

BLADEOS™

Release Notes

10Gb Ethernet Switch Module for IBM BladeCenter®

Version 5.1

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BLADE
NETWORK TECHNOLOGIES

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Release Notes

The 10Gb Ethernet Switch Module (GbESM) is one of up to four GbESMs that can be installed in the IBM BladeCenter chassis.

These release notes provide the latest information regarding BLADEOS 5.1 for the 10Gb Ethernet Switch Module. This supplement modifies information found in the complete documentation:

- *BLADEOS 5.1 Application Guide* for the 10Gb Ethernet Switch Module for IBM BladeCenter
- *BLADEOS 5.1 Command Reference* for the 10Gb Ethernet Switch Module for IBM BladeCenter
- *BLADEOS 5.1 ISCLI Reference* for the 10Gb Ethernet Switch Module for IBM BladeCenter
- *BLADEOS 5.1 BBI Quick Guide* for the 10Gb Ethernet Switch Module for IBM BladeCenter
- 10Gb Ethernet Switch Module for IBM BladeCenter, *Installation Guide*

The publications listed above are available from the IBM support website:

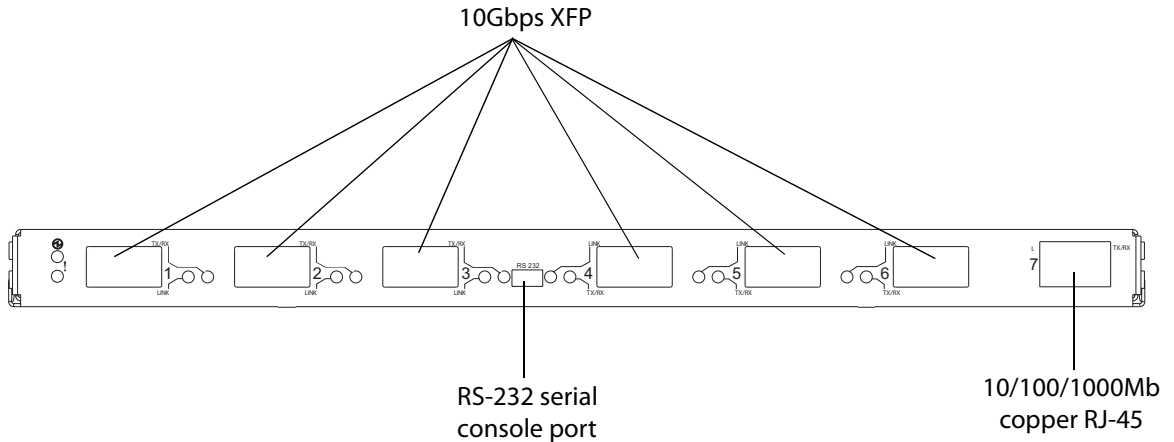
<http://www.ibm.com/systems/support>

Please keep these release notes with your product manuals.

Hardware Support

BLADEOS 5.1 software is supported only on the 10Gb Ethernet Switch Module (Figure 1) for IBM BladeCenter. The GbESM is a high performance Layer 2-3 embedded network switch that features tight integration with IBM BladeCenter H or BladeCenter HT management modules.

Figure 1 10Gb Ethernet Switch Module Faceplate



The GbESM has the following port capacities:

- Six 10Gbps XFP (LC connector)
- Fourteen 10Gb internal ports
- One 10/100/1000Mb external copper management (RJ-45)
- Two 100Mb internal management ports
- One RS-232 serial port

Updating the Switch Software Image

The switch software image is the executable code running on the GbESM. A version of the image ships with the switch, and comes pre-installed on the device. As new versions of the image are released, you can upgrade the software running on your switch. To get the latest version of software available for your GbESM, go to:

<http://www.ibm.com/systems/support>

From the BLADEOS CLI, use the `/boot/cur` command to determine the current software version.

The typical upgrade process for the software image consists of the following steps:

- Place the new image onto a FTP or TFTP server on your network, or on a local computer.
- Transfer the new image to your switch.
- Select the new software image to be loaded into switch memory the next time the switch is reset.

Loading New Software to Your Switch

The switch can store up to two different software images, called `image1` and `image2`, as well as boot software, called `boot`. When you load new software, you must specify where it should be placed: either into `image1`, `image2`, or `boot`.

For example, if your active image is currently loaded into `image1`, you would probably load the new image software into `image2`. This lets you test the new software and reload the original active image (stored in `image1`), if needed.

To download a new software image to your switch, you will need the following:

- The image and boot software loaded on a FTP or TFTP server on your network
 - Boot file: `GbESM-10G-5.1.1.0_Boot.img`
 - Image file: `GbESM-10G-5.1.1.0_OS.img`

Note – Be sure to download both the new boot file and the new image file.

- The hostname or IP address of the FTP or TFTP server
- The name of the new software image or boot file

Note – The DNS parameters must be configured if specifying hostnames.

When the above requirements are met, use one of the following procedures to download the new software to your switch. You can use the BLADEOS CLI, the ISCLI, or the BBI to download and activate new software.

Using the BLADEOS CLI

1. At the Boot Options# prompt, enter:

```
Boot Options# gting
```

2. Enter the name of the switch software to be replaced:

```
Enter name of switch software image to be replaced  
["image1"/"image2"/"boot"]: <image>
```

3. Enter the hostname or IP address of the FTP or TFTP server.

```
Enter hostname or IP address of FTP/TFTP server: <hostname or IP address>
```

4. Enter the name of the new software file on the server.

```
Enter name of file on FTP/TFTP server: <filename>
```

The exact form of the name will vary by server. However, the file location is normally relative to the FTP or TFTP directory (usually /tftpboot).

5. Enter your username for the server, if applicable.

```
Enter username for FTP server or hit return for  
TFTP server: {<username>|<Enter>}
```

6. Enter the switch port to use for the file transfer. The default option is the mgt port.

```
Enter the port to use for downloading the image  
["mgt"|"ext7"|"data"]:
```

7. The system prompts you to confirm your request.

Once confirmed, the software will load into the switch.

8. When loading is complete, enter the following command at the Boot Options# prompt:

```
Boot Options# image
```

9. The system informs you of which software image (image1 or image2) is currently set to be loaded at the next reset, and prompts you to enter a new choice:

```
Currently set to use switch software "image1" on next reset.  
Specify new image to use on next reset ["image1"/"image2"]:
```

Specify the image that contains the newly loaded software.

Using the ISCLI

1. In Privileged EXEC mode, enter the following command:

```
Router# copy {tftp|ftp} {image1|image2|boot-image} [mgt-port|ext7-port|
data-port]
```

Specify a port, or press <Enter> to use the default (management port).

2. Enter the hostname or IP address of the FTP or TFTP server.

```
Address or name of remote host: <name or IP address> [mgt-port|ext7-port|
data-port]
```

Specify a port, or press <Enter> to use the default (management port).

3. Enter the name of the new software file on the server.

```
Source file name: <filename>
```

The exact form of the name will vary by server. However, the file location is normally relative to the FTP or TFTP directory (usually tftpboot).

4. Enter your username and password for the server, if applicable.

```
User name: {<username>|<Enter>}
```

5. The system prompts you to confirm your request.

Once confirmed, the software will load into the switch.

6. When loading is complete, use the following command in Global Configuration mode to select which software image (image1 or image2) you want to run in switch memory for the next reboot:

```
Router(config)# boot image {image1|image2}
```

The system will then verify which image is set to be loaded at the next reset:

```
Next boot will use switch software image1 instead of image2.
```

Using the BBI

You can use the Browser-Based Interface to load software onto the GbESM. The software image to load can reside in one of the following locations:

- FTP server
- TFTP server
- Local computer

After you log onto the BBI, perform the following steps to load a software image:

1. Click the Configure context tab in the toolbar.
2. In the Navigation Window, select **System > Config/Image Control**.

The Switch Image and Configuration Management page appears.

3. Select the port to use for the image transfer:
 - **mgt**: Selects the internal management port (MGT1 or MGT2).
 - **ext7**: Selects the external management port (EXT7).
 - **data**: Selects a data port (INT1–INT14, EXT1–EXT6).
4. If you are loading software from your computer (HTTP client), skip this step and go to the next. Otherwise, if you are loading software from a FTP/TFTP server, enter the server's information in the FTP/TFTP Settings section.
5. In the Image Settings section, select the image version you want to replace (Image for Transfer).
 - If you are loading software from a FTP/TFTP server, enter the file name and click **Get Image**.
 - If you are loading software from your computer, click **Browse**.

In the File Upload Dialog, select the file and click **OK**. Then click **Download via Browser**.

Once the image has loaded, the page refreshes to show the new software.

New and Updated Features

BLADEOS 5.1 for 10Gb Ethernet Switch Module (GbESM) has been updated to include new and enhanced features in support of server and peer switch discovery, as well as failure detection at the link layer. In addition, there are enhancements to existing implementations in the areas of dynamic routing protocols, configuration and reporting.

The list of features below summarizes the updated features. For more detailed information about configuring GbESM features and capabilities, refer to the complete BLADEOS 5.1 documentation as listed on [page 3](#).

Remote Monitoring

BLADEOS 5.1 now supports Remote Monitoring (RMON).

RMON allows network devices to exchange network monitoring data, gather cumulative and history statistics for Ethernet interfaces, and create and trigger alarms for user-defined events.

An RMON management application can be used to access RMON MIB information on the GbESM, as described in RFC 1757. The switch supports RMON Group 1 (Statistics), Group 2 (History), Group 3 (Alarms), and Group 9 (Events).

RMON properties are configured globally in the RMON menu, and enabled on a per-port basis in the Port menu:

# / cfg/rmon	<i>(global RMON menu)</i>
-and-	
# / cfg/port <x>/ rmon	<i>(per-port RMON menu)</i>

Link Layer Detection Protocol

BLADEOS 5.1 now supports 802.1AB Link Layer Detection Protocol (LLDP). Using LLDP, the GbESM advertises port and link information to other LLDP-capable devices and accepts their LLDP advertisements for the purpose of discovering pertinent information about remote ports.

Switch port information and any remote device information is stored in a Managed Information Base (MIB). Higher-layer management tools may access the MIB to accumulate and report such information, and even to and discover configuration inconsistencies between systems on the same IEEE 802 LAN.

The LLDP configuration menu is accessed using the following CLI command:

/ cfg/12/11dp

Uni-Directional Link Discovery Protocol

BLADEOS 5.1 now supports the Uni-Directional Link Discovery (UDLD) protocol, compliant with RFC 5171. UDLD operates at Layer 2 in conjunction with existing IEEE 802.3 Layer 1 fault detection mechanisms. It is used between peer devices to detect and disable unidirectional Ethernet links caused, for instance, by mis-wired cable strands, interface malfunctions, or media converter faults.

UDLD is configured on a per-port basis. It is disabled by default. The UDLD configuration menu is available using the following CLI command:

```
# /cfg/port <x>/udld
```

Operation/Administration/Maintenance Protocol

BLADEOS 5.1 now supports IEEE 802.3ah Operation, Administration, and Maintenance (OAM) protocol. OAM allows the switch to detect faults on physical port links. Using OAM, if the Local Information that a port sends does not match the Remote Information received, the link is determined to be in an anomalous condition and is automatically disabled.

OAM is configured on a per-port basis. It is disabled by default. The OAM configuration menu is available using the following CLI command:

```
# /cfg/port <x>/oam
```

sFlow Monitoring

BLADEOS 5.1 now supports sFlow technology for monitoring traffic in data networks. The switch software includes an embedded sFlow agent which can be configured on a per-port basis to sample network traffic and provide continuous statistical report information to a central sFlow analyzer.

sFlow features are disabled by default, but may be configured using the following menu:

```
# /cfg/sys/sflow
```

Internal Loopback Interface

BLADEOS 5.1 now supports up to five loopback interfaces.

A loopback interface is an interface which is assigned an IP address, but is not associated with any particular physical port. The loopback interface is thus always available for higher layer protocols to use and advertise to the general network, regardless of which specific ports are in operation.

Loopback interfaces can be of benefit in a number of protocols, improving access to a switch, as well as increasing its reliability, security, and scalability. In addition, loopback interfaces can add flexibility and simplify management, information gathering, and filtering.

One example of this increased reliability is for OSPF to use a loopback interface in combination with host routes to advertise an interface route which will be available regardless of the status of individual physical links. This provides a higher probability that the routing traffic will be received and subsequently forwarded.

Further reliability and performance could be provided by configuring parallel BGP paths to a loopback interface on a peer device, which would result in improved load sharing.

Access and security can be improved through filtering. Incoming traffic can be filtered by rules that specify loopback interfaces as the only acceptable destination addresses.

Information gathering and filtering as well as management can potentially be simplified if protocols such as SNMP use loopback interfaces for receiving and sending trap and log type information.

The Loopback Interface configuration menu is accessed using the following CLI command:

```
# /cfg/13/loopif <loopback interface number (1-5)>
```

Rate Limiting

BLADEOS 5.1 now supports traffic rate limits for packets broadcast, multicast, and unknown unicast packets. For each port, the maximum number of packets permitted per second for each packet type can be specified. The following commands have been added to the Port menu (`/cfg/port <x>`) to support rate limiting:

- **brate** <value> | **dis** Broadcast limit, 0 to 262143 packets per second, or no limit.
- **mrates** <value> | **dis** Multicast limit, 0 to 262143 packets per second, or no limit.
- **drates** <value> | **dis** Unknown unicast limit, 0 to 262143 packets per second, or no limit.

Hot Links

BLADEOS 5.1 now supports Hot Links. Hot Links provides basic link redundancy with fast recovery for network topologies that require Spanning Tree to be turned off.

Hot Links allows up to five triggers, each of which consists of a pair of layer 2 interfaces that may contain either an individual port or trunk. One interface is the Master, and the other is a Backup. While the Master interface is active and forwarding traffic, the Backup interface is placed in a standby state and blocks traffic. If the Master interface fails, the Backup interface becomes active and forwards traffic. Once the Master interface is restored, it transitions to the standby state and blocks traffic unless the Backup interface fails.

OSPF Enhancements

BLADEOS 5.1 includes multiple enhancements to the GbESM Open Shortest Path First (OSPF) implementation:

■ Passive Interfaces

OSPF interfaces may be configured as *passive*. Passive interfaces send LSAs to active interfaces, but do not receive LSAs, hello packets, or any other OSPF protocol information from active interfaces. Passive interfaces behave as stub networks, allowing OSPF routing devices to be aware of devices that do otherwise participate in OSPF (either because they do not support it, or because the administrator chooses to restrict OSPF traffic exchange or transit). The following command has been added:

```
# /cfg/13/ospf/if <x>/passive {enable|disable}
```

■ Point-to-Point Networks

For LANs that have only two OSPF routing agents (the GbESM and one other device), specifying the interfaces as part of a point-to-point network allows the switch to significantly reduce the amount of routing information it must carry and manage, enhancing OSPF efficiency. The following command has been added:

```
# /cfg/13/ospf/if <x>/ptop {enable|disable}
```

■ Sub-second timers

To increase OSPF convergence speed, hello and dead timers for OSPF interfaces and virtual interfaces can now be specified in milliseconds by adding “ms” to the number. For example:

```
# /cfg/13/ospf/if <x>/hello 200ms (200 milliseconds)
```

■ Loopback Interface Address

OSPF can now be configured to use the GbESM internal loopback address in advertising its Router ID.

LACP Trunk Enhancements

BLADEOS 5.1 now supports up to eight links in each LACP Link Aggregation Group (LAG).

Layer 2 Failover Enhancements

BLADEOS 5.1 includes multiple enhancements to the Layer 2 Failover feature to support advanced NIC teaming:

- In addition to the automatic monitoring triggers for trunk links, the switch software now supports new manual monitoring triggers. This allows you to define a list of ports and/or static or dynamic trunks to disable when a link failure threshold is reached on set of trigger ports and/or static or dynamic trunks.
- Up to two LACP keys can be used for each failover trigger. Previously, only one per trigger was supported.

ACL Precedence Enhancement

With BLADEOS 5.1, the implementation of Access Control Lists (ACLs) has been standardized to use ascending order of precedence.

ACLs that are assigned to a port are now processed in numeric sequence, based on ACL number. Lower-numbered ACLs take precedence over higher-numbered ACLs within each precedence group. For example, ACL 1 (if assigned to the port) is evaluated first and has top priority within precedence group 1.

When upgrading from an earlier version of BLADEOS, the ACLs are automatically renumbered to maintain prior function within the new order of precedence.

Forwarding Database Enhancements

Configuration of the Forwarding Database (FDB) aging feature has been simplified. Because FDB aging required the same value configured in all Spanning Tree Groups (STGs), the per-STG aging parameters have been replaced with a single, global configuration command:

#	<code>/cfg/12/stg <STG number>/brg/aging <value></code>	<i>(old per-STG command)</i>
	<i>-replaced by-</i>	
#	<code>/cfg/12/fdb/aging <value></code>	<i>(new global command)</i>

ISL Layer 2 Protocol Enhancements

BLADEOS 5.1 now supports additional Layer 2 protocols on Inter-Switch Link (ISL) ports:

- VRRP
- STP
- RSTP/MSTP
- 802.1Q VLAN Tagging
- 802.1p QoS/CoS
- 802.1X Port-Based Access Control
- ACLs

STP Fast Uplink Bridge Priority

With BLADEOS 5.1, the Fast Uplink Convergence bridge priority has been set to 65535.

CLI List and Range Inputs

For CLI commands that allow an individual item to be selected from within a numeric range, lists and ranges of items can now be specified. For example, the `/info/vlan` command permits the following options:

# /info/vlan	(show all VLANs)
# /info/vlan 1	(show only VLAN 1)
# /info/vlan 1,3,4095	(show listed VLANs)
# /info/vlan 1-20	(show range 1 through 20)
# /info/vlan 1-5,90-99,4090-4095	(show multiple ranges)
# /info/vlan 1-5,19,20,4090-4095	(show a mix of lists and ranges)

The numbers in a range must be separated by a dash: `<start of range>-<end of range>`

Multiple ranges or list items are permitted using a comma: `<range or item 1>, <range or item 2>`

Do not use spaces within list and range specifications.

Ranges can also be used to apply the same command option to multiple items. For example, to enable multiple ports with one command:

# /cfg/port 1-4/ena	(Enable ports 1 through 4)
---------------------	----------------------------

Note – Port ranges accept only port numbers, not aliases such as INT1 or EXT1

BC-S Chassis Support

BLADEOS 5.1 supports the BladeCenter BC-S chassis. When the GbESM is installed in the BC-S chassis, the following information displays reflect the BC-S port mapping:

- Port link information (/info/link) for switches installed in bay 1 and bay 2:

Alias	Port	Speed	Duplex	Flow Ctrl		Link
----	----	----	-----	--TX--	---RX---	-----
INT1A	1	1000	full	yes	yes	up
INT1B	2	1000	full	yes	yes	up
INT2A	3	1000	full	yes	yes	up
INT2B	4	1000	full	yes	yes	up
INT3A	5	1000	full	yes	yes	down
INT3B	6	1000	full	yes	yes	up
INT4A	7	1000	full	yes	yes	up
INT4B	8	1000	full	yes	yes	up
INT5A	9	1000	full	yes	yes	up
INT5B	10	1000	full	yes	yes	up
INT6A	11	1000	full	yes	yes	up
INT6B	12	1000	full	yes	yes	up
SMGT1	13	1000	full	yes	yes	up
SMGT2	14	1000	full	yes	yes	up
MGT1	15	100	full	yes	yes	up
EXT1	17	10000	any	yes	yes	up
EXT2	18	10000	any	yes	yes	up
EXT3	19	10000	any	yes	yes	up
EXT4	20	1000	any	yes	yes	up
EXT5	21	1000	any	yes	yes	up
EXT6	22	1000	any	yes	yes	up
EXT7	23	1000	any	yes	yes	up
EXT8	24	1000	any	yes	yes	up
EXT9	25	1000	any	yes	yes	up

- Port link information (/info/link) for switches installed in bay 3 and bay 4:

Alias	Port	Speed	Duplex	Flow Ctrl		Link
----	----	----	-----	--TX--	---RX---	-----
INT1	1	1000	full	yes	yes	up
INT2	2	1000	full	yes	yes	up
INT3	3	1000	full	yes	yes	down
INT4	4	1000	full	yes	yes	up
INT5	5	1000	full	yes	yes	up
INT6	6	1000	full	yes	yes	up
MGT1	15	100	full	yes	yes	up
EXT1	17	10000	any	yes	yes	up
EXT2	18	10000	any	yes	yes	up
...						

■ Port information (/info/port) for switches installed in bay 1 and bay 2:

Alias	Port	Tag	Fast	Lrn	Fld	PVID	NAME	VLAN(s)
INT1A	1	y	n	e	e	1	INT1A	1 4095
INT1B	2	y	n	e	e	1	INT1B	1 4095
INT2A	3	y	n	e	e	1	INT2A	1 4095
INT2B	4	y	n	e	e	1	INT2B	1 4095
INT3A	5	y	n	e	e	1	INT3A	1 4095
INT3B	6	y	n	e	e	1	INT3B	1 4095
INT4A	7	y	n	e	e	1	INT4A	1 4095
INT4B	8	y	n	e	e	1	INT4B	1 4095
INT5A	9	y	n	e	e	1	INT5A	1 4095
INT5B	10	y	n	e	e	1	INT5B	1 4095
INT6A	11	y	n	e	e	1	INT6A	1 4095
INT6B	12	y	n	e	e	1	INT6B	1 4095
SMGT1	13	y	n	e	e	1	SMGT1	1 4095
SMGT2	14	y	n	e	e	1	SMGT2	1 4095
MGT1	15	y	n	e	e	4095*	MGT1	4095
EXT1	17	n	n	e	e	1	EXT1	1
EXT2	18	n	n	e	e	1	EXT2	1
EXT3	19	n	n	e	e	1	EXT3	1
EXT4	20	n	n	e	e	1	EXT4	1
EXT5	21	n	n	e	e	1	EXT5	1
EXT6	22	n	n	e	e	1	EXT6	1
EXT7	23	n	n	e	e	1	EXT7	1
EXT8	24	n	n	e	e	1	EXT8	1
EXT9	25	n	n	e	e	1	EXT9	1

■ Port information (/info/port) for switches installed in bay 3 and bay 4:

Alias	Port	Tag	Fast	Lrn	Fld	PVID	NAME	VLAN(s)
INT1	1	y	n	e	e	1	INT1	1 4095
INT2	2	y	n	e	e	1	INT2	1 4095
INT3	3	y	n	e	e	1	INT3	1 4095
INT4	4	y	n	e	e	1	INT4	1 4095
INT5	5	y	n	e	e	1	INT5	1 4095
INT6	6	y	n	e	e	1	INT6	1 4095
MGT1	15	y	n	e	e	4095*	MGT1	4095
EXT1	17	n	n	e	e	1	EXT1	1
EXT2	18	n	n	e	e	1	EXT2	1
...								

Other Features

BLADEOS 5.1 now also supports

- PVRST
- Guest VLAN

Supplemental Information

This section provides additional information about configuring and operating the GbESM and BLADEOS.

Management Module

- The “Fast POST=Disabled/Enabled” inside the IBM management module Web interface “I/O Module Admin Power/Restart” does not apply to the GbESM.

Solution: To boot with Fast or Extended POST, go to the “I/O Module Admin/Power/Restart” window. Select the GbESM, and then choose “Restart Module and Run Standard Diagnostics” or “Restart Module and Run Extended Diagnostics.”

- The following table correlates the Firmware Type listed in the IBM management module’s Web interface “Firmware VPD” window to the GbESM software version:

Table 1 Firmware Type list

Firmware Type	Description
Boot ROM	GbESM Boot code version
Main Application 1	Currently running image
Main Application 2	Backup image

- Within the IBM management module Web interface, the Java applets of “Start Telnet Session” and “Start Web Session” do not support changing of default known ports 23 and 80 respectively.

Solution: If the Telnet or HTTP port on the GbESM is changed to something other than the default port number, the user must use a separate Telnet client or Web browser that supports specifying a non-default port to start a session to the GbESM user interface.

Management Module/GbESM Connectivity

Currently, the IBM management module is designed to provide one-way control of the GbESM. As a result, the GbESM may lose connectivity to the management module via the management port under the following conditions:

- If new IP attributes are pushed from the management module to the GbESM while the IP Routing table is full, the new attributes will not be applied.
Solution: Enable “External Management over all ports,” connect to the switch using other interface and then clear the routing table. Then push the IP address from the management module. If this does not work, use Solution 2 below.
- If you execute the `/boot/reset` CLI command on the GbESM or the GbESM resets itself, the management module might not push the IP attributes to the switch, and connectivity may be lost.

Solution 1: If you should experience any connectivity issues between the switch module and the management module, go to the “I/O Module Configuration” window on the management module’s Web interface. Under the “New Static IP Configuration” section, click **Save** to trigger the management module to push the stored IP attributes to the switch module.

Solution 2: If Solution 1 does not resolve your connectivity issue, then go to the “I/O Module Admin/Power/Restart” window on the management module’s Web interface. Restart the switch module in question.

Solution 3: If this still does not resolve the issue, enable Preserve new IP configuration on all resets setting on the management module and restart the switch module via the “I/O Module Admin/Power/Restart” window on the management module’s Web interface.

Note – As a rule, always use the management module Web interface to change the GbESM management IP attributes (IP address, mask and gateway), and then click Save to push the IP attributes to the switch module. Use of the command-line interface to change the switch module management IP attributes may result in duplicated entries for the management IP Interface in the switch route table and/or loss of connectivity via the management module.

Secure Management Network

The following GbESM attributes are reserved to provide secure management access to and from the IBM management module:

Internal management—

- MGT1 (port 15) and MGT2 (port 16)
- VLAN 4095
- IP interface 250
- Gateway 254

External management—

- EXT7 (port 23)
- VLAN 4094
- IP interface 249
- Gateway 253

For more information about remotely managing the GbESM through the external ports, see “Accessing the Switch” in the *BLADEOS 5.1 Application Guide*.

Note – The external uplink ports (EXTx) cannot be members of management VLANs.

Ping and Telnet Port Options

Some commands, such as `ping` and `telnet`, offer an option to specify the port to use for transferring data.

Use the `ping` command to verify station-to-station connectivity across the network, as follows:

```
ping <host name> | <IP address> [<tries> [<delay>]] [-m | -mgt | -e | -ext7 |  
-d | -data]
```

where `hostname` or `IP address` specify the target device, `tries` (optional) is the number of attempts (1-32), and `delay` (optional) is the number of milliseconds between attempts.

By default, the `-m/-mgt` option for the internal management ports is used. To use the external management port, specify the `-e` or `-ext7` option. To use data ports, specify the `-d` or `-data` option.

Use the `telnet` command to Telnet out of the switch, as follows:

```
telnet <hostname> | <IP address> [<service port>] [-m | -mgt | -e | -ext7 |  
-d | -data]
```

where *hostname* or *IP address* specify the target device, and service port (optional) is the logical port for Telnet services on the target device.

By default, the `-m/-mgt` option for the internal management ports is used. To use the external management port, specify the `-e` or `-ext7` option. To use data ports, specify the `-d` or `-data` option.

Secure Shell (SSH)

Because SSH key generation is CPU intensive, the GbESM attempts to avoid unnecessary key generation. The process generates three server keys:

1. One key is generated to replace the current server key, if used.
2. A second key is generated as a spare, in case the current server key is used and the specified interval expires.
3. A third key is generated for use at the next reboot.

Therefore, if you never login via SSH, you will only see two key generation events. You may see all three events directly following a reboot. If you want to witness the key generation after the specified interval has expired, then you must login via SSH at least once during each expiration interval.

Port Mirroring Tags BPDUs Packets

When you perform port mirroring, Spanning Tree BPDUs packets are VLAN tagged at the monitoring port. This is standard behavior of port mirroring on the GbESM. All mirrored egress traffic is tagged.

Trunk Group Configuration Tips

Please be aware of the following information when you configure trunk groups:

- Always configure trunk groups first on both ends, before you physically connect the links.
- Configure all ports in a trunk group to the same speed.

Spanning Tree Configuration Tips

To ensure proper operation with switches that use Cisco Per VLAN Spanning Tree (PVST+), you must do one of the following:

- Create a separate Spanning Tree Group for each VLAN.
- Manually add all associated VLANs into a single Spanning Tree Group.

Syslog Configuration Tip

The *facility* parameter traditionally is used to correlate services (such as IP, CLI, etc.) to messages. This is done to distinguish between the different services that are running in the network/device. However, for the GbESM, there is a single configured facility value (0-7) used on all messages. By configuring a unique facility value for each switch, a single SYSLOG server can distinguish between the various GbESMs in the network. Refer to “System Host Log Configuration” in the *BLADEOS 5.1 Command Reference*.

Internal Port Autonegotiation

By default, link autonegotiation is turned on for internal ports. This is in contrast to external ports, where autonegotiation is off by default. Internal ports use autonegotiation in order to support the Wake-Over-LAN (WOL) features of some servers. If an attached server does not support autonegotiation or WOL, turn autonegotiation off for the internal port.

Known issues

The following are known issues for BLADEOS 5.1 on the 10Gb Ethernet Switch Module.

Port EXT7 Behavior

- EXT7 LEDs:

While port EXT7 is disabled, the Link and Tx/Rx LEDs continue to respond to an active connection. This behavior does not affect the functionality of the port.

To verify the status of port EXT7, check the link information display (`/info/link`).

- EXT7 Displays

When you configure port EXT7 as disabled (`/cfg/port ext7/dis`), the `/oper/port ext7/cur` command displays the port status as enabled.

To verify the status of port EXT7, check the link information display (`/info/link`).

Jumbo Frames

Some ingress jumbo frames (for example, ICMP) are not routed from one VLAN to another VLAN. Jumbo frames are routed across data VLANs.

Access Control Lists

- When an Access Control List (ACL) is installed on two different ports, only one statistics counter will be available. The GbESM does not support two different statistics counter for one ACL installed on two different ports.
- The ACL filters for TCP/UDP work properly only on packets that do not have IP options.
- When configuring an ACL to set 802.1p priority for in-profile packets, and updating the DSCP field using TOS bits for out-of-profile packets, the out-of-profile packets will have also the 802.1p priority set as defined in the in-profile setting.

IGMP Relay

If an IGMP v2 joins an IGMP group on the same port where an IGMP v1 join has already been issued, the software will default to the IGMP v1 timeout value.

Link Aggregation Control Protocol

If a static trunk on a GbESM is connected to another GbESM with LACP configured (but no active LACP trunk), the `/info/12/trunk` command might erroneously report the static trunk as forwarding.

If you configure LACP (active/passive) on one port, also configure LACP on the partner switch, at the end of the link. If you connect LACP with a static trunk, there will be no connectivity on that link.

Static Mrouter

If a port has a static multicast router (Mrouter) configured, and you move the port to a different VLAN, the static Mrouter appears in the `/info/13/igmp/mrouter/dump` output for the original VLAN.

Solution: When you move the port to a new VLAN, remove the static Mrouter from the port, and add it again.

QoS Metering

Traffic may exceed the configured maximum burst size of the ACL meter (`/cfg/port <x>/aclqos/meter/mbsize`) by one packet, with that packet remaining In-Profile. Once the ACL meter has been exceeded, additional burst packets fall Out-of-Profile.

QoS and Trunking

When you assign an ACL (or ACL Group) to one port in a trunk, BLADEOS does not automatically assign the ACL to other ports in the trunk, and it does not prompt you to assign the ACL to other ports in the trunk.

Solution: Manually assign each ACL or ACL Group to all ports in a trunk.

RIP MIBs

Due to backward-compatibility issues, two Routing Information Protocol (RIP) MIBs are available in BLADEOS: `ripCfg` and `rip2Cfg`. Use the `rip2Cfg` MIB to configure RIPv1 and RIPv2 through SNMP.

BLADEOS does not support the standard RIPv2 MIB, as described in RFC 1724. Use the `rip2Cfg` MIB to configure RIPv1 and RIPv2 through SNMP.

Trunk and Link Loop

When you create a trunk or link loop between the GbESM and another switch, packets might loop infinitely at line rate within the related links. When this problem occurs, the GbESM continuously displays the following messages at the console:

```
WARNING: packet_sent u: 0, dv_active: tx ring full  
packet_sent dcnt=114, public1=110, vcnt=1025
```

Solution: Remove the loop to resolve this misconfiguration.

Browser Based Interface

- Some versions of Microsoft Internet Explorer version 6.x do not perform HTTP download efficiently. If you have one of these versions, HTTP software download might take much longer than expected (up to several minutes).
- Web-browsers from different vendors may vary in their support of standard features. If you encounter problems using the BBI in a particular browser, a different browser may resolve the issue.