Brocade Fabric OS v7.3.0a
Release Notes v2.0

August 15, 2014

Document History

Document Title	Summary of Changes	Publication Date
Brocade Fabric OS v7.3.0a Release Notes v1.0	Initial Release	August 8, 2014
Brocade Fabric OS v7.3.0a Release Notes v2.0	Revise Non-disruptive Firmware Download description under New FCIP Features on Brocade 7840, include 7840 for Advanced FICON Acceleration license, add a firmware downgrade note to Miscallaneous section, add defects 519709 and 522753	August 15, 2014

Contents

Overview

FOS v7.3.0a is a patch release based on FOS v7.3.0. All hardware platforms and features supported in FOS v7.3.0 are also supported in FOS v7.3.0a.

New Hardware Support

FOS v7.3 introduces support for the following **new** 16G FC hardware platform:

- Brocade 7840 Gen 5 FC extension switch platform that offers the following capabilities:
    - Support 24 16G FC ports, 16 10GE/1GE FCIP ports, and 2 40GE FCIP ports
    - Support maximum 40G WAN throughput with two WAN Rate upgrade licenses.
    - Support maximum 20G bandwidth on a VE port.
    - Support existing FCIP features on Brocade 7800 and FX8-24 blade.
    - Support non-disruptive firmware download.
    - Support Fabric Vision features.
    - Support increased compression performance.
    - Support stream based flow control.
    - Support out of order TCP delivery.
    - Support WAN link test tool.
- Brocade FC16-64 port blade for Brocade 8510 that offers the following capabilities:
    - 16 QSFP ports per blade provide total 64 FC ports supporting 16G, 8G, and 4G speeds.
    - 512 16G FC ports in a fully populated Brocade 8510-8 chassis.

FOS v7.3 introduces the support of the **existing** FCOE10-24 blade in a Brocade **8510-8** chassis.

FOS v7.3 supports all hardware platforms supported by FOS v7.2.x.

Summary of New Software Features

In addition to new hardware support, FOS v7.3 also includes support for a number of software features and enhancements:

- Support for new FCIP features on Brocade 7840.
- Monitoring and Alerting Policy Suites (MAPS) enhancements
    - Monitor Fabric Performance Impact due to bottleneck conditions
    - Monitor new FCIP statistics on Brocade 7840
    - Monitor fabric scalability limits
    - Monitor ClearLink diagnostics ports
    - Monitor Ethernet management ports
    - Monitor Flow Vision learning flows
    - Support Port Decommissioning as an action
    - Support dynamic groups
    - Support port group augmentation
    - Usability enhancements
- Flow Vision enhancements
    - Flow Performance Monitor enhancements
    - Flow Mirror enhancements
    - Flow Generator enhancements
    - Miscellaneous Flow Vision enhancements
- ClearLink Diagnostic Port (D_Port) enhancements
    - D_Port and MAPS integration
    - Dynamic D_Port and On-demand D_Port on ISLs
    - D_Port Provision
    - D_Port test result display enhancements
    - D_Port on FC16-64 QSFPs
- Read Diagnostics Parameter (RDP)
- Link Cable Beacon (Port Peer Beacon)

- E_Port Balance Priority Routing enhancement
- FCR enhancements
    - Enhancements to FCR CLIs
    - Support fabric alias names for edge fabric IDs
- Security enhancements
    - Support SHA-256 for FCAP and DH-CHAP
    - Support in-flight encryption with FCAP generated keys
    - Support fabric-wide consistency policy co-existence with FCR
    - Open Software Source packages upgrade
- Access Gateway enhancements
    - Support user account and password database distribution to Access Gateway
    - Support dynamic D_Port on links connecting to HBAs.
- Zoning enhancement
    - Disallow zone merge with mismatching default zone access mode
- Support High Integrity Fabric
- RAS enhancements
- FICON enhancements
- Brocade 8510 ICL scalability enhancements
- Miscellaneous enhancements

New Feature Descriptions

New FCIP Features on Brocade 7840

In addition to the existing FCIP features supported on Brocade 7800 and FX8-24, FOS v7.3 supports the following new FCIP features on Brocade 7840.

- Support maximum 40G WAN throughput.
- Support maximum 20G bandwidth on a VE port.
- Non-disruptive firmware download.
- Fabric Vision for Extension.
    - ClearLink Diagnostic Port (D_Port) on all FC ports.
    - Monitoring and Alerting Policy Suites (MAPS) for FCIP QoS, tunnels, and circuits.
    - Full Flow Vision capabilities on all FC ports.
- Ethernet Jumbo Frame
- IPSec enhancement
- Adaptive Rate Limiting (ARL) enhancements
- Increased compression performance
- Path MTU Discovery
- Stream based flow control
- Out of order TCP delivery
- WAN test tool

Support maximum 40G WAN throughput

FOS v7.3 supports maximum 40G WAN throughput on Brocade 7840. The maximum throughput is supported with two WAN Rate Upgrade licenses. The base configuration without either WAN upgrade license supports maximum 5G WAN throughput.

Support maximum 20G bandwidth on a VE port

FOS v7.3 supports on Brocade 7840 10 VE mode with maximum 20G bandwidth on a VE port and 20 VE mode with maximum 10G bandwidth on a VE port. End users can create single FCIP circuit with 20G bandwidth or create multiple circuits to load balance with different bandwidths that sum to 20G.

Non-disruptive Firmware Download

FOS v7.3 supports firmware download on Brocade 7840 without disruption to FCIP links. During a non-disruptive firmware download, throughput of individual FCIP tunnels are maintained, while the total bandwidth is limited to half of the maximum bandwidth supported on the platform.

Fabric Vision for Extension

FOS v7.3 supports and expands Fabric Vision features for Brocade 7840 Extension platform. These include:
- ClearLink Diagnostic Port (D_Port) on all FC ports to diagnose FC link optics and cable problems.
- Monitoring and Alerting Policy Suites (MAPS) enhancements to provide pre-defined threshold and alerting rules for FCIP statistics at QoS level, tunnel level, and circuit level and capture FCIP specific violations in MAPS dashboard.
- Full Flow Vision feature support on all FC ports to provide broad visibility, deep insight, and pre-production validation for traffic between data centers across FCIP links.

Ethernet Jumbo Frame

FOS v7.3 supports a Jumbo IP frame with MTU up to 9216 bytes on Brocade 7840.

IPSec Enhancements

FOS v7.3 increase IPSec performance on Brocade 7840 with near line-rate throughput. FOS v7.3 implements IPSec configuration through a policy applied to a FCIP tunnel. IPSec supports both IPv4 and IPv6 and jumbo frames.

Adaptive Rate Limiting (ARL) Enhancements

FOS v7.3 implements two new ARL algorithms, Modified Multiplicative Decrease and Time-based Decrease, to provide additional performance tailored to network conditions. In addition, ARL ramp up time has been decreased from 10s to 1s comparing to Brocade 7800.

Increased Compression Performance

FOS v7.3 supports increased compression performance on FC data frames on Brocade 7840 before they are sent through FCIP channels. End users can choose None, Aggressive Deflate, Deflate, and Fast Deflate compression algorithm to choose from the highest compression ratio but lowest pre-compression throughput at 10G to lowest compression ratio but highest pre-compression throughput at 40G.

Path MTU Discovery

FOS v7.3 supports path MTU discovery on Brocade 7840 to automatically discover IP MTU settings over the WANs.

Stream Based Flow Control

FOS v7.3 supports stream based flow control on Brocade 7840 to isolate slow devices from affecting performance of other devices for emulated devices sharing the same VE_Port.

Out of Order TCP Delivery

FOS v7.3 supports out of order TCP delivery on Brocade 7840 over WAN connections to minimize retransmission of FC frames in a scenario of TCP packet loss.

WAN Test Tool

FOS v7.3 supports a WAN test tool on Brocade 7840 to generate test traffic over a pair of IP addresses to test a WAN path for any network issue.

Monitoring and Alerting Policy Suite (MAPS) Enhancements

FOS v7.3 has a number of important MAPS feature enhancements. These include:

- Monitor Fabric Performance Impact
- Monitor new FCIP statistics on Brocade 7840
- Monitor fabric scalability limits
- Monitor ClearLink Diagnostic ports
- Monitor Ethernet management ports
- Monitor Flow Vision learning flows
- Support Port Decommissioning as an action
- Support dynamic groups
- Support port group augmentation
- Usability enhancements

Monitor Fabric Performance Impact

FOS v7.3 supports automatic monitoring and alerting of latency bottleneck conditions through pre-defined thresholds and alerts in all pre-defined policies in MAPS. The advanced monitoring capabilities identify ports in

two latency severity levels and provide intuitive reporting in MAPS dashboard under a new Fabric Performance Impact category.

Monitor FCIP statistics

FOS v7.3 supports new monitoring elements (RTT, Jitter) in the FCIP circuit group, adds a FCIP tunnel group to monitor tunnel state change and throughput, adds 4 FCIP tunnel QoS groups to monitor throughput and packet loss for each QoS priority. These new monitoring elements and groups are included in MAPS pre-defined policies and supported only on Brocade 7840.

Monitor fabric scalability limit

FOS v7.3 supports new monitoring elements in the switch group to monitor them against the fabric scalability limits supported by Brocade. These elements include number of device connections in a layer2 fabric, number of imported devices in a metaSAN, number of FCRs in a backbone fabric, and zoning database size. These new monitoring elements are included in MAPS pre-defined policies.

Monitor ClearLink Diagnostic (D_Port) ports

FOS v7.3 supports new monitoring elements for port error statistics (CRC, ITW, PE, LF, and LOSS_SYNC) in a new D_Port logical group to monitor D_Port tests so that the test results can be determined by thresholds in the MAPS rules. These new monitoring elements and groups are included in MAPS pre-defined policies.

Monitor Ethernet management port

FOS v7.3 supports monitoring Ethernet management port state in a new Ethernet port group to generate alerts if states for Ethernet management ports are changed. These new monitoring elements and group are included in MAPS pre-defined policies.

Monitor Flow Vision learning flows

FOS v7.3 supports importing and monitoring of learning flows created through Flow Vision in MAPS. Administrators can use this capability to configure thresholds and alerts for application flows without knowing the source or destination device identities in advance.

Support Port Decommissioning as an action

FOS v7.3 supports port decommissioning as an action that can be triggered by MAPS rules. With port decommissioning, ports can be gracefully shutdown in the event of violations without I/O interruption. FOS v7.3 supports port decommissioning on E_Port natively through MAPS. For port decommissioning on F_Port, Brocade Network Advisor 12.3 is required.

Support dynamic group based on user defined pattern

FOS v7.3 introduces dynamic group to enhance logic group definition for port objects. Administrators can create custom groups whose membership dynamically changes based on user defined port identity traits.

Support port group augmentation

FOS v7.3 implements port group augmentation to pre-defined groups and dynamic groups so that administrators can make small adjustments to group memberships without having to create a new group.

Usability enhancements

FOS v7.3 has a number of usability enhancements to MAPS. These include:

- Change *mapssam* CLI to display system CPU, memory, and flash usage.
- Change *mapsrule* and *logicalgroup* CLIs to make deletion of rules and groups easier.
- Add a new option to *mapsConfig* CLI to send test emails to validate email configuration.

Flow Vision Enhancements

FOS v7.3 has a number of important Flow Vision enhancements to the Flow Monitor, Flow Generator, and Flow Mirror functionalities.

Flow Monitor enhancements

FOS v7.3 extends the learning capability to Flow Monitor on E_Port and Ex_Port. FOS v7.3 also supports Flow Monitor for static and learning flows on XISL ports and backbone E_Port. These enhancements allow administrators to apply Flow Monitor function at all point of interests in most supported SAN topologies.

Flow Mirror enhancements

FOS v7.3 introduces Local Flow Mirror to mirror application flows to a mirror port on the same local switch where the flows are defined. This feature enables administrators to attach external analyzers to the mirror port to capture all frames belonging to the flows for deep analysis. FOS v7.3 enhance Flow Mirror to mirror flows originated from switch CPU and egress on a port, to mirror flows on either ingress or egress on F_Port and F_Port trunks. FOS v7.3 adds the support of combination of *-frametype* and *-ingrport* keywords and combination of *-frametype* and *-bidir* keywords in flow definition for Flow Mirror.

Flow Generator enhancements

FOS v7.3 introduces a system pre-defined flow *sys_gen_all_simports* for Flow Generator to generate test traffic from every SIM port in a switch to all the other SIM ports. This allows administrators to fully stress test a switch before deployment.

Miscellaneous Flow Vision enhancements

FOS v7.3 supports duplicated flow definition to be created but not activated in a switch. Administrators can create flows with the same parameters but for different Flow Vision functions. FOS v7.3 increases the maximum number of flows on fixed port switches to 128 user-defined flows and 128 sub flows and on backbone switches to 512 user-defined flows and 512 sub flows.

ClearLink Diagnostic (D_Port) Enhancements

FOS v7.3 implements following important D_Port feature enhancements.

D_Port and MAPS Integration

FOS v7.3 integrate D_Port test with MAPS threshold based monitoring. Administrators can use this ability to automatically monitor D_Port tests and determine D_Port test success or failure base on threshold settings within MAPS.

Dynamic D_Port and On-demand D_Port

FOS v7.3 implements dynamic D_Port and on-demand D_Port modes on ISLs. With these modes, administrators can configure D_Port test to be run automatically on ISLs after switch enable, slot enable, or port persistent enable.

D_Port Provision

FOS v7.3 implements D_Port provision list to be configured by CLI command portcfgdport (via --provision option). Ports on the pre-provisioned list do not need to be disabled before being configured as D_Port.

portCfgDport Show Result

FOS v7.3 enhances the D_Port test result displayed by portCfgDport command (via --show option) to clearly identify loopback connection type or remote port index.

Port LED Display D_Port Result

FOS v7.3 implements visually display D_Port test failure by flashing yellow on the port LED.

D_Port on FC16-64 Blade QSFPs

FOS v7.3 implements D_Port test on the FC compliant QSFPs for FC16-64 blade. Electrical loopback and optical loopback tests are not supported on these QSFPs. Only link saturation test and link distance and latency measurements are performed.

Read Diagnostics Parameters

FOS v7.3 introduces the Read Diagnostics Parameters feature to support reporting diagnostics parameters associated with optics and media for any link between Nx_port and Fx_port from any point within a fabric. Administrators can use this ability to discover and diagnose link related errors or degrading conditions from a single point anywhere within a fabric.

Link Cable Beacon (Port Peer Beacon)

FOS v7.3 introduces the support of Link Cable Beacon feature, with which administrators can run the *portpeerbeacon* command to turn on port LED beacon on both end of a link cable connection. Administrators can use this feature to quickly identify peer ports of a connection without physically tracing the cables in a data center.

E_Port Balance Priority Routing

FOS v7.3 enhances routing policy with the E_Port Balance Priority option. With this enhancement, when multiple paths to a domain exist, routing policy would assign routes so that the bandwidth demands from source ports are evenly distributed among all E_Ports.

FCR enhancements

FOS v7.3 adds a number of enhancements to FCR.

lsanZoneShow Change

FOS v7.3 enhances CLI lsanZoneShow (via -d option) to display the fabric IDs for devices exist in a fabric and devices imported to a fabric.

lsCfg Change

FOS v7.3 enhances CLI lsCfg (via --show -n option) to display additional information for a logical switch.

Fabric Alias Name

FOS v7.3 supports assigning alias names to each edge fabric IDs. Administrator can use the fabric alias name to represent each edge fabric.

Security Enhancements

FOS v7.3 has a number of important security enhancements.

FCAP and DH-CHAP Enhancements

FOS v7.3 supports SHA-256 hashing algorithm for FCAP and DH-CHAP in both FIPS mode and non-FIPS mode to provide stronger security.

In-flight Encryption Enhancements

FOS v7.3 supports in-flight encryption with session keys derived from FCAP. With this enhancement, administrators can use FCAP and in-flight encryption features at the same time.

Fabric-wide Consistency Policy Enhancements

FOS v7.3 supports FCRs to be present in a fabric with strict fabric-wide consistency policy configuration. Administrators can turn on strict fabric-wide consistency policy even when an FCR is connected to the fabric via an Ex_Port.

Open Source Software Packages

FOS v7.3 upgrades a number of important open source software packages (openSSH, openSSL, Apache) to provide stronger security.

Access Gateway Enhancements

FOS v7.3 implements following Access Gateway (AG) enhancements.

ClearLink Diagnostics (D_Port) Support on AG

FOS v7.3 supports dynamic D_Port on connections between an AG and an HBA to allow automatically start D_Port test requested by an HBA.

User Account and Password Distribution to AG

FOS v7.3 supports user account and password database distribution from a native switch to an AG so that user accounts and passwords can be managed the same way as native switches in a fabric.

Fabric Device Management Interface (FDMI) Data Access on AG

FOS v7.3 adds the support of accessing device information for devices that are registered with FDMI and connected through AGs.

Zoning Enhancements

FOS v7.3 enhances zoning to disallow two fabrics with empty zoning configuration to merge if one fabric has All Access as default zone access mode and the other has No Access as default zone access mode. This enhancement prevents the fabric with All Access default zone access mode from losing all device connections due to converting to No Access default zone access mode after fabrics merging.

High Integrity Fabric

FOS v7.3 introduces support of High Integrity Fabric mode to ensure strict and consistent fabric configurations required by a FICON fabric, which include Insistent Domain ID and strict fabric-wide Switch Connection Control policy. Administrators can use the High Integrity Fabric mode to enforce these configurations for a FICON fabric.

RAS Enhancements

FOS v7.3 implements the following RAS enhancements.

Frame Viewer (Class 3 Discard Log) Enhancements

FOS v7.3 enhances Frame Viewer to capture two new types of class 3 discard frames. The new discard types captured include destination unreachable frames and unroutable frames.

Audit Log for Class 3 Discard Frames

FOS v7.3 adds to audit log message for each class 3 discard frame. This ability to allow administrator to configure audit log to send class 3 discard frame messages to a centralized syslog server, which does not have size limitation of a switch Frame Viewer log.

Forward Error Correction (FEC) Enhancements

FOS v7.3 adds the ability to allow FEC capability negotiation during speed negotiation in Transmitter Training Signal. This ability can be configured by existing CLI command portCfgFec.

Firmware Download Enhancement

FOS v7.3 introduces firmware sync ability for the firmware on an active CP to be automatically synced to a standby CP after the standby CP is hot-plugged into a backbone switch chassis. Administrator can configure this ability on their chassis to enable quick operational replacement of a standby CP.

Rolling Reboot Detection Enhancements

FOS v7.3 enhances the rolling reboot detection feature to detect and stop a rolling reboot in disabled FOS switch state as a first attempt. This would enable an administrator to capture more diagnostic information.

New external RASLOG for Link Reset

FOS v7.3 adds a new external RASLOG (Cx-1014) for Link Reset due to credit loss for both front-end and back-end ports.

supportInfoClear Command

FOS v7.3 introduces a new CLI command supportInfoClear to clear a number of statistics counters and logs. This command can help administrators to quickly reset the counters and logs on behalf of switch vendors in support scenarios.

Brocade 8510 ICL Scalability Enhancement

FOS v7.3 increases the supported number 8510 chassis connected via ICL in a core-edge topology to twelve switches.

Miscellaneous Enhancements

trunkShow CLI Enhancement

FOS v7.3 adds to CLI trunkShow (via -swname option) to display the switch name of the neighboring switch connected on the other end of trunked ports.

fabricShow CLI Enhancement

FOS v7.3 adds to CLI fabricShow (via -version option) to display the firmware version of each switch listed in the fabricShow output.

portShow and portName CLI Enhancement

FOS v7.3 enhances the CLI portShow and portName to display as port name the host name registered with FDMI for the host system attached to that port. Administrators must enable the "Display FDMI Host Name" configuration via the configure CLI.

fspfShow and lsdbShow CLI Enhancement

FOS v7.3 changes fspfShow and lsdbShow CLI output to omit all zero value to be listed in port bitmap values.

Device Probing and Update on ALPA 0xC0 and 0x40

FOS v7.3 enhances FCP probing for devices connected to a port with ALPA 0xC0 and 0x40 to obtain the device information for NS entry.

For base devices that logged in with ALPA 0xC0 and 0x40, FOS v7.3 provides the ability to update NS entries when these base devices perform logout. Administrators can turn on this update mode to ensure NS and login database consistency with "F-port Device Update Mode" option under the "Fabric parameters" section of the configure CLI. This option can only be changed when a switch is disabled.

NPIV Base Device Logout Enhancements

FOS v7.3 enhances NPIV by allowing NPIV devices remain logged in on a port to a fabric when the base device on the same port performs a logout. Administrator can configure this feature via the portCfgFlogiLogout CLI.

fosExec Remote Execution

FOS v7.3 adds the ability to execute a FOS CLI command via fosExec CLI on a remote domain in the fabric. Administrators can enable this capability to execute CLI commands on multiple switches from a single switch in a fabric.

CS_CTL QoS Enhancements

FOS v7.3 enhances CS_CTL based QoS feature by reporting the CS_CTL auto mode in responses to device FLOGI, FDISC, and PLOGI requests.

bottleneckMon CLI Change

FOS v7.3 deprecates the back-end credit recovery options in the bottleneckMon CLI. These options are supported via the existing creditRecovMode CLI.

Maximum Auto Speed Negotiation

FOS v7.3 allows configuring a maximum speed for port auto speed negotiation with CLI portcfgspeed (via -m option). Administrators can use this to control the maximum speed a device is allowed to join a fabric but still allow port speed to be auto negotiated.

Back-end credit recovery on FX8-24 blade

FOS v7.3 enhances back-end credit loss detection and recovery to back-end links on FX8-24 with the existing CLI command creditRecovMode.

aptPolicy change

FOS v7.3 deprecates AP policy related configuration from the CLI command aptPolicy. AP policy is used only by FR4-18i blade, which is not supported since FOS 7.1.

slotPowerOn and slotPowerOff enhancement

FOS v7.3 supports slotPowerOn and slotPowerOff command on core blades in a DCX/DCX-4 or DCX 8510/DCX 8510-4 chassis. Administrators can use this command to power on or off a core blade without physical presence.

Port Transition from Persistent Disabled to Disabled

FOS v7.3 supports directly transition a persistently disabled port to the disabled state without having to persistently enable the port first. Administrator can configure this option via the new portCfgPersistence command

portBeacon Change

FOS v7.3 enhances the portBeacon command to list all beaconing ports in a switch (via -all option).

ethif Command

FOS v7.3 introduces a new CLI command ethif to manage the switch Ethernet management interfaces. With this command, administrator can configure and show the state Ethernet management interfaces.

haRedundancy Command

FOS v7.3 introduces a new CLI command haRedundancy to display switch uptime and HA redundancy settings for a backbone switch.

Optionally Licensed Software

Fabric OS v7.3 includes all basic switch and fabric support software, as well as optionally licensed software that is enabled via license keys.

Optionally licensed features include:

Brocade Ports on Demand—Allows customers to instantly scale the fabric by provisioning additional ports via license key upgrade. (Applies to select models of switches).

Brocade Extended Fabrics—Provides greater than 10km of switched fabric connectivity at full bandwidth over long distances (depending on platform this can be up to 3000km).

> **Note:**
> If a port on 16G FC blades or a 16G switch is configured to operate at 10G speed, Extended fabrics license is not needed to enable long distance connectivity on that port.

Brocade ISL Trunking— Provides the ability to aggregate multiple physical links into one logical link for enhanced network performance and fault tolerance. Also includes Access Gateway ISL Trunking on those products that support Access Gateway deployment.

Brocade Advanced Performance Monitoring—Enables performance monitoring of networked storage resources. This license includes the Top Talkers feature.

Brocade Fabric Watch — Monitors mission-critical switch operations. Fabric Watch includes Port Fencing capabilities.

Brocade Fabric Vision – Enables MAPS (Monitoring and Alerting Policy Suite), Flow Vision, and ClearLink (D_Port) to non-Brocade devices. MAPS enables rules based monitoring and alerting capabilities, provides comprehensive dashboards to quickly troubleshoot problems in Brocade SAN environments. Flow Vision enables host to LUN flow monitoring, application flow mirroring for non-disruptive capture and deeper analysis, and test traffic flow generation function for SAN infrastructure validation. D_Port to non-Brocade devices allows extensive diagnostic testing of links to devices other than Brocade switches and adapters. (Functionality requires support by attached device, availability TBD).

Fabric Vision license also enables Fabric Watch and Advanced Performance Monitoring functionalities without requiring Brocade Fabric Watch or Brocade Advanced Performance Monitoring license (with FOS v7.2 and later only).

Note:

> If installed on a switch operating with FOS v7.1.x, the Fabric Vision license will be displayed as "Fabric Insight".   If installed on a switch operating with FOS v7.0.x or earlier, the Fabric Vision license will be displayed as "Unknown". Fabric Vision features are not supported under FOS v7.1.x or earlier.

FICON Management Server— Also known as "CUP" (Control Unit Port), enables host-control of switches in Mainframe environments.

Enhanced Group Management — This license enables full management of devices in a data center fabric with deeper element management functionality and greater management task aggregation throughout the environment. This license is used in conjunction with Brocade Network Advisor application software and is applicable to all FC platforms supported by FOS v7.0 or later.

> **Note:** This capability is enabled by default on all Gen 5 65XX model switches and DCX 8510 platforms, and on DCX and DCX-4S platforms that are running Fabric OS v7.0.0 or later. Gen 5 embedded switches receive this capability by default with FOS v7.2.1 and later. Individual upgrade is required when upgrading directly to FOS v7.2.1 on Gen 5 embedded switches. Subsequent group operations on Gen 5 embedded switches including group upgrade are supported..

Adaptive Networking with QoS—Adaptive Networking provides a rich framework of capability allowing a user to ensure high priority connections obtain the bandwidth necessary for optimum performance, even in congested environments. The QoS SID/DID Prioritization and Ingress Rate Limiting features are the first components of this license option, and are fully available on all 8Gb and 16Gb platforms.

> **Note :**
>
> With FOS v7.2, the Adaptive Networking license has become part of the base FOS firmware, and features under this license no longer require the license to be installed. Customers that wish to have these capabilities without purchasing the license are required to upgrade to FOS v7.2 or later.
>
> Brocade 6520 does not require the Adaptive Networking with QoS license to enable the capabilities associated with this license. These capabilities are included by default on the Brocade 6520.

Server Application Optimization — When deployed with Brocade Server Adapters, this license optimizes overall application performance for physical servers and virtual machines by extending virtual channels to the server infrastructure. Application specific traffic flows can be configured, prioritized, and optimized throughout the entire data center infrastructure. This license is not supported on the Brocade 8000.

> **Note :**
>
> With FOS v7.2, Server Application Optimization license has become part of the base FOS firmware, and features under this license no longer require the license to be installed. Customers that wish to have these capabilities without purchasing the license are required to upgrade to FOS v7.2 or later.
>
> Brocade 6520 does not require the SAO license to enable the capabilities associated with this license. These capabilities are included by default on the Brocade 6520.

Integrated Routing— This license allows any port in a DCX 8510-8, DCX 8510-4, Brocade 6510, Brocade 6520, DCX-4S, DCX, 5300, 5100, 7800, 7840, or Brocade Encryption Switch to be configured as an Ex_port or VEx_port (on some platforms) supporting Fibre Channel Routing.

Encryption Performance Upgrade — This license provides additional encryption processing power. For the Brocade Encryption Switch or a DCX/DCX-4S/DCX 8510-8/DCX 8510-4, the Encryption Performance License can be installed to enable full encryption processing power on the BES or on all FS8-18 blades installed in a DCX/DCX-4S/DCX 8510-8/DCX 8510-4 chassis.

DataFort Compatibility — This license is required on the Brocade Encryption Switch or DCX/DCX-4S/DCX 8510-8/DCX 8510-4 with FS8-18 blade(s) to read and decrypt NetApp DataFort-encrypted disk and tape LUNs. DataFort Compatibility License is also required on the Brocade Encryption Switch or DCX/DCX-4S/DCX 8510-8/DCX 8510-4 Backbone with FS8-18 Encryption Blade(s) installed to write and encrypt the disk and tape LUNs in NetApp DataFort Mode (Metadata and Encryption Algorithm) so that DataFort can read and decrypt these LUNs. DataFort Mode tape encryption and compression is supported beginning with the FOS v6.2.0 release on DCX platforms. Availability of the DataFort Compatibility license is limited; contact your vendor for details.

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 high traffic load. This license is available on the 7800, 7840, and the DCX/DCX-4S/DCX 8510-8/DCX 8510-4 for the FX8-24 on an individual slot basis.

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, Brocade 6520 this license enables 10G FC ports. This license is not applicable to Brocade 7840 or Brocade 6505.

> **On FX8-24:**
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> With this license installed and assigned to a slot with an FX8-24 blade, two additional operating modes (in addition to 10 1GbE ports mode) can be selected:
>
> - 10 1GbE ports and 1 10GbE port, or
>
> - 2 10GbE ports
>
> **On FC16-xx:**
>
> - Enables 10G FC capability on an FC16-xx blade in a slot that has this license
>
> **On Brocade 6510, Brocade 6520:**
>
> - Enables 10G FC capability on Brocade 6510 and Brocade 6520.

This license is available on the DCX/DCX-4S/DCX 8510-8/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 7800, 7840, and the DCX/DCX-4S/DCX 8510-8/DCX 8510-4 for the FX8-24 on an individual slot basis.

7800 Port Upgrade – This license allows a Brocade 7800 to enable 16 FC ports (instead of the base four ports) and six GbE ports (instead of the base two ports). This license is also required to enable additional FCIP tunnels and also for advanced capabilities like tape read/write pipelining.

ICL 16-link, or Inter Chassis Links -- This license provides dedicated high-bandwidth links between two Brocade DCX chassis, without consuming valuable front-end 8Gb ports. Each chassis must have the 16-link ICL license installed in order to enable the full 16-link ICL connections. (Available on the DCX only.)

ICL 8-Link – This license activates all eight links on ICL ports on a DCX-4S chassis or half of the ICL bandwidth for each ICL port on the DCX platform by enabling only eight links out of the sixteen links available. This allows users to purchase half the bandwidth of DCX ICL ports initially and upgrade with an additional 8-link license to utilize the full ICL bandwidth at a later time. This license is also useful for environments that wish to create ICL connections between a DCX and a DCX-4S, the latter of which cannot support more than 8 links on an ICL port. Available on the DCX-4S and DCX platforms only.

ICL POD License – This license activates ICL ports on core blades of DCX 8510 platforms. An ICL 1st POD license only enables half of the ICL ports on CR16-8 core blades of DCX 8510-8 or all of the ICL ports on CR16-4 core blades on DCX 8510-4. An ICL 2nd POD license enables all ICL ports on CR16-8 core blades on a DCX 8510-8 platform. (The ICL 2nd POD license does not apply to the DCX 8510-4.)

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.

Note that 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. This license is recognized/displayed when operating with FOS v7.0.1 but enforced with FOS v7.1.0 or later.

> **Note:** The EICL license supports a maximum of nine DCX 8510 chassis connected in a full mesh topology or up to twelve 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 the additional WAN throughput up to 10 Gbps on Brocade 7840. The base configuration of Brocade 7840 without the WAN Rate Upgrade 1 license provides WAN throughput up to 5 Gbps.

WAN Rate Upgrade 2 License – The WAN Rate Upgrade 2 license provides unlimited WAN throughput (other than the hardware limit) on Brocade 7840. The WAN Rate Upgrade 2 licenses also enable the use of two 40GbE ports on 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. They control the aggregate bandwith for all tunnels on a Brocade 7840. The entire capacity controlled by the licenses can be assigned to a single tunnel subject to hardware limitation, 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.

Temporary License Support

The following licenses are available in FOS v7.3 as Universal Temporary or regular temporary licenses:

- Fabric (E_Port) license
- Extended Fabric license
- Trunking license
- High Performance Extension license
- Advanced Performance Monitoring license
- Fabric Watch license
- Integrated Routing license
- Advanced Extension license
- Advanced FICON Acceleration license
- 10GbE FCIP/10GFibre Channel license
- FICON Management Server (CUP)
- Enterprise ICL license
- Fabric Vision license

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 only be installed once on a particular switch, but can be applied to as many switches as desired. Temporary use duration (the length of time the feature will be enabled on a switch) is provided with the license key. All Universal Temporary license keys have an expiration date upon which the license can no longer be installed on any unit.

Supported Switches

FOS v7.3.0 supports the following platforms:

- 300, 5100, 5300, 7800, VA-40FC, Brocade Encryption Switch, DCX, DCX-4S
- 6510, 6505, 6520, 7840, DCX 8510-8, DCX 8510-4
- FC8-16, FC8-32, FC8-48, FC8-64, FX8-24, FS8-18, FCOE10-24
- FC16-32, FC16-48, FC16-64, FC8-32E, FC8-48E
- 5410, M5424, 5430, 5431, 5432, 5450, 5460, 5470, 5480, NC-5480
- 6547, 6548, M6505

Access Gateway mode is also supported by Fabric OS v7.3, and is supported on the following switches: the Brocade 300, 5100, VA-40FC, 5410, 5430, 5431, 5450, 5460, 5470, 5480, NC-5480, M5424, 6547, 6548, M6505, 6510, 6505.

The Brocade 8000 is not supported with FOS v7.2.0 and later.

Standards Compliance

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 Brocade Web site: *http://www.brocade.com/sanstandards*

The FCOE10-24 blade conforms to the following Ethernet standards:

- IEEE 802.1D   Spanning Tree Protocol
- IEEE 802.1s   Multiple Spanning Tree
- IEEE 802.1w   Rapid reconfiguration of Spanning Tree Protocol
- IEEE 802.3ad   Link Aggregation with LACP
- IEEE 802.3ae   10G Ethernet
- IEEE 802.1Q   VLAN Tagging
- IEEE 802.1p   Class of Service Prioritization and Tagging
- IEEE 802.1v   VLAN Classification by Protocol and Port
- IEEE 802.1AB   Link Layer Discovery Protocol (LLDP)
- IEEE 802.3x   Flow Control (Pause Frames)

The following draft versions of the Converged Enhanced Ethernet (CEE) and Fibre Channel over Ethernet (FCoE) Standards are also supported on the FCOE10-24 blade:

- IEEE 802.1Qbb   Priority-based Flow Control
- IEEE 802.1Qaz   Enhanced Transmission Selection
- IEEE 802.1   DCB Capability Exchange Protocol (Proposed under the DCB Task Group of IEEE 802.1 Working Group)
- FC-BB-5   FCoE (Rev 2.0)

Technical Support

Contact your switch supplier for hardware, firmware, and software support, including product repairs and part ordering. 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 FOS v6.2 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 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 are shown here:

FT00X0054E9

AVS0305E012

The serial number label is located as follows:

- Brocade Encryption Switch, VA-40FC, 300, 5100, 5300, 6510, 6505, 6520 — On the switch ID pull-out tab located on the bottom of the port side of the switch

- Brocade 7800, 7840 — 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 front)

- Brocade DCX, DCX 8510-8 — Bottom right of the port side

- Brocade DCX-4S, DCX 8510-4 — Back, upper left under the power supply

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, except for the Brocade DCX/DCX-4S and DCX 8510-8/DCX 8510-4. For the Brocade DCX/DCX-4S and DCX 8510-8/DCX 8510-4 access the numbers on the WWN cards by removing the Brocade logo plate at the top of the non-port side. The WWN is printed on the LED side of both cards.

1. **License Identifier (License ID)**

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

Use the **licenseIdShow** command to display the License Identifier.

FOS Migration Considerations

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

FOS Upgrade and Downgrade Special Considerations

DCX/DCX-4S units running any FOS v7.2.x can be non-disruptively upgraded to FOS v7.3.0a. This upgrade is non-disruptive to both FC and FCoE traffic (when using FCOE10-24 blades).

Any firmware activation on Brocade 7800, or DCX, DCX-4S, DCX 8510-8, DCX 8510-4 with FX8-24 will disrupt I/O traffic on the FCIP links.

Disruptive upgrades to Fabric OS v7.3.0a are allowed and supported from FOS v7.1.x (up to a two-level migration) using the optional "-s" parameter with the *firmwaredownload* command.

If there are multiple node EGs (encryption groups) in a fabric, please complete firmwaredownload on one node at a time before downloading on another node.

Recommended Migration Paths to FOS v7.3.0a

Migrating from FOS v7.2

Any 8G or 16G platform running any FOS v7.2.x firmware can be non-disruptively upgraded to FOS v7.3.0a.

Migrating from FOS v7.1

Any 8G or 16G platform operating at FOS v7.1.x must be upgraded to FOS v7.2.x before non-disruptively upgrading to FOS v7.3.0a.

Disruptive upgrade to FOS v7.3.0a from FOS v7.1 is supported.

Important Notes

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

Issues that may significantly impact testing of the new hardware platforms are captured in the Defect Tables at the end of this document.

Brocade Network Advisor Compatibility

Brocade Network Advisor greatly simplifies the steps involved in daily operations while improving the performance and reliability of the overall SAN and IP networking environment. Brocade Network Advisor unifies, under a single platform, network management for SAN, LAN and converged networks. Brocade Network Advisor provides a consistent user experience, across the entire Brocade portfolio of switches, routers and adapters.

Brocade Network Advisor provides health and performance dashboards, with an easy-to-use graphical user interface and comprehensive features that automate repetitive tasks. With Brocade Network Advisor, storage and network administrators can proactively manage their SAN environments to support non-stop networking, address issues before they impact operations, and minimize manual tasks.

Brocade Network Advisor is available with flexible packaging and licensing options for a wide range of network deployments and for future network expansion. Brocade Network Advisor 12.3.0 is available in

- SAN-only edition
- IP-only edition
- SAN+IP edition.

For SAN Management, Network Advisor 12.3.0 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 one FOS fabric at a time and up to 1,000 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 thirty-six physical or virtual fabrics (FOS) and up to 2,560 switch ports. It supports Brocade backbone and director products (DCX 8510-4/DCX-4S, 48Ks, etc.), 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 Brocade HBAs / CNAs.

- *Network Advisor Enterprise*: a management application designed for enterprise-class SANs for managing up to thirty-six physical or virtual fabrics and up to 9,000 switch ports. Network Advisor SAN Enterprise supports all the hardware platforms and features that Network Advisor Professional Plus supports, and adds support for the Brocade DCX Backbone (DCX 8510-8/DCX) and Fiber Connectivity (FICON) capabilities.

More details about Network Advisor's new enhancements can be found in the Network Advisor 12.3.0 Release Notes, Network Advisor 12.3.0 User Guide, and Network Advisor 12.3.0 Installation, Migration, & Transition Guides.

Note:

Brocade Network Advisor 12.3.0 or later is required to manage switches running FOS 7.3.0 or later.

The Brocade Network Advisor seed switch should always have the highest FOS version used in the fabric.

WebTools Compatibility

FOS v7.3.0 is qualified and supported with Oracle JRE 1.7.0 update 60. Please refer to Other Important Notes and Recommendations section for more details.

SMI Compatibility

- It is important to note that host SMI-S agents cannot be used to manage switches running FOS v7.3.

  If users want to manage a switch running FOS v7.3 using SMI-S interface, they must use Brocade Network Advisor's integrated SMI agent.

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. Brocade recommends using 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 prior to installing on your switch. Use only FOS versions that are supported by the provider.

For a list of the effective end-of-life dates for all versions of Fabric OS, visit the following Brocade Web site:

http://www.brocade.com/support/end_of_life.jsp

Supported Products and FOS Interoperability	
4900, 7500, 7500e, 5000, 200E, 48K Brocade 4012, 4016, 4018, 4020, 4024, 4424	v6.2.2 or later[5]
Brocade 5410, 5480, 5424, 5450, 5460, 5470, NC-5480	v6.2.0 or later[5]
Brocade 6548, 5432	V7.2.1 of later[9]
Brocade DCX, 300, 5100, 5300	v6.1.0e and later [1] [5] [7]
VA-40FC	v6.2.1_vfc [5], v6.2.2 or later [5]
Brocade DCX-4S	v6.2.0 or later [5] [7]
Brocade DCX with FS8-18 blade(s), Brocade Encryption Switch	v6.1.1_enc or later [5]
Brocade 7800, DCX and DCX-4S with FCOE10-24 or FX8-24 blades	V6.3.0 or later
Brocade 8000[9]	V6.1.2_CEE1 or later
Brocade DCX/DCX-4S with FA4-18 blade(s)	DCX requires v6.0.x or later [5], DCX-4S requires 6.2.x or later[4] [7]
Brocade DCX 8510-8/DCX 8510-4	FOS v7.0 or later
Brocade DCX 8510-8/DCX 8510-4 with FC16-64 blade	FOS v7.3.0 or later
Brocade DCX 8510-8 with FCOE10-24 blade	FOS v7.3.0 or later
Brocade 6510	FOS v7.0 or later
Brocade 6505	FOS v7.0.1 or later
Brocade 6520	FOS v7.1 or later
Brocade 7840	FOS v7.3.0 or later
5430	FOS v7.1 or later[9]
5431, 6547, M6505	FOS v7.2 or later[9]

Supported Products and FOS Interoperability	
48000 with FA4-18 blade(s), Brocade 7600	V6.2.2 or later [5]
Mi10k, M6140 (McDATA Fabric Mode and Open Fabric Mode)	Not Supported

Multi-Protocol Router Interoperability	
Brocade 7500 and FR4-18i blade	V6.2.2 and higher [3] [5] [7]
McDATA SANRouters 1620 and 2640	Not Supported

NOS (VDX Platform) Interoperability	
Brocade VDX6710, VDX6720, VDX6730	NOS v2.1.1 or later[6]
Brocade VDX8770	NOS 3.0 or later

Table Notes:

[1] When directly attached to a Host or Target that is part of an encryption flow.

[2] These platforms may not be directly attached to hosts or targets for encryption flows.

[3] McDATA 1620 and 2640 SANRouters should not be used with FOS-based routing (FCR) for connections to the same edge fabric.

[4] FA4-18 is not supported in a DCX/DCX-4S that is running FOS v7.0 or later

[5] If operating with **FOS v6.2.2e or earlier**, Adaptive Networking QoS must be disabled when connecting to 16G FC platform. Otherwise, ISL will segment.

[6] Connectivity to FC SAN is established via VDX6730 connected to FCR running FOS v7.0.1 or later. FCR platforms supported include 5100, VA-40FC, 5300, 7800, DCX, DCX-4S, DCX 8510-8, DCX 8510-4, 6510, 6520 (requires FOS v7.1 or later). For higher FCR backbone scalability (refer to separate "Brocade SAN Scalability Guidelines" documentation for details), please use 5300, 6520, DCX, DCX-4S, DCX 8510-8, and DCX 8510-4.

[7] FR4-18i and FC10-6 are not supported on DCX/DCX-4S on FOS v7.1 or later.

[8] Brocade 8000 is not supported with FOS v7.2 or later.

[9] Represents the earliest major FOS version. These embedded platforms running respective dedicated FOS versions can also interoperate with FOS v7.2.

Zoning Compatibility Note:

Users are recommended to upgrade to the following versions of firmware when interoperating with a switch running FOS v7.0 or later in the same layer 2 fabric to overcome some of the zoning operations restrictions that otherwise exist:

Main code level	Patch code levels with full zoning compatibility
FOS v6.2	FOS v6.2.2d or later
FOS v6.3	FOS v6.3.2a or later

FOS v6.4	FOS v6.4.1 or later

If there are switches running FOS versions lower than the above listed patch levels in the same fabric as a switch with FOS v7.0 or later, then cfgsave and cfgenable operations **initiated** from these switches will fail if the zoning database is greater than 128KB. In such scenarios zoning operations such as cfgsave/cfgenable can still be performed successfully if initiated from a switch running FOS v7.0 or later.

SNMP Support

Starting with FOS v7.2.0, the *Fabric OS MIB Reference* document is not updated. You can obtain the latest MIBs from the downloads area of MyBrocade site after logging in.

For information about SNMP support in Fabric Operating System (FOS) and how to use MIBs, see the *Fabric OS Administrator's Guide*.

Obtaining the MIBs

You can download the MIB files required for this release from the downloads area of the MyBrocade site.

To download the Brocade-specific MIBs from the Brocade Technical Support website, you must have a user name and password.

1.   On your web browser, go to http://my.brocade.com.

2.   Login with your user name and password.

3.   Click the downloads tab.

4.   On the downloads tab, under Product Downloads, select All Operating Systems from the Download by list.

5.   Select Fabric Operating System (FOS), and then navigate to the release.

6.   Navigate to the link for the MIBs package and either open the file or save it to disk.

NOTE: Distribution of standard MIBs has been stopped. Download the required standard MIBs from the *http://www.oidview.com/ or http://www.mibdepot.com/* website.

FOS v7.3.0a Changes in SNMP MIBs and Objects

This release introduces the following changes in MIBs and objects.

New MIBs

There are no new MIBs introduced in this patch release.

Modified MIBs

The "swIODState" MIB object is newly added to the **SW.mib** to display the In-Order delivery (IOD) state.

MIB Object and OID	Description
swIODState 1.3.6.1.4.1.1588.2.1.1.1.1.38	The MIB object represents the IOD feature state. Possible values are: • 1 – enabled • 2 – disabled • 3 – unknown

FOS v7.3.0 Changes in SNMP MIBs and Objects

This release introduces the following changes in MIBs and objects:

New MIBs

There are no new MIBs introduced in this release.

Updated MIBs

The following existing MIBs are supported for Brocade 7840 platform.

- **BRCD-FCIP-EXT-MIB**

Table Name	Is Supported	Description
fcipExtendedLinkTable	Yes	This table contains statistical information about FCIP tunnel compression, retransmission, packet loss, and latency details. The information stored in this table is returned in response to **portshow fciptunnel** commands.
fcipConnStatsTable	Yes	The table contains statistical information about FCIP tunnel compression, retransmission, packet loss, and latency details. **Note:** This table shows circuits and TCP connections stats. However, for Brocade 7840 platform this table shows only circuit stats.

- **IF-MIB**

Table Name	Is Supported	Description
ifTable	Yes	This table contains the statistics of switch interfaces including FCIP tunnels.
ifXTable	Yes	This table is enhanced version of ifTable.
ifTestTable	No	Not supported.
ifStackTable	No	Not supported.
ifRcvAddressTable	No	Not supported.

- **FCIP-MGMT-MIB**

Table Name	Is Supported	Description
fcipEntityInstanceTable	Yes	This table contains the information related to FCIP entities.
fcipLinkErrorsTable	No	Not supported.
fcipLinkTable	Yes	This table contains the information about link of FCIP entities.
fcipTcpConnTable	No	Not supported.

ifRcvAddressTable	No	Not supported.

MIB Objects

fcipExtendedLinkTable

This table contains statistical information about FCIP tunnel compression, retransmission, packet loss, and latency details.

MIB Object and OID	Description
fcipExtendedLinkIfIndex 1.3.6.1.4.1.1588.4.1.1.1	The ifIndex value of the virtual interface corresponding to the FCIP tunnels running over TCP/IP.
fcipExtendedLinkTcpRetransmits 1.3.6.1.4.1.1588.4.1.1.2	The number of retransmitted packets.
fcipExtendedLinkTcpDroppedPackets 1.3.6.1.4.1.1588.4.1.1.3	The number of dropped packets.
fcipExtendedLinkTcpSmoothedRTT 1.3.6.1.4.1.1588.4.1.1.4	The round trip time (latency) in milliseconds for a transfer over an FCIP tunnel.
fcipExtendedLinkCompressionRatio 1.3.6.1.4.1.1588.4.1.1.5	The ratio between compressed bytes and raw bytes over an FCIP tunnel.
fcipExtendedLinkRawBytes 1.3.6.1.4.1.1588.4.1.1.6	The total number of raw bytes sent or received.
fcipExtendedLinkCompressedBytes 1.3.6.1.4.1.1588.4.1.1.7	The total number of compressed bytes received over an FCIP tunnel.
fcipExtendedLinkConnectedCount 1.3.6.1.4.1.1588.4.1.1.8	The total number of TCP session connections.
fcipExtendedLinkRtxRtxTO 1.3.6.1.4.1.1588.4.1.1.9	A counter containing retransmit packets due to timeout.
fcipExtendedLinkRtxDupAck 1.3.6.1.4.1.1588.4.1.1.10	A counter containing retransmit packets due to duplicate acknowledgement.
fcipExtendedLinkDupAck 1.3.6.1.4.1.1588.4.1.1.11	A counter containing duplicate acknowledgement packets.
fcipExtendedLinkRtt 1.3.6.1.4.1.1588.4.1.1.12	The round trip time in milliseconds.
fcipExtendedLinkOoo 1.3.6.1.4.1.1588.4.1.1.13	A counter containing TCP out-of-order.
fcipExtendedLinkSlowStarts 1.3.6.1.4.1.1588.4.1.1.14	A counter containing slow starts.

fcipConnStatsTable

This table contains statistical information about FCIP circuit and connection compression, retransmission, packet loss, and latency details. For Brocade 7840 platform this table shows only circuit stats.

MIB Object and OID	Description
xfcipEntityId 1.3.6.1.4.1.1588.4.2.1.1	The FCIP entity identifier.
xfcipLinkIfIndex 1.3.6.1.4.1.1588.4.2.1.2	The ifIndex value of the virtual interface corresponding to the FCIP Link running over TCP/IP.
xfcipLinkIndex 1.3.6.1.4.1.1588.4.2.1.3	An arbitrary integer that uniquely identifies one FCIP link within an FCIP entity.
xfcipExtendedLinkTcpRetransmits 1.3.6.1.4.1.1588.4.2.1.4	The number of retransmitted packets.
xfcipExtendedLinkTcpDroppedPackets 1.3.6.1.4.1.1588.4.2.1.5	The number of dropped packets.
xfcipExtendedLinkTcpSmoothedRTT 1.3.6.1.4.1.1588.4.2.1.7	The round trip time (latency) in milliseconds.
xfcipExtendedLinkCompressionRatio 1.3.6.1.4.1.1588.4.2.1.6	The compression ratio of the link.
xfcipExtendedLinkRawBytes 1.3.6.1.4.1.1588.4.2.1.8	The total number of raw bytes sent or received.
xfcipExtendedLinkCompressedBytes 1.3.6.1.4.1.1588.4.2.1.9	The total number of compressed bytes sent or received.

ifTable

This table contains the statistics of switch interfaces including FCIP tunnels.

MIB Object and OID	Description
ifIndex .1.3.6.1.2.1.2.2.1.1	The interface index.
ifDesc .1.3.6.1.2.1.2.2.1.2	The description of the interface.
ifType .1.3.6.1.2.1.2.2.1.3	The media type.
ifMtu .1.3.6.1.2.1.2.2.1.4	The largest size packet that can be transmitted.
ifSpeed .1.3.6.1.2.1.2.2.1.5	The interface speed in Mbps.

MIB Object and OID	Description
ifPhysAddress .1.3.6.1.2.1.2.2.1.6	The physical address of the interface.
ifAdminStatus .1.3.6.1.2.1.2.2.1.7	The admin status of the interface
ifOperStatus .1.3.6.1.2.1.2.2.1.8	The operational status of the interface.
ifLastChange .1.3.6.1.2.1.2.2.1.9	The operational state time.
ifInOctets .1.3.6.1.2.1.2.2.1.10	The number of received bytes.
ifInUcastPkts .1.3.6.1.2.1.2.2.1.11	The number of received unicast packets.
ifInNUcastPkts .1.3.6.1.2.1.2.2.1.12	This object is deprecated in favour of ifInMulticastPkts and ifInBroadcastPkts.
ifInDiscards .1.3.6.1.2.1.2.2.1.13	The number of discarded packets.
IfInErrors .1.3.6.1.2.1.2.2.1.14	The number of received packets having errors.
ifInUnknownProtos .1.3.6.1.2.1.2.2.1.15	The number of received packets having unknown or unsupported protocols.
ifOutOctets .1.3.6.1.2.1.2.2.1.16	The number of transmitted bytes.
ifOutUcastPkts .1.3.6.1.2.1.2.2.1.17	The number of transmitted unicast packets.
ifOutNUcastPkts .1.3.6.1.2.1.2.2.1.18	This object is deprecated in favour of ifOutMulticastPkts and ifOutBroadcastPkts.
ifOutDiscards .1.3.6.1.2.1.2.2.1.19	The number of discarded outgoing packets.
ifOutErrors .1.3.6.1.2.1.2.2.1.20	The number of outgoing packets not transmitted because packet has error.
ifOutQLen .1.3.6.1.2.1.2.2.1.21	The length of outgoing packets.
ifSpecific .1.3.6.1.2.1.2.2.1.22	This object is deprecated.

ifXTable

This table is enhance version of ifTable.

MIB Object and OID	Description
ifName .1.3.6.1.2.1.31.1.1.1.1	The interface name.
ifInMulticastPkts .1.3.6.1.2.1.31.1.1.1.2	The number of received multicast packets.
ifInBroadcastPkts .1.3.6.1.2.1.31.1.1.1.3	The number of received broadcast packets.
ifOutMulticastPkts .1.3.6.1.2.1.31.1.1.1.4	The number of transmitted multicast packets.
fOutBroadcastPkts .1.3.6.1.2.1.31.1.1.1.5	The number of transmitted broadcast packets.
ifHCInOctets .1.3.6.1.2.1.31.1.1.1.6	The number of received bytes in 64 bits format.
ifHCInUcastPkts .1.3.6.1.2.1.31.1.1.1.7	The number of received unicast packets in 64 bits format.
ifHCInMulticastPkts .1.3.6.1.2.1.31.1.1.1.8	The number of received multicast packets in 64 bits format.
fHCInBroadcastPkts .1.3.6.1.2.1.31.1.1.1.9	The number of received broadcast packets in 64 bits format.
ifHCOutOctets .1.3.6.1.2.1.31.1.1.1.10	The number of transmitted bytes in 64 bits format.
ifHCOutUcastPkts .1.3.6.1.2.1.31.1.1.1.11	The number of transmitted unicast packets in 64 bits format.
ifHCOutMulticastPkts .1.3.6.1.2.1.31.1.1.1.12	The number of transmitted multicast packets in 64 bits format.
ifHCOutBroadcastPkts .1.3.6.1.2.1.31.1.1.1.13	The number of transmitted broadcast packets in 64 bits format.
ifLinkUpDownTrapEnable .1.3.6.1.2.1.31.1.1.1.14	Indicates if linkUp/linkDown traps must be generated for this interface.
ifHighSpeed .1.3.6.1.2.1.31.1.1.1.15	The interface speed in Mbps.
ifPromiscuousMode .1.3.6.1.2.1.31.1.1.1.16	Indicates if it accepts all the packets on the media. Value must be 2.

MIB Object and OID	Description
ifConnectorPresent .1.3.6.1.2.1.31.1.1.1.17	This object has the value 'true(1)' if the interface sublayer has a physical connector and the value false(2)' otherwise.

fcipEntityInstanceTable

This table contains information related to FCIP entities.

MIB Object and OID	Description
fcipEntityId 1.3.6.1.2.1.224.1.1.4.1.1	The entity identifier.
fcipEntityName 1.3.6.1.2.1.224.1.1.4.1.2	The entity name.
fcipEntityAddressType 1.3.6.1.2.1.224.1.1.4.1.3	The address type and it can be ipv4, ipv6, etc.,
fcipEntityAddress 1.3.6.1.2.1.224.1.1.4.1.4	The address of the entity.
fcipEntityTcpConnPort 1.3.6.1.2.1.224.1.1.4.1.5	The connection port number.
fcipEntitySeqNumWrap 1.3.6.1.2.1.224.1.1.4.1.6	The sequence number.
fcipEntityPHBSupport 1.3.6.1.2.1.224.1.1.4.1.7	Not supported.
fcipEntityStatus 1.3.6.1.2.1.224.1.1.4.1.8	The entity status and it is always active.

fcipLinkTable

This table contains information about link of FCIP entities.

MIB Object and OID	Description
fcipLinkIndex 1.3.6.1.2.1.224.1.1.5.1.1	The ifIndex of ifTable.
fcipLinkIfIndex 1.3.6.1.2.1.224.1.1.5.1.2	The ifIndex value of the virtual interface corresponding to the FCIP Link running over TCP/IP.
fcipLinkCost 1.3.6.1.2.1.224.1.1.5.1.3	The link cost.
fcipLinkLocalFcipEntityMode 1.3.6.1.2.1.224.1.1.5.1.4	The entity mode and it is always eport.

MIB Object and OID	Description
fcipLinkLocalFcipEntityAddressType 1.3.6.1.2.1.224.1.1.5.1.5	The address type.
fcipLinkLocalFcipEntityAddress 1.3.6.1.2.1.224.1.1.5.1.6	The entity address.
fcipLinkRemFcipEntityId 1.3.6.1.2.1.224.1.1.5.1.7	The remote entity identifier.
fcipLinkRemFcipEntityAddressType 1.3.6.1.2.1.224.1.1.5.1.8	The remote entity address type.
fcipLinkRemFcipEntityAddress 1.3.6.1.2.1.224.1.1.5.1.9	The remote entity address.
fcipLinkStatus 1.3.6.1.2.1.224.1.1.5.1.10	The link status and it is always active.
fcipLinkCreateTime 1.3.6.1.2.1.224.1.1.5.1.11	Not supported.

fcipTcpConnTable

This table contains TCP connection information about the link.

MIB Object and OID	Description
fcipTcpConnLocalPort 1.3.6.1.2.1.224.1.1.6.1.1	The TCP connection local port.
fcipTcpConnRemPort 1.3.6.1.2.1.224.1.1.6.1.2	The TCP connection remote port.
fcipTcpConnRWSize 1.3.6.1.2.1.224.1.1.6.1.3	The windows size.
fcipTcpConnMSS 1.3.6.1.2.1.224.1.1.6.1.4	The segment size.

Modified MIBs

The following changes have been made to the **SW.mib:**

- The "swBrcdBitObjVal" MIB object is newly added.

MIB Object and OID	Description
swBrcdBitObjVal 1.3.6.1.4.1.1588.2.1.1.1.1.37	The MIB object will have object value for each change mentioned in swBrcdGenericTrap. It will be empty for the events which do not have any values.

- The "swFCPortPrevType" MIB object is updated to include D_Port option.

Updated Traps

The following BD traps are updated to include a new variable "slotPort" to display port number in slot/port format:

- bdTrap
- bdClearTrap

Deprecated/Obsoleted MIBs

The following MIB objects/traps in **SW.mib** are deprecated:

- swTrackChangesInfo
- swTelnetShellAdmStatus
- swTrackChangesTrap

Blade Support

Fabric OS v7.3 software is fully qualified and supports the blades for the DCX/DCX-4S noted in the following table:

DCX/DCX-4S Blade Support Matrix	
16-, 32-, 48- and 64-port 8Gbit port blades (FC8-16, FC8-32, FC8-48, FC8-64)	Supported with FOS v6.0 and above (FC8-64 requires FOS v6.4) with any mix and up to 8/4 of each. No restrictions around intermix.
FC10-6	Not supported on FOS v7.1 or later
Intelligent blade	Up to a total of 8/4 intelligent blades. See below for maximum supported limits of each blade.
Virtualization/Application Blade (FA4-18)	Not supported on FOS v7.0 or later
FCIP/FC Router blade (FR4-18i)	Not supported on FOS v7.1 or later
Encryption Blade (FS8-18)	Up to a maximum of 4 blades of this type.
Extension Blade (FX8-24)	Up to a max of 4 blades of this type.
FCoE/L2 CEE blade FCOE10-24	Up to a max of 4 blades of this type. **Not supported in the same chassis with other intelligent blades or the FC8-64 port blade.**
FC16-32, FC16-48, FC16-64, FC8-32E, FC8-48E	Not supported

Table 1 Blade Support Matrix for DCX and DCX-4S with FOS v7.3

Note: The iSCSI FC4-16IP blade is not qualified for the DCX/DCX-4S.

Fabric OS v7.3 software is fully qualified and supports the blades for the DCX 8510-8 and DCX 8510-4 noted in the table below.

DCX 8510-8/DCX 8510-4 Blade Support Matrix	
FC16-32, FC16-48 16G FC blades	FOS v7.0 or later.
FC16-64 blade[2]	FOS v7.3 or later.
FC8-64 64 port 8Gbit port blade	With any mix and up to 8/4 of each. No restrictions around intermix. **Note:** FC8-16, FC8-32, FC8-48 blades are **not** supported on DCX 8510 platforms.
FC8-32E, FC8-48E[1]	FOS v7.0.1 or later.
Intelligent blade	Up to a total of 8/4 intelligent blades. See below for maximum supported limits of each blade.
FCIP/FC Router blade (FR4-18i)	Not supported.
Virtualization/Application Blade (FA4-18)	Not Supported
Encryption Blade (FS8-18)	Up to a maximum of 4 blades of this type.
Extension Blade (FX8-24)	Up to a max of 4 blades of this type.
FCoE/L2 CEE blade FCOE10-24	Supported at slot 1 position only on DCX 8510-8 with FOS v7.3.0. Supported in the same chassis with FC16-32 and FC8-32E blades only. Not supported with any other port blades or intelligent blades in the same chassis. Not supported in DCX 8510-4 chassis.

Table 2 Blade Support Matrix for DCX 8510-8 and DCX 8510-4 with FOS v7.3

Note: The iSCSI FC4-16IP blade is not qualified for the DCX 8510-8/DCX 8510-4.

1. Note that 16G SFP+ is not supported in FC8-32E and FC8-48E blades
2. 8510 core blade QSFPs, part numbers 57-1000267-01 and 57-0000090-01, are not supported in FC16-64. However, the QSFP supported in FC16-64, part number 57-1000294-01, is also supported on 8510 core blades.

Power Supply Requirements for Blades in DCX/DCX-4S				
Blades	**Type of Blade**	**DCX/DCX-4S @110 VAC (Redundant configurations)**	**DCX/DCX-4S @200-240 VAC (Redundant configurations)**	**Comments**
FC10-6[1], FC8-16, FC8-32, FC 8-48, FC8-64	Port Blade	2 Power Supplies	2 Power Supplies	• Distribute the Power Supplies evenly to 2 different AC connections for redundancy.
FR4-18i[1]	Intelligent Blade	Not Supported	2 Power Supplies	
FS8-18, FX8-24, FCOE10-24	Intelligent Blade	Not Supported	DCX: 2 or 4 Power Supplies DCX-4S: 2 Power Supplies	• For DCX with three or more FS8-18 Blades, (2+2) 220VAC Power Supplies are required for redundancy. • For DCX with one or two FS8-18 Blades, (2) 220VAC Power Supplies are required for redundancy. • For DCX-4S, (2) 220VAC Power Supplies provide redundant configuration with any supported number of FS8-18 Blades. • For both DCX and DCX-4S with FX8-24 blades, (1+1) 220VAC Power Supplies are required for redundancy.

Table 3 Power Supply Requirements for DCX and DCX-4S

1. Note that FC10-6 and FR4-18i are not supported with FOS v7.1 or later

Typical Power Supply Requirements Guidelines for Blades in DCX 8510-8					
(For specific calculation of power draw with different blade combinations, please refer to Appendix A: Power Specifications in the 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 8Gb or 16Gb ports with QSFP ICLs	FC8-64, FC16-32, FC16-64, FC8-32E	Port Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies
256 16Gb ports + QSFP ICLs	FC16-32, FC16-48 (Maximum of fully populated FC16-32 blades), FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies Max 8 FC16-32 port blades
256 8Gb ports + QSFP ICLs	FC8-32E, FC8-48E (Maximum of fully populated FC8-32E blades)	Port Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies Max 8 FC8-32E port blades
192 16Gb Ports & max 2 intelligent blades (FX8-24 /FS8-18/combination) with QSFP ICLs	FC16-32, FC16-48, FC16-64, FX8-24, FS8-18	Port / Intelligent Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies Max four FC16-48 port blades and max 2 Intelligent blades
192 8Gb Ports & max 2 intelligent blades (FX8-24 /FS8-18/ combination) with QSFP ICLs	FC8-32E, FC8-48E, FX8-24, FS8-18	Port / Intelligent Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies Max four FC8-48E port blades and max 2 Intelligent blades
336 16Gb 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	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies Max 7 FC16-48 port blades
336 8Gb ports + QSFP ICLs	FC8-48E (Maximum of seven FC8-48E blades, with one empty port blade slot)	Port Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies Max 7 FC8-48E port blades

Typical Power Supply Requirements Guidelines for Blades in DCX 8510-8					
(For specific calculation of power draw with different blade combinations, please refer to Appendix A: Power Specifications in the 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
384 16Gb ports + QSFP ICLs	FC16-48	Port Blade	Not Supported	4 Power Supplies	200-240VAC: For DCX 8510-8, four (2+2)[1] 220V AC Power Supplies are required
384 16Gb ports + QSFP ICLs	FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies
384 8Gb ports + QSFP ICLs	FC8-48E	Port Blade	4 Power Supplies	4 Power Supplies	200-240VAC: For DCX 8510-8, four (2+2)[1] 220V AC Power Supplies are required
Any combination of 8Gb or 16Gb ports and intelligent blades with QSFP ICLs	FC16-32, FC16-48, FC8-64, FC8-32E, FC8-48E, FS8-18, FX8-24	Intelligent Blade /Combination	Dependent on configuration. Requires power calculation for specific configuration	2 or 4 Power Supplies, depending on configuration	For DCX 8510-8, four (2+2)[1] 220V AC Power Supplies are required when any special purpose blade are installed
512 16Gb ports	FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies
512 16Gb ports + QSFP ICLs	FC16-64	Port Blade	4 Power Supplies	2 Power Supplies	200-240VAC: 1+1 Power Supplies 110VAC: 2+2[1] Power Supplies

Table 4 Power Supply Requirements for DCX 8510-8

Notes:

1. When 2+2 power supply combination is used, the users are advised to configure the Fabric Watch setting for switch marginal state to be two power supplies. Users can use the CLI switchstatuspolicyset to configure this value if the current value is set to zero. In FOS v7.0.x, the default setting for the marginal state due to missing power supplies is incorrectly set to zero, which will prevent Fabric Watch from generating notifications when the switch enters the marginal state due to missing power supplies

Typical Power Supply Requirements Guidelines for Blades in DCX 8510-4					
(For specific calculation of power draw with different blade combinations, please refer to Appendix A: Power Specifications in the 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, FC8-32E	Port Blade	2 Power Supplies	2 Power Supplies	1+1 redundancy with 110 or 200-240 VAC power supplies
Any combination of 8Gb or 16 Gb ports and intelligent blades with QSFP ICLs	FC16-32, FC16-48, FC16-64, FC8-32E, FC8-48E, FC8-64, FS8-18, FX8-24	Intelligent Blade /Combination	Not Supported	2 Power Supplies	200-240VAC: 1+1 Power Supplies

Table 5 Power Supply Requirements for DCX 8510-4

Scalability

All scalability limits are subject to change. Limits may be increased once further testing has been completed, even after the release of Fabric OS. For current scalability limits for Fabric OS, refer to the *Brocade Scalability Guidelines* document, available under the *Technology and Architecture Resources* section at http://www.brocade.com/compatibility

Other Important Notes and Recommendations

Note: Please note that most content in this section is primarily applicable to FOS v7.2.1a firmware and has not been completely updated for FOS v7.3.0. Contents of this section may or may not be entirely applicable to FOS v7.3.0 firmware.

Adaptive Networking/Flow-Based QoS Prioritization

- Any 8G or 4G FC platform running FOS v6.2.2e or lower version of firmware cannot form an E-port with a 16G FC platform when Adaptive Networking QoS is enabled at both ends of the ISL. Users must disable QoS at either end of the ISL in order to successfully form an E-port under this condition.

  Users can disable QoS via portcfgQos --disable command. Please consult Fabric OS Command Reference manual for details related to portcfgQoS command.

- When using QoS in a fabric with 4G ports or switches, FOS v6.2.2 or later must be installed on all 4G products in order to pass QoS info. E_Ports from the DCX to other switches must come up AFTER 6.2.2 is running on those switches.

- When FOS is upgraded from v7.1.x to v7.2.0 or later:

  - If the Adaptive Networking license was NOT installed in v7.1.x, all ports will have QOS disabled following the firmware upgrade and links will come up in normal mode.

  - If the Adaptive Networking license was installed in v7.1.x, there will be no change in port QOS mode following the upgrade.

- If the remote port supports QOS and QOS is not explicitly disabled on the local or remote port, the link will come up in QOS mode.

- Otherwise, the link will come up in normal mode.

- If FOS v7.2 or later is factory installed (or net installed), Adaptive Networking features are always available. This matches the behavior of the Brocade 6520 and all products shipping with prior versions of FOS and with the Adaptive Networking license factory installed.

  - Ports will come up in AE mode by default

  - If the remote port supports QOS and is not explicitly disabled, the link will come up in QOS mode. Otherwise, the link will come up in normal mode.

Access Gateway

- Users who want to utilize Access Gateway's Device-based mapping feature in the ESX environments are encouraged to refer to the SAN TechNote GA-TN-276-00 for best implementation practices. Please follow these instructions to access this technote:

  - Log in to http://my.brocade.com

  - Go to Documentation > Tech Notes.

  - Look for the Tech Note on Access Gateway Device-Based Mapping in VMware ESX Server.

Brocade HBA/Adapter Compatibility

- Brocade HBA/Adapter should be using driver version 2.3.0.2 or later when attached to 16G ports on Brocade switches.

D_Port

- The 16Gb QSFP optics used in FC16-64 blade do not support electrical loopback and optical loopback tests. Support is limited to:

  - Link traffic tests across the 16Gb QSFPs

  - Roundtrip link latency measurements

  - Link distance measurements for links that are longer than 100 meter

Edge Hold Time

- Edge Hold Time (EHT) default settings for FOS v7.x have changed from those in some FOS v6.4.x releases. The following table shows the Default EHT value based on different FOS release levels originally installed at the factory:

Factory Installed Version of FOS	Default EHT Value
FOS v7.X	220 ms
FOS v6.4.3x	500 ms
FOS v6.4.2x	500 ms
FOS v6.4.1x	220 ms

FOS v6.4.0x	500 ms
Any version prior to FOS v6.4.0	500 ms

Gen 5 platforms and blades are capable of setting an EHT value on an individual port basis. On 8G platforms EHT is set on an ASIC-wide basis, meaning all ports on a common ASIC will have the same EHT setting. Extra care should be given when configuring EHT on 8G platforms or Gen 5 platforms with 8G blades to ensure E_Ports are configured with an appropriate Hold Time setting.

When using Virtual Fabrics and creating a new Logical Switch when running FOS v7.1.0 or later, the default EHT setting for the new Logical Switch will be the FOS default value of 220ms. However, with FOS v7.1.0 and later, each Logical Switch can be configured with a unique EHT setting that is independent of other Logical Switches and the Default Switch. Any Gen 5 ports (Condor3 based) assigned to that Logical Switch will be configured with that Logical Switch's EHT setting. Any 8G ports (Condor2 based) will continue to share the EHT value configured for the Default Switch.

For more information on EHT behaviors and recommendations, refer to the Brocade SAN Fabric Resiliency Best Practices v2.0 document available on www.brocade.com.

Encryption Behavior for the Brocade Encryption Switch (BES) and FS8-18

- SafeNet's KeySecure hosting NetApp's LKM (SSKM) is supported for data encryption operations with SSKM operating in PVM mode. Please see SSKM documentation for operating in PVM mode for details. Operation in HVM mode is not supported
    - RASlog SPC-3005 with error 34 may be seen if the link key used by a BES/FS8-18 is re-established. Please refer to the LKM/SSKM Encryption Admin Guide for the workaround. Also, please ensure that two (2) SSKM's are present in the deployment for workaround to be performed.
- For crypto tape operations, please ensure to use Emulex FC HBA firmware/drivers 2.82A4/7.2.50.007 or higher. Use of lower level firmware/drivers may result in hosts not being able to access their tape LUNs through a crypto target container.

- Adding of 3PAR Session/Enclosure LUNs to CTCs is now supported. Session/Enclosure LUNs (LUN 0xFE) used by 3PAR InServ arrays must be added to CryptoTarget (CTC) containers with LUN state set to "cleartext", encryption policy set to "cleartext". BES/FS8-18 will not perform any explicit enforcement of this requirement.

- The Brocade Encryption switch and FS8-18 blade do not support QoS. When using encryption or Frame Redirection, participating flows should not be included in QoS Zones.

- The RSA DPM Appliance SW v3.2 is supported. The procedure for setting up the DPM Appliance with BES or a DCX/DCX-4S/DCX 8510 with FS8-18 blades is located in the Encryption Admin Guide.

- Support for registering a 2nd DPM Appliance on BES/FS8-18 is blocked. If the DPM Appliances are clustered, then the virtual IP address hosted by a 3rd party IP load balancer for the DPM Cluster must be registered on BES/FS8-18 in the primary slot for Key Vault IP.

- With Windows and Veritas Volume Manager/Veritas Dynamic Multipathing, when LUN sizes less than 400MB are presented to BES for encryption, a host panic may occur and this configuration is not supported in the FOS v6.3.1 or later release.

- Hot Code Load from FOS v7.2.x to FOS v7.3 is supported. Cryptographic operations and I/O will be disrupted but other layer 2 FC traffic will not be disrupted.

- When disk and tape CTCs are hosted on the same encryption engine, re-keying cannot be done while tape backup or restore operations are running. Re-keying operations must be scheduled at a time that

does not conflict with normal tape I/O operations. The LUNs should not be configured with auto rekey option when single EE has disk and tape CTCs.

- Gatekeeper LUNs used by SYMAPI on the host for configuring SRDF/TF using in-band management must be added to their containers with LUN state as "cleartext", encryption policy as "cleartext" and without "-newLUN" option.

- FOS7.2 and later supports KMIP key vault type for Thales e-Security Key Authority SW v4.0.0 KMIP servers. Please refer to the KMIP Encryption Admin Guide for more details.

    - Replication feature from Thales e-Security Key Authority KMIP server is not supported with BES/FS8-18.

- In FOS 7.1.0 or later the encryption FPGA has been upgraded to include parity protection of lookup memory (ROM) within the AES engine. This change enhances parity error detection capability of the FPGA.

- BES/FS8-18 will reject the SCSI commands WRITE SAME, ATS(Compare and Write/Vendor Specific opcode 0xF1) and EXTENDED COPY, which are related to VAAI (vStorage APIs for Array Integration) hardware acceleration in vSphere 4.1/5.x. This will result in non-VAAI methods of data transfer for the underlying arrays, and may affect the performance of VM related operations.

- VMware VMFS5 uses ATS commands with arrays that support ATS. BES/FS8-18 does not support this command set. Use of a workaround procedure is required in order to configure encryption in a VMFS 5 environment. Please refer to Brocade Tech Note "Deployment Options for VMware VMFS-5 with Brocade Encryption" for details.

- XIV storage arrays that have been upgraded to firmware 11.2x or later required to support encryption on thin provisioned LUNs will report all XIV data LUNs as TP=Yes.

FCIP (Brocade 7800 and FX8-24)

- Any firmware activation will disrupt I/O traffic on FCIP links.

- Latency measurements supported on FCIP Tunnels:

    - 1GbE & 10GbE - 200ms round trip time and 1% loss.

- After inserting a 4G SFP in GE ports of an FX8-24 blade or 7800 switch, sometimes "sfpshow" output might display "Cannot read serial data!". Removing and re-inserting the SFP should resolve this issue. It is recommended that users perform sfpshow immediately after inserting the SFP and ensure SFP is seated properly before connecting the cables.

- When running FOS v7.2.0 or later, if the new FCIP Circuit Group feature is configured on any FCIP Circuits, a downgrade operation to pre-FOS v7.2.0 will be blocked until the feature is removed from the FCIP configuration(s).

FCIP (Brocade 7840)

- Brocade 7840 does not support FCIP connection to Brocade 7800 or FX8-24.

- FOS v7.3.0 does not support non-disruptive firmware download in one-to-many sites configuration.

- FOS v7.3.0 does not support concurrent non-disruptive firmware download.

- FOS v7.3.0 does not support non-disruptive firmware download on the 20VE Mode.

- FOS v7.3.0 does not support 10G speed on the 24 16G FC ports on Brocade 7840.

- FOS v7.3.0 does not support VEX port on Brocade 7840.

- FOS v7.3.0 does not support base switch on Brocade 7840.

- FOS v7.3.0 does not support credit recovery on BI ports on Brocade 7840.

- Running offline diagnostic tests results in FCIP tunnels down. Reboot the switch after offline diagnostic tests to recover the tunnels.

FCoE/DCB/CEE (FCOE10-24)

- When upgrading a DCX/DCX-4S with one or more FCOE10-24 blades from FOS v6.x to FOS v7.0.0 or later, the user should carefully review Chapter 5 of the FOS v7.0.0 Converged Enhanced Ethernet Administrator's Guide.

- Ethernet L2 traffic with xSTP Hello timer set to less than or equal to 3 seconds may experience momentary traffic disruption during HA failover.

- Hot plugging a CP with firmware level less than FOS v6.3.0 into a DCX or DCX-4S with an active FCOE10-24 blade will result in the new standby CP not coming up.

- When operating in Converged Mode, tagged traffic on the native VLAN of the switch interface is processed normally. The host should be configured not to send VLAN tagged traffic on the switch's native VLAN.

- When operating in Converged Mode, tagged frames coming with a VLAN tag equal to the configured native VLAN are dropped.

- The Converged Network Adapter (CNA) may lose connectivity to the FCOE10-24 if the CNA interface is toggled repeatedly over time. This issue is related to the CNA and rebooting the CNA restores connectivity.

- The FCOE10-24 support only one CEE map on all interfaces connected to CNAs. Additionally, CEE map is not recommended for use with non-FCoE traffic. QoS commands are recommended for interfaces carrying non-FCoE traffic.

- Before upgrading to FOS v6.4.1_fcoe/v6.4.1_fcoe1/v7.0.0 or later, if the CEE map "default" value already exists, the same "default" value is preserved after upgrading to FOS v6.4.1_fcoe/v6.4.1_fcoe1/v7.0.0 or later. However, if the CEE map "default" is not configured before upgrading to FOS v6.4.1_fcoe/v6.4.1_fcoe1/v7.0.0 or later, then after upgrading to FOS v6.4.1_fcoe/v6.4.1_fcoe1/v7.0.0 or later, the following CEE map "default" will be created automatically:

    cee-map default

    priority-group-table 1 weight 40 pfc

    priority-group-table 2 weight 60

    priority-table 2 2 2 1 2 2 2 2

- When upgrading from FOS v6.3.x or v6.4.x to FOS v6.4.1_fcoe/v6.4.1_fcoe1/v7.0.0 or later, the CEE start up configuration dcf.conf file will be incompatible with the FCoE provisioning changes implemented in v6.4.1_fcoe and later releases. Users can save the dcf.conf file as a backup and apply it once the firmware upgrade is completed to get the DCX/DCX-4S to the same startup configuration as in the older release.

- It is recommended that Spanning Tree Protocol and its variants be disabled on CEE interfaces that are connected to an FCoE device.

- The Fabric Provided MAC Address (FPMA) and the Fibre Channel Identifier (FCID) assigned to a VN_Port cannot be associated with any single front-end CEE port on which the FLOGI was received.

- LLDP neighbor information may be released before the timer expires when DCBX is enabled on a CEE interface. This occurs only when the CEE interface state changes from active to any other state. When the DCBX is not enabled, the neighbor information is not released until the timer expires, irrespective of the interface state.

- The FCoE login group name should be unique in a fabric-wide FCoE login management configuration. If there is a login group name conflict, the merge logic would rename the login group by including the last three bytes of the switch WWN in the login group name. As long as the OUI of the switch WWNs are identical this merge logic guarantees uniqueness in any modified login group name (switches with the same OUI will have unique last 3 bytes in WWN). However, if the participating switches have different OUIs but identical last three bytes in the switch WWNs, then the merge logic will fail to guarantee uniqueness of login group names. This will result in one of the login groups being dropped from the configuration. This means, no device can login to the login group that is dropped as a result of this name conflict. Users must create a new login group with a non-conflicting name to allow device logins.

- Ethernet switch services must be explicitly enabled using the command *"fosconfig –enable ethsw"* before powering on an FCOE10-24 blade. Failure to do so will cause the blade to be faulted (fault 9). Users can enable ethsw after upgrading firmware without FC traffic interruption.

- Upgrading firmware on a DCX or DCX-4S with one or more FCOE10-24 blades from FOS v6.4.1_fcoe1 to FOS v7.0 or later will be non-disruptive to FCoE traffic through FCOE10-24 blades and FC traffic.

- Upgrading firmware on a DCX or DCX-4S with one or more FCOE10-24 blades from FOS v6.3.x, v6.4.x, and v6.4.1_fcoe to FOS v7.0 or later will be disruptive to any traffic through the FCOE10-24 blades.

- When rebooting a DCX or DCX-4S with an FCOE10-24 blade, Qlogic CNA and LSAN zoning, the switch will become very unresponsive for a period of time. This is due to the CNA sending excessive MS queries to the switch.

- The FCOE10-24 can handle 169 small FCoE frames in bursts. If you are using the FCOE10-24, and you delete a large number of v-ports with HCM, some of the v-ports may not appear to be deleted. To correct this, disable and re-enable FCoE with the following CLI commands:

    switch:admin>**fcoe –disable slot/port**

    switch:admin>**fcoe –enable slot/port**

- When a FCOE10-24 blade is powered off during configuration replay, the interface specific configuration won't get applied. Later when FCOE10-24 blade is powered on, all physical interfaces will come up with default configurations. User can execute "copy startup-config running-config" command to apply the new configuration after powering on the FCOE10-24 blade.

- When IGMP Snooping is disabled on a VLAN, all configured IGMP groups are removed from that VLAN. User has to reconfigure the IGMP groups after enabling the IGMP snooping on that VLAN.

- FOS v7.3 adds the support of FCOE10-24 blade in DCX 8510-8 chassis with following limitations:

    o Only one FCOE10-24 blade is supported at the fixed slot 1 position. Inserting the blade into other slot positions, however, will not fault the blade.

    o An FCOE10-24 blade can co-exist with FC16-32 and FC8-32E blades only in a DCX 8510-8 chassis.

    o Only supports FCoE direct attach.

    o Layer2 Ethernet traffic is not supported.

    o If an FCoE10-24 blade is inserted into a DCX 8510-8 chassis, it is required to reboot the chassis or slot poweroff/poweron core blades. A chassis reboot or slot poweroff/poweron core blades must also be performed if the FCoE10-24 blade is removed and replaced with another blade type.

FCR and Integrated Routing

- With routing and dual backbone fabrics, the backbone fabric ID must be changed to keep the IDs unique.

- VEX edge to VEX edge device sharing will not be supported.

Forward Error Correction (FEC)

- Though FEC capability is generally supported on Condor3 (16G capable FC) ports when operating at either 10G or 16G speed, it is not supported with all DWDM links. Hence FEC may need to be disabled on Condor3 ports when using DWDM links with some vendors by using 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 7.x Compatibility Matrix for supported DWDM equipment and restrictions on FEC use.

FICON

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

FL_Port (Loop) Support

- FL_Port is not supported on FC16-32, FC16-48, FC16-64, FC8-32E, FC8-48E, Brocade 6510, Brocade 6505, Brocade 6520, or Brocade 7840.

- The FC8-48 and FC8-64 blade support attachment of loop devices.

  - Virtual Fabrics must be enabled on the chassis and loop devices may only be attached to ports on a 48-port or 64-port blade assigned to a non-Default Logical Switch operating with the default 10-bit addressing mode (they may not be in the default Logical Switch).

- A maximum of 144 ports may be used for connectivity to loop devices in a single Logical Switch within a chassis in 10-bit dynamic area mode on DCX-4S.

- A maximum of 112 ports may be used for connectivity to loop devices in a single Logical Switch within a chassis in 10-bit dynamic area mode on DCX.

- Loop devices continue to be supported when attached to ports on the FC8-16, FC8-32   with no new restrictions.

Flow Vision

- Users must not specify well known FC addresses, domain controller addresses or CUP Port ID (in FMS mode) for either the source or the destination device field while defining flows.
- Flow Vision does not support port swap. Users must not create flows on ports that are already swapped and users must not swap the ports on which the flows are currently defined.
- After a HA reboot, a flow generator flow can be created if the source or the destination port is F-Port. But traffic will not be initiated. Toggling the port will enforce the restriction again to simulated ports.
- Flow Monitor does not support flows with defined LUN parameters on ingress ports on 8G platforms.

ICLs on DCX/DCX-4S

- If a DCX with an 8-link ICL license is connected to a DCX with a 16-link license, the DCX with the 16-link license will report enc_out errors. The errors are harmless, but will continue to increment. These errors will not be reported if a DCX with a 16-link license is connected to a DCX-4S with only 8-link ICL ports.

- If ICL ports are disabled on only one side of an ICL link, the enabled side may see enc_out errors.

Native Connectivity (M-EOS interoperability)

- A switch running FOS v7.0 or later cannot form E-port connectivity with any M-EOS platform.

- Platform running FOS v7.1 or later does not support EX port configuration in Interopmode 2 or Interopmode 3.

- Device sharing between a switch running FOS v7.1 or later and McDATA fabrics is allowed via Integrated Routing platforms using FOS v7.0.x (or earlier) firmware.

Port Initialization

Users may observe that a port is in "Port Throttled" state when an F_Port is being initialized. This is mostly an informational message that is shown in switchshow output indicating systematic initialization of F_Ports.

However, a port may remain in "Port Throttled" state for an extended period of time and may never come online if it fails to negotiate speed successfully with the neighboring port. Users are advised to check the speed setting of the neighboring switch port to determine the cause of the speed negotiation failure.

Example Output:

```
74   9   10   36ed40   id   N8          In_Sync    FC  Disabled (Port
Throttled)
```

Port Mirroring

- Port Mirroring is not supported on the Brocade 7800.

Virtual Fabrics

- When creating Logical Fabrics that include switches that are not Virtual Fabrics capable, it is possible to have two Logical Switches with different FIDs in the same fabric connected via a VF incapable switch. Extra caution should be used to verify the FIDs match for all switches in the same Logical Fabric.

- A switch with Virtual Fabrics enabled may not participate in a fabric that is using Password Database distribution or Administrative Domains. The Virtual Fabrics feature must be disabled prior to deploying in a fabric using these features.

- ISL R_RDY mode is not supported in a base switch with FOS version 7.0 or higher.

WebTools

-

- WebTools since FOS v7.1.0 has a "SupportSave" interface. It only collects, however, information specifics to WebTools. It does not contain the same information as collected by supportSave initiated through CLI or Brocade Network Advisor.

- When launching WebTools on a computer without Internet access, it could take up to 5 minutes to complete because the certificate revocation check performed for the WebTools application takes time to timeout. Users can turn off the certification revocation check on the Java control panel as a workaround.

- FOS v7.3.0 is qualified and supported with Oracle JRE 1.7.0 update 60. When launching Web tools directly using the browser for FOS 7.3.0, ensure that Oracle JRE update 1.7u60 is installed in that machine. WebTools can be launched from the local client of Brocade Network Advisor installed on Windows OS. Launching WebTools from local client of Brocade Network Advisor installed on Linux OS will fail due to the expiration check with JRE 1.7 update 51. As a workaround for this issue on Linux, please do the following changes in the Brocade Network Advisor installed computer.

  1. Add following lines in <User Home>/.java/deployment/deployment.properties file
     deployment.expiration.check.enabled=false

     For example, if the user is root then the absolute path of this file is as below

/root/.java/deployment/deployment.properties

2. Launch the java control panel using below command and click on Ok button
<Network Advisor Home>\jre\bin\jcontrol

Please refer to Brocade Network Advisor release notes for more details.

In addition, users must check the "Enable Java content in the browser" box under the Security tab of Java Control Console to allow launching WebTools from BNA server clients.

Zoning

- There are limitations to zoning operations that can be performed from a FOS v6.x switch that is in the same fabric as a FOS v7.0 or later switch if the FOS v6.x switch is not running the recommended firmware version. Please see Fabric OS Interoperability section for details.

Miscellaneous

- Users must also keep the RADIUS accounting port (Authentication Port+1) open in the firewall to ensure proper working of the RADIUS authentication.

- Using a Windows anonymous FTP server for supportsave collection:

    When using anonymous ftp, to avoid long delays or failure of simultaneous supportsave collections when AP blades are present in a director chassis, the number of unlimited anonymous users for a Windows FTP server should be configured as follows:

    Number of anonymous FTP connections = (Number of director chassis) + (Number of installed Application Blades x 3)

- RASlog message AN-1010 may be seen occasionally indicating "Severe latency bottleneck detected". Even though it is a "Warning" message, it is likely to be a false alarm and can be ignored.

- POST diagnostics for the Brocade 5100 have been modified beginning with FOS v6.3.1b and v6.4.0 to eliminate an "INIT NOT DONE" error at the end of an ASIC diagnostic port loopback test. This modification addresses BL-1020 Initialization errors encountered during the POST portloopbacktest. (Defect 263200)

- It is important to note that the outputs of slotshow –p and chassisShow commands also display the maximum allowed power consumption per slot. These are absolute maximum values and should not be confused with the real-time power consumption on 16G blades. The chassisshow command has a "Power Usage (Watts):" field that shows the actual power consumed in real-time on 16G blades.

- Class 3 frames that have been trapped to CPU will be discarded in the following scenarios on DCX/DCX-4S/DCX 8510 during the following conditions:

    - HA failover on DCX/DCX-4S/DCX 8510 platforms while running FOS v7.0 or later firmware

    - Firmware upgrade from v7.0 to a later release on Brocade 300, 5100, VA-40FC, 5300, 6510

    - Firmware upgrade from v7.0.1 to a later release on Brocade 6505

    - Firmware upgrade from v7.1.0 to a later release on Brocade 6520

- The QSFP information in the sfpshow output will indicate the ID field as all zeros. This is as designed.

```
ras080:FID128:root> sfpshow 5/32
QSFP No: 8 Channel No:0
Identifier:  13   QSFP+
Connector:   12   MPO Parallel Optic
Transceiver: 0000000000000000 16_Gbps  id
```

- It is recommended that for directors with more than 300 E_Ports, the switch be disabled prior to executing the "switchCfgTrunk" command (used to disable or enable trunking on the switch).

- During non-disruptive firmware upgrades, E_Ports in R-RDY mode may cause some frame drops on the E-port links.

- The Brocade Network Advisor seed switch should always have the highest FOS version used in the fabric.

- For login authentication through RADIUS, Brocade switch should be able to reach RADIUS servers through TCP authentication port (default 1812) and accounting port (default 1813). Both of these ports must be kept open in any firewall settings.

- When a firmware upgrade on a Brocade 6510 switch initiated through Brocade Network Advisor results with "failed to enforce new iptable rules" error message, the switch could be inaccessible via SSH and/or Telnet. Activating (from console) a new policy with rules of default active policy will restore access to the switch.

- Firmware downgrade from FOS v7.3.0 with one or more ports enabled with the Flow Generator feature as a SIM port will be blocked. The SIM ports configuration must first be disabled.

- Firmware upgrade to FOS v7.3.0 with one or more ports enabled with the Flow Generator feature as a SIM port will be blocked. The SIM ports configuration must first be disabled.

- FOS v7.3.0 includes a fix for defect 492340 where users may see frame drops on the back-end edge and core ports with FS8-18 and FX8-24 blades in DCX 8510 chassis. This fix will only take effect after the affected blades are powered off and on. After the fix takes effect, a new credit allocation model leads to fewer credits available for long distance ports. If there are long distance port configurations that have used up all the credits prior to applying this fix, some long distance ports may experience degraded performance.

- Firmware downgrade from FOS v7.3.0 will be blocked when any logical switch is configured with in-flight encryption with FCAP protocol or SHA-256 hashing algorithm is used with FCAP or DH-CHAP protocol. These configurations must be removed from all logical switches for downgrade.

Defects

Closed with Code Change in Fabric OS v7.3.0a

This section lists the defects with Critical, High and Medium Technical Severity closed with a code change as of August 8, 2014 in Fabric OS v7.3.0a

Defect ID: DEFECT000333728	
Technical Severity: Medium	**Probability:** Low
Product: FOS	**Technology:** Monitoring/RAS
Reported In Release: FOS6.4.0	**Technology Area:** Fabric Watch
Symptom: Packet loss and Utilization is only applicable to VE_ports.	
Condition: Admin Guide has been updated to indicates that these two areas are only applicable to VE_ports.	

Defect ID: DEFECT000483437	
Technical Severity: High	**Probability:** High
Product: FOS	**Technology:** Management
Reported In Release: FOS7.2.0	**Technology Area:** Web Tools
Symptom: On Web Tools, the cascaded switch Icon in Fabric Tree gets greyed out and the pop up shows the status as "Unmonitored".	
Condition: This issue occurs when a switch is running FOS version v7.2.0 or higher while the remote switch is running FOS version v7.1.x or lower, and one of switches has VF enabled while the other switch has VF disabled. This issue will not occur if all switches are running FOS version v7.2.0 or higher, regardless of whether VF is enabled or disabled.	
Workaround: Run same FOS version on all switches in the fabric.	

Defect ID: DEFECT000496874	
Technical Severity: High	**Probability:** High
Product: FOS	**Technology:** Distance
Reported In Release: FOS7.1.1	**Technology Area:** Extended Fabrics
Symptom: During DWDM failover test, Link Reset from Buffer to Buffer (BB) credit recovery timed out resulting in link reinitialization.	
Condition: Can occur when two consecutive BB credit recovery interrupts occur due to invalid characters in link and while traffic is passing.	
Recovery: Port disable and enable the affected port to recover.	

Defect ID: DEFECT000500085	
Technical Severity: Medium	**Probability:** Medium
Product: FOS	**Technology:** Management
Reported In Release: FOS7.2.0	**Technology Area:** NTP - Network Time Protocol
Symptom: Switches in the fabric are unable to communicate with the NTP server.	
Condition: When the BR5647 is insert into the embedded chassis or when the chassis CMM is rebooted, the CMM will push the NTP network configuration for internal communication to external fabric wide.	
Recovery: Reconfigure NTP address in any other non-embedded switch in the fabric.	

Defect ID:	DEFECT000500362	
Technical Severity: Medium		**Probability:** Medium
Product: FOS		**Technology:** Other
Reported In Release: FOS7.3.0		**Technology Area:** Other
Symptom: Customer may see QOS High/Low priority enabled ports default to Medium priority after hareboot on switches.		
Condition: The priority change will occur while processing sync dump, if Special Zones (Redirect or Traffic Isolation) are present in the database along with QOS Zone.		
Recovery: To recover the correct priority, execute the cfgsave and cfgenable commands. If the priority is not restored, execute the cfgdisable and cfgclear commands, and then re-create the same zone configuration and enable zone configuration. If both steps fail, reboot the switch to recover the correct priority.		

Defect ID:	DEFECT000500567	
Technical Severity: High		**Probability:** Low
Product: FOS		**Technology:** Traffic Management
Reported In Release: FOS7.3.0		**Technology Area:** Routing
Symptom: Customer may see traffic disruption if ICL connections are not symmetric when 8G edge blade is present.		
Condition: When 8G edge port blade is present and ICL connections are not symmetric (which is a recommended use case).		
Workaround: Avoid configuring asymmetric ICL connections.		
Recovery: Reconfigure the ICL connection as symmetrical.		

Defect ID:	DEFECT000509898	
Technical Severity: Medium		**Probability:** Medium
Product: FOS		**Technology:** Other
Reported In Release: FOS7.3.0		**Technology Area:** Other
Symptom: Switchshow and portcfgshow displays ports configuration as "Auto Negotiate" when configured as fixed speed after firmeare download to FOS 7.3.0		
Condition: After a firmware download to FOS v7.3.0 from previous release, switchshow and portcfgshow displays port configuration as auto negotiate when configured as fixed speed. The actual link speed is the configured speed.		
Recovery: Perform a hareboot or hafailvoer after the firmware download to FOS v7.3.0.		

Defect ID:	DEFECT000510334	
Technical Severity: High		**Probability:** Low
Product: FOS		**Technology:** Other
Reported In Release: FOS7.0.2		**Technology Area:** Other
Symptom: In an encryption environment (BES or FS8-18), the addition of a LUN to a crypto target container fails getting either device is busy or timeout when trying to configure.		
Condition: Issue can be seen when there are more ITLs configured in the LUN or encryption engine was stressed with heavy I/O.		

Defect ID:	DEFECT000511719	
Technical Severity: Medium		**Probability:** Low
Product: FOS		**Technology:** Management
Reported In Release: FOS7.3.0		**Technology Area:** Web Tools
Symptom: Unable to view HA status of the 7840 FCIP tunnel from WebTools to determine if firmware download will be disruptive.		
Condition: WebTools does not display the HA status of a 7840 FCIP tunnel prior to firmware download		
Workaround: View the 7840 FCIP tunnel HA status from FOS CLI		

Defect ID:	DEFECT000512057	
Technical Severity: Medium	**Probability:** High	
Product: FOS	**Technology:** Monitoring/RAS	
Reported In Release: FOS7.2.0	**Technology Area:** Fabric Watch	
Symptom: Error messages start after firmware update from FOS v7.0.x to FOS v7.1.x and continue when upgrading to FOS v7.2.x. After downgrading back to 7.0.x, faulty port messages stop from Fabric Watch.		
Condition: Running FOS 7.1 and above, with a port remains in passive mode, which would simply complete speed negotiation and failing link init, results in FW-xxxx flood in RAS log.		
Workaround: Disable the port that does not cut off light		

Defect ID:	DEFECT000512507	
Technical Severity: High	**Probability:** Medium	
Product: FOS	**Technology:** Traffic Management	
Reported In Release: FOS7.2.0	**Technology Area:** Routing	
Symptom: Observed performance issue on FX8-24 when there are exactly two equal bandwidth FCIP tunnels.		
Condition: Only applicable when there are two incoming paths (E-ports, trunks, EX-ports) on a given FX8-24 or BR7800 ASIC Chip.		
Workaround: Use one or greater than two incoming path to FX8-24 and 7800, or configure one of the links with a slightly lower bandwidth.		

Defect ID:	DEFECT000513923	
Technical Severity: High	**Probability:** High	
Product: FOS	**Technology:** Virtualization	
Reported In Release: FOS7.2.0	**Technology Area:** Access Gateway	
Symptom: ELS commands get rejected and host on AG switch can no longer communicate with the target in the 3rd party vendor fabric.		
Condition: This may happen in a Fabric with Access Gateway F-port with at least one NPIV login, and one of the NPIV logins has a PID with the domain and area portion equal to that of the target.		
Workaround: Reconfigure the fabric switch so that the domain and area portions of PIDs on Access Gateway F-ports do not match the domain and area portions of the target's PID.		
Recovery: Reboot the Access Gateway switch.		

Defect ID:	DEFECT000514203	
Technical Severity: Medium	**Probability:** Low	
Product: FOS	**Technology:** Distance	
Reported In Release: FOS7.3.0	**Technology Area:** FCIP	
Symptom: The 7840 console output shows many XTUN 1997 messages during I/O.		
Condition: An active FCIP Tunnel on a lossy or busy network.		
Recovery: No impact to IO		

Defect ID:	DEFECT000514741	
Technical Severity: Medium	**Probability:** High	
Product: FOS	**Technology:** Distance	
Reported In Release: FOS7.3.0	**Technology Area:** FCIP	
Symptom: FFDC is observed for log drop message. The FFDC message is harmless in functionality, it is only for internal purpose to find out which message gets dropped.		
Condition: There could be many internal raslog messages that overrun the raslog queue, thus the message is seen		
Recovery: no action needed when this happens.		

Defect ID: DEFECT000515787	
Technical Severity: Medium	**Probability:** Medium
Product: FOS	**Technology:** Distance
Reported In Release: FOS7.3.0	**Technology Area:** FCIP
Symptom: The CLI command 'portshow fciptunnel --reset' does not reset the connected count field properly in the FCIP tunnel statistics, and so it may show an invalid count after this command is issued.	
Condition: Issue may occur when the 'portshow fciptunnel --reset' command is issued to reset the FCIP tunnel counters.	
Workaround: Avoid using the '--reset' option with the portshow fciptunnel command.	

Defect ID: DEFECT000516255	
Technical Severity: High	**Probability:** Low
Product: FOS	**Technology:** Distance
Reported In Release: FOS7.3.0	**Technology Area:** FCIP
Symptom: Any replication devices using ELS (PRLI) and ELS _ACC frames as heartbeat during the replication might have potential traffic disrupted when doing non-disruptive firmwaredownload in FCR configuration.	
Condition: When replication devices on the edge fabric to 7840 through EX port. Replication devices must use ELS (PRLI) and ELS_ACC as heart beat for every few seconds. The windows for heartbeat loss is 3 minutes. IO will stop if replication device can not recover.	

Defect ID: DEFECT000516599	
Technical Severity: High	**Probability:** Medium
Product: FOS	**Technology:** Distance
Reported In Release: FOS7.2.0	**Technology Area:** FCIP
Symptom: XTUN-1008 messages reported every 5 minutes in the RAS log and BNA console	
Condition: After extended uptime in a large FCIP FCP Fast Write and Open Systems Tape Pipelining configuration.	
Recovery: Reboot FCIP switch or power cycle the slot that is reporting the messages	

Defect ID: DEFECT000516703	
Technical Severity: High	**Probability:** Medium
Product: FOS	**Technology:** Distance
Reported In Release: FOS7.1.0	**Technology Area:** FCIP
Symptom: FICN-1062 and FICN-1063 abort messages on XRC and IFCC on host.	
Condition: In a large FICON disk mirroring configuration that includes base and alias devices in the connected primary controllers	
Workaround: None required – IFCCs will occur and normal channel error recovery will complete	

Defect ID: DEFECT000516934	
Technical Severity: High	**Probability:** Medium
Product: FOS	**Technology:** Monitoring/RAS
Reported In Release: FOS7.3.0	**Technology Area:** Equipment Status
Symptom: FC16-64 DC power consumption is set to 160W but needs to be lowered to its actual maximum.	
Condition: FC16-64 is inserted in a 8510-8 or 8510-4 chassis, slotshow -p will display DC power consumption as 160W.	

Defect ID:	DEFECT000518620	
Technical Severity: High		**Probability:** Medium
Product: FOS		**Technology:** Other
Reported In Release: FOS7.2.1		**Technology Area:** Other
Symptom: Detect 400K CRC errors with good EOF on backend C-port. Md demon terminated with ASSERT.		
Condition: This happens when MAPS and Auto tuning are enabled at the same time.		
Workaround: Avoid using MAPS and Auto-tuning at the same time.		

Defect ID:	DEFECT000519709	
Technical Severity: Medium		**Probability:** Medium
Product: FOS		**Technology:** Distance
Reported In Release: FOS7.3.0		**Technology Area:** FCIP
Symptom: After mutliple bounces, the FCIP circuit will show as degraded. This will cause the FCIP tunnel to show as degraded as well.		
Condition: The FCIP circuit/tunnel is bounced multiple times. This repeated bouncing can result in degraded condition.		
Recovery: Reboot the 7840 to recover from the FCIP circuit/tunnel degraded state.		

Defect ID:	DEFECT000520145	
Technical Severity: High		**Probability:** High
Product: FOS		**Technology:** Security
Reported In Release: FOS7.3.0		**Technology Area:** Fabric Authentication
Symptom: "Authentication Failure" is displayed in switchshow output for an EX_Port.		
Condition: EX_Port is disabled with reason "Authentication Failure", when Edge Fabric is configured with FCAP authentication type alone and EX_port is configured with other authentication type.		
Recovery: Disable FCAP authentication in edge fabric switch.		

Defect ID:	DEFECT000522389	
Technical Severity: Medium		**Probability:** High
Product: FOS		**Technology:** Security
Reported In Release: FOS7.3.0		**Technology Area:** FIPS
Symptom: Openssl advisories CVE-2014-0076 and CVE-2014-3470 have been implemented as a precautionary step to patch a vulnerability identified by NIST.		
Condition: Although FOS use a version of OpenSSL that contains these vulnerabilities, none uses ECDH or ECDSA. Therefore, there is no exposure to these vulnerabilities.		
Workaround: Since there is no exposure to these vulnerabilities, no workaround is required.		

Defect ID:	DEFECT000522753	
Technical Severity: Medium		**Probability:** Low
Product: FOS		**Technology:** Distance
Reported In Release: FOS7.3.0		**Technology Area:** Tunnel Management
Symptom: The FCIP Data Processor will encounter a software exception and then reload.		
Condition: While performing supportsave data collection, for the ARL module, if the FCIP tunnels are in a particular phase of the disconnecting process this software exception will be encountered.		

Defect ID: DEFECT000523412	
Technical Severity: High	**Probability:** High
Product: FOS	**Technology:** Distance
Reported In Release: FOS7.3.0	**Technology Area:** FCIP
Symptom: 7840 goes offline after about 30 days of run time.	
Condition: There is a small memory leak on the heartbeat between 7840 CP and DP, which cause the 7840 to run out of memory after about 30 days.	
Recovery: Reboot the 7840.	