Monitor>`**interface statistics 7**

RMON Restrictions with NetScout Manager

When using the NetScout Manager application, the following restrictions apply:

- Since the GS2000 supports only the two basic RMON groups, NetScout applications that rely on the other groups, such as Top N Talkers, will return an error.
- The interface number supplied should be equal to the port number of the desired port. For example, to monitor port 2 use interface number 2.
- The interface name returned using the Test Agent command is incorrect and should be ignored.
- Using the Switch option results in the wrong set of ports.
- The reporting of multicast packets in the short term history display has a significant variance between intervals. The smaller the interval time, the greater the variance. For accurate interval multicast packet counts, it is recommended to have an interval time of at least 10 minutes.

Restrictions and Conditions for the GS2000 ATM Ports

This section lists known restrictions and conditions specific to the ATM ports in the V3.0 release.

Nonsupport of Nonzero VP Values in ATM

Nonzero Virtual Path (VP) values are not supported for ATM in this release.

No FLOWmaster Support for ATM

GS2000 3.0 firmware does not support FLOWmaster for ATM networks.

Configuring Link Parameters

ATM link failures may be caused by an out-of-revision modPHY card. Be sure that the modPHY card is at the revision as shown in the following table:

ModPHY Type	Part Number	Revision Level
E1 (2 Mb/s) UTP/ScTP	DAGE1-AA	C01 or higher
E3 (34 Mb/s) coaxial	DAGGE-AA	E01or higher
DS1/T1 (1.54 Mb/s) UTP/ScTP	DAGT1-AA	A01 or higher
DS3/T3 (44 Mb/s) coaxial	DAGGT-AA	A01 or higher
STS-3c (155 Mb/s) UTP/ScTP	DAGGU-AA	E01 or higher
OC-3 (155 Mb/s) MMF	DAGGM-AA	C01 or higher
OC-3 (155 Mb/s) SMF	DAGGS-AA	C01 or higher

ATM Bridge Tunnels and LECs

If the default LEC or bridge tunnel does not come up, one of the ATM logical interfaces may already be configured. Reset to factory settings (or at the Config> prompt, enter **clear ATM**) to use the default configuration.

ATM E1/T1 LAN Emulation Performance

LAN Emulation does not function for an ATM E1 or T1 ModPHY due to low line rates.

Split Path Routing Learning Problems with LAN Emulation

In certain IP network configurations, outbound packets between a source and a destination may take one path while inbound packets may take a different path on their return. This is known as Split Path Routing. If ATM LAN Emulation (LANE) is used to construct these paths, throughput reductions will be seen. The throughput will be reduced to anywhere from one packet per second to ten packets per second depending on the Broadcast and Unknown Server (BUS) rate throughput set in the GS2000. The default rate is one frame per second and can be modified for each LEC interface using the **set max unknown frame count** and **set max unknown frame time** commands.

This situation occurs because traffic flow in these paths is unidirectional. In ATM LAN Emulation, the creation and subsequent use of a direct virtual circuit (VC) between LANE clients depends on traffic in both directions to prevent the VC from being aged out. With unidirectional traffic, the direct VC does get aged out (aging time = bridge aging time) and any subsequent traffic is sent through the BUS. The V1.0 LANE standard states that unknown unicast traffic on the BUS is limited to a maximum rate of ten frames per second. This problem can be avoided by reconfiguring the network to eliminate split paths.

Problems Configuring GS2000 ATM Ports Using clearVISN MCM

Problems and solutions configuring the GS2000 ATM ports with the clearVISN MultiChassis Manager (MCM) are as follows:

- **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 GS2000 does not allow more than one LEC with the same LAN name to be enabled. This includes multiple LECs with blank (i.e. 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 may recently have been configured without performing a required restart of the GS2000 line card. To restart the line card, use MCM's RESET button in the GS2000 Summary view, or use the Command Line Interface Restart command from the configuration menu.

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

You can manually configure an ATM FDDI bridge tunnel on one GS2000 line card to connect to an ATM Ethernet bridge tunnel on another line card or module. While this configuration does allow the bridge tunnel to come up, the mismatch in tunnel types causes unwanted and unpredictable results. For this reason, it is recommended that you do not attempt 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.

Copying ATM Configurations to Another Module is Not Supported

GS2000 V3.0 does not support copying ATM configurations to another module. If you back up a module's configuration database to a server with the intention of later restoring it to a GS2000 line card other than the one it was originally saved from, you must clear the ATM configuration (**Config> clear atm**) before saving the configuration.

ATM LEC Maximum Frame Size is Not Settable from the Web Management Interface

Do not use the GS2000 Web Management interface to set the ATM LEC maximum frame size. This causes the module to crash. You must use the CLI (**ATM/n LEC Config> set max_frame_size**) command to set ATM LEC maximum frame size.

Firmware Upgrades

Refer to Chapter 10 in *DIGITAL GIGAswitch GS2000 Management* for instructions on how to perform firmware upgrades. You can use the Command Line Interface (CLI) or the web-based management application to upgrade the module.

If you are using the CLI to perform the upgrade, do not log out from the Main prompt during the upgrade.

Note: You must install the V3.0 boot block software first. Then install the Version 3.0 firmware.

You can perform firmware upgrades for the GS2000 line cards using the CLI **reload** or **load remote** commands or using the clearVISN Flash Loader application. The **reload** and **load remote** commands rely on IP Host Services being configured.

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

Upgrading from V2.0 to V3.0

To upgrade from V2.0 to V3.0, you must upgrade to V2.0.6 first, then to V3.0. When upgrading to V2.06, please review the V2.0.6 release notes as they contain important information with respect to the upgrade process. If an attempt is made to upgrade a GS2000 line card that is running a version earlier than V2.0.6, either via the clearVISN Flash Loader program or via the CLI **load remote** or **reload** commands, the update will fail with either a timeout or out of memory error message.

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 you confirm, the module restarts in Host-only mode and issues a TFTP GET request using the image file location. 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 cyclic redundancy check (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.

Clearing the ARP Cache

You must clear your ARP cache (`Config>` **clear arp**) and reconfigure the ARP configuration data at the completion of your upgrade, unless routing was enabled prior to the upgrade and it remains enabled at the completion of the upgrade. Refer to "Special Considerations for This Release" on page 4 for additional information.

Documentation

The following documentation supports the GS2000 Line Card Version 3.0 firmware release:

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

These documents exist in Adobe Acrobat Portable Document Format (PDF) and in PostScript format at the following location:

http://www.networks.digital.com

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.

GS2000 MIB Support

The GS2000 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	Comments
mib-2	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)	
ethernet	.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
fddi	.mib-2(1).transmission(10).fddi(15).fddimib(73)	
	rfc-1512 rfc-1285 -> rfc-1512	
	fddimibSMT(1) fddimibMAC(2) fddimibPATH(3) ddimibPORT(4)	
ds1	.mib-2(1).transmission(10).ds1(30)	
	rfc-1406	
	dsx1ConfigTable(6)	set
	dsx1CurrentTable(7) dsx1IntervalTable(8) dsx1TotalTable(9)	
	dsx1FarEndCurrent(10)	not supported
	dsx1Interval(11)	not supported
	dsx1total(12)	not supported
	dsx1FracTable(13)	not supported

MIB	RFC/GROUP	Comments
ds3	.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
sonet	.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
rmon	.mib-2(1).rmon(16)	
	rfc-1757	
	alarm(3)	set
	event(9)	set
mau	.mib-2(1).snmpDot3MauMgt(26)	
	draft-ietf-hubmib-mau-mib-03.txt	
	dot3RpMauBasicGroup(1)	not applicable
	dot3IfMauBasicGroup(2)	
	dot3BroadMauBasicGroup(3)	not applicable
	dot3IfMauAutoNegGroup(5)	

MIB	RFC/GROUP	Comments
bridge	.mib-2(1).dot1dBridge(17)	
	(multiple spanning tree support)	
	rfc-1493 rfc-1286 -> rfc-1493 & rfc-1525	
	dot1dBase(1) dot1dStp(2) dot1dSr(3) dot1dTp(4)	 set not applicable set
	not implemented:	
	dot1dStatic dot1dStaticTable(1)	destination address filtering
	traps	
interfaces	.mib-2(1).ifMIB(31).ifMIBObjects(1)	
	rfc-1573	
	ifStackTable(2)	
digital	.private(4).enterprises(1).dec(36).ema(2) mib-extensions-1(18)	
elan	elanext(1).efddi(1) elanext(1).ebridge(4) ebrIfSpanTable ebrTwoPortStatic ebrTwoProtoFilt ebrNTP	set set not supported not supported not supported not supported
atm	.mib-2(1).atmMIB(37)	
	rfc-1695	
	atmInterfaceConfTable(2) atmInterfaceDs3PlcpTable(3) atmInterfaceTCTable(4) atmTrafficDescrParamTable(5) atmVplTable(6) atmVclTable(7) atmVpCrossConnectIndexNext(8) atmVpCrossConnectTable(9) atmVcCrossConnectTable aal5VccTable	set not supported not supported not supported
comet	comet-mib(2) cinterface(1)	
vlan	vlan_v1.mib	
	pe2000(33).bridgeGroup(1) bridgeGroupPortTable(4) bridgeGroupNameTable(5) bridgeGroupPeBusTagTable(7) bridgeGroup atomics	set

MIB	RFC/GROUP	Comments
proteon	.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)
	  nvram(1)
	  reset(2)
	xface(2)
	proto(3)
		
		no documentation

atm	dec_atm.mib	

	atmExpand(17)
	  ad(1)
	  dxatm(2)
		
		not supported

atm bridge tunnel	decAtmBridgeTunnel.mib	
	decAtmBridgeTunnel(28)	
atm lec	.private(4).enterprises(1).atmForum(353). atmForumNetworkManagement(5) .atmfLanEmulation(3) .leClientMIB(1) .leClientMIBObjects	
	atmLecClient.mib	set not supported in v1.0
	lecConfigTable(1) lecStatusTable(2) lecMappingTable(3) lecServerVccTable(5) lecAtmAddressTable(6) lecMacAddressTable(7) lecRouteDescrTable(8) leArpTable(9) leRDArpTable(10)	not supported in v1.0 not supported in v1.0 not supported in v1.0 not supported in v1.0 not supported in v1.0 not supported in v1.0 not supported in v1.0 not supported in v1.0