



Fabric OS 8.2.2a

Brocade Fabric OS 8.2.2a Release Notes

Release Notes

Version 1.0

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Preface

1.1 Contacting Technical Support for your Brocade® Product

For product support information and the latest information on contacting the Technical Assistance Center, go to <https://www.broadcom.com/support/fibre-channel-networking/>. If you purchased Brocade product support directly from Broadcom, use one of the following methods to contact the Technical Assistance Center 24x7.

Online	Telephone
<p>For nonurgent issues, the preferred method is to log in to myBroadcom at https://www.broadcom.com/mybroadcom. (You must initially register to gain access to the Customer Support Portal.) Once there, select Customer Support Portal > Support Portal. You will now be able to navigate to the following sites:</p> <ul style="list-style-type: none">▪ Knowledge Search: Clicking the top-right magnifying glass brings up a search bar.▪ Case Management: The legacy MyBrocade case management tool (MyCases) has been replaced with the Fibre Channel Networking case management tool.▪ DocSafe: You can download software and documentation.▪ Other Resources: Licensing Portal (top), SAN Health (top and bottom), Communities (top), Education (top).	<p>Required for Severity 1 (critical) issues: Please call Fibre Channel Networking Global Support at one of the numbers listed at https://www.broadcom.com/support/fibre-channel-networking/.</p>

If you purchased Brocade product support from a Broadcom OEM/solution provider, contact your OEM/solution provider for all your product support needs.

- OEM/solution providers are trained and certified by Broadcom to support Brocade products.
- Broadcom provides backline support for issues that cannot be resolved by the OEM/solution provider.
- Brocade Supplemental Support augments your existing OEM support contract, providing direct access to Brocade expertise. For more information on this option, contact Broadcom or your OEM.

For questions regarding service levels and response times, contact your OEM/solution provider.

To expedite your call, have the following information immediately available:

1. General Information:

Technical support contract number, if applicable.

Switch model.

Switch operating system version.

Error numbers and messages received.

`supportSave` command output and associated files.

For dual-CP platforms running Fabric OS 6.2 and above, the `supportSave` command gathers information from both CPs and any AP blades installed in the chassis.

Detailed description of the problem, including the switch or fabric behavior immediately following the problem and any specific questions.

Description of any troubleshooting steps already performed and the results.

Serial console and Telnet session logs.

Syslog message logs.

2. Switch Serial Number.

The switch serial number is provided on the serial number label, examples of which follow:



The serial number label is located as follows:

Brocade 6520, 6510, 6505, G630, G620, G610 – On the switch ID pull-out tab located on the bottom of the port side of the switch.

Brocade 7840, 7810 – On the pull-out tab on the front left side of the chassis underneath the serial console and Ethernet connection and on the bottom of the switch in a well on the left side underneath (looking from the front).

Brocade DCX 8510-8 – Bottom right of the port side.

Brocade DCX 8510-4 – Back, upper left under the power supply.

Brocade X6-8, X6-4 – Lower portion of the chassis on the nonport side beneath the fan assemblies.

3. World Wide Name (WWN).

When the Virtual Fabric feature is enabled on a switch, each logical switch has a unique switch WWN. Use the `wwn` command to display the switch WWN.

If you cannot use the `wwn` command because the switch is inoperable, you can get the primary WWN from the same place as the serial number.

4. License Identifier (License ID).

There is only one license ID associated with a physical switch or director/backbone chassis. This license ID is required as part of the ordering process for new FOS licenses.

Use the `licenseIdShow` command to display the license ID.

1.2 Related Documentation

White papers, data sheets are available at www.broadcom.com. Product documentation for all supported releases is available at myBroadcom to registered users. Registered users can also find release notes at myBroadcom.

Locating Product Manuals and Release Notes

The following sections outline how to locate and download Brocade product manuals and release notes from myBroadcom. Although the illustrations show Fibre Channel and Fabric OS (FOS), they work for all Brocade products and operating systems.

1.3 Locating Product Manuals and Release Notes

Complete the following steps to locate your product manuals on myBroadcom.

- Go to <https://www.broadcom.com/mybroadcom/>, click **Login**, and enter your username and password.
If you do not have an account, click **Register** to set up your account.
- Select **Customer Support Portal > DocSafe (Software/Document Downloads)**.
- Choose one of the following:
 - Enter the product name or the software version number in the **Search** box. For example, the following search is for software and documentation files for software version 8.2.

The screenshot shows the 'Search Downloads' page. At the top, there are navigation links: 'Recent Documents', 'My Bookmarks', 'My Bookmarks Folders', 'My Saved Searches', and 'Historical Downloads (Requested via Email download link)'. Below these is a search bar with a 'Product Search...' placeholder and an 'OR' separator. To the right of the separator is a text input field containing '8.2'. A blue 'Search' button is to the right of the input field. Below the input field, there is a small text 'Partial Keyword Allowed' and a link for 'Advanced Search'.

- Click the **Product Search** box, select **FIBRE CHANNEL NETWORKING**, and select a product from the product list.

The screenshot shows the 'Search Downloads' page with the search bar expanded. The search bar contains 'Product Search...' and 'OR' followed by 'Enter Keyword'. A dropdown menu is open on the left side of the search bar, listing various product categories. The 'FIBRE CHANNEL NETWORKING' category is highlighted in red. Below it, several sub-categories are listed, including 'All Hardware Products', 'All Operating Systems', 'AMP Operating Systems', and 'Fabric Operating Systems'. The 'AMP Operating Systems' and 'Fabric Operating Systems' sub-categories are also highlighted in red. The 'Search' button and 'Advanced Search' link are visible on the right side of the search bar.

The list of documents and software available for the product displays.

- Clear the **Software** check box to list only the documents and release notes.

Showing 200 Results

Edit Visible Columns					
Show: <input type="checkbox"/> Software <input checked="" type="checkbox"/> Documents <input type="checkbox"/> Archived					
	Number	Title	Product	Document Type	
<input type="checkbox"/>	FICON Administrator's Guide 7.0.x	FICON Administrator's Guide, 7.0.x (932.24 KB)	Fabric Operating System (FOS)	TECH_PUBS	-
<input type="checkbox"/>	Brocade G620 Technical Specifications	Brocade G620 Technical Specifications (491.03 KB)	Fabric Operating System (FOS)	TECH_PUBS	-
<input type="checkbox"/>	Fabric OS v6.2.1a Release Notes v2.0	Fabric OS v6.2.1a Release Notes v2.0 (1.18 MB)	Fabric Operating System (FOS)	RELEASE_NOTES	-
<input type="checkbox"/>	Fabric OS v6.1.0a Release Notes v4.0	Fabric OS v6.1.0a Release Notes v4.0 (2.12 MB)	Fabric Operating System (FOS)	RELEASE_NOTES	-
<input type="checkbox"/>	Fabric OS v6.4.3_dcb4 for IBM 69Y1909 Release Notes v1.0	Fabric OS v6.4.3_dcb4 for IBM 69Y1909 Release Notes v1.0 (413.14 KB)	Fabric Operating System (FOS)	RELEASE_NOTES	-
<input type="checkbox"/>	Fabric OS v7.4.2a Release Notes v2.0	Fabric OS v7.4.2a Release Notes v2.0 (3.36 MB)	Fabric Operating System (FOS)	RELEASE_NOTES	-
<input type="checkbox"/>	Fabric OS v7.3.0c Release Notes v3.0	Fabric OS v7.3.0c Release Notes v3.0 (265.91 KB)	Fabric Operating System (FOS)	RELEASE_NOTES	-

1.4 Document Feedback

Quality is our first concern and we have made every effort to ensure the accuracy and completeness of this document. If you find an error or omission or you think that a topic needs further development, we want to hear from you. You can provide feedback by sending an email to documentation.PDL@broadcom.com. Provide the publication title, publication number, and as much detail as possible, including the topic heading and page number, as well as your suggestions for improvement.

Overview

Fabric OS 8.2.2a is a patch release based on Fabric OS 8.2.2. All hardware platforms and features supported in FOS 8.2.2 are also supported in FOS 8.2.2a. This release contains minor enhancements and fixes for defects listed at the end of this document.

What's New in FOS 8.2.2a

1.5 Software Features

The following sections list new, modified, and deprecated software features for this release.

1.5.1 Modified Software Features

This release includes the following enhancements to existing features and supports:

- Support FOS End User License Agreement (EULA) acknowledgement and acceptance prior to installing firmware on Brocade SAN switch platforms. On any SAN switch platforms running FOS v8.2.2a or later, using the `firmwareDownload` or `firmwareCleanInstall` CLI commands to install any version of FOS firmware will be prompted with the EULA acceptance message.

Do you accept and agree to the terms outlined in the End User License Agreement (EULA) for this product?

Please respond with (Y/y) to Accept, (N/n) to Not accept, or (D/d) to Display the EULA:

Firmware installation is only allowed to proceed after accepting EULA in the above prompt. Alternatively, use the new `-showEULA` to display the EULA and use the `-acceptEULA` option to accept the EULA with the `firmwareDownload` or `firmwareCleanInstall` CLI commands.

- Support FOS EULA display, acknowledgement, and acceptance in the Web Tools firmware download page.

1.6 Resolution of Important Defects

This release provides the following important defect fixes:

- FOS-813692: I/O failures and traffic disruption reported after performing hfailover on Gen6 chassis-based switches.
- FOS-812985: Kernel or user daemon panic caused by trace module corruption.
- FOS-811952: Experience silent reboot (reboot reason: reset) or switch hung for hours/days

1.7 CLI Comman Changes

1.7.1 Modified Commands

The following CLI commands are changed in this release:

- `firmwareDownload`: adds new options `-showEULA` and `-acceptEULA`
- `firmwareCleanInstall`: adds new options `-showEULA` and `-acceptEULA`

What's New in FOS 8.2.2

1.8 Software Features

The following sections list new, modified, and deprecated software features for this release.

1.8.1 Modified Software Features

This release includes the following enhancements to existing features and supports:

- Support 10Gb/s Ethernet ports in Brocade 7810 base configuration without the Extension Upgrade license.
- Support a user configurable port for SCP and SFTP protocols with the `firmwareDownload` and `supportSave` commands.
- Support a user configurable port attribute for SCP and SFTP protocols with the `brocade-operation-supportsave` REST API module.
- Support REST API GET operation without a session authorization key. HTTP GET operations can be completed with a single request using a Basic Authentication header.

1.8.2 Deprecated Software Features

This release includes the following deprecation of existing features and supports:

- The IPsec feature on Management Ethernet Interface is deprecated. Hence, the `ipseconfig` CLI command is deprecated.
- The `switchUptime` CLI command is deprecated.

What's New in FOS 8.2.1

1.9 Hardware

The following sections list new hardware introduced with this release and hardware that is no longer supported with this release.

1.9.1 New Devices

Product Name	Device Name
Brocade 7810	Gen 6 (32Gb/s) Distance Extension Switch

1.9.2 New Blades

None.

1.9.3 New Optical Transceivers

FOS 8.2.1 supports the following new optical transceiver on the noted devices:

- 32Gb/s Fibre Channel 25 KM ELWL SFP (customer P/N XBR-000278) on the Brocade G620, G630, FC32-48, and SX6 blade.

1.9.4 Deprecated Hardware

None.

1.10 Software Features

The following sections list new, modified, and deprecated software features for this release.

1.10.1 New Software Features

The following software features are new in this release:

- Counterfeit License Protection
- REST API with New RESTCONF Modules
- Management Interface Rate Limiting

1.10.1.2 Counterfeit License Protection

FOS 8.2.1 introduces counterfeit license protection (CLP) on the Brocade 6505, 6510, G610, G620, and 7810 to prevent misuse of the `licenseAdd` command. CLP performs the following actions based on the number of times that the `licenseAdd` command is invoked:

- RASLOG WARNING message when 25 invalid `licenseAdd` operations are detected within a 24-hour period.
- RASLOG CRITICAL message when 40 invalid `licenseAdd` operations are detected within a 24-hour period.
- Shuts down a switch when 50 invalid `licenseAdd` operations are detected within a 24-hour period.

A switch that is shut down due to CLP detection will no longer be able to boot to a functional state. Customers may request a replacement unit from their support provider.

1.10.1.3 REST API with New RESTCONF Modules

FOS 8.2.1 expands REST API support from that supported in FOS 8.2.0a with the following new features and corresponding RESTCONF modules:

- Physical chassis, FRU, and optical transceiver: `brocade-chassis`, `brocade-fru`, and `brocade-media`
- Switch configuration: `brocade-fibrechannel-configuration`
- SupportSave: `brocade-operation-supportsave` and `brocade-operation-showstatus`
- Trunking: `brocade-fibrechannel-trunk`
- RASLOG and syslog configuration: `brocade-logging`
- System security: `brocade-security`
- System time zone and time server: `brocade-time`
- Monitoring and Alerting Policy Suite (MAPS): `brocade-maps`

FOS 8.2.1 enhances the following existing RESTCONF modules:

- `brocade-fibrechannel`
- `brocade-fibrechannel-switch`
- `brocade-access-gateway`

For a detailed description of the new modules and attributes, refer to the *Brocade Fabric OS REST API Reference Manual* for FOS 8.2.1.

1.10.1.4 Management Interface Rate Limiting

FOS 8.2.1 implements hardware-based ingress rate limiting on the management interface of X6 directors to prevent denial of service (DOS) attacks through the Ethernet management interface. When this feature is enabled, hardware performs ingress rate limiting when a DOS attack on the Eth0 or Eth3 management interface is detected. Normal management application traffic from Web Tools, SNMP, and Brocade Network Advisor is not affected when there is no DOS attack. These applications may appear sluggish when a DOS attack is detected.

1.10.2 Modified Software Features

The following software features have been enhanced in this release:

- MAPS (Monitoring and Alerting Policy Suite)
- Access Gateway
- Fabric Services
- System Security
- configure Command Enhancements
- Extension
- Power supply microcontroller firmware utility
- Miscellaneous

1.10.2.1 MAPS Enhancements

1.10.2.1.1 UCS/FI Login Imbalance Monitoring

FOS 8.2.1 adds MAPS monitoring of Cisco UCS Fabric Interconnect (FI) connections to Brocade switches in NPV mode. MAPS monitors the distribution of UCS servers over the uplinks between FI and Brocade switches to remain balanced over time. When MAPS detects an imbalance, it alerts the SAN administrator of the condition or triggers an automatic rebalance action.

1.10.2.1.2 Miscellaneous

1.10.2.1.2.1 Default Rule Change

FOS 8.2.1 replaces the default rule names in FOS 8.2.0x detailed in the following table with the new default rule names:

FOS 8.2.0x Rule Names	FOS 8.2.1 Rule Names
defALL_DPIP_EXTN_FLOW_C	defALL_DPIP_EXTN_FLOW_P_90
defALL_DPIP_EXTN_FLOW_M	defALL_DPIP_EXTN_FLOW_P_80
defALL_DPIP_EXTN_FLOW_A	defALL_DPIP_EXTN_FLOW_P_65
defALL_DPIP_EXTN_FLOW_MAX	defALL_DPIP_EXTN_FLOW_P_TOTAL

NOTE The default rules will be automatically converted to the new rule names during firmware upgrade from FOS 8.2.0x to FOS 8.2.1 or later. However, user-defined rules of the IP_EXTN_FLOW monitoring system must be changed manually to follow the new rule name format.

1.10.2.1.2.2 Alert Severity Change

FOS 8.2.1 changes the alert severity from ERROR to CRITICAL for the following default rule:

```
defALL_E_PORTSC3TXTO_20 ALL_E_PORTS(C3TXTO/MIN>20) RASLOG
```

FOS 8.2.1 changes the alert severity from WARNING to ERROR for the following default rule:

```
defALL_FANFAN_STATE_FAULTY ALL_FANS(FAN_STATE/NONE==FAULTY) RASLOG
```

1.10.2.2 Access Gateway Enhancements

1.10.2.2.1 Slow-Drain Device Quarantine on AG

FOS 7.4 and later support Slow-Drain Device Quarantine (SDDQ) to mitigate congestion due to slow-drain devices connected to switches in native mode. FOS 8.2.1 enhances SDDQ support on AG to be able to quarantine slow-drain devices connected to Access Gateway.

1.10.2.2.2 Port NPIV Configuration

FOS 8.2.1 adds support of the `portCfgNpivPort` command for a switch in AG mode. With this support, administrators can enable or disable NPIV mode for a port when a switch is in Access Gateway mode.

1.10.2.3 Fabric Services Enhancements

1.10.2.3.1 GZS and GAZS Commands

FOS 8.2.1 adds support of the Get Zone Set (GZS) and Get Active Zone Set (GAZS) commands under FC-GS-8 for zone servers. GZS queries for Zone Set Database, whereas GAZS queries for Active Zone Set (or Effective Configuration Set).

1.10.2.3.2 Impaired Port Enhancements

FOS 8.2.1 enhances the impaired port feature introduced in FOS 8.2.0. With FOS 8.2.0, an impaired port can be used as a principal link, which is used in fabric-related events, even though there are parallel nonimpaired links available. With FOS 8.2.1, when a principal link is impaired and parallel links exist, an alternate link will be selected as the principal link.

1.10.2.4 System Security Enhancements

1.10.2.4.1 Minimum Password Difference

FOS 8.2.1 adds the new `-minDiff` to `passwdcfg` CLI command to enable SAN administrators to configure the password policy to require the minimum number of characters that must be different between a current password and a new password.

1.10.2.4.2 Session Logout Message

FOS 8.2.1 displays a logout message for SSH or Telnet session logout, exit, or timeout on the standard session terminal window.

1.10.2.4.3 rootAccess Command Change

FOS 8.2.1 adds the `-force` option to the `rootAccess` command to bypass the interactive prompt of the command execution.

1.10.2.4.4 HTTPS KeepAlive

FOS 8.2.1 adds support of HTTP server connection KeepAlive. The server KeepAlive is supported only with secure HTTPS connections to switches. The KeepAlive support may be enabled with the command `mgmtapp --enable keepalive` in FOS 8.2.1 or later.

1.10.2.5 configure Command Enhancements

FOS 8.2.1 introduces options to the `configure` CLI command to allow a number of switch configuration parameters to be set without going through the interactive CLI menu. For details, refer to the *Brocade Fabric OS Command Reference Manual* for FOS 8.2.1.

1.10.2.6 Extension Enhancements

FOS 8.2.1 supports dynamic LAG (LACP) on Gigabit Ethernet LAN ports on extension platforms.

1.10.2.7 Power Supply Microcontroller Firmware Utility

Some power supply models for Brocade Gen 6 platforms support field upgrade of the firmware image used by their microcontrollers. FOS 8.2.1 introduces the `psutil` CLI command for field upgrade of the power supply microcontroller firmware. The power supply firmware is packaged as part of FOS 8.2.1 and later. Administrators can use the `psutil` command to check the power supply firmware version and when necessary upgrade to a later version.

1.10.2.8 Miscellaneous Enhancements

FOS 8.2.1 includes the following miscellaneous enhancements:

1.10.2.8.1 chassisName Command

FOS 8.2.1 enhances the `chassisName` command to increase the name length from 15 characters to 31 characters on the DCX 8510 and X6 directors.

1.10.2.8.2 ISL R_RDY in Base Switch

FOS 8.2.1 supports the `portcfgislmode` command to configure ISL R_RDY mode on the ISLs in a base switch, that is, the XISLs. With this enhancement, devices that support R_RDY mode can also be used on XISLs.

1.10.2.8.3 sfpShow -link Enhancement

FOS 8.2.1 displays the alert thresholds for peer port optics through the `sfpShow -link` option. The alert thresholds are displayed for voltage, temperature, Tx Bias, Tx Power, and Rx Power metrics. The alert thresholds are displayed for peer port optics only.

1.11 CLI Command Changes

The following sections list new, modified, and deprecated commands for this release.

1.11.1 New Commands

The following commands are new in this release:

- `bladePortMap`
- `deviceLogin`
- `factoryFanShow`
- `psUtil`

1.11.2 Modified Commands

Refer to the Modified Commands section of the *Brocade Fabric OS Command Reference Manual* for Fabric OS 8.2.1.

1.11.3 Deprecated Commands

The *Brocade Fabric OS Command Reference Manual* documents all FOS commands that are officially supported. Any commands not listed in the command reference for a specific release are not supported and may be subject to removal without notification. Refer to the Deprecated Commands section in the *Brocade Fabric OS Command Reference Manual* for Fabric OS 8.2.1.

1.12 Supported Standards and RFCs

This software conforms to the Fibre Channel standards in a manner consistent with accepted engineering practices and procedures. In certain cases, Brocade might add proprietary supplemental functions to those specified in the standards. For a list of FC standards conformance, visit the following Broadcom SAN Standards website:

<https://www.broadcom.com/support/fibre-channel-networking/san-standards/>

Software License Support

1.13 Optionally Licensed Software

Fabric OS 8.2 includes all basic switch and fabric support software, as well as optionally licensed software that is enabled using license keys.

Optionally licensed features include:

Brocade Ports on Demand – This license allows customers to instantly scale the fabric by provisioning additional SFP ports via license key upgrade. (Applies to select switch models.)

Brocade Q-Flex Ports on Demand – This license allows customers to further scale the fabric and increase flexibility by provisioning additional 4x32G QSFP ports via license key upgrade. (Applies to the Brocade G620 only.)

Brocade Extended Fabrics – This license provides greater than 10 km of switched fabric connectivity at full bandwidth over long distances (depending on the platform, this can be up to 3000 km).

Brocade ISL Trunking – This license provides the ability to aggregate multiple physical links into one logical link for enhanced network performance and fault tolerance. It also includes Access Gateway ISL Trunking on those products that support Access Gateway deployment.

Brocade Fabric Vision – This license enables support for MAPS (Monitoring and Alerting Policy Suite), Flow Vision, and ClearLink (D_Port) when connecting to non-Brocade devices. MAPS enables rules-based monitoring and alerting capabilities, and it provides comprehensive dashboards to quickly troubleshoot problems in Brocade SAN environments. Flow Vision enables host-to-LUN flow monitoring, application flow mirroring for nondisruptive capture and deeper analysis, and a test traffic flow generation function for SAN infrastructure validation. Support for D_Port to non-Brocade devices allows extensive diagnostic testing of links to devices other than Brocade switches and adapters.

NOTE On Brocade G620, G630, Brocade X6-8, and Brocade X6-4 platforms, this license enables the use of IO Insight capability. The license itself is identified as “Fabric Vision and IO Insight” on these platforms.

FICON Management Server – Also known as CUP (Control Unit Port), this license enables host control of switches in mainframe environments.

Integrated Routing – This license allows any Fibre Channel port in a DCX 8510-8, DCX 8510-4, Brocade 6510, Brocade 6520, Brocade 7840, or Brocade G620 to be configured as an EX_Port supporting Fibre Channel Routing (FCR). This eliminates the need to add an FR4-18i blade or use a Brocade 7500 for FCR purposes, and it also provides either quadruple or octuple the bandwidth for each FCR connection (when connected to another 16Gb/s- or 32Gb/s-capable port).

Integrated Routing Ports on Demand – This license allows any Fibre Channel port in a Brocade 7810, G630, X6-8, or X6-4 to be configured as an EX_Port supporting Fibre Channel Routing. The maximum number of EX_Ports supported per platform is provided in the license. This eliminates the need to add an FR4-18i blade or use a Brocade 7500 for FCR purposes, and it also provides octuple the bandwidth for each FCR connection (when connected to another 32Gb/s-capable port).

Advanced Extension – This license enables two advanced extension features: FCIP Trunking and Adaptive Rate Limiting. The FCIP Trunking feature allows multiple IP source and destination address pairs (defined as FCIP circuits) via multiple 1GbE or 10GbE interfaces to provide a high-bandwidth FCIP tunnel and failover resiliency. In addition, each FCIP circuit supports four QoS classes (Class-F, High, Medium, and Low Priority), each as a TCP connection. The Adaptive Rate Limiting feature provides a minimum bandwidth guarantee for each tunnel with full utilization of the available network bandwidth without impacting throughput performance under a high-traffic load. This license is available on the DCX 8510-8/DCX 8510-4 for the FX8-24 on an individual slot basis. The upgrade license on Brocade 7810 includes this license to enable 10GbE ports.

10GbE FCIP/10G Fibre Channel – This license enables the two 10GbE ports on the FX8-24 and/or the 10G FC capability on FC16-xx blade ports supported on DCX 8510 platforms except for the FC16-64 blade. On the Brocade 6510 and Brocade 6520, this license enables 10G FC ports. The upgrade license on Brocade 7810 includes this license to enable six 10GbE ports. This license is not applicable to the Brocade 7840, Brocade G620, or Brocade X6 platforms.

On the FX8-24:

With this license installed and assigned to a slot with an FX8-24 blade, two additional operating modes (in addition to 10x1GbE ports mode) can be selected:

10x1GbE ports and 1x10GbE ports

or

2x10GbE ports

On the FC16-xx:

Enables 10G FC capability on an FC16-xx blade in a slot that has this license.

On the Brocade 6510 and Brocade 6520:

Enables 10G FC capability on Brocade 6510 and Brocade 6520 switches.

This license is available on the DCX 8510-8 and DCX 8510-4 on an individual slot basis.

Advanced FICON Acceleration – This licensed feature uses specialized data management techniques and automated intelligence to accelerate FICON tape read and write and IBM Global Mirror data replication operations over distance, while maintaining the integrity of command and acknowledgement sequences. This license is available on the Brocade 7840 and the Brocade DCX 8510-8 and DCX 8510-4 for the FX8-24 on an individual slot basis.

ICL POD License – This license activates ICL ports on DCX 8510 or X6 platform core blades. An ICL license must be installed on the director platforms at both ends of the ICL connection.

On the Brocade DCX 8510-8 and X6-8:

The first ICL POD license enables 16 (half of the total) UltraScale ICL QSFP ports on the DCX 8510-8 or X6-8 Directors, enabling 8 ICL ports on each core blade. These are QSFP port numbers 0, 1, 2, 3, 4, 5, 6, and 7 on the DCX 8510-8; while on the X6-8, the QSFP port numbers are 0, 1, 2, 3, 8, 9, 10, and 11. The second ICL POD license enables the remaining 16 UltraScale ICL QSFP ports on the directors. These are QSFP port numbers 8, 9, 10, 11, 12, 13, 14, and 15 on each core blade of the DCX 8510-8; while on the X6-8, these are QSFP port numbers 4, 5, 6, 7, 12, 13, 14, and 15 on each core blade.

Note that the trunk boundaries are different between CR32-8 core blades on the X6-8 and CR16-8 core blades on the DCX 8510-8.

On the Brocade DCX 8510-4 and X6-4:

ICL POD licenses are different between X6-4 and DCX 8510-4 Directors. On the X6-4, the first ICL POD license enables 8 (half of the total) UltraScale ICL QSFP ports on the director, enabling 4 ICL ports on each core blade, which are QSFP port numbers 0, 1, 4, and 5. The second ICL POD license on the X6-4 enables the remaining 8 UltraScale ICL QSFP ports on the director, which are QSFP port numbers 2, 3, 6, and 7 on each core blade. On the DCX 8510-4, a single ICL POD license enables all 16 UltraScale ICL QSFP ports on the director.

Enterprise ICL (EICL) License – The EICL license is required on a Brocade DCX 8510 chassis when that chassis is connected to four or more Brocade DCX 8510 chassis via ICLs. This license is not applicable to X6 Directors.

This license requirement does not depend upon the total number of DCX 8510 chassis that exist in a fabric, but only on the number of other chassis connected to a DCX 8510 via ICLs.

NOTE The EICL license supports a maximum of nine (9) DCX 8510 chassis connected in a full-mesh topology or up to twelve (12) DCX 8510 chassis connected in a core-edge topology. Refer to the *Brocade SAN Scalability Guidelines* document for additional information.

WAN Rate Upgrade 1 License – The WAN Rate Upgrade 1 license provides additional WAN throughput up to 10Gb/s on a Brocade 7840. The base configuration for a Brocade 7840 without this license provides WAN throughput up to 5Gb/s.

WAN Rate Upgrade 2 License – The WAN Rate Upgrade 2 license provides unlimited WAN throughput (up to the hardware limit) on a Brocade 7840. WAN Rate Upgrade 2 licenses also enable the use of two 40GbE ports on a Brocade 7840. The 40GbE ports cannot be configured without the WAN Rate Upgrade 2 license. A WAN Rate Upgrade 1 license must be installed on a Brocade 7840 before a WAN Rate Upgrade 2 license is installed. A WAN Rate Upgrade 1 license cannot be removed before the WAN Rate Upgrade 2 license has been removed.

NOTE The WAN Rate Upgrade 1 and WAN Rate Upgrade 2 licenses apply only to Brocade 7840 platforms. They control the aggregate bandwidth for all tunnels on that Brocade 7840. The entire capacity controlled by the licenses can be assigned to a single tunnel, or a portion of the capacity can be assigned to multiple tunnels. The total bandwidth aggregated for all tunnels should not exceed the limits established by the licenses.

Extension Upgrade License – The Extension Upgrade license is available on the Brocade 7810, enabling additional ports, capacity, and features that provide the following: 12 32Gb/s FC ports, 6 10Gb/s Ethernet ports, 4 tunnels, 6 circuits per tunnel, 2.5Gb/s WAN throughput, Fabric Vision, Extension Trunking, Brocade ISL Trunking, Integrated Routing Ports on Demand, and Brocade Extended Fabrics. This license is shown as a combination of existing FOS licenses that enable the above capabilities and features.

NOTE FOS v8.2.2 and later supports 6 10Gb/s Ethernet ports in base configuration of Brocade 7810. 10 Gb/s Ethernet ports can be enabled without the Extension Upgrade license.

1.14 Temporary License Support

The following licenses are available in Fabric OS 8.2.2 as either universal temporary or regular temporary licenses:

- Fabric (E_Port)
- Extended Fabric
- Trunking
- High Performance Extension
- Advanced Performance Monitoring
- Fabric Watch
- Integrated Routing
- Integrated Routing Ports on Demand
- Advanced Extension
- Advanced FICON Acceleration
- 10GbE FCIP/10GFibre Channel
- FICON Management Server (CUP)
- Enterprise ICL
- Fabric Vision
- WAN Rate Upgrade 1
- WAN Rate Upgrade 2
- Extension Upgrade

NOTE Temporary licenses for features available on a per-slot basis enable the feature for any and all slots in the chassis.

Temporary and universal temporary licenses have durations and expiration dates established in the licenses themselves. FOS will accept up to two temporary licenses and a single universal license on a unit. Universal temporary license keys can be installed only once on a particular switch, but they can be applied to as many switches as desired. Temporary use duration (the length of time for which the feature will be enabled on a switch) is provided with the license key. All universal temporary license keys have an expiration date after which the license can no longer be installed on any unit.

Temporary and universal temporary licenses for Brocade 7810 Extension Upgrade are supported with FOS v8.2.2 or later. Temporary and universal temporary license for Extension Upgrade do not enable additional ports on 7810.

Hardware Support

1.15 Supported Devices

The following devices are supported in this release:

- G610, G620, G630, X6-4, X6-8
- 6505, 6510, 6520, DCX 8510-4, DCX 8510-8
- M6505,6542, 6543, 6545, 6546, 6547, 6548, 6558
- 7810, 7840

1.16 Supported Blades

1.16.1 DCX 8510-8/DCX 8510-4 Blade Support

Fabric OS 8.2 software is fully qualified and supports the blades for the DCX 8510-8 and DCX 8510-4 as noted in the following table:

Blades	OS Support
FC16-32, FC16-48 16G FC blades	Supported.
FC16-64 blade ^{1, 2}	Supported.
FC8-64 64-port 8-Gb port blade	Not supported.
FC8-32E, FC8-48E	Not supported.
FCIP/FC Router blade (FR4-18i)	Not supported.
Virtualization/Application blade (FA4-18)	Not supported.
Encryption blade (FS8-18)	Not supported.
Extension blade (FX8-24)	Supported. Up to a maximum of four blades of this type.
FCoE/L2 CEE blade FCOE10-24	Not supported.

¹ 8510 core blade QSFPs, part numbers 57-1000267-01 and 57-0000090-01, are not supported in the FC16-64. The QSFPs supported in the FC16-64, part number 57-1000294-02, is supported on 8510 core blades.

² E_Port connections on the FC16-64 blade have the following restriction: connecting a QSFP port between an FC16-64 blade and an ICL QSFP port on a core blade is not supported.

1.16.2 X6-8/X6-4 Blade Support

Fabric OS 8.2 software is fully qualified and supports the blades for the X6-8 and X6-4 as noted in the following table. None of the legacy blades (16G or lower speed) are supported in the Gen 6 chassis.

Blades	OS Support
FC32-48 32G FC blade	Supported.
SX6 Gen 6 Extension blade	Supported. Up to a maximum of four blades of this type.
FC32-64 32G FC/FCoE blade	Supported. A maximum of two blades of this type is supported when four SX6 blades are present in the same X6-8 chassis.

NOTE The QSFP supported in the FC16-64, part number 57-1000294-02, is also supported on X6 core blades under the condition that the port speed must be configured at a fixed 16Gb/s. Otherwise, the optics will fault.

1.17 Supported Power Supplies

1.17.1 Brocade G620 Power Supplies

The following table lists the power supplies for the Brocade G620 that are supported in this release:

Part Number	Description	Compatible Devices
XBRG250WPSAC-F	Power supply and fan assembly, nonport-side air exhaust	Brocade G620
XBRG250WPSAC-R	Power supply and fan assembly, nonport-side air intake	Brocade G620

1.17.2 Brocade G630 Power Supplies

The following table lists the power supplies for the Brocade G630 that are supported in this release:

Part Number	Description	Compatible Devices
XBR-1500WPSAC-F	Power supply and fan assembly, nonport-side air exhaust	Brocade G630
XBR-1500WPSAC-R	Power supply and fan assembly, nonport-side air intake	Brocade G630

1.17.3 DCX 8510-8 Power Supply Requirements

1.17.3.1 Typical Power Supply Requirements for Blades in DCX 8510-8 Backbones

(For a specific calculation of power draw with different blade combinations, see Appendix A, Power Specifications, in the *Brocade DCX 8510-8 Backbone Hardware Reference Manual*.)

Configured Number of Ports	Blades	Type of Blade	DCX 8510-8 @110 VAC (Redundant Configurations)	DCX 8510-8 @200–240 VAC (Redundant Configurations)	Comments
Any combination of 8-Gb or 16-Gb ports with QSFP ICLs	FC16-32, FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200–240 VAC: 1+1 Power Supplies 110 VAC: 2+2 ³ Power Supplies
256 16-Gb ports + QSFP ICLs	FC16-32, FC16-48 (Maximum of fully populated FC16-32 blades), FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200–240 VAC: 1+1 Power Supplies 110 VAC: 2+2 ³ Power Supplies Max 8 FC16-32 port blades
192 16-Gb ports & max 2 intelligent blades (FX8-24) with QSFP ICLs	FC16-32, FC16-48, FC16-64, FX8-24	Port / Intelligent Blade	4 Power Supplies	2 Power Supplies	200–240 VAC: 1+1 Power Supplies 110 VAC: 2+2 ³ Power Supplies Max four FC16-48 port blades and max 2 intelligent blades
336 16-Gb ports + QSFP ICLs	FC16-48 (Maximum of seven FC16-48 blades, with one empty port blade slot)	Port Blade	4 Power Supplies	2 Power Supplies	200–240 VAC: 1+1 Power Supplies 110 VAC: 2+2 ³ Power Supplies Max 7 FC16-48 port blades
384 16-Gb ports + QSFP ICLs	FC16-48	Port Blade	Not Supported	4 Power Supplies	200–240 VAC: For DCX 8510-8, four (2+2) ³ 220 VAC Power Supplies are required.
384 16-Gb ports + QSFP ICLs	FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200–240 VAC: 1+1 Power Supplies 110 VAC: 2+2 ¹ Power Supplies
Any combination of 8-Gb or 16-Gb ports and intelligent blades with QSFP ICLs	FC16-32, FC16-48, FX8-24	Intelligent Blade / Combination	Dependent on the configuration. Requires a power calculation for the specific configuration.	2 or 4 Power Supplies, depending on the configuration	For DCX 8510-8, four (2+2) ³ 220 VAC Power Supplies are required when any special-purpose blades are installed.
512 16-Gb ports	FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200–240 VAC: 1+1 Power Supplies 110 VAC: 2+2 ³ Power Supplies

³When a 2+2 power supply combination is used, the users are advised to configure the MAPS setting for switch Marginal State to be one Bad Power Supply.

Configured Number of Ports	Blades	Type of Blade	DCX 8510-8 @110 VAC (Redundant Configurations)	DCX 8510-8 @200–240 VAC (Redundant Configurations)	Comments
512 16-Gb ports + QSFP ICLs	FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200–240 VAC: 1+1 Power Supplies 110 VAC: 2+2 ³ Power Supplies

1.17.4 DCX 8510-4 Power Supply Requirements

1.17.4.1 Typical Power Supply Requirements for Blades in DCX 8510-4 Backbones

(For a specific calculation of power draw with different blade combinations, refer to Appendix A, Power Specifications, in the *Brocade DCX 8510-4 Backbone Hardware Reference Manual*.)

Configured Number of Ports	Blades	Type of Blade	DCX 8510-4 @110 VAC (Redundant Configurations)	DCX 8510-4 @200–240 VAC (Redundant Configurations)	Comments
96 ports max with QSFP ICLs	FC16-32	Port Blade	2 Power Supplies	2 Power Supplies	1+1 redundancy with 110 or 200–240 VAC power supplies
Any combination of 8-Gb or 16-Gb ports and intelligent blades with QSFP ICLs	FC16-32, FC16-48, FC16-64, FX8-24	Intelligent Blade / Combination	Not Supported	2 Power Supplies	200–240 VAC: 1+1 Power Supplies

1.17.5 Brocade X6 Power Supplies

The following table lists the supported power supplies for Brocade X6 and recommended microcontroller firmware versions in this release:

Part Number	Description	Compatible Devices	Recommended Microcontroller Firmware Version
XBR-X6-RACNPIPSU-0104	AC power supply and fan assembly, nonport-side air intake	Brocade X6	Primary FW version: 3.4 Sec LLC FW version: 3.2 Sec COM FW version: 3.1
XBR-X6-RACNPEPSU-0104	AC power supply and fan assembly, nonport-side air exhaust	Brocade X6	Primary FW version: 3.4 Sec LLC FW version: 3.2 Sec COM FW version: 3.1
XBR-X6-HVNPIPSU-0104	High voltage AC/DC power supply and fan assembly, nonport-side air intake	Brocade X6	N/A
XBR-X6-HVNPEPSU-0104	High voltage AC/DC power supply and fan assembly, nonport-side air exhaust	Brocade X6	N/A

1.17.6 X6-8 Power Supply Requirements

1.17.6.1 Typical Power Supply Requirements for Blades in X6-8 Directors

(For a specific calculation of power draw with different blade combinations, refer to the Power Consumption section in the *Brocade X6-8 Director Hardware Installation Guide*.)

Configured Number of Ports	Blades	Type of Blade	X6-8 @100–120 VAC (Redundant Configurations) ⁴	X6-8 @200–240 VAC (Redundant Configurations) ^{4,5}
144 32Gb/s ports + QSFP ICLs	FC32-48	Port Blade	3 or 4 Power Supplies (2+1 or 2+2 redundancy)	2 Power Supplies (1+1 redundancy)
384 32Gb/s ports + QSFP ICLs	FC32-48	Port Blade	Not Supported	3 or 4 Power Supplies (2+1 or 2+2 redundancy)
Any combination of 32Gb/s ports and Extension blades with QSFP ICLs	FC32-48, FC32-64, SX6	Port Blade Extension Blade	Not Supported	3 or 4 Power Supplies (2+1 or 2+2 redundancy)

1.17.7 X6-4 Power Supply Requirements

1.17.7.1 Typical Power Supply Requirements for Blades in X6-4 Directors

(For a specific calculation of power draw with different blade combinations, refer to the Power Consumption section in the *Brocade X6-4 Director Hardware Installation Guide*.)

Configured Number of Ports	Blades	Type of Blade	X6-4 @100–120 VAC (Redundant Configurations) ⁵	X6-4 @200–240 VAC (Redundant Configurations) ⁵
Any combination of 32Gb/s ports and Extension blades with QSFP ICLs	FC32-48, FC32-64, SX6	Port Blade Extension Blade	Not Supported	2 Power Supplies (1+1 redundancy)

1.17.8 Supported Optics

For a list of supported fiber-optic transceivers that are available from Brocade, refer to the latest version of the *Brocade Transceiver Support Matrix* available online at www.broadcom.com.

⁴ For N+1 or N+N redundancy, N PSUs must be available for the system to support the load. In other words, failure of up to 1 PSU in an N+1 configuration or N PSUs in an N+N configuration will not impact the system's operation.

⁵ For 1+1 redundancy, 1 PSU must be available for the system to support the load. In other words, failure of up to 1 PSU will not impact system's operation.

Software Upgrades and Downgrades

1.18 Image Filenames

Download the following images from <https://www.broadcom.com/mybroadcom>.

Image Filename	Description
v8.2.2a.zip	Fabric OS 8.2.2a for Windows
v8.2.2a.tar.gz	Fabric OS 8.2.2a for Linux
v8.2.2a.md5	Fabric OS 8.2.2a Checksum
v8.2.2a_all_mibs.tar.gz	Fabric OS 8.2.2a MIBs
v8.2.2a_releasenotes_v2.0.pdf	Fabric OS 8.2.2a Release Notes v2.0

1.19 Migration Path

This section contains important details to consider before migrating to or from this FOS release.

1.19.1 Migrating from FOS 8.1

Any Brocade platform running any FOS 8.1.0a or later version can be nondisruptively upgraded to FOS 8.2.2a with the following exceptions:

- A nondisruptive firmware upgrade from FOS 8.1.0 to FOS 8.2.2 on the Brocade G610 is not supported.

1.19.2 Migrating from FOS 8.0

Any Brocade platform and supported blades in the **DCX 8510-8/DCX 8510-4 Blade Support** table and the **X6-8/X6-4 Blade Support** table running any FOS 8.0 firmware must be upgraded to FOS 8.1.x firmware before it can be nondisruptively upgraded to FOS 8.2.2a.

1.20 Upgrade/Downgrade Considerations

Any firmware activation on a DCX 8510-8 or DCX 8510-4 with an FX8-24 blade installed will disrupt I/O traffic on the FCIP links.

Disruptive upgrades to Fabric OS 8.2.2a are allowed and are supported from FOS 8.0.x (up to a two-level migration) using the optional `-s` parameter with the `firmwaredownload` command.

Firmware downgrades from FOS 8.2.2a to FOS 8.2.0x or earlier versions on the Brocade G610 or 6505 are not allowed.

On a Brocade G620 with the `switchShow` command displaying “switchType” field identified as 162.5, firmware downgrades from FOS 8.2.1a to earlier versions are not allowed.

On any Brocade SAN switch platform running FOS v8.2.2a or later, firmware upgrade or downgrade must acknowledge and accept EULA before firmware can installation.

Limitations and Restrictions

This chapter contains information that you should consider before you use this Fabric OS release.

1.21 Scalability

All scalability limits are subject to change. Limits may be increased once further testing has been completed, even after the release of this version of the Fabric OS software. For current scalability limits for Fabric OS software, refer to the *Brocade SAN Scalability Guidelines for Brocade Fabric OS 8.X* document.

1.22 Compatibility/Interoperability

1.22.1 Brocade SANnav Management Portal Compatibility

Brocade SANnav Management Portal and Global View are new SAN management software offerings for Brocade SAN environments. There are two distinct SANnav product offerings:

- Brocade SANnav Management Portal
- Brocade SANnav Global View

Brocade SANnav Management Portal allows management of one or more SAN fabrics that are in the same or different geographical locations and supports up to a maximum of 15,000 (15K) physical SAN ports. For environments that are larger than 15K ports, users can deploy multiple SANnav Management Portal instances.

Brocade SANnav Global View is a higher-level management application that provides visibility, summarization and seamless navigation across multiple SANnav Management Portal instances. Users can drill-down to any individual SANnav Management Portal instance from SANnav Global View to perform detailed monitoring, investigation, and troubleshooting.

SANnav Management Portal 2.0.x supports managing SAN switches running Fabric OS v8.2.2x. Compatibility with FOS versions can be found in the SANnav Management Portal 2.0.x Release Notes.

1.22.2 Brocade Network Advisor Compatibility

Brocade Network Advisor is available with flexible packaging and licensing options for a wide range of network deployments and for future network expansion. For SAN management, Network Advisor 14.4.3 is available in three editions:

- **Network Advisor Professional** – A fabric management application that is ideally suited for small-size businesses that need a lightweight management product to manage their smaller fabrics. It manages two FOS fabrics at a time and up to 300 switch ports. It provides support for Brocade FC switches, Brocade HBAs/CNAs, and Fibre Channel over Ethernet (FCoE) switches.
- **Network Advisor Professional Plus** – A SAN management application designed for medium-size businesses or departmental SANs for managing up to 36 physical or virtual fabrics (FOS) and up to 2560 switch ports. It supports Brocade director products (for example, X6-4, DCX 8510-4/DCX-4S, 48Ks), FC switches, Fibre Channel over IP (FCIP) switches, Fibre Channel Routing (FCR) switches/Integrated Routing (IR) capabilities, Fibre Channel over Ethernet (FCoE)/DCB switches, and QLogic and Emulex HBAs/CNAs.
- **Network Advisor Enterprise** – A management application designed for enterprise-class SANs for managing up to 100 physical or virtual fabrics and up to 15,000 switch ports. Network Advisor Enterprise supports all the hardware platforms and features that Network Advisor Professional Plus supports, and it adds support for the Brocade directors (X6-8, DCX 8510-8/DCX) and Fiber Connectivity (FICON) capabilities.

More details about new enhancements for Brocade Network Advisor can be found in the Network Advisor 14.4.3 release notes, Network Advisor 14.4.3 user guide, and Network Advisor 14.4.3 installation, migration, and transition guides.

NOTE

- Brocade Network Advisor 14.4.3 or later is required to manage switches running Fabric OS 8.2.2.
- The Brocade Network Advisor seed switch should always have the highest FOS version used in the fabric.

1.22.3 Web Tools Compatibility

Fabric OS 8.2.2a is qualified and supported with Oracle Java version 8 update 202. See the “Important Notes” section for more details.

1.22.4 SMI Compatibility

It is important to note that host SMI-S agents cannot be used to manage switches running Fabric OS 8.2.2a. If you want to manage a switch running Fabric OS 8.2.2 using the SMI-S interface, you must use SMI agent integrated in either Professional Plus or Enterprise edition of Brocade Network Advisor.

1.22.5 Fabric OS Compatibility

- The following table lists the earliest versions of Brocade software supported in this release, that is, the *earliest* supported software versions that interoperate. Use the *latest* software versions to get the greatest benefit from the SAN.
- To ensure that a configuration is fully supported, always check the appropriate SAN, storage, or blade server product support page to verify support of specific code levels on specific switch platforms before installing on your switch. Use only Fabric OS versions that are supported by the provider.
- For a list of the effective end-of-life dates for all versions of Fabric OS software, visit the following Brocade website: <https://www.broadcom.com/support/fibre-channel-networking/eol>.

Supported Products	Fabric OS Interoperability
Brocade 5424, 5430, 5431, 5432, 5450, 5460, 5470, 5480, NC-5480	7.4.2 or later
Brocade 300	7.4.2 or later
Brocade 7800	7.4.2 or later
Brocade DCX 8510-8/DCX 8510-4	FOS 8.0.2 or later
Brocade DCX 8510-8/DCX 8510-4 with FC16-64 blade	FOS 8.0.2 or later
Brocade DCX 8510-8 with FCOE10-24 blade	FOS 8.0.2 or later
Brocade 6505, 6510, 6520, 7840	FOS 8.0.2 or later
Brocade 6542	FOS 8.0.2 or later ⁸
Brocade 6543	FOS 8.0.2 or later
Brocade 6547, 6548, M6505, 6545, 6546	FOS 8.0.2 or later
Brocade 6558	FOS 8.0.2 or later ⁶
Brocade G610	FOS 8.1.0 or later
Brocade G620	FOS 8.0.2 or later

⁸ Support merged from embedded FOS releases.

Supported Products	Fabric OS Interoperability
Brocade G630	FOS 8.2.0 or later
Brocade 7810	FOS 8.2.1 or later
Brocade X6-8/X6-4	FOS 8.0.2 or later
Brocade X6-8/X6-4 with FC32-48 blade or SX6 blade	FOS 8.0.2 or later
Brocade X6-8/X6-4 with FC32-64 blade	FOS 8.2.0 or later

1.22.6 SNMP Support

Fabric OS 8.2.2 documents the supported MIBs in the *Brocade Fabric OS MIB Reference Manual*. For information about SNMP support in Fabric OS software and how to use MIBs, refer to the *Brocade Fabric OS Administration Guide* for Fabric OS 8.2.2.

1.22.6.1 Obtaining MIBs

You can download the MIB files required for this release from the Downloads area of the myBroadcom site. To download the Brocade-specific MIBs, you must have a user name and password. Perform the following steps.

1. Go to <https://www.broadcom.com/mybroadcom/>, click **Login**, and enter your username and password.
If you do not have an account, click **Register** to set up your account.
2. Select **Customer Support Portal > DocSafe (Software/Document Downloads)**.
3. Enter the product name or the software version number in the **Search** box. For example, the following search is for software and documentation files for software version 8.2.

The screenshot shows the 'Search Downloads' interface on the myBroadcom website. At the top, there are navigation links: 'Recent Documents', 'My Bookmarks', 'My Bookmarks Folders', 'My Saved Searches', and 'Historical Downloads (Requested via Email download link)'. Below these is a search bar with a 'Product Search...' placeholder and an 'OR' button. The search box contains the text '8.2'. To the right of the search box is a blue 'Search' button and a link for 'Advanced Search'.

4. When the list of file appears, clear the **Documents** box.
5. Navigate to the link for the MIBs package and download the file to your drive.

Distribution of standard MIBs has been stopped. Download the required standard MIBs from the <http://www.oidview.com/> or <http://www.mibdepot.com/> or <https://www.simpleweb.org/ietf/mibs/>.

1.22.7 REST API Support

Fabric OS 8.2.2 documents the supported REST API functions in the *Brocade Fabric OS REST API Reference Manual*.

1.22.7.1 Obtaining YANG Files

YANG is a standard data modelling language that defines the data sent over the FOS REST API. Each FOS REST API module is defined in a YANG module file with a .yang name extension. To download the Brocade FOS-specific YANG files from the Brocade Technical Support website, you must have a user name and password. Perform the following steps to obtain the YANG files.

1. Go to <https://www.broadcom.com/mybroadcom/>, click **Login**, and enter your username and password.
If you do not have an account, click **Register** to set up your account.
2. Select **Customer Support Portal > Documents and Software**.
3. Enter the product name or the software version number in the **Search** box.
4. When the list of files appears, clear the **Documents** box.
5. Navigate to the link for the Fabric OS package file, either for Windows or for Linux, and download it to your disk.
6. Unzip or untar the Fabric OS package file; the `yang.tar.gz` file contains the collection of YANG module files that this FOS release version supports. Untar the `yang.tar.gz` file to obtain individual YANG module files.

Alternatively, download the YANG files for a specific FOS version from <https://github.com/brocade/yang>

1.23 Important Notes

1.23.1 FCoE

The following topologies for FCoE on the FC32-64 are not supported with FOS 8.2.2:

- Cisco UCS server directly connected to the FC32-64 without a Fabric Interconnect module.
- Cisco UCS server with a Fabric Interconnect module connected to the FC32-64 via a Nexus 5000 series switch in between. Neither running FCoE NPV mode nor L2 switching mode on the Nexus 5000 is supported.

1.23.2 FC-NVMe

- FOS 8.1.0 or later is required to support FC-NVMe devices.
- FOS 8.2.1 or earlier does not support FC-NVMe over FCR configurations. FOS 8.2.1b supports FC-NVMe in edge fabric to edge fabric over FCR configuration.

1.23.3 In-flight Encryption and Compression

- FOS 8.2 supports in-flight encryption and compression on the Brocade 6510, 6520, DCX 8510, G620, G630, and FC32-48 port blade. In-flight encryption or compression on the Brocade G620 and G630 is supported with FOS 8.2.0a or later.
- To enable in-flight encryption on the Brocade G620, SFP ports 44 to 47 must be disabled. If ports 44 to 47 have been configured for in-flight compression with FOS 8.1.x or earlier, a firmware upgrade to FOS 8.2.0a or later will be blocked until in-flight compression is moved to other ports in the switch.
- FOS 8.2.1a or later is required to support trunking for encryption ports on the FC32-48 port blade.
- Firmware upgrade to FOS v8.2.2 or later with encryption ports enabled on FC32-48 blade is nondisruptive.

1.23.4 VM Insight

- VM Insight is supported on the Brocade G610, G620, G630, and X6 running FOS 8.1.0 and later. Brocade Gen 5 Fibre Channel platforms support frames with the optional FC Application Header for VM Insight to pass through. The Brocade 7840 and SX6 running FOS 8.1.0 support the Application Header in the FCP emulating tunnel. The FCP emulating tunnel or FICON emulation is not supported in other extension platforms or earlier firmware. Nonemulating tunnel on extension platforms support pass through of the Application Header.
- VM Insight is not supported across FCR, but frames with the Application Header may traverse through FCR.
- FOS 8.2.0 supports VM performance metrics in flows on the ingress F_Port only. The Brocade G610 and G620 support FC metrics. Brocade X6 Directors support both FC metrics and SCSI IO metrics.
- Legacy static flow does not monitor SCSI IOPS statistics for frames with the Application Header.
- Duplicate subflow entries are displayed after a switch HA failover or multiple restarts of VM traffic without clearing the status. The workaround is to use the `flow --reset sys_mon_all_vms` command.
- FOS 8.2.0 does not support VM Insight for FC-NVMe traffic.

1.23.5 ClearLink Diagnostics (D_Port)

- Fabric OS 8.2 supports D_Port tests between two Brocade switches and between Brocade switches and Gen 5 (16Gb/s) and Gen 6 (32Gb/s) Fibre Channel adapters from QLogic and Emulex. The following are specific adapter models and driver versions tested by Brocade with Fabric OS 8.2 for ClearLink.⁷

⁷ Adapter firmware or driver versions that are later than the ones listed in the table may not work.

	Emulex 16G Adapter	Emulex 32G Adapter	QLogic 16G Adapter	QLogic 32G Adapter
Adapter Model	LPe16002B-M6	LPe32002-M2	QLE2672	QLE2742
Adapter Firmware	11.4.204.20	11.4.142.23	v8.05.44	v8.05.44
Adapter Driver	11.4.142.23	11.4.204.8	STOR Miniport 9.1.17.21	STOR Miniport 9.1.17.21

- The D_Port long-duration test can be run only on one port at a time.
- Long-duration electrical loopback tests are not supported.
- D_Port tests on 4x32GFC breakout QSFP optics (P/N 57-1000351-01) and 128GFC non-breakout QSFP optics (P/N 57-1000331-01) have the following restrictions:
- D_Port for these modules in X6 ICL ports is supported without electric or optical loopback tests.
- D_Port on any user port connected by a QSFP require all four user ports within the same QSFP to be in D_Port mode.
- D_Port tests require all user ports in a QSFP to be in the same logical switch.
- Dynamic or On-Demand D_Ports are not supported on the user ports in these modules.
- If a D_Port test between a Brocade switch and an Emulex adapter is stopped shortly after the test has started, the adapter firmware may display “No FC Cables connecting the port to switch.” The workaround is to restart the D_Port test until completion.
- If a D_Port test is run through optical media for long distance but the ports are not configured for long distance, D_Port test can fail without a pre-check error message about the configuration mismatch.

1.23.6 Forward Error Correction

- FEC is mandatory with Gen 6 Fibre Channel operating at 32Gb/s. This means that the `portcfgfec` command applies only to ports that are running at 16Gb/s or 10Gb/s.
- FEC capability is not supported with all DWDM links. This means that FEC may need to be disabled on 16Gb/s or 10Gb/s ports when using DWDM links with some vendors. This is done using the `portcfgfec` command. Failure to disable FEC on these DWDM links may result in link failure during port bring-up. Refer to the *Brocade Fabric OS 8.x Compatibility Matrix* for supported DWDM equipment and restrictions on FEC use.

1.23.7 Access Gateway

- The 32G links with 4x32G QSFP ports (port 48 to port 63) do not have default mappings. These ports will be disabled by default when a Brocade G620 is enabled for Access Gateway mode or when the configuration is set to the default.
- Attempts to remove failover port mapping from N_Port number 0 on an Access Gateway fail. This problem does not exist on other N_Port numbers.

1.23.8 Ingress Rate Limiting

- Fabric OS 8.2 does not support ingress rate limiting on Brocade Gen 6 (G610, G620, G630, or X6) platforms.

1.23.9 Ethernet Management Interface

- The recommended interface speed configuration for a Brocade G620 is 1G auto-negotiate. If a G620 is configured for 10/100M Gb/s forced-speed and fails to establish a link, use a cross-over cable.
- If a Brocade switch management interface is running at 10 Mb/s, certain FOS operations such as `firmwaredownload` may fail.
- The 10Gb/s management interface on CPX6 blades is not supported.
- Half-duplex mode are not supported since FOS v8.1.x and is blocked. Firmware upgrade to FOS v8.2.2 is blocked if half-duplex mode is configured.

- External default route to the private IPv4 Class B network of 172.16.0.0/16 is unreachable over the management interface due to the existence of a more specific route from an internal Virtual Fabric ID address of 172.16.0.61/16 for FID 128. The solution is to delete the external default route or change it to a more specific address. The Virtual Fabric address will no longer block management access to the IPv4 Class B address range of 172.16.0.0/16.

1.23.10 Extension

- IP extension (IPEXT) between a Brocade 7840 and an SX6 blade is supported only if the 7840 is running FOS 8.0.2 or later. FCIP extension between a Brocade 7840 with FOS 8.0.2 or later. An SX6 blade with FOS 8.0.2 or later is supported. Extension between a Brocade 7840 or SX6 and a Brocade 7810 is supported only if the 7840 or SX6 is running FOS 8.2.0 or later. The following table documents the combinations.

Site1 Switch/Blade	Site1 Firmware	Site2 Switch/Blade	Site2 Firmware	Supported
7840	8.0.2 or later	7840	8.0.2 or later	Both FCIP and IPEXT traffic
SX6	8.0.2 or later	7840	8.0.2	FCIP traffic but not IPEXT traffic
SX6	8.0.2 or later	7840	8.0.2 or later	Both FCIP and IPEXT traffic
SX6	8.0.2 or later	SX6	8.0.2 or later	Both FCIP and IPEXT traffic
7840	8.2.0 or later	7810	8.2.1 or later	Both FCIP and IPEXT traffic
SX6	8.2.0 or later	7810	8.2.1 or later	Both FCIP and IPEXT traffic

- Do not to configure the HA VE pair (VE16, VE26), (VE17, VE27), (VE18, VE28), and so on, where each VE in the pair is in a different LS with a different traffic policy (port-based routing and exchange-based routing). The workaround is to configure different HA VE pairs such as (VE16, VE27), (VE17, VE26), and so on when putting each VE pair in a different LS with a different traffic policy.
- When Non-Terminate TCP (NT-TCP) is enabled on traffic control lists (TCLs) and a firmware downgrade to FOS 7.4.1d is attempted on the Brocade 7840, the downgrade will be blocked. Users must remove NT-TCP from the TCLs with NT-TCP enabled in order to downgrade the firmware. After the firmware is downgraded to FOS 7.4.1d, users can re-enable the NT-TCP flag.
- Nondisruptive firmware downloads for IP extension support nondisruption to IP traffic for all terminate TCP connections. UDP and non-terminate TCP traffic may be disrupted during HCL.
- After firmware downgrade completion, the Brocade 7840 needs a switch reboot and the SX6 needs a blade power-cycle. HCL is not supported on firmware downgrades.

When downgrading from FOS 8.1.0a to an earlier release during HCL, the following message may be seen. This message can be ignored and has no functional impact.

```
[ESM-1100], 343, SLOT 1 FID 128, WARNING, switch0, esm_cfg_ip.c:2226 Could not get PMTU info from cfgdb
```

- If a Brocade 7840 or Brocade X6 Director with an SX6 blade in a non-VF is assigned a fabric ID other than 128, then during a heavy traffic load, the back-end ports on the 7840 and SX6 may encounter credit loss, which can result in traffic disruption over the VE ports. This is tracked as Defect 660208.
- If a 10 Gb/s port is configured on a base configuration of Brocade 7810 with FOS v8.2.2 or later without an Extension Upgrade license, users may see configuration replay errors after the firmware on the 7810 is downgraded to FOS v8.2.1x.

1.23.11 Brocade Analytics Monitoring Platform

- FOS 8.2.0 and later support vTap on Brocade Gen 5 and Gen 6 platforms to be monitored by the Brocade Analytics Monitoring Platform. The supported Brocade platforms include: 6505, 6510, 6520, DCX 8510, 6543, 6545, 6546, 6547, 6548, M6505, 6558, G610, G620, G630, X6.
- vTap is not supported on QSFP ports (port 96 to 127) on the Brocade G630 in Virtual Fabric (VF) mode. It is supported in non-VF mode only.
- If QSFP ports (port 96 to 127) on a Brocade G630 switch are part of the `sys_analytics_vtap` flow definition, the mirrored frames from these QSFP ports will be discarded for some duration after an HA reboot or after a `sys_analytics_vtap` flow de-activation.
- The Analytics Switch Link (ASL) connection is not supported on QSFP ports (port 96 to 127) on the Brocade G630. Enabling ASL on these ports will segment the link.
- vTap and auto-discovered AF_Ports do not support high availability. In the event that an AF_Port is rediscovered by a fabric switch after a domain change on the attached Analytics Monitoring Platform and is followed by an `hafailover` or `hareboot` of the fabric switch, the remote AF_Port information will be stale and vTap flows cannot be activated. In this case, use one of the following workarounds:
 - Manually configure the AF_Port after `hafailover` or `hareboot`.
 - Disable and then enable the AF_Port on the Analytics Monitoring Platform.
 - Deactivate the vTap flow before the firmware download, `hafailover`, or `hareboot`, and activate the vTap flow again.
- vTap and CS_CTL are mutually exclusive on a fabric switch. If CS_CTL is enabled on one port, the entire switch cannot enable vTap. An F_Port trunk supporting CS_CTL must have all ports in the trunk group enabling CS_CTL. Similarly, in order to enable vTap, all ports in an F_Port trunk must have CS_CTL disabled. In addition, the master port of a trunk should remain the same between CS_CTL enabling and disabling. If this sequence is not followed, vTap may remain active even after CS_CTL is enabled on an F_Port, or the error message “Disable QoS zones error” may be observed when enabling vTap. A suggested method is to use the following sequence:
 1. When enabling CS_CTL mode, enable it on all slave ports, followed by enabling it on the master port, noted as port M.
 2. When disabling CS_CTL mode, disable all active ports in the trunk, except the master port M. Disable CS_CTL mode on port M. Enable all ports in the trunk followed by disabling CS_CTL mode on the remaining ports.
 3. When CS_CTL is enabled on a port without any connection, after rebooting and disabling CS_CTL, vTap cannot be enabled. The workaround is to enable the port as a SIM port after disabling CS_CTL and then to toggle the port and remove the SIM port configuration.
- vTap and in-flight encryption or compression compatibility are supported only on the following platforms: Brocade DCX 8510, X6, G620, G630, and 6520. On DCX 8510 and 6520 platforms, the chassis configuration “vTap and Encryption/Compression Coexistence Mode” must be enabled when ports with vTap enabled and ports with in-flight encryption or compression enabled belong to the same ASICs. Refer to the hardware installation guides for these platforms for the port-to-ASIC mapping boundary.
- When “vTap and Encryption/Compression Coexistence Mode” is enabled, the total IOPS on the same ASIC is limited to 250,000. If the IOPS exceeds the limit, the vTap flow will be deactivated.
- When “vTap and Encryption/Compression Coexistence Mode” is enabled, the effective default zone access mode must not be “All Access.”
- Running the `flow --show sys_analytics_vtap` command when vTap and QoS High compatibility mode is enabled but the vTap flow is not active may display the following message incorrectly: “Enable vTap and QoS High Priority Zone Compatibility Mode to active vTap flow. Please use the `configurechassis` command to enable this compatibility mode.” This is tracked as Defect 604429.
- After a `configuredownload` followed by `switchenable` or a flow statistics reset on the Brocade X6 and G620, MAPS may incorrectly report a VTAP IOPS > 250,000 violation.
- AMPOS 2.2.0 or later is required to support FC32-64 blades. Users should upgrade the Brocade Analytics Monitoring Platform to AMPOS 2.2.0 or later before adding FC32-64 blades to the X6.

1.23.12 Flow Vision

- Flow Vision supports only logical group names that begin with alphabetic characters.
- Frame count statistics of a Flow Monitoring flow may stop incrementing after a `statsclear` command. To work around the problem, users may run the `slotstatsclear` command. To recover from such condition, users should run the following steps:
 - (a) Disable all flows in the logical switch.
 - (b) Delete the problem flow.
 - (c) Create a new flow to replace the problem flow.
 - (d) Activate the new replacement flow.
 - (e) Verify the new replacement flow.
 - (f) Enable all other flows.
- IO Insight metrics are supported on ingress and egress ports on the Brocade X6 and on egress ports on Brocade G620 and G630 switches. They are not supported on Brocade G610 switches.
- Activating a Flow Monitoring flow on an egress port on the Brocade G610 with the `-frametype` parameter may cause a resource not available error.
- FC-NVMe flow IO Insight metrics are supported with a Flow Monitoring flow on a port defined on the Brocade G630 and FC32-64 blade only. Users must use the `-nsid` parameter with the `flow --create` command to monitor FC-NVMe flows. Either a valid Name Space ID (NSID) must be used or the `all` keyword must be used to select all valid NSIDs.
- When a flow is created with the `-frametype` parameter, FC-NVMe traffic is included in the metrics for the following SCSI frame types: SCSI, SCSTur, SCSEXferdy, and SCSIGoodStatus.
- Flow Mirroring is not supported on QSFP ports (port 96 to 127) on the Brocade G630 with Virtual Fabric (VF) mode. It is supported in non-VF mode only.
- Mirror ports are not supported on QSFP ports (port 96 to 127) on the Brocade G630. Enabling a mirror port on these ports will disable the ports.
- If a flow is imported to MAPS and configured with incorrectly configured flow metrics thresholds, a high frequency violation of the thresholds may result in very slow display of the RASLOG alerts for the violations.

1.23.13 FICON

For FICON-qualified releases, refer to the Additional Considerations for FICON Environments section of the Appendix for details and notes on deployment in FICON environments. (This appendix is included only for releases that have completed FICON qualification.)

1.23.14 MAPS

MAPS monitoring of UCS server login does not support the FENCE action even though the `mapsrule` command does not block the configuration.

1.23.15 Miscellaneous

- If the ambient temperature is above the recommended operational limit, the power supply units may shut down, in particular when the ambient temperature is above 62°C for Brocade X6 Directors. This will result in the switch being shut down without any warning. Refer to the *Brocade G620 Hardware Installation Guide* and the *Brocade X6-8/X6-4 Hardware Installation Guide* for the recommended ambient temperature limits for the switches.
- After a power supply unit is removed from a Brocade G620, the `historyshow` command may miss the entries for this FRU removal or insertion event. In addition, the RASLog error message EM-1028 may be logged when the power supply is removed. This condition can be corrected by power-cycling the switch.
- After running offline diagnostics mode 1 on QSFP ports, a Brocade G620 must be rebooted before operational use.

- All links in an ICL QSFP connection on a Brocade X6 Director must be configured to the same speed using the `portcfgspeed` command from one of the following supported speeds: 16Gb/s, 32Gb/s, or ASN. To connect an ICL from an X6 with a 4x32GFC breakout optic (P/N 57-1000351-01) or a 4x16G FC optic to a 4x16G FC optic in a DCX 8510, the X6 port's speed must be set to 16Gb/s.
- When the zoning database size exceeds the maximum supported limit, 2 MB for directors and 1 MB for fixed-port switches, a firmware upgrade from FOS 8.0.x to FOS 8.1.0a or later may be blocked. Users should run the `cfgSize` command to make sure that the "Zone DB max size" is not exceeded.
- ASN is not supported with 4x32GFC breakout optics (P/N 57-1000351-01).
- When connecting 4x32G FC breakout optics (P/N 57-1000351-01) to 32Gb/s SFP peer ports on Gen 6 platforms, ports may auto-negotiate to 16Gb/s after `switchdisable` and `switchenable` on the Gen 6 platforms with 32Gb/s SFP ports. To avoid this issue, the Gen 6 platforms with 32Gb/s SFPs should be upgraded to FOS 8.2.0 or later or to FOS 8.1.2b or later. This issue is more likely to occur when the Gen 6 platforms with 32Gb/s SFPs are X6 directors.
- Brocade G630 LEDs illuminate amber and green during power-up.
- When launching Web Tools over an HTTPS connection and a security warning message for an untrusted certificate pops up, the pop-up message should be responded to within 20 seconds.
- When upgrading to FOS 8.1.0b or later and HTTPS is enabled, administrators must have the Certificate Authority (CA), intermediate, and root certificates installed to ensure that the chain of certificate validation is successful. HTTPS will be disabled in FOS 8.1.0b or later if the chain of certificate validation fails. To verify if the CA is correct and the CA chain validation is successful, issue the following command on a Linux server:

```
openssl verify -CAfile ca.pem servercert.pem
```

In the example above, `ca.pem` is the CA certificate and `servercert.pem` is the switch certificate. If the switch certificate is signed by the intermediate certificate, use the completed chain CA certificate; otherwise, use the root certificate.

- When replacing a FC32-64 blade with a FC32-48 blade, flexport and FCoE configurations should be removed before the FC32-64 blade is removed.

Security Vulnerability Fixes

This section lists the Common Vulnerabilities and Exposures (CVEs) that have been addressed. Each CVE is identified by the CVE ID number.

The following CVEs have been addressed in FOS v8.2.2:

- **CVE ID: CVE-2018-15473** - OpenSSH through 7.7 is prone to a user enumeration vulnerability due to not delaying bailout for an invalid authenticating user until after the packet containing the request has been fully parsed, related to `auth2-gss.c`, `auth2-hostbased.c`, and `auth2-pubkey.c`.
- **CVE ID: CVE-2017-15906** - The `process_open` function in `sftp-server.c` in OpenSSH before 7.6 does not properly prevent write operations in read only mode, which allows attackers to create zero-length files.
- **CVE ID: CVE-2018-0734** - The OpenSSL DSA signature algorithm has been shown to be vulnerable to a timing side channel attack. An attacker could use variations in the signing algorithm to recover the private key.
- **CVE ID: CVE-2018-0737** - The OpenSSL RSA Key generation algorithm has been shown to be vulnerable to a cache timing side channel attack. An attacker with sufficient access to mount cache timing attacks during the RSA key generation process could recover the private key.
- **CVE ID: CVE-2017-3737** - OpenSSL does not properly handle `SSL_read()` and `SSL_write()` while being invoked in an error state, causing data to be passed without being decrypted or encrypted directly from the SSL/TLS record layer.

Defects

1.24 Closed with Code Changes in FOS 8.2.2a

Defect ID:	FOS-815835		
Technical Severity:	Medium	Probability:	Medium
Product:	Fabric OS	Technology Group:	Traffic Management
Reported In Release:	FOS9.0.0	Technology:	Name Server / Zoning
Symptom:	Various non-intrusive misbehaviors observed on device enforcement.		
Condition:	1. Move a port from default switch to logical switch, original PID in the default switch still exists in the new logical switch. 2. Prohibit two local ports by PDCM in FICON environment. routing is still allowed between the two ports. This applies to FOS8.2.1 and later releases.		

Defect ID:	FOS-815218		
Technical Severity:	Medium	Probability:	Medium
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS8.1.2a	Technology:	FCIP - Fibre Channel over IP
Symptom:	FCIP DP panics		
Condition:	After aborts have been processed on a FICON Emulation enabled tunnel when end device re-used an exchange.		
Recovery:	It recovers after panic.		

Defect ID:	FOS-815152		
Technical Severity:	Medium	Probability:	Low
Product:	Fabric OS	Technology Group:	System
Reported In Release:	FOS8.2.2	Technology:	CLI
Symptom:	During firmwaredownload, the error message is not properly worded.		
Condition:	Perform CLI firmwaredownload on a switch with ethernet management port configured in half duplex mode.		
Workaround:	Configure switch management port to Full Duplex mode. Half duplex mode is not supported.		

Defect ID:	FOS-814782		
Technical Severity:	Medium	Probability:	Low
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS9.0.0	Technology:	CLI - Command Line Interface
Symptom:	Firmwarecheck failure on ASCGW certification file.		
Condition:	There is no functional impact to majority of customers with default switch configurations. Switch may be forced into a reboot loop if *all* the following conditions are met: 1. User should have automatic 'firmwarecheck' enabled on the switch ("firmwarecheck --enable") 2. User should be using ASC-G 3. User should have imported enterprise CA certification for the ASC-G. In the above state, if and when the switch is rebooted it will result in rolling reboot due to 'firmwarecheck' failure. This applies to FOS8.2.1c and FOS8.2.2.		

Defect ID:	FOS-813692		
Technical Severity:	High	Probability:	Low
Product:	Fabric OS	Technology Group:	Traffic Management
Reported In Release:	FOS8.2.1	Technology:	Port bring up
Symptom:	Lot of I/O failures and traffic disruption reported after performing hafailover on Gen6 chassis-based switches.		
Condition:	Port blade and/or core blade slot power cycles, followed by hafailover.		
Recovery:	Core blade power off and power on recover from this state.		

Defect ID:	FOS-812985		
Technical Severity:	High	Probability:	Low
Product:	Fabric OS	Technology Group:	System
Reported In Release:	FOS8.2.1c	Technology:	Component
Symptom:	Kernel or user daemon panic caused by trace module corruption.		
Condition:	Trace module is corrupted and subsequently when user daemon or kernel attempts to log a trace, switch may experience a panic.		
Recovery:	Switch recovers automatically after the panic without requiring further action.		

Defect ID:	FOS-811952		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	System
Reported In Release:	FOS8.1.2d	Technology:	Component
Symptom:	Experience silent reboot (reboot reason: reset) or switch hung for hours/days.		
Condition:	Running script with nested or concatenated CLI commands over 512 bytes long.		
Workaround:	Allow 5 seconds of idle time between commands and keep CLI length under 512 bytes.		

Defect ID:	FOS-808514		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1a	Technology:	Management Server
Symptom:	After a host behind an NPIV device reboots, it is unable to discover any of its LSAN devices.		
Condition:	Under a rare condition, intercommunication packets between name server were dropped.		
Recovery:	Perform a hafailover to recover name server communication.		

1.25 Closed with Code Changes in FOS 8.2.2

Defect ID:	FOS-812603		
Technical Severity:	Medium	Probability:	High
Product:	Fabric OS	Technology Group:	Monitoring
Reported In Release:	FOS8.2.1a	Technology:	MAPS - Monitoring and Alerting Policy Suite
Symptom:	MAPS MISSING_SFP monitors on a Logical Switch (LS) but may not action for their own LS and instead alert the violation on Default Switch		
Condition:	This is seen when multiple logical switches are created and MISSING_SFP monitoring is activated in DS and at least 1 LS.		

Defect ID:	FOS-812496		
Technical Severity:	Low	Probability:	null
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1	Technology:	CLI
Symptom:	The CLI command configure --default leads to a segmentation fault		
Condition:	This stems from a bug in the validation of the parameters when CLI command configure --default is invoked.		

Defect ID:	FOS-811866		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS8.2.2	Technology:	FCIP
Symptom:	During FICON Channel Path Recovery on an FICON Emulation enabled FCIP Extended CHPID, encountered BLZ-5024 and DP reboot.		
Condition:	When FICON Channel Path Recovery (System Resets or Logical Path Remove) is occurring on a FICON Emulation enabled FCIP Tunnel and there are device IOs outstanding at the same time.		

Defect ID:	FOS-811403		
Technical Severity:	Medium	Probability:	Low
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS8.1.0b	Technology:	FCIP
Symptom:	The primary indicator for this defect is almost full utilization of WQE buffers in switch DP complex. Secondary indicators for this issue could be buffer allocation failure FTRACE triggers or a DP reset.		
Condition:	Buffer leaks can occur when IP extension connections are established or rejected.		

Defect ID:	FOS-811375		
Technical Severity:	Medium	Probability:	Medium
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS8.1.2f	Technology:	FCIP
Symptom:	On a ficon created circuit, the output between portshow fcipcircuit --detail, and portcfgshow fcipcircuit --detail will show different values for the keepalive timeout. The portshow fcipcircuit --detail output will show the correct keepalive timeout value of 1000ms, but the portcfgshow fcipcircuit --detail may incorrectly show the non-FICON default value of 6000ms.		

Condition:	This only occurs on a circuit created with ficon enabled. Any circuit created without ficon, modified later to be ficon, or ficon circuit changed to a different keepalive value and back to 1000 will not have this display issue.
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Defect ID:	FOS-810918		
Technical Severity:	High	Probability:	Low
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS8.0.1a	Technology:	FCIP
Symptom:	IPEX enabled extension switch responds with RST to the incoming SYN packet on the LAN side.		
Condition:	If the target tunnel is down, all the incoming SYN packets on the LAN side will be dropped and responded back with RST for both terminated and non-terminated TCP flows.		

Defect ID:	FOS-810773		
Technical Severity:	Medium	Probability:	Low
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS8.2.1a	Technology:	FCIP - Fibre Channel over IP
Symptom:	An IPEX connected application may take a long time to timeout and recover extended TCP flows after a local LAN connectivity outage.		
Condition:	When there is a temporary loss of connectivity on the LAN, IP extended flows may timeout on the extension switch due to the TCP keep alive timing out. If the application has a higher timeout value than the extension switch, the connection will not be cleaned up until it is timed out by the application.		

Defect ID:	FOS-809983		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS7.4.2c	Technology:	FCIP
Symptom:	Customer may encounter "a tape write errors has occurred" on OSTP enabled tunnel on 7800, when appending to LTO8 tape drives.		
Condition:	OSTP Enabled tunnel on 7800, FX8-24 or 7840 (SX6 in later FOS levels) when appending to an LTO8 tape. This issue does not occur with LTO5 tape drives.		
Workaround:	Disable Open Systems Tape Pipelining feature on FCIP tunnel.		

Defect ID:	FOS-809770		
Technical Severity:	High	Probability:	Low
Product:	Fabric OS	Technology Group:	Extension
Reported In Release:	FOS8.1.2a4	Technology:	FCIP - Fibre Channel over IP
Symptom:	FICON Aborted sequences over FICON Emulation enabled FCIP Tunnel after Extension HCL and potential FFDC due to FCIP DP Panic		
Condition:	Timing issue with aborts occurring and processing emulated XRC RRS response sequences.		

Defect ID:	FOS-809514		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	Monitoring/RAS

Reported In Release:	FOS7.4.2c	Technology:	End-to-end Performance Monitoring
Symptom:	User may encounter cold reboot, along with mdd termination, during MAPS rule creation with an invalid timebase.		
Condition:	This may occur during MAPS rule creation with an invalid timebase on FOS versions v8.0.2x and lower. This release also enhanced code to block invalid timebase configuration.		

Defect ID:	FOS-809147		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	Monitoring
Reported In Release:	FOS8.2.1a	Technology:	D-Port - Diagnostic Port
Symptom:	User may encounter CP reboot when running the CLI command portdporttest --clear all		
Condition:	This occurs when running portdporttest command, and accompanied by the message - Error: comm error between CLI and fabricd		

Defect ID:	FOS-808083		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	Virtualization
Reported In Release:	FOS8.1.2g	Technology:	Virtual Fabrics
Symptom:	Hafailover results in the port with port address zero being disabled.		
Condition:	FMS mode must be enabled in the logical switch. A base fabric must be operational in the switch. The logical switch must have Allow XISL enabled in the configure CLI command. One of the following conditions would have needed to occur since the last hafailover: - A chassisreboot or power cycle - Enabling Allow XISL in the configure CLI command - Adding a new domain to the base fabric - Removing and then re-adding an existing domain in the base fabric		
Recovery:	Enable the port with port address zero after hafailover		

Defect ID:	FOS-807912		
Technical Severity:	High	Probability:	Low
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1b	Technology:	CLI
Symptom:	User may encounter the following error message at telnet / log in time switchName: fabosShowInit failed with -1 at line:144:root> With no impact on FOS functionality.		
Condition:	This is seen if the user attempts to telnet / log into the system before / while it is still in the process of coming up and has not gone through its config init yet.		

Defect ID:	FOS-807708		
Technical Severity:	Medium	Probability:	High
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1a	Technology:	SNMPv2, SNMPv3 & MIBs
Symptom:	Two different swTelnetTable objects are found to be defined in FOS8.2.1a SW-MIB.		
Condition:	This is generally a benign issue but may confuse and cause issues with some MIB compilers.		

Defect ID:	FOS-806894		
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Technical Severity:	Medium	Probability:	Low
Product:	Fabric OS	Technology Group:	Monitoring
Reported In Release:	FOS8.1.2a	Technology:	RAS - Reliability, Availability, and Serviceability
Symptom:	System run in a a prolong period of sub-optimal performance condition before faulting the core blade		
Condition:	Suspect a hardware error condition caused stale asic after multiple slow drain devices detected		
Recovery:	Power cycle the switch. This release added C4-1048/C3-1048 to help user identify the condition as soon as possible to act on it.		

Defect ID:	FOS-806764		
Technical Severity:	Low	Probability:	null
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1a	Technology:	Fibre Channel Addressing
Symptom:	User sees the following error when executing the CLI command portshow: porttrunkarea is configured for F-port trunks.'i or -x' option not supported.		
Condition:	This is seen on Logical ports that are not visible		

Defect ID:	FOS-805530		
Technical Severity:	High	Probability:	High
Product:	Fabric OS	Technology Group:	Security
Reported In Release:	FOS8.2.1a	Technology:	In-flight Encryption
Symptom:	During firmware migration from v8.1.x to v8.2.x, all In-Flight Encryption enabled E-Ports on FC32-48 ports were faulted. IO errors resulted on the switch and device ports throughout the fabric. 2018/10/02-19:25:56, [C4-1042], 28, SLOT 2 CHASSIS, WARNING, Algi1, Port in Slot 6, Port 305(0) getting faulted because of encryption block error.		
Condition:	An upgrade from v8.1.x to v8.2.x or higher, or downgrade from v8.2.x to v8.1.x, with online ISLs with Encryption enabled on FC32-48 blade in X6 platforms.		
Workaround:	Disable all encryption ports before upgrade.		
Recovery:	Since the issue leads to ports bouncing, no further recover needed		

Defect ID:	FOS-804616		
Technical Severity:	High	Probability:	Medium
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1	Technology:	CLI
Symptom:	Software VERIFY error when WWN based Persistent PID is configured		
Condition:	When there is a WWN based Persistent PID feature is configured on the switch,software VERIFY error maybe seen in the following cases: a. With no WWN entries bound with the PID and if a reboot/hareboot is issued on the switch b. Last bounded entry is attempted for removal using "wwnaddress --unbind"		
Workaround:	At least one WWN based Persistent PID entry could be bound to avoid the VERIFY		
Recovery:	The switch does not reboot. No recovery needed.		

Defect ID:	FOS-804296		
Technical Severity:	Medium	Probability:	Medium
Product:	Fabric OS	Technology Group:	Management

Reported In Release:	FOS8.2.1	Technology:	Configuration Fundamentals
Symptom:	CLI command configdefault on a X6-8 and X6-4 chassis base switch, that has encrypted links, pass without warning the user to remove the encrypted links before the operation.		
Condition:	CLI command configdefault should be blocked when encrypted port is configured on FC32-48 blade, otherwise results in resource unallocated error.		
Workaround:	Remove the encryption configuration from the FC32-48 port before attempting the configdefault operation		

Defect ID:	FOS-803902		
Technical Severity:	High	Probability:	Low
Product:	Fabric OS	Technology Group:	Other
Reported In Release:	FOS8.2.1	Technology:	Other
Symptom:	Active CP panic on an X6 chassis, with SX6 extension blade, that is an FCR core switch		
Condition:	In extremely rare cases, the CP panic may be seen due to a race condition in the switch		

Defect ID:	FOS-803194		
Technical Severity:	Medium	Probability:	Low
Product:	Fabric OS	Technology Group:	Monitoring
Reported In Release:	FOS8.2.1	Technology:	MAPS - Monitoring and Alerting Policy Suite
Symptom:	100GE (25x4) QSFP in the FC32-64 blade does not report correct Tx Power and leads to violations reported by MAPS		
Condition:	When Ethernet QSFPs are present in the FC32-64 blade		
Workaround:	Turn off SFP monitoring in MAPS for QSFPs		

Defect ID:	FOS-803011		
Technical Severity:	Medium	Probability:	Low
Product:	Fabric OS	Technology Group:	Monitoring/RAS
Reported In Release:	FOS8.1.2b	Technology:	Logging
Symptom:	Switch panic due to kernel trace module corruption. It also prevents user daemon generate proper core file during daemon coredump.		
Condition:	It happens when a user daemon coredumps, and FFDC triggers to log a trace.		

Defect ID:	FOS-660425		
Technical Severity:	High	Probability:	Low
Product:	Fabric OS	Technology Group:	Traffic Management
Reported In Release:	FOS8.1.2a	Technology:	Routing
Symptom:	Hosts unable to see target in a deactivated TI zone setup		
Condition:	Logical switch has a failover-disabled TI Zone that is deactivated. Paths in the fabric attempt to use the E-ports in the deactivated TI Zone.		
Workaround:	After deactivating the TI Zone, disable all E-ports that have the same destination as the E-port with the DC-only route. Then enable them all to clear the condition.		

Recovery:	Disable all E-ports that have the same destination as the E-port with the DC-only route. Then enable them all to clear the condition.
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1.26 Closed without Code Changes in FOS 8.2.2

Defect ID:	FOS-807634	Technical Severity:	High
Reason Code:	Code Freeze	Probability:	Medium
Product:	Fabric OS	Technology Group:	Security
Reported In Release:	FOS8.2.1b	Technology:	AAA - Authentication, Authorization, and Accounting
Symptom:	IPv6 with peap-mschapv2 is not a supported combination. However IPv6 radius configuration is being successfully added with peap-mschapv2 protocol using REST.		
Condition:	This seen when IPv6 radius configuration is being added with peap-mschapv2 protocol		

Defect ID:	FOS-804694	Technical Severity:	Medium
Reason Code:	Not Reproducible	Probability:	Medium
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1	Technology:	Firmware upload/download
Symptom:	The standby CP firmware doesn't sync with the active CP firmware version when CPs have different firmware versions.		
Condition:	If Auto firmwaresync is set from active and firmwaredownload is performed on the standby CP, and when reboot/hafailover is issued, the firmwaresync will not be triggered.		
Workaround:	Issue the firmwaresync command manually if firmware sync is required.		
Recovery:	Issuing the firmwaresync manually will cause the firmware to be in sync with the active CP.		

Defect ID:	FOS-804650	Technical Severity:	High
Reason Code:	Already Implemented	Probability:	Medium
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1	Technology:	Virtual Fabrics
Symptom:	Software verify will be seen for each port that is attempted to be moved between partitions.		
Condition:	Issue observed when moving FC32-64 blades between Logical partitions.		
Recovery:	Software verify messages observed on console is harmless. The movement operation will complete without any side effects.		

Defect ID:	FOS-804103	Technical Severity:	Medium
Reason Code:	Not Reproducible	Probability:	Low
Product:	Fabric OS	Technology Group:	Monitoring
Reported In Release:	FOS8.2.1	Technology:	Flow Vision
Symptom:	Failure to remove SIM port blocks attempt to remove expired flow vision license.		
Condition:	This symptom is observed only when flow generator flow is active.		
Workaround:	Remove SIM port using "flow --ctrlcfg simport -disable".		
Recovery:	Remove SIM port using "flow --ctrlcfg simport -disable".		

Defect ID:	FOS-801447	Technical Severity:	Medium
Reason Code:	Already Implemented	Probability:	Low
Product:	Fabric OS	Technology Group:	Other
Reported In Release:	FOS8.2.1	Technology:	Other
Symptom:	Error message "esm_cfg_ipsec.c:7889 IPsec: mkdir /mnt/etc/fabos/certs/extn/ rc=-1 errno=2" may be displayed on console.		
Condition:	The message may be observed during non-disruptive firmwaredownload operation on 7840.		

Defect ID:	FOS-801128	Technical Severity:	Medium
Reason Code:	Not Reproducible	Probability:	Low
Product:	Fabric OS	Technology Group:	Monitoring
Reported In Release:	FOS8.2.1	Technology:	APM - Advanced Performance Monitoring
Symptom:	Portperfshow command may display throughput greater than the port speed.		
Condition:	The issue is observed when the port is running at almost full bandwidth.		
Recovery:	Corrected values will be updated during the next portpershow display cycle.		

Defect ID:	FOS-800976	Technical Severity:	High
Reason Code:	Not Reproducible	Probability:	Medium
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1	Technology:	Configuration Fundamentals
Symptom:	GET on /brocade-maps/dashboard-rule is missing the rest of the output in the object field.		
Condition:	This is per design and the user is able to access the unit of the value from monitoring-system-matrix container.		

Defect ID:	FOS-800300	Technical Severity:	High
Reason Code:	Not Reproducible	Probability:	Medium
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.2.1	Technology:	CLI - Command Line Interface
Symptom:	spinfab fails on G630 E-ports		
Condition:	After running offline diag tests on G630, spinfab tests may fail or frames may drop.		
Workaround:	Reboot the G630 after running offline Diag test (Plb, turboramtest , portledtest and systemverification).		
Recovery:	Reboot the switch.		

Defect ID:	FOS-660483	Technical Severity:	Medium
Reason Code:	Implemented	Probability:	Low
Product:	Fabric OS	Technology Group:	Management
Reported In Release:	FOS8.1.2a	Technology:	High Availability
Symptom:	Customer may experience that a port bounce results in loss of sync		
Condition:	This may be encountered on a switch with FMS mode enabled and there is device performing PLOGIN with invalid SID.		

Defect ID:	FOS-654083	Technical Severity:	High
Reason Code:	Not Reproducible	Probability:	Low

Product:	Fabric OS	Technology Group:	Security
Reported In Release:	FOS8.2.0	Technology:	Security Policies
Symptom:	When multiple back to back password distribution is performed on a fabric with large number of Access Gateway switches connected, the transaction doesn't complete in an Access Gateway switch and further transactions are not allowed for the Access Gateway switch.		
Condition:	Multiple back to back password distribution on a fabric with large number of Access Gateway switches.		

Revision History

FOS-822a-RN100; December 20, 2019

Initial document version.

