

Brocade Switch Installation and Configuration

INST-120

Student Guide

Revision 1023



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Revision: October 2023



Brocade Switch Installation and Configuration

INST-120

Brocade Education Services

Revision 1023

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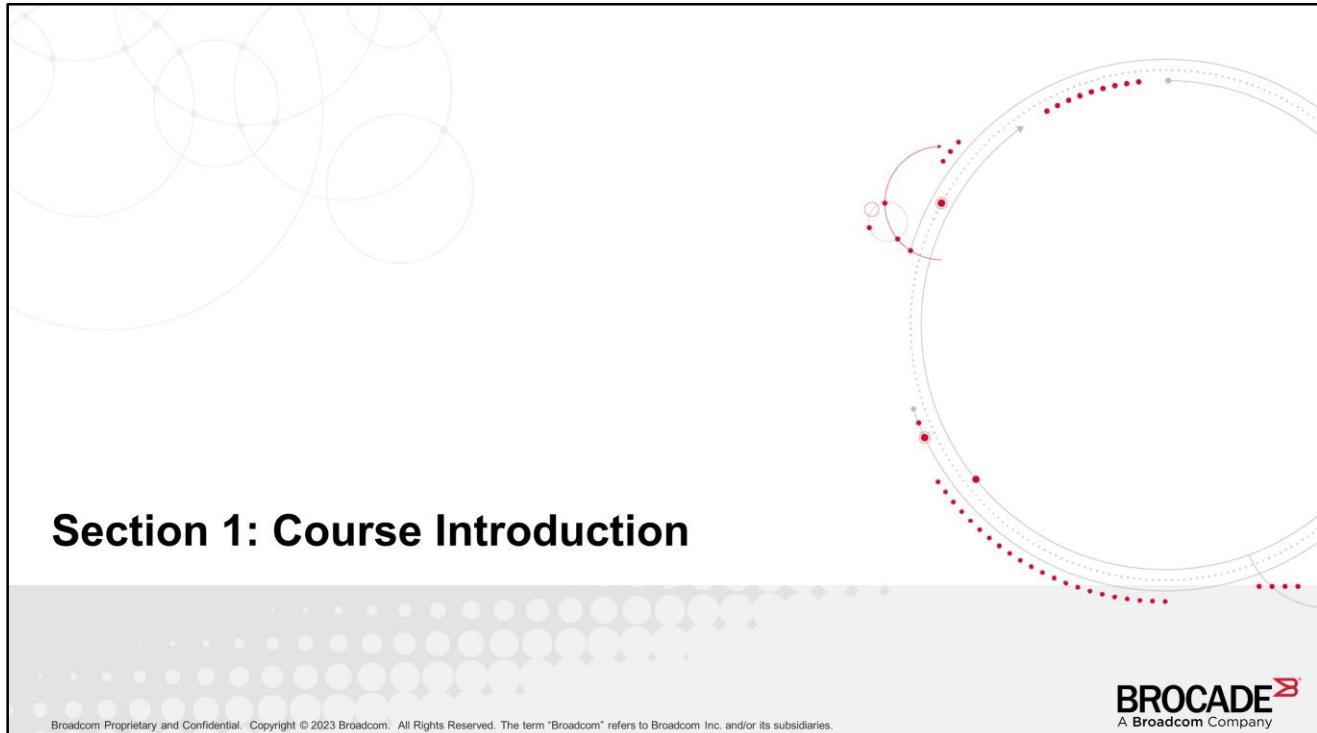


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Section 1: Course Introduction

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Course Overview

- This course covers initial switch configuration, verification and backup when deploying a new Brocade Fibre Channel switch

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Course Prerequisites

Before taking this course, it is recommended that you complete the following courses or have equivalent experience with Fibre Channel SANs:

- Introduction to Fibre Channel SANs (FCSAN-101)
- At least one of the following Brocade hardware classes
 - Introduction to Brocade Gen 6 Hardware (HWG6-120)
 - Introduction to Brocade Gen 7 Switch Hardware (HWG7S-122)
 - Introduction to Brocade Gen 7 Director Hardware (HWG7D-121)



Course Objectives

After completing this course, students should be able to:

- Configure basic switch settings such as:
 - IP addresses
 - Configuring domain ID
 - Adding licensing
- Verify switch operations and status such as:
 - Port settings and status
 - Domain IDs and fabric.ops parameters
- Discuss switch configuration backup and restore techniques



Course Agenda

Required Learning Elements:

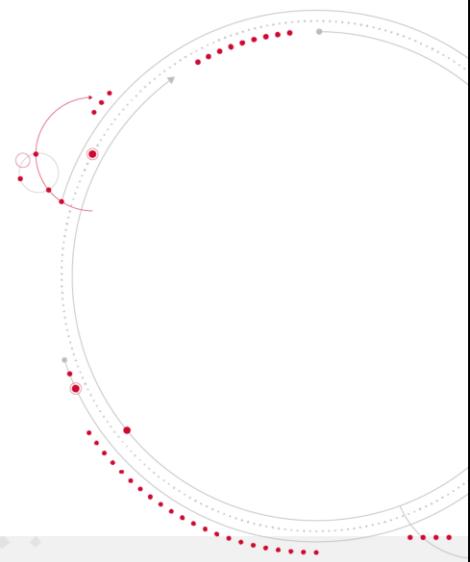
- Module 1: Switch Installation and Configuration
- Assessment Test

Optional Learning Elements:

- Welcome to Brocade Education (Course Introduction)
- Student Guide (downloadable PDF)
- Recorded Demonstration

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Section 2: Switch Installation and Configuration

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Installation Concerns

- **Power:** Cable dual power switches to dual power circuits
- **Air:** Verify air flow direction for each module to be installed and plan rack placement accordingly¹
- **Cables:**²
 - Allow for manageable cable slack to minimize stress²
 - Do not mix singlemode (longwave) with multimode (shortwave) in patch panel
 - Secure with Velcro straps
 - Be wary of distances – total can add up quickly with patch panels
 - Create a port map
- **Monitor switch environment:**

— psshows	Displays power status
— fanshow	Displays fan status
— tempshow	Displays temp readings
— sensorshow	Displays all sensor readings

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Footnote 1: Improper cable planning can cause problems and may impact performance in the SAN. Although patch panels are helpful in a cable management scenario, attempt to minimize the number of connections as every fiber optic interconnection generates a few dB of signal loss. Keep manageable slack to minimize cable stress. Use different color Velcro straps for trunk groups.

For more information on power supplies, fans, and temperature readings see the hardware reference manual for the appropriate switch model.

Footnote 2: Do not stress the cable by doing any of the following:

- Applying additional twists
- Pulling or stretching beyond its specified pulling load rating
- Bending it beyond its specified bend radius, and certainly not beyond 90°
- Creating tension in suspended runs
- Stapling or applying pressure with cable ties

Brocade Management Interfaces and Tools

- Command Line Interface
 - Serial Communication (PuTTY or tip)
 - Telnet (port 23)
 - SSHv2 (port 22)
- SANnav Management Portal
- Web Tools
 - HTTP
 - HTTPS requires a digital certificate to be installed on the switch¹
- SNMPv1 and SNMPv3
- Storage Management Initiative Specification (SMI-S)²

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Footnote 1: Secure Socket Layer (SSL) is part of base Fabric OS. SSL works by using a key to encrypt data transferred over an SSL connection. By convention, URLs that require an SSL connection start with “https:” instead of “http:.” All Brocade supported Internet browsers support SSL.

Configuration of the SSL protocol involves obtaining, installing, and configuring PKI certificates:

- Public Key Infrastructure (PKI) is a system of public key encryption using digital certificates from a Certificate Authority (CA) and other registration authority to verify and authenticate the validity of each party involved in an electronic transaction.
- The CA works as part of a Public Key Infrastructure (PKI) and therefore checks with a registration authority (RA) to verify digital certificate requestor information. Once RA verifies information CA can issue a certificate. The information that the RA verifies depends on the CA, but includes items such as owners public key; certificate expiration date; owners name and other public key owner information.

Footnote 2: The SMI Agent software provides a Common Information Model (CIM) agent for switch and director products. The SMI Agent performs the functions of a general purpose server as defined in the Storage Management Initiative Specification (SMI-S version 1.2.0) and enables a standard set of management functions to be performed by third-party CIM clients.

Command Line Interface (CLI) Shortcuts

- Use the left and right arrow keys on the keyboard to move the cursor
- Up and down arrows scroll through previously used commands
- Command completion
 - Use the tab key to complete command¹
- History of commands (`h` command)
- Multiple commands issued on one line
 - `<command1>;<command2>`
 - Executes command1 then command2
 - `<command1> && <command2>`
 - Execute command1 and only if command1 runs successfully then execute command2
- Help for commands
 - `help <command>`

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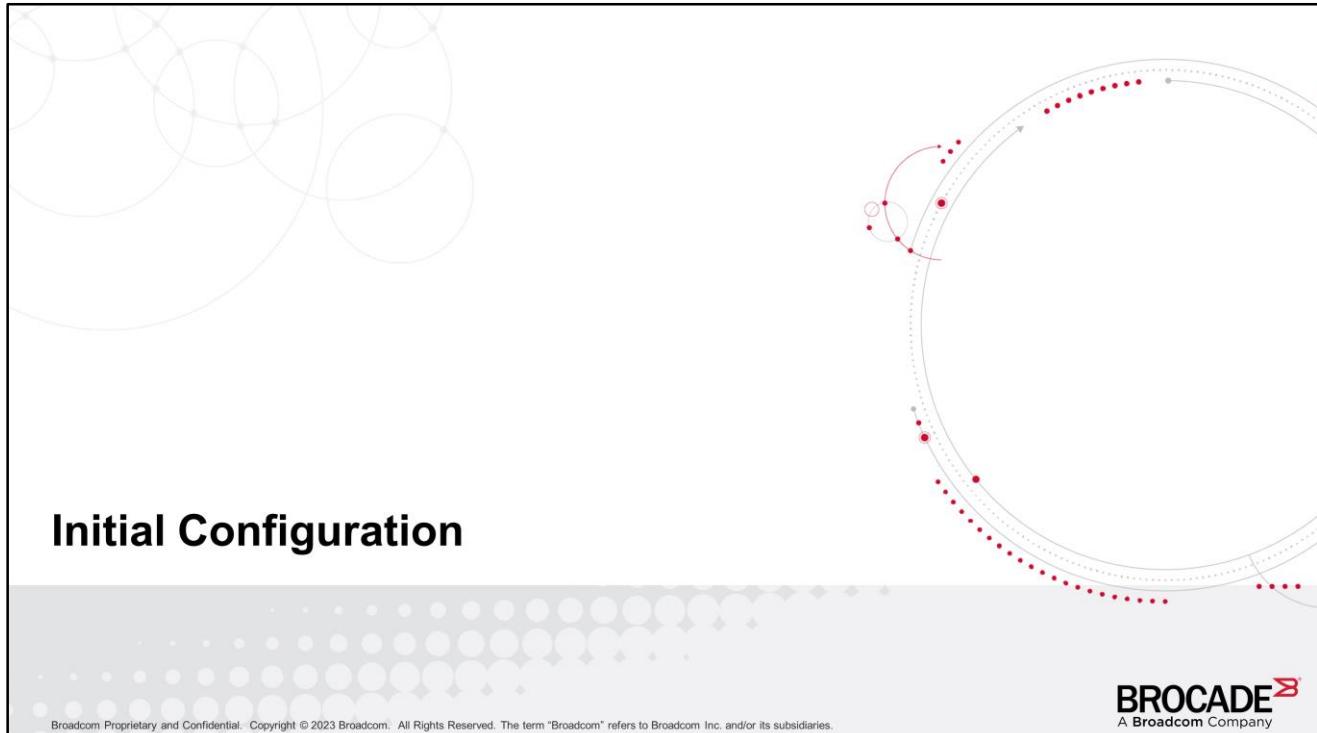
When administrating Brocade switches using the command line interface, certain key strokes can be helpful administrating the switch.

Footnote 1: The tab key will complete a command only when there is one available command option. For example, if you enter `cfgs` and then press the tab key nothing happens as there is more than one command that starts with `cfgs`. However, typing `cfgsa` completes the `cfgsave` command.

If more than one command is available, pressing the tab key twice will bring up a list of remaining available commands.

```
SW1:FID128:admin> cfgs
cfgsave  cfgshow  cfgsize
```

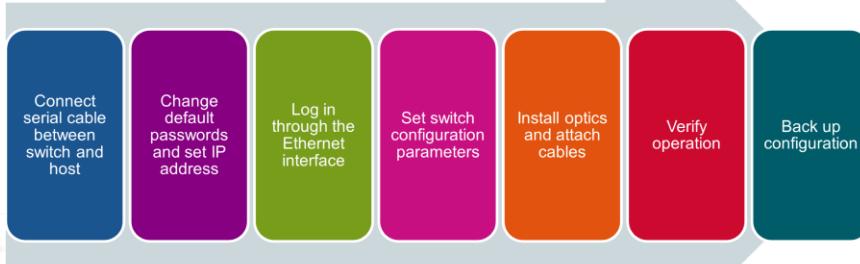
Note: Command is considered successful even if the syntax was incorrect. Proper syntax is reported to the console and the command is considered successfully completed. An example of an unsuccessful command is running `cfgclear` and answering `no` to the prompt.



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Overview of Basic Configuration Tasks



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Each colored rectangle represents a task in setting up a Brocade SAN switch. In the following slides, the corresponding colored rectangle task appears in the upper right-hand corner of the slide to which the step belongs.

Connect the Serial Cable

Connect serial cable between switch and host

- Connect a PC to the switch with:
 - Terminal emulator software
 - An available COM port
- Or a UNIX system with:
 - Tip utility
 - An available serial port
- Cable:
 - The required serial cable is provided with the switch
 - Connect the cable to the server and the console port on the switch



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When a new switch has arrived for installation into a fabric, it is suggested to use a serial cable to configure the switch with an IP address. After the IP address is configured, the serial connection to the switch may be dropped and an SSH, telnet, or Web Tools session may be used for further switch configuration because of its convenience and speed.

To configure the connection in a B-Series environment

Bits per second: 9600

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None

Installation steps

1. Insert the serial cable provided to an RS-232 serial port on the workstation. FOS switches use a straight-through cable.
2. Verify the switch has power and is past the POST stage.

Change default passwords and set IP address

Change Default Passwords

- Login to switch from serial port terminal
 - Default accounts are: admin, user
 - The User account is generally limited to view only type command, so use the admin account for this initial setup
 - Default password for both: password
- When you initially login as admin, you must immediately change the password for the default accounts
 - Passwords must be between 8 and 40 characters by default

See notes for example

```
SW1 login: admin
Password:
Place Security Banner Here
-----
Please change passwords for switch default accounts now.
Use Control-C to exit or press 'Enter' key to proceed.
```

- Use the `passwdcfg --showall` command to display password rules

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The following example shows the output for changing default password.

```
Fabric OS (sw0)
sw0 login: admin
Password:
Please change passwords for switch default accounts now.
for user - admin
Changing password for admin
Enter old password:
Enter new password:
Re-type new password:
passwd: all authentication tokens updated successfully
Please change passwords for switch default accounts now.
for user - user
Changing password for user
Enter new password:
Re-type new password:
passwd: all authentication tokens updated successfully
Saving passwords to stable storage.
Passwords saved to stable storage successfully
```

More information about the password policy, next slide

To display the password policy run command:

```
SW1:FID128:admin> passwdcfg --showall
passwdcfg minlength: 8
passwdcfg lowercase: 0
passwdcfg uppercase: 0
passwdcfg charset: 0
passwdcfg allowuser: Yes
passwdcfg digits: 0
passwdcfg punctuation: 0
passwdcfg history: 1
passwdcfg minpasswordage: 0
passwdcfg maxpasswordage: 0
passwdcfg warning: 0
passwdcfg lockoutthreshold: 0
passwdcfg lockoutduration: 30
passwdcfg adminlockout: 0
passwdcfg repeat: 1
passwdcfg sequence: 1
passwdcfg status: 0
passwdcfg reverse: 0
passwdcfg oldpasswd: 0
passwdcfg minDiff: 0
```

Use the **passwdcfg --set** command to change the password policy options. Refer to the Brocade Fabric OS Command Reference Manual 9.0.x for more information on policy options.

Set the Management IP Address

Change default passwords and set IP address

- Use the `ipaddrset` command to configure the switch IP address
 - Default IP Address: 10.77.77.77
 - Default netmask: 255.255.255.0
- Obtain addressing information for your network
 - Set the switch IP address and netmask
 - Example: `switch:FID128:admin> ipaddrset -ipv4 -add 11.1.2.4/24`
 - Set the default gateway (use the `-gwip gateway_ip` option to set the gateway address)
- Directors require more than one IP address on the same subnet
 - One IP address required for switch management
 - This IP address is dynamically assigned to the active Control Processor (CP)
 - One IP Address required per Control Processor
 - Default IP Addresses for directors: 10.77.77.77 (management), 10.77.77.75 (cp0), 10.77.77.74 (cp1)

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The Ethernet (network) interface provides management access, including direct access to the Fabric OS CLI, and allows other tools, such as Web Tools, to interact with the switch. You can use either Dynamic Host Configuration Protocol (DHCP) or static IP addresses for the Ethernet network interface configuration.

Brocade X7 and X6 Directors, you must set IP addresses for the following components:

- Both Control Processors (CP0 and CP1)
- Chassis management IP

Brocade Switches

On Brocade switches, you must set the Ethernet and chassis management IP interfaces. Setting the chassis management IP address eliminates the need to know which CP is active and automatically connects the requestor to the currently active CP.

You can continue to use a static Ethernet addressing system or allow the DHCP client to automatically acquire Ethernet addresses.

NOTE: When you change the Ethernet interface settings, open connections such as SSH or Telnet may be dropped. Reconnect using the new Ethernet IP address information or change the Ethernet settings using a console session through the serial port to maintain your session during the change. You must connect through the serial port to set the Ethernet IP address if the Ethernet network interface is not configured already.

Useful Ethernet interface commands:

```
SW1:FID128:admin> ethif --help
Please enter the following options.
To display the link attributes.
ethif --show interface
To set the attributes.
ethif --set interface -auto-negotiate | -an [on|off] -speed
[10|100|1000] -duplex [full]
Usage.
ethif --help.
```

```
SW1:FID128:admin> ethif --show eth0
eth0 interface:
Link mode: negotiated 1000baseT-FD, link ok
MAC Address: D8:1F:CC:28:58:6D
eth0      Link encap:Ethernet HWaddr D8:1F:CC:18:38:6D
          UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1
          RX packets:83045904 errors:0 dropped:2 overruns:0 frame:0
          TX packets:62186 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4665075279 (4448.9 Mb)   TX bytes:4399572 (4.1 Mb)
          Memory:fe5e6000-fe5e6fff
```

Log in through the Ethernet interface

Log in Through the Ethernet Interface

- Multiple concurrent telnet sessions are allowed
 - Use `killtelnet` to terminate a telnet connection
- Login using a standard telnet or SSHv2 client
- Telnet access may be disabled to force administrators to connect through an encrypted SSHv2 session
 - Accomplished using the `ipfilter` command¹

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Footnote 1: ipfilter command usage:

```
SW1:FID128:admin> ipfilter --help
Usage: ipfilter
--help:           display the ipfilter synopsis
--create <policyname> -type <ipv4 | ipv6>: create an IP filter policy
--clone <policyname> -from <src_policyname>:
               create an IP filter policy as a copy of existing policy
--show [-a] [policyname]: display one or all IP filter policy
--save [policyname]: save one or all IP filter policy
--activate <policyname>: activate an IP filter policy
--delete <policyname>: delete an IP filter policy
--addrule <policyname> -rule <rule_number> -sip <source_IP> -dp
<dest_port> -proto <protocol> -act <permit | deny> -dip
<destination_IP>: add a rule to an IP filter policy
               -dip is optional.
--delrule <policyname> -rule <rule_number>: delete a rule from an IP
               filter policy
--transabort:    aborts an open IP filter transaction
```

Setting the Domain ID

Set switch configuration parameters

- The Domain ID (DID) is a unique identifier for a switch within a fabric
 - Default DID value is 1
 - Range is 1-239 (0 is not allowed)
- Although domain IDs are assigned dynamically when a switch is enabled, best practice is to change them manually so that you can control the ID number¹
- Use the `configure` command and change the fabric parameters to set the DID
 - This is a disruptive process (must run `switchdisable` command to disable the switch before you can configure the domain ID)

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If a switch has a domain ID when it is enabled, and that domain ID conflicts with another switch in the fabric, the conflict is automatically resolved if the other switch's domain ID is not persistently set. The process can take several seconds, during which time traffic is delayed. If both switches have their domain IDs persistently set, one of them needs to have its domain ID changed to a domain ID not used within the fabric.

Note: The default domain ID for Brocade switches is 1. To avoid future conflicts and unexpected changes when additional switches are enabled that might be assigned the default ID, it is recommended that you change the default ID to an insistent domain ID.

See next notes slide for steps to set the domain ID

Setting the domain ID

1. Connect to the switch and log in on an account assigned to the admin role.
2. Enter the `switchDisable` command to disable the switch.
3. Enter the `configure` command.
4. Enter **y** after the Fabric Parameters prompt.

```
Fabric parameters (yes, y, no, n): [no] y
```

5. Enter a unique domain ID at the Domain prompt. Use a domain ID value from 1 through 239 for normal operating mode (FCSW-compatible).

```
Domain: (1..239) [1] 3
```

6. Respond to the remaining prompts, or press **Ctrl-D** to accept the other settings and exit.
7. Enter the `switchEnable` command to re-enable the switch.

Activate Licensed Features

Set switch configuration parameters

- Used to enable Fabric OS features
- Based on the switch license ID
 - To display the switch license ID run the `license -show -lid` command
- A single license key may activate one feature or a bundle of features
 - To add a license use the `license -install -key lic_key` command
 - To obtain a license, log into your Broadcom.com account and click on Brocade Products and then click on Licensing to bring up the Licensing Portal
- Useful license commands
 - `license --install [-key lic_key]`
 - `license --remove [serial_num] [-key lic_key]`
 - `license --show serial_num [-lid | -port]`
 - `license [--release | --reserve] [-port port_num | port_num_range]`
 - Useful for ports on demand license

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```
SW1:FID128:admin> license --show
License Id : 10:00:c4:f5:7c:41:1e:cc
License 1 :
-----
        License key          :
MNAtEGHaK3LWR9QFYDDr3tXXB3GXrRJWBSWDF
        License features      : Extended Fabric
                                Trunking
                                Integrated Routing
                                Fabric Vision and IO Insight
License 2 :
-----
        License key          :
fGf9MZDENHEDmmarFJGB9HgPAfHrCXQPaEEESKEAMMKA
        License features      : Ports on Demand
        License Capacity       : 24
License 3 :
-----
        License key          :
MSCFXrBJKMGBDLP4NWRKaYWrtFTR3TDtBAfSQNYHAMQaB
        License features      : Q-Flex Ports on Demand
        License Capacity       : 16
```

Set the Fabric Wide Clock

Set switch configuration parameters

- The **principal switch** maintains time for an entire fabric
- Subordinate switches synchronize time from the principal
- Use the `tsclockserver` command to instruct the principal switch to synchronize time with an NTP server
 - Specify addresses of NTP servers to synchronize with
 - Specify LOCL (must be uppercase) to stop NTP synchronization
 - Note: The `tsclockserver` command can be run on any switch in the fabric
- Use the `date` command to manually set the fabric date and time
 - Running the `date` command with no arguments displays the current date and time
 - Running the `date "mmddhhmmyy"` command sets the date and time¹
 - The `date` command becomes read-only if an NTP server is specified

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Footnote 1: Date parameters defined:

mm is the month, valid values are 01-12
dd is the date, valid values are 01-31
hh is the hour, valid values are 00-23

- mm is minutes, valid values are 00-59
- yy is the year, valid values are 00-99

```
SW1:FID128:admin> date
Tue May 16 15:00:57 UTC 2020
SW1:FID128:admin> tsclockserver
LOCL
SW1:FID128:admin> tsclockserver 128.118.25.3
Updating Clock Server configuration...done.
SW1:FID128:admin> tsclockserver
128.118.25.3
SW1:FID128:admin> date "0516073416"
External Time Synchronization in place. Cannot execute this
command.
SW1:FID128:admin> tsclockserver LOCL
Updating Clock Server configuration...done.
SW1:FID128:admin> tsclockserver
LOCL3
SW1:FID128:admin> date "0516073416"
Tue May 16 07:34:00 UTC 2016
```

Set Switch Time Zone

Set switch configuration parameters

- Set on each switch in the fabric
 - Individual switches maintain time zone information independently
- Use the `tstimezone` command to set the switch time zone in relationship to Greenwich Mean Time (GMT)
- Use `tstimezone` command with the `--interactive` operand to provide a time zone menu¹

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```
SW1:FID128:admin> tstimezone -7
SW1:FID128:admin> tstimezone
Time Zone Hour Offset: -7
Time Zone Minute Offset: 0
```

See the next two notes pages for an example of using the `tstimezone -interactive` command.

```
SW1:FID128:admin> tstimezone --interactive
Please identify a location so that time zone rules can be set correctly.
Please select a continent or ocean.
1) Africa           4) Arctic Ocean      7) Australia       10) Pacific
                           Ocean
2) Americas         5) Asia             8) Europe
3) Antarctica       6) Atlantic Ocean    9) Indian Ocean
Enter number or control-D to quit ?2
```

Please select a country.

```
1) Anguilla          19) Dominican Republic   37) Peru
2) Antigua & Barbuda 20) Ecuador            38) Puerto Rico
3) Argentina         21) El Salvador        39) St Barthelemy
4) Aruba             22) French Guiana     40) St Kitts & Nevis
5) Bahamas           23) Greenland          41) St Lucia
6) Barbados          24) Grenada            42) St Maarten (Dutch)
7) Belize             25) Guadeloupe        43) St Martin (French)
8) Bolivia            26) Guatemala          44) St Pierre & Miquelon
9) Brazil             27) Guyana             45) St Vincent
10) Canada            28) Haiti               46) Suriname
11) Caribbean NL     29) Honduras           47) Trinidad & Tobago
12) Cayman Islands   30) Jamaica            48) Turks & Caicos Is
13) Chile              31) Martinique        49) United States
14) Colombia          32) Mexico              50) Uruguay
15) Costa Rica        33) Montserrat        51) Venezuela
16) Cuba               34) Nicaragua          52) Virgin Islands (UK)
17) CuraÃ§ao Islands (US) 35) Panama            53) Virgin
18) Dominica          36) Paraguay
Enter number or control-D to quit ?49
```

Continued on the next notes page:

Continuing with the `tstimezone --interactive` command:

Please select one of the following time zone regions.

- | | |
|-------------------------------------|--------------------------------------|
| 1) Eastern (most areas) | 16) Central - ND (Morton rural) |
| 2) Eastern - MI (most areas) | 17) Central - ND (Mercer) |
| 3) Eastern - KY (Louisville area) | 18) Mountain (most areas) |
| 4) Eastern - KY (Wayne) | 19) Mountain - ID (south); OR (east) |
| 5) Eastern - IN (most areas) | 20) MST - Arizona (except Navajo) |
| 6) Eastern - IN (Da, Du, K, Mn) | 21) Pacific |
| 7) Eastern - IN (Pulaski) | 22) Alaska (most areas) |
| 8) Eastern - IN (Crawford) | 23) Alaska - Juneau area |
| 9) Eastern - IN (Pike) | 24) Alaska - Sitka area |
| 10) Eastern - IN (Switzerland) | 25) Alaska - Annette Island |
| 11) Central (most areas) | 26) Alaska - Yakutat |
| 12) Central - IN (Perry) | 27) Alaska (west) |
| 13) Central - IN (Starke) | 28) Aleutian Islands |
| 14) Central - MI (Wisconsin border) | 29) Hawaii |
| 15) Central - ND (Oliver) | |

Enter number or control-D to quit ?**18**

The following information has been given:

United States
Mountain (most areas)

Therefore TZ='America/Denver' will be used.

Local time is now: Tue Dec 15 08:42:11 MST 2020.

Universal Time is now: Tue Dec 15 15:42:11 UTC 2020.

Is the above information OK?

- 1) Yes
- 2) No

Enter number or control-D to quit ?**1**

System Time Zone change will take effect at next reboot. On Chassis, reboot both CPs simultaneously.

Footnote 1: After using the `--interactive` operand you must use the `--old` argument to change back to offset mode. Some time zones require interactive mode to set including 30 minute India time zones.

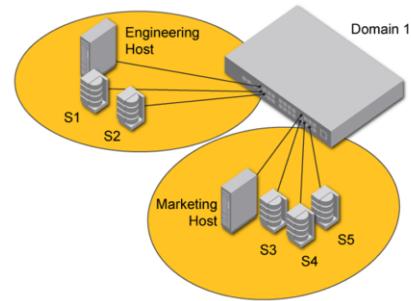
Example: Eastern Time (United States) is GMT-5

```
SW1:FID128:admin> tstimezone --old -5
```

Configure Zoning

- Zoning partitions devices attached to a fabric into logical groups called zones
 - When enabled, devices defined in the same zone are restricted to communicate only with devices in that zone
 - Devices not defined in a zone cannot communicate with any device
 - Fabric OS uses a default zone when no zoning is configured
 - Default setting allows all device access
 - It's recommended to set default zone to "no access" before attaching devices¹
 - If adding a new switch to an existing fabric, zoning will be pushed to the new switch
 - Enabling zoning is a recommended best practice and strongly advised
- **Note – Zoning Fundamentals (ZONE-120) course has more details on zoning**

Set switch configuration parameters



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Footnote 1: If this is the first switch in the fabric, it's recommended to set default zone to no access before attaching host and storage. This will prevent hosts from trying to access every storage port attached to the switch until you are ready to zone the host and storage together. If this switch is being added to an existing fabric, set the default zone to match the fabric the new switch is being added to.

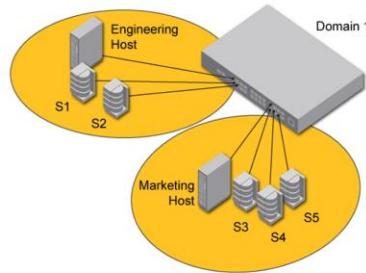
Install SFPs and attach cables

- Install optics
- Connect cables



Install optics
and attach
cables

- Power on host and storage devices
 - If not already powered up



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Verify operation

Port Status LEDs

- Port status LED behavior may vary by switch and blade type
- Check the hardware reference guide for your particular switch or blade

Example: G720 Switch LEDs	Status of Hardware
No light	Indicates one of the following: <ul style="list-style-type: none">• No signal or light carrier (media or cable) detected.• The device may be currently initializing.• The connected device is configured in an offline state.
Steady green	The port is online (connected to an external device) but has no traffic.
Slow-flashing green (on for 1 second; then off for 1 second)	The port is online but is segmented because of a loopback cable or incompatible device connection.
Fast-flashing green (on for 1/4 second; then off for 1/4 second)	The port is online, and an internal loopback diagnostic test is running.
Flickering green	The port is online, and frames are flowing through the port.
Steady amber	The port is receiving light or signal carrier, but it is not online yet.
Slow-flashing amber (on for 2 seconds; then off for 2 seconds)	The port is disabled because of diagnostics or the <code>portDisable</code> command.
Fast-flashing amber (on for 1/2 second; then off for 1/2 second)	The SFP+ or port is faulty.

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Verifying Switch Operation

- Display the switch and port status:

```
SW1:FID128:admin> switchshow
switchName: SW1
switchType: 180.0
switchState: Online
switchMode: Native
switchRole: Principal
switchDomain: 1
switchId: fffc01
switchWwn: 10:00:d8:1f:cc:1a:08:a8
zoning: OFF
switchBeacon: OFF
FC Router: OFF
HIF Mode: OFF
Allow XISL Use: OFF
LS Attributes: [FID: 128, Base Switch: No, Default Switch: Yes, Ficon Switch: No, Address Mode 0]
Index Port Address Media Speed State Proto
=====
 0 0 020000 -- N16 Online FC F-Port 10:00:00:00:c9:24:76:16
 1 1 020100 -- N16 Online FC F-Port 10:00:00:00:c9:29:06:4d
 2 2 020200 -- N32 No_Module FC (POD license not assigned or reserved yet)
 3 3 020300 -- N32 No_Module FC (POD license not assigned or reserved yet)
 4 4 020400 id N32 Online FC E-Port 10:00:c4:f5:7c:0e:b9:3c "SW2" (upstream) (Trunk master)
 5 5 020500 id N32 Online FC E-Port (Trunk port, master is Port 4 )
 6 6 020800 id N32 Online FC E-Port (Trunk port, master is Port 4 )
 7 7 020900 id N32 Online FC E-Port (Trunk port, master is Port 4 )
<truncated output>
```



G720 Switch

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Use this command to display switch, blade, and port status information. Output may vary depending on the switch model.

When used without operands, `switchShow` displays the following information:

switchName: Switch name.

switchType: Switch model and revision numbers.

switchState: Switch state: Online, Offline, Testing, or Faulty. When you issue the `switchcfgPersistentDisable` command followed by the `switchEnable` command, the switch state changes to, "Online (Temporary)". The switch remains in this state until you issue the `switchcfgPersistentEnable` command.

switchMode: Switch operation mode: Access Gateway (if AG is enabled).

switchRole: Switch role: Principal, Subordinate, or Disabled.

switchDomain: Switch domain ID: 1 to 239.

switchId: Switch embedded port D_ID.

switchWwn: Switch world wide name (WWN).

switchBeacon: Switch beaconing state: On or Off.

Zoning: The name of the active zone is displayed in parentheses. Active only when Access Gateway mode is disabled.

FC Router: FC Router state: On or Off.

FC Router BB Fabric ID: The backbone fabric ID for FC routing.

Fabric Name: The name assigned to the fabric. The fabric name is set with the `fabricName` command.

HIF Mode: Indicates HIF mode of the switch. Values are ON or OFF. The HIF mode can be set using the `configure` command.

Allow XISL Use: Allows the switch to use interswitch links (XILS) in the base fabric to carry traffic to this logical switch. Values are ON or OFF.

LS Attributes: On a switch in Virtual Fabric mode, this field displays logical switch attributes, including the fabric ID associated with the logical switch, the switch role (default switch, base switch, or FICON mode logical switch), and the fabric Address Mode (0, 2 or 3). If Virtual Fabrics are disabled, only the Address Mode is displayed. The fabric Address Mode value is set by the `configure` command (Enable a 256 Area Limit).

The switch summary is followed by one-line description for non-EX_Ports and one or two lines for EX_Ports:

Index

Port index is a number between 0 and the maximum number of supported ports on the platform. The port index identifies the port number relative to the switch.

Slot: Slot number; 1-12.

Port: Port number; 0-15, 0-31, or 0-63.

PortWWN: Port world wide name (WWN).

Address: The 24-bit Address Identifier.

Media: Media types include the following:

- **--**: No module present. Applicable to all port types.
- **Cu**: Displays when the copper (default) GbE port ge0 or ge1 is active. If the optical GbE port is active and an SFP is installed (copper or optical), "id" is displayed. If nothing is installed on the optical port, the Media field shows "--". The "cu" field also displays for inter-chassis links (ICLs).
- **Id**: Serial ID. Indicates that an SFP is installed. Use `sfpShow` to get more information about the SFP, including the serial number.

Speed: The speed of the port. Valid port speeds include the following:

- **XG**: XGb/s fixed transfer speed
- **NX**: XGb/s negotiated transfer speed
- **AN**: Autonegotiating
- **UN**: Unknown

State: Port state information. Valid states include the following:

- **No_Card** No interface card present.
- **No_Module** No module (GBIC or other) present.
- **Mod_Val** Module validation in process.
- **Mod_Inv** Module speed mismatch or incompatible SFP.
- **Mod_Uns** Module unsupported.
- **No_Light** The module is not receiving light. This state is not applicable to 16Gb/s-capable interchassis link (ICL) ports.
- **No_SigDet**: No signal is detected on the port. For 16Gb/s-capable interchassis link (ICL) ports, this state replaces the No_Light indicator. It indicates that a quad small form-factor pluggable (QSFP) has been installed but is not connected with a cable.
- **No_Sync**: The module is receiving light but is out of sync.
- **In_Sync**: The module is receiving light and in sync.
- **Laser_Flt**: The module is signaling a laser fault.
- **Port_Flt**: The port is marked faulty.
- **Hard_Flt**: The port is hard faulted.
- **Lock_Ref**: The port is locking to the reference signal.
- **Testing**: The port is running diagnostics.

State (cont.): Port state information. Valid states include the following:

- **Offline:** A port connection is not established (for virtual ports only).
- **Online:** The port is up and running.
- **Transient:** The port is disabled and re-enabled by MAPS to recover from the bottleneck condition caused by the target device.
- **Proto:** Protocol support by GbE port. Valid protocols include the following:
- **ISCSI:** The port supports ISCSI (deprecated).
- **FCIP:** The port supports FCIP.
- **FCoE:** The port supports Fibre Channel over Ethernet.
- **LAN:** The port supports LAN.
- **Comment:** Optionally displays one of the following:
- **Copper or Optical:** Displays which GbE port is currently active in the Brocade 7810 Switch. Copper indicates that the RJ-45 GbE port is currently active. Optical (default) indicates that the currently active GbE port accepts both copper and optical connections (SFPs).
- **Disabled:** The port is disabled. Port disable reasons may be stated in parenthesis.
- **Disabled (FMS Mode):** The port is disabled and in Ficon Server Management mode.
- **Disabled (No area available for PID assignment):** The port is disabled because a PID could not be assigned for the stated reason.
- **Disabled (persistent) *disable reason*:** This port has been disabled with the `portCfgPersistentDisable` command.
- **Disabled (Persistently disabled port) *disable reason*:** This port has been disabled for unspecified reasons.
- **Disabled (Fabric Vision License required):** This D_Port has been disabled because the Fabric Vision license is not installed on the switch.
- **Disabled (Insistent Domain ID):** This port has been disabled because the switch did not get the requested domain ID.
- **Disabled (EX_Port IR POD License Limit Exceeded):** The EX_Port has been disabled because the Integrated Routing license limit for the number of EX_Ports allowed in a switch has exceeded.
- **Disabled (License not Installed for Integrated Routing):** The EX_port has been disabled because License for Integrated Routing not installed in the switch.
- **Disabled (Incompatible AMP Version):** This port has been disabled because of Analytics Monitoring Platform (AMP) version conflict.

State (cont.): Port state information. Valid states include the following:

- **Disabled (Port not bound to Address in FICON Switch):** This port has been disabled because it is not bound to an area after migrating into a FICON switch. Use the `portaddress --bind` command to bind the port.
- **Disabled (Decommissioned):** The E_Port has been disabled by decommissioning operation.
- **Disabled (Port Throttled):** The port has been disabled due to high CPU utilization and will be up later when the CPU load is lower or when the number of ports attempting ASN is less than threshold due to CPU load, whichever happens earlier.
- **Bypassed:** The port is bypassed (loop only).
- **Loopback:** The port is in loopback mode.
- **D_Port:** Diagnostic port; D_Port feature can be configured on both E_Port and F_Port. D_Port on E_Port displays the world wide node name (WWNN) of the remote switch and D_Port on F_Port displays the world wide port name (WWPN) of remote port.
- **E_Port:** Fabric port; displays the world wide name (WWN) and name of the attached switch. If the port is configured as an EX_Port, the WWN of the attached switch is the same as the router.
- **F_Port:** Point-to-point port; displays the WWN of the attached N_Port. If that specific F_Port receives 1 FDISC frame, **switchShow** displays the total number of NPIV Public ports as 1, for example: F_Port 1 NPort + 1 NPIV devices. If the base device logs out with NPIV devices logged in, the command displays the number of NPIV devices, for example, F_Port 1 NPort + 2 NPIV.
- **G_Port:** Point-to-point port, but not yet E_Port or F_Port.
- **L_Port:** Loop port; displays the number of NL_Ports.
- **EX_Port:** Router port; displays the WWN of the attached edge switch.
- **VF_Port:** FCoE Virtual F_Port. Displays the WWN of the attached ENode. For example, if there are NPIV devices logged in (2 FDISCs were received), then **switchShow** displays the total number of NPIV Public ports as 2 (VF_Port 1 NPort + 2 NPIV public).
- **VF_Port Disabled:** FCoE Virtual F_Port is disabled.
- **D_Port Dynamic:** The port is in Dynamic D_Port mode. Use the **configure** command to set the Dynamic D_Port mode.
- **D_Port On-demand:** The port is in On-demand D_Port mode. Use the **configure** command to set the On-demand D_Port mode.
- **D_Port protocol violation:** The port is stuck in G_Port state. The Static D_Port configuration is removed but the remote port is still in Static D-Port mode, which results in the switch port stuck in G_Port mode.

State (cont.): Port state information. Valid states include the following:

- **D_Port F_Port WWN Dynamic:** The port is connected to a device port in the D_Port mode.
- **(Impaired):** The port is not used for routing, if the port is marked as Impaired.
- **SIM Port:** The port is a simulated (SIM) port.
- **Mirror Port:** The port is a mirror port.
- **(Trunk master):** The port is the master port in a group of trunking ports.
- **(Trunk port, master is port #x):** The port is configured as a trunking port; the master port is port #x.
- **(upstream):** The E_Port is an upstream path toward the principal switch of the fabric.
- **(downstream):** The E_Port is a downstream path away from the principal switch of the fabric.
- **FICON Persistent DID:** This port has been disabled, because the switch could not obtain its configuration domain ID during the fabric reconfiguration when `fmsmode` was enabled.
- **Fabric ID conflict:** Two different fabrics have been assigned the same fabric ID. Applicable only to EX_Ports and Logical Fabric environments.
- **Fabric ID oversubscribed:** One fabric has been assigned two different fabric IDs (EX_Ports only).
- **AoQ:** Application-oriented QoS; indicates that an F_Port or N_Port has negotiated a link that is capable of quality of service (QoS). Both sides of the link have QoS capability and agreed on the protocol. The link could be between an HBA and an Access Gateway, between an Access Gateway and an edge switch, or between an HBA and an edge switch.
- **LB mode:** If the Access Gateway cannot negotiate QoS capabilities with the edge switch, an HBA connected to the Access Gateway will not be able to negotiate a QoS link with the Access Gateway.
- **(logical):** Indicates a logical port. The `switchShow` output shows all logical ports currently present in the logical switch. The command displays -1 for the slot for logical ports and the user port number for slot port. The logical port numbers are not persistent and may change when the logical interswitch links (LISLs) are deleted and recreated. A logical port is shown to be in one of the following states: E_Port (if the port is online), offline, or disabled. When the port is disabled, a reason is provided.
- **Segmented:** Indicates a segmented or disabled port along with one of the following segmentation reasons:

State (cont.): Port state information. Valid states include the following:

- **(Encrypt incompatible):** Port segmentation or port disable due to encryption incompatibility.
- **(Compress incompatible):** Port segmentation or port disable due to mismatched configurations.
- **(Encrypt limitation):** Port segmentation or port disable due to reaching encryption limitations.
- **(Compress limitation):** Port segmentation or port disable due to reaching compression limitations.
- **(Authentication failure):** Port segmentation or port disable due to authentication failure.
- **(Defzone conflict):** Port segmentation due to defzone states.
- **(Type mismatch):** D_Port configuration mismatch between local and remote switch.
- **(D-port mode mismatch, Not D-port):** The local port is configured as D_Port and remote port is not a D_Port. This segmentation reason is displayed for the local port.
- **(D-port mode mismatch, Static D-port):** The local port is configured as D_Port and remote port is not a D_Port. This segmentation reason is displayed for the remote port.
- **(ESC mismatch, AMP Version Conflict):** Port segmentation due to Analytics Monitoring Platform (AMP) version mismatch.
- **(Incompatible AMP Version):** Port segmentation due to incompatible Analytics Monitoring Platform (AMP) version.

Verify
operation

Port Status

- Port status command

```
portshow [slotnumber/]portnumber
```

```
SW1:FID128:admin> portshow 0
portIndex: 0
portName: edu_init1
portHealth: HEALTHY
Authentication: None
portDisableReason: None
portCFlags: 0x1
portFlags: 0x10020b03
LocalSwcFlags: 0x0
portType: 26.0
POD Port: Port is licensed
portState: 1 Online
Protocol: FC
portPhys: 6 In_Sync
port generation number: 20
state transition count: 7
(truncated output, see notes)
```

Port Name or if no name defined port number will be displayed

PRESENT ACTIVE F_PORT G_PORT U_PORT LOGICAL ONLINE LOGIN NOELP ACCEPT FLOGI

Port initialization from right to left and current port type (F_Port in this example)

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```
portId: 020000
portIfId: 4302003e
portWwn: 20:00:c4:f5:7c:41:le:cc
portWwn of device(s) connected: 21:00:f4:e9:d4:17:2c:00
Distance: normal
portSpeed: N16Gbps
FEC: Active
Credit Recovery: Inactive
Aoq: Inactive
FAA: Inactive
F_Trunk: Inactive
LE domain: 0
Peer beacon: Off
FC Fastwrite: OFF
Interrupts: 64 Link_failure: 1 Frjt: 0
Unknown: 0 Loss_of_sync: 1 Fbsy: 0
Lli: 64 Loss_of_sig: 3
Proc_rqrdr: 3867 Protocol_err: 0
Timed_out: 0 Invalid_word: 0
Tx_unavail: 0 Invalid_crc: 0
Delim_err: 0 Address_err: 0
Lr_in: 9 Ols_in: 1
Lr_out: 5 Ols_out: 5
Cong_Prim_in: 0
```

Port WWN of attached device
Distance: Normal credit buffers
port speed


 Verify
operation

Switch Health Report

- Brocade Monitoring Alerting Policy Suite (MAPS) dashboard provides switch health status

```
SW1:FID128admin> mapsdb --show
<Truncated output>
2 Switch Health Report:
=====
Current Switch Policy Status: MARGINAL
Contributing Factors:
-----
*BAD PWR (MARGINAL).
3.1 Summary Report:
=====
```

Category	Today	Last 7 days	
Port Health	No Errors	No Errors	
BE Port Health	No Errors	In operating range	
Extension GE Port Health	No Errors	No Errors	
Fru Health	In operating range	In operating range	
Security Violations	In operating range	No Errors	
Fabric State Changes	No Errors	No Errors	
Switch Resource	In operating range	In operating range	
Extension Health	No Errors	No Errors	
Fabric Performance Impact	In operating range	In operating range	
IO Latency	In operating range	In operating range	

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Switch Status Policy includes the following:

- **Power Supplies (BAD_PWR)** - Power supply thresholds detect absent or failed power supplies, and power supplies that are not in the correct slot for redundancy.
- **Temperatures (BAD_TEMP)** - Temperature thresholds, faulty temperature sensors.
- **Fans (BAD_FAN)** - Number of problematic fans, including missing fans and faulty fans.
- **Flash (FLASH_USAGE)** - Flash thresholds.
- **Margin Ports (MARG_PORTS)** - Thresholds for physical ports, E_Ports, and F_Ports (both optical and copper). Whenever these thresholds are persistently high, the port is marginal.
- **Faulty Ports (FAULTY_PORTS)** - Hardware-related port faults.
- **Missing SFPs (MISSING_SFP)** - Ports that are missing SFP media.
- **Error Ports (ERR_PORTS)** - Ports with errors.
- **WWN (WWN_DOWN)** - Faulty WWN card (applies to modular switches only).
- **Core Blade (DOWN_CORE)** - Faulty core blades (applies to modular switches only).
- **Faulty blades (FAULTY_BLADE)** - Faulty blades (applies to modular switches only).
- **High Availability (HA_SYNC)** - Switch does not have a redundant CP (this applies to modular switches only).

Notes continued on next page

FRU Health:

- **Power supplies (PS_STATE)** - State of a power supply has changed.
- **Fans (FAN_STATE)** - State of a fan has changed.
- **Blades (BLADE_STATE)** - State of a slot has changed.
- **SFPs (SFP_STATE)** - State of the SFP transceiver has changed.
- **WWN (WWN_STATE)** - State of a WWN card has changed.

Switch Resource:

- **Temperature (TEMP)** - The ambient temperature inside the switch in degrees Celsius. Temperature sensors monitor the switch in case the temperature rises to levels at which damage to the switch might occur.
- **Flash (FLASH_USAGE)** - The available compact flash space, calculated by comparing the percentage of flash space consumed with the configured high threshold value.
- **CPU usage (CPU)** - The percentage of CPU available, calculated by comparing the percentage of CPU consumed with the configured threshold value.
- **Memory (MEMORY_USAGE)** - The available memory, calculated by comparing the percentage of memory consumed with the configured threshold value.
- **Management port (ETH_MGMT_PORT_STATE)** - The status of the management port (Bond0).

Notes continued on next page

The `mapsDb` command displays or clears the dashboard which shows an at-a-glance snapshot of the switch health status.

Use this command to view the summary of the events or rules triggered and the objects on which the rules were triggered over a specified period of time, and to clear the dashboard data. When used with the `--show` option, this command displays the following information:

Dashboard Information:

- Displays the dashboard start time, active policies, configured alerts, fenced ports, decommissioned ports, fenced circuits, quarantined ports, and the ports with highest zoned device ratio.

Switch Health Report:

- Displays the overall status of the switch. If the overall status is not healthy, the contributing factors and the fenced ports are listed.

Summary Report:

- Displays the status of the monitoring categories needed to determine the current health of the switch. The health state of each category is contributed to by a group of monitoring systems or error counters, and the rules configured in the active policy. The summary view displays the following information for each category: information collected since midnight of the current day and the historical information collected over the last 7 days.

The health state can be one of the following:

- No Error - No error has occurred.
- In operating range - The errors are within the thresholds configured in the active policy.
- Out of operating range - The errors are above the configured thresholds and this triggers the rules configured in the active policy. This indicates that some attributes of the switch are operating out of the configured range.

Rules Affecting Health:

- Displays the conditions that contributed to the current switch status. The following information is displayed: number of rules triggered in a category, repeat count, triggered rules, execution time, the elements for which rules were triggered, and the triggered value.

Note continued on next page

```
SW1:FID128:admin> mapsdb --show
```

1 Dashboard Information:

```
=====
DB start time:           Wed Aug 26 20:45:25 2020
Active policy:          dflt_base_policy
Configured Notifications: SW_CRITICAL,SW_MARGINAL,SFP_MARGINAL,FPIN
Fenced Ports :          None
Decommissioned Ports :   None
Fenced circuits :       None
Quarantined Ports :     None
```

Top Zoned PIDs <pid(it-flows)>:

2 Switch Health Report:

```
=====
Current Switch Policy Status: MARGINAL
Contributing Factors:
-----
*BAD_PWR (MARGINAL).
```

3.1 Summary Report:

Category	Today	Last 7 days	
Port Health	No Errors	No Errors	
BE Port Health	No Errors	In operating range	
Extension GE Port Health	No Errors	No Errors	
Fru Health	In operating range	In operating range	
Security Violations	In operating range	No Errors	
Fabric State Changes	No Errors	No Errors	
Switch Resource	In operating range	In operating range	
Extension Health	No Errors	No Errors	
Fabric Performance Impact	In operating range	In operating range	
IO Latency	In operating range	In operating range	

3.2 Rules Affecting Health:

Category (Violation Count)	RepeatCount	Rule Name	Execution
Time	Object	Triggered Value (Units)	

Currently the switch status is MARGINAL due to a bad power supply

Verify operation

FRU Status Commands

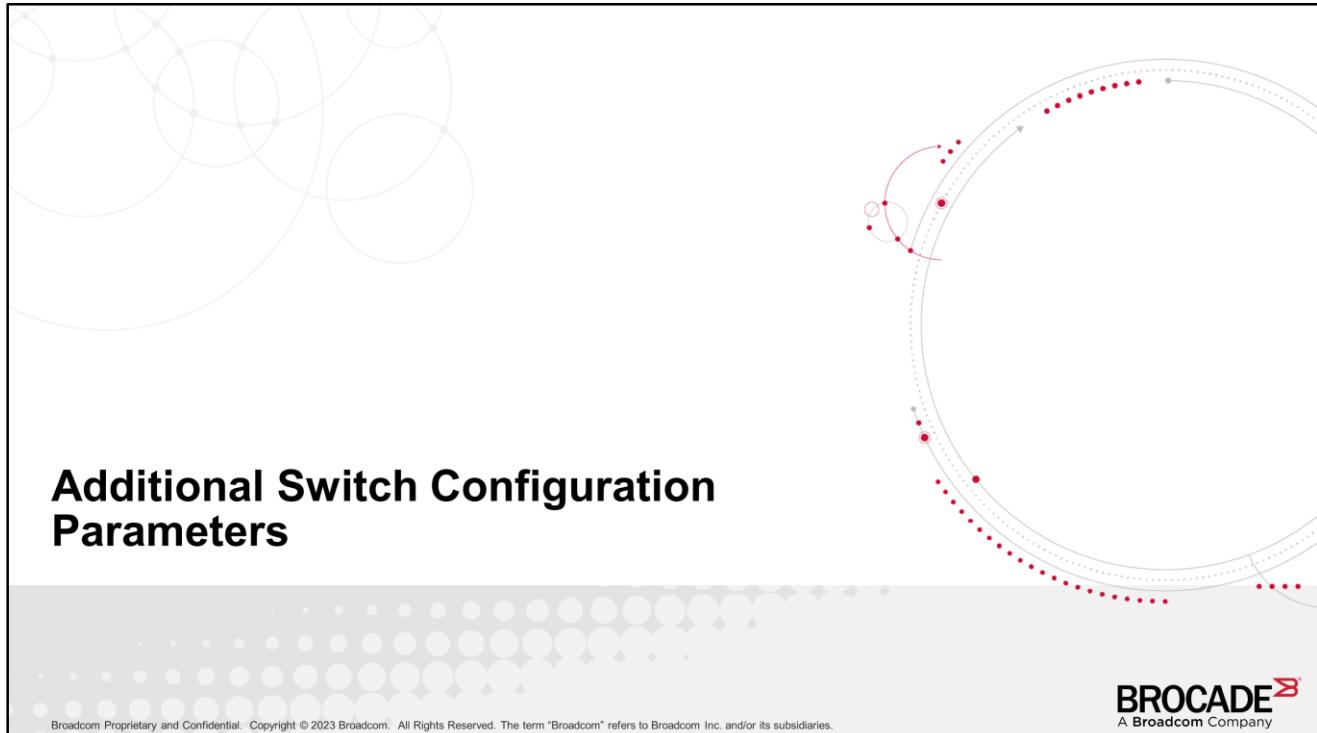
- The **sensorshow** command displays the current temperature, fan, and power supply status from sensors located on the switch

```
SW1:admin> sensorshow
sensor  1: (Temperature) is Absent
sensor  2: (Temperature) is Ok, value is 35 C
sensor  3: (Temperature) is Ok, value is 38 C
sensor  4: (Temperature) is Ok, value is 42 C
sensor  5: (Temperature) is Ok, value is 46 C
sensor  6: (Temperature) is Ok, value is 43 C
sensor  7: (Temperature) is Ok, value is 45 C
<truncated output>
sensor 48: (Fan          ) is Ok,speed is 4918 RPM
sensor 49: (Fan          ) is Ok,speed is 5037 RPM
sensor 50: (Fan          ) is Ok,speed is 4966 RPM
sensor 51: (Power Supply) is Ok
sensor 52: (Power Supply) is Ok
sensor 53: (Power Supply) is Absent
```

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Use this command to display the current temperature, fan, and power supply status and readings from sensors located on the switch. The actual location of the sensors varies, depending on the switch type.



Additional Switch Configuration Parameters

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Configuration Parameters

Set switch configuration parameters

- The Configuration parameters dictates switch behavior
 - Set using the `configure` command
 - Most configuration parameters require the switch to be offline (disabled)
 - Disable the switch before setting fabric configuration parameters
`SW1:admin> switchdisable; configure`
 - Reset some factory defaults by using the `configdefault` command
`SW1:admin> switchdisable; configdefault`
 - Parameters not reset by a `configdefault`
 - Ethernet MAC address, IP address, subnet mask, and boot ROM parameters
 - IP gateway address
 - License keys
 - OEM customization
 - Product ID and Vendor ID
 - SNMP configuration
 - System name
 - Chassis name
 - World wide name
 - Zoning configuration (includes aliases, zones, and configurations)
 - Security parameters and policies
 - User account passwords (includes all user configuration and all built-in accounts)
 - Switch PID format
 - Ethernet Link Mode

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Note: For a complete list please see the Fabric OS Command Reference Guide for the version of Fabric OS you are running

```
SW1:FID128:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no] y
Domain: (1..239) [2]
WWN Based persistent PID (yes, y, no, n): [no]
Allow XISL Use (yes, y, no, n): [no]
R_A_TOV: (4000..120000) [10000]
E_D_TOV: (1000..5000) [2000]
WAN_TOV: (0..30000) [0]
MAX_HOPS: (7..19) [7]
Data field size: (256..2112) [2112]
Sequence Level Switching: (0..1) [0]
Disable Device Probing: (0..1) [0]
Suppress Class F Traffic: (0..1) [0]
Per-frame Route Priority: (0..1) [0]
BB credit: (1..27) [16]
Insistent Domain ID Mode (yes, y, no, n): [no]
<truncated output>
```

Set switch configuration parameters

Fabric Names

- Fabric Names are used to assign meaningful and an easy-to-remember name to a fabric
 - Easier to identify specific fabrics in a Virtual Fabric environment
 - All printable characters including spaces are allowed in a fabric name
 - Configurable in both switch online or offline modes
 - Duplicate fabric names are not allowed in a single chassis with Virtual Fabrics
 - Example:

```
SW1:FID128:admin> fabricname --set edu_fabric1
Fabric Name is Set to edu_fabric1
SW1:FID128:admin> fabricname --show
Fabric Name: "edu_fabric1"
```

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Usage:

```
fabricname --set [fabric name]    fabric name takes any ascii
                                         string up to length 123 characters
fabricname --clear
fabricname --show
fabricname --help
```

Actions:

- | | |
|---------|--|
| --set | - This will set the fabric name to be the string given by the argument which is 1 to 128 characters in length. If no fabric name is specified, the existing fabric name is synchronized across the fabric. |
| --clear | - This will clear the fabric name already set |
| --show | - This will show the current fabric name |
| --help | - Shows this help menu |

Additional information on next notes page

Command examples that show the fabric name

```
SW1:FID128:admin> switchshow
switchName:      SW1
switchType:      180
switchState:     Online
switchMode:      Native
switchRole:      Principal
switchDomain:    2
switchId:        fffc02
switchWwn:       10:00:c4:f5:7c:41:1e:cc
zoning:          ON (Production)
switchBeacon:    OFF
FC Router:      OFF
Fabric Name:   edu_fabric1
<truncated output>
```

```
SW1:FID128:admin> fabricshow
Switch ID  Worldwide Name           Enet IP Addr   FC IP Addr  Name
-----
1: fffc01  10:00:c4:f5:7c:46:2c:a0 10.124.91.4   0.0.0.0    "G720_Core"
2: fffc02  10:00:c4:f5:7c:41:1e:cc 10.124.91.3   0.0.0.0    >"G720"
3: fffc03  10:00:00:05:33:7f:05:b0 10.124.91.5   0.0.0.0    "G720_Edge"
150: fffc96 10:00:c4:f5:7c:35:ab:58 10.124.91.29  0.0.0.0    "AMP"
```

The Fabric has 4 switches
Fabric Name: edu_fabric1

Set switch configuration parameters

Set the Chassis Name

- The chassis name for the switch should be set along with the switch name
 - Used to distinguish the physical chassis from logical switches in Virtual Fabric mode
 - Used for naming **supportsave** files
 - Default chassis name is the switch model number
- The chassis name can be set using the `chassisname` command:
 - Set chassis name

```
chassis:admin> chassisname Education_1
```
 - Display chassis name

```
chassis:admin> chassisname
Education_1
```

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Chassis name rules are slightly different from switch naming rules:

- The chassis name is limited to 31 characters
- A chassis name must begin with a letter
- Can consist of letters, numbers, underscore or hyphen characters
- Spaces are not permitted

Set the Switch Name

Set switch configuration parameters

- Switch names should be unique for easier administration
- Following are naming suggestions, use one or a combination:
 - Site or building where switch is located
 - Floor or room where switch is located
 - Indicate topology (core switch vs. edge switch)
 - Rack ID
 - Switch type
 - Fabric ID
 - Domain ID
 - Example: SJC2_C4_E_G720
 - San Jose Campus, building 2
 - Room C4
 - Rack E
 - Switch model G720
- Switch name is assigned using the `switchname` command¹

When you login a switch the switch name is part of the prompt: example:
SJC2_C4_E_G720:FID128:admin>

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Footnote 1: Changing the switch name causes a domain address format registered state change notification (RSCN) to be issued.

Having a well thought-out switch naming convention enables easy identification of physical switches if a problem arises. Use a switch naming convention that scales across the organization, keeping in mind that the SAN might start small but can be extended enterprise-wide over time. Switch names can be duplicated in the fabric. To see a list of the existing switch names and their IP settings, use the `fabricshow` command.

Switch name rules:

- Up to 30 characters on all platforms
- A switch name must begin with a letter or number
- Can consist of letters, numbers, underscore or hyphen characters
- Spaces are not permitted.

```
SW1:FID128:admin> switchname "SJC2_C4_E_G720"
Committing configuration...
Done.
SJC2_C4_E_G720:FID128:admin>
```

Set switch configuration parameters

Configure Registered Organization Name (RON)

- Use the (Registered Organization Name) `ron` command to set the organization name for the switch
 - Only supported on directors and is not on departmental switches
 - Command options:
`ron --set "org_name"`
`ron --show`
`ron -help`
 - Example:

See notes for additional information

```
SW1:FID128:admin> ron -set "Brocade"
Registered Organization Name will be set to: Brocade
Once changes are committed, it cannot be modified.
Are you sure you want to commit these changes? (Y/N)? y
Registered Organization Name is set successfully.

SW1:FID128:admin> ron --show
Registered Organization Name : Brocade
Registration complete on : Dec 2020
```

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- RON provide a mechanism to track the Registered Organization Name (RON).
- RON is to be set only once by customers and cannot be changed/removed by customers.
- RON will be part of the Support Save to identify customer organizations
- Supported on Fabric OS v8.2.0 and higher
- The maximum length for the origination name is 28 characters
- RON is supported only for chassis based platforms.

Departmental_Switch:FID128:admin> **ron --set "education"**

This command is not supported on this platform.

It works only on Dual CP system

Set switch configuration parameters

Set Banners

- Two types of banners:

- Message of the Day (MOTD) sets the banner on the chassis and displays before you login

- Example: `motd --set`

```
SW1:admin> motd --set "Access by unauthorized personnel is prohibited."
```

- Login banner uses the `bannerset` command to set the banner on the chassis and it displays after you successfully log in

- Example: `bannerset`

```
SW1:admin> bannerset "You have successfully logged into the switch."
```

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```
SW1:FID128:admin> motd --set "Access by unauthorized personnel is prohibited."
```

```
SW1:FID128:admin> motd --show
```

```
Access by unauthorized personnel is prohibited.
```

```
SW1:FID128:admin> bannerset "You have successfully logged into the switch."
```

```
SW1:FID128:admin> bannershow
```

```
You have successfully logged into the switch.
```

```
login as: admin
```

```
Access by unauthorized personnel is prohibited.
```

```
admin@10.255.237.9's password:
```

```
You have successfully logged into the switch.
```

Display Banners

- MOTD

```
SW1:admin> motd --show
```

Access by unauthorized personnel is prohibited.

Set switch configuration parameters

- Login banner

```
SW1:admin> bannershow
```

Banner: You have successfully logged into the switch.

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Set switch configuration parameters

Port Speeds

- Individual port speeds can be set by the administrator

```
portcfgspeed [slot/]port speed
  0  - Auto Negotiate (Hardware) (default setting)
  4  - 4Gbps
  8  - 8Gbps
 10  - 10Gbps
 16  - 16Gbps
 25  - 25Gbps
 32  - 32Gbps
 40  - 40Gbps (for Ethernet port)
 53  - The port is at a fixed speed 53Gbs, supported only on Gen 7 core blades
 64  - 64Gbps (Gen 7 switches only)
```

- If port is hard coded, the SFP must be able to negotiate the hard-coded port speed, otherwise the port will not come up
 - switchshow and portshow outputs display the port speed

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See next notes page for portcfgspeed usage information.

Usage: portCfgSpeed [SlotNumber/]PortNumber Speed_Level

OR

```
portcfgspeed -i <port_index | portindex_range>
[-f] Speed_Level [-m] <max_auto_speed>
```

OR

```
portcfgspeed <-slot | -s > <slot# | slotrange>
Speed_Level [-m] <max_auto_speed>
```

-i: Confirms port swap has been disabled and to give port index as operand

-x: Confirms port swap has been disabled and to give port index in HEX format as operand

-f: ignores non-existing indexes

portindex_range: Specifies the range of port index <portindex1-portindex2> (example: 12-14)

Speed_Level:	0	-	Auto Negotiate (Hardware)
	4	-	4Gbps
	8	-	8Gbps
	10	-	10Gbps
	16	-	16Gbps
	25	-	25Gbps
	32	-	32Gbps
	40	-	40Gbps
	53	-	53Gbps
	64	-	64Gbps

-m: Option to set auto negotiation maximum speed

4	-	Auto max speed 4G
8	-	Auto max speed 8G
16	-	Auto max speed 16G
32	-	Auto max speed 32G
64	-	Auto max speed 64G

Set switch configuration parameters

Configuring 10 Gbps Fibre Channel

- Octet speed combo must be set to 2 or 3 to support 10 Gbps speeds
 - 1: Supports auto-negotiated or fixed port speeds of 32, 16, 8, and 4Gb/s in Brocade Gen 6 platform (10G is not supported for combo 1)
 - 2: Supports auto-negotiated or fixed port speeds of 10, 8, and 4Gb/s in Brocade Gen 6 platforms
 - 3: Supports auto-negotiated or fixed port speeds of 16 and 10Gb/s in Brocade Gen 5 platforms
- Port must be disabled first: `portcfgoctetspeedcombo [slot/]port combo`
- To reset to default: `portcfgoctetspeedcombo [slot/]port combo --default`
- Port must be configured for 10 Gbps operation: `portcfgspeed [slot/]port 10`
- The `portcfgoctetspeedcombo` command is not supported on the Brocade 7810, Brocade G610, and Brocade Gen 7 Platform switches. On these platforms use `portcfgspeed` command instead to configure 10G speed

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The `portcfgoctetspeedcombo` command will set the possible speeds for the entire port group. If you are configuring 10 Gbps ports in a port group be sure that there are no 8/16/32 gbps ports connected as you will lose the ability to use those port speeds after the port group has been changed.

Synopsis:

```
portcfgoctetspeedcombo [slot]port combo  
portcfgoctetspeedcombo [slot]port -default
```

- The command is supported on Ethernet ports.

The operation of the `portCfgOctetSpeedCombo` can be disruptive.

Port Settings and Commands

Set switch configuration parameters

SW1:FID128:admin> **portcfgshow | more**

Ports of Slot 0	0	1	2	3	4	5	9	10	14	15
Octet Speed Combo	1	1	1	1	1	1	1	1	1	1
Speed	AN	AN	AN	AN	32	32	AN	AN	AN	AN
Trunk Port	ON									
Long Distance
VC Link Init
Disabled E_Port
Locked E_Port
ISL R_RDY Mode
RSCN Suppressed
Persistent Disable
LOS TOV mode	0	0	0	0	0	0	0	0	0	0
NPIV capability	ON									
NPIV PP Limit	126	126	126	126	126	126	126	126	126	126
NPIV FLOGI Logout
QOS Port	AE									
EX Port

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Use this command to display the current configuration of a port. The behavior of this command is platform-specific; output varies depending on port type and platform, and not all options are supported on all platforms.

Command usage:

```
portcfgshow
portcfgshow [slot/]port
portcfgshow -i [-index1[-index2] [...] [-f]]
portcfgshow -slot [slot1[-slot2] [...]]
portcfgshow [option] [slot/]ge_port
portcfgshow [fciptunnel | fcipcircuit]
[all | [slot/]veport] [optional_argument]
portcfgshow ipsec-policy
portcfgshow lag
portcfgshow tcl
portcfgshow sla
```

See notes of the next several pages for additional information

Port Settings and Commands (cont.)

Set switch configuration parameters

(portcfgshow output continued from previous slide)

Ports of Slot 0	0	1	2	3	4	5	9	10	14	15
Mirror Port
Credit Recovery	ON									
Fport Buffers
Eport Credits
Port Auto Disable
CSCTL mode
D-Port mode
D-Port over DWDM
Compression
Encryption
10G/16G FEC	ON									
16G FEC via TTS
Fault Delay	0	0	0	0	0	0	0	0	0	0
SIM Port
TDZ mode
Clean Address Bit

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Additional information for the `Portcfgshow` command output:

Octet Speed Combo: Displays the speed configuration for a port octet. This value is set by the `portCfgoctetSpeed -Combo` command. Port octet speed configuration is supported on 16Gb/s and higher speed capable platforms. On unsupported platforms the Octet Speed Combo field is suppressed. Valid Octet Combo values include the following:

- **1:** On Brocade Gen 5 switches and blades: Autonegotiated or fixed port speeds of 16, 8, 4, and 2Gb/s. On Brocade Gen 6 switches and blades: Autonegotiated or fixed port speeds of 32, 16, 8, and 4Gb/s.
- **2:** On Brocade Gen 5 switches and blades: Autonegotiated or fixed port speeds of 10, 8, 4, and 2Gb/s. On Brocade Gen 6 switches and blades: Autonegotiated or fixed port speeds of 10, 8, and 4Gb/s.
- **3:** Autonegotiated or fixed port speeds of 16 and 10Gb/s.

Speed: Displays Auto for auto speed negotiation mode, or a specific speed of 1Gb/s, 2Gb/s, 4Gb/s, 8Gb/s, or 16Gb/s, and soft, 10, or AX on 8Gb/s. This value is set by the `portCfgspeed` command.

Trunk Port: Displays ON when port is set for trunking. Displays (...) or OFF when trunking is disabled on the port. This value is set by the `portCfgTrunkPort` command.

Additional information for the `Portcfgshow` command output (cont.):

Long Distance: Displays (...) or OFF when long distance mode is off; otherwise, displays long distance levels. This value is set by the `portCfgLongDistance` command. Values are as follows:

- **LE:** The link is up to 10 km.
- **LD:** The distance is determined dynamically.
- **LS:** The distance is determined statically by user input.

VC Link Init: Displays (...) or OFF when the long distance link initialization option is turned off. Displays ON when it is turned on for long distance mode. This value is set by the `portCfgLongDistance` command.

Desired Distance: Displays the desired distance of the port. This field is displayed only when `portCfgShow` is executed for a single port and would only display for LS and LD long distance mode.

Reserved Buffers: Displays the reserved buffers for the port. This field is displayed only when `portCfgShow` is executed for a single port and would only display for LS and LD long distance mode.

Disabled E_Port: Displays ON when the port is not allowed to be an E_Port. Displays (...) or OFF when the port is allowed to function as an E_Port. This value is set by the `portCfgEport` command.

ISL R_RDY Mode: Displays ON when ISL R_RDY mode is enabled on the port. Displays (...) or OFF when ISL R_RDY mode is disabled. This value is set by the `portCfgISLMode` command.

RSCN Suppressed: Displays ON when RSCN suppression is enabled on the port. Displays (...) or OFF when RSCN suppression is disabled. This value is set by the `portCfg_rscnsupr` command.

Persistent Disable: Displays ON when the port is persistently disabled; otherwise displays (...) or OFF. This value is set by the `portCfgPersistentDisable` command.

LOS TOV mode: Displays 1 (ON:FixSpd) or 2 (ON:AN&FixSpd) when LOS TOV is enabled on the port; otherwise displays (...) or 0 (OFF). This value is set by the `portCfgLossTov` command.

NPIV capability: Displays ON when N_Port ID Virtualization (NPIV) is enabled on the port (default). Displays (...) or OFF when NPIV capability is disabled. This value is set by the `portCfgNPIVPort` command.

NPIV PP Limit: Displays the maximum number of allowed logins for the port. Displays the default of 126 or the configured maximum. This parameter is set with the `portCfgNPIVPort -setloginlimit` command.

Additional information for the `Portcfgshow` command output (cont.):

NPIV FLOGI Logout: Displays ON when the Base Device Logout feature is enabled and the base device can logout without disrupting the NPIV devices on the same port. Displays (...) when the base device log out causes the NPIV devices on the same port to log out.

QOS E_Port: Displays ON when Quality of Service (QoS) is enabled on the E_Port (or EX_Port) when QoS is enabled in an FCR deployment scenario. Displays (...) or OFF when QoS is disabled. By default, QoS is enabled if sufficient buffers are available. Displays AE when QoS is configured as Auto Enabled. In the AE state, QoS is enabled based on the availability of buffers. Use `is1Show` to determine the current status of QoS (on or off) in the AE state. This value is set by the `portCfgQos` command.

EX_Port: Displays ON when the port is configured as an EX_Port. Otherwise displays (...) or OFF. This value is set by the `portCfgExPort` command.

Mirror Port: Displays ON when Mirror Port is enabled on the port. Displays (...) or OFF when Mirror Port is disabled. This value is set by the `portCfg mirrorport` command.

SIM Port: Displays ON when SIM Port is enabled on the port. Displays (...) or OFF when SIM Port is disabled. This value is set by the `flow --control flow_name - simport` command.

Credit Recovery: Displays ON when Credit Recovery is enabled on the port. Displays (...) or OFF when the feature is disabled. This value is set by the `portCfgCreditRecovery` command. The credit recovery feature is enabled by default.

Port Auto Disable: Displays On when the Auto Disable feature is enabled on a port. Displays (...) or OFF when the feature is disabled. This feature causes ports to become disabled when they encounter an event that would cause them to reinitialize. This feature is enabled by the `portCfgAutoDisable` command. The feature is disabled by default. In the single port view, the configured trigger conditions are displayed when the feature is disabled. See the example section for an illustration.

F_Port Buffers: Displays the number of configured F_Port buffers. Displays (...) or OFF if no buffers are configured. The buffer value is set by the `portCfgfPortbuffers` command.

E_Port Credits: Displays the number of configured E_Port credits. Displays (...) or OFF if no credits are configured. The credit value is set by the `portCfgEportCredits` command.

CSCTL mode: Displays ON if CSCTL mode is enabled on the port. Displays (...) or OFF if the feature is disabled. This parameter is set with the `portCfgQos` command.

TDZ mode: Displays ON when Target Driven Zoning (TDZ) is enabled on a port and the port is online or offline. Displays (...) or OFF when the configuration is disabled. TDZ is enabled by the `portCfgTdz` command; it is disabled by default.

Additional information for the `Portcfgshow` command output (cont.):

D_Port mode: Displays ON when the port is configured as a D_Port; otherwise displays (..) or OFF. Refer to the `portCfgDPort` command for more information. This parameter is displayed only on on 16Gb/scapable blades that support D_Port capability.

D_Port over DWDM: Displays ON when dwdm is enabled on that port using the `portcfgdport` command. This option is used to set if the link connecting two switches is a DWDM (Dense Wavelength Division Multiplexing) link. However, it can be set on normal links also.

Fault Delay: Displays the Fault delay value. Displays 0 if the value is R_A_TOV. This is the default. Displays 1 if the value is 1.2 seconds. This value is set by the `portCfgFaultDelay` command. valid for FC ports only.

Compression: Displays ON when compression is enabled on a port. Displays (..) or OFF when the configuration is disabled. Compression is enabled by the `portCfgCompress` command; it is disabled by default.

Encryption: Displays ON when encryption is enabled on a port. Displays (..) or OFF when the configuration is disabled. Encryption is enabled by the `portCfgEncrypt` command; it is disabled by default.

10G/16G FEC: Displays ON when Forward Error Correction (FEC) is enabled on a port and the port is online. Displays (..) or OFF when the configuration is disabled. FEC is enabled by the `portCfgFec` command; it is enabled by default.

16G FEC via TTS: Displays ON when control of the Forward Error Correction (FEC) state is permitted via TTS by an externally attached host or device. Displays (..) or OFF when the external control of FEC is disabled. See `portCfgFec` command help page for additional information.

Clean Address Bit: Displays ON when the port is configured with Clean Address Bit. Displays (..) or OFF when the port configuration is disabled. See `portCfgCleanAddress` command help page for additional information.

Congestion Signal: Displays the port level configuration of the congestion signal primitives. Displays (..) or OFF when the port configuration is disabled. See `portCfgCongestionSignal` command help page for additional information.

Enabling / Disabling Ports

Set switch configuration parameters

- Port enable/disable commands:

```
portdisable [slotnumber/]port1-port2  
portenable [slotnumber/]port1-port2  
portcfgpersistentdisable [slotnumber/]port1-port2  
portcfgpersistentenable [slotnumber/]port1-port2
```

- Example: To disable multiple port ranges:

```
SW1:FID128:admin> portdisable 2/24-26 3/10-12
```

— This example would disable slot 2, ports 24-26 and slot 3 ports 10-12

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```
SW1:FID128:admin> portshow 0
```

```
portIndex: 0  
portName: edu_init1  
portHealth: HEALTHY  
  
Authentication: None  
portDisableReason: None  
portCFlags: 0x1  
portFlags: 0x10020b03  
  
LocalSwcFlags: 0x0  
portType: 26.0  
POD Port: Port is licensed  
portState: 1 Online  
Protocol: FC  
portPhys: 6 In_Sync  
port generation number: 12  
state transition count: 5
```

Port name

Port initialization from right to left
U, G to F_Port

```
PRESENT ACTIVE F_PORT G_PORT U_PORT  
LOGICAL_ONLINE LOGIN NOELP ACCEPT FLOGI
```

Port Name

Set switch configuration parameters

- A port name is assigned to all FC ports on a switch by default

Class of Switch	Default PortName Format	Example
Switch	Port<port_no>	8
Director	Slot<slot_no>/ port<port_no>	1/8

- To change the port name:

```
SW1:FID128:admin> portname 8 -n Gen7-edu1
```

```
SW1:FID128:admin> portshow 8
```

```
portIndex: 8
```

```
portName: Gen7-edu1
```

```
portHealth: HEALTHY
```

```
<truncated output>
```



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Running the command `portname x` (where x is the port number) will display the portname, example:

```
SW1:FID128:admin> portname 1  
port 1: Gen7-edu1
```

Port Name (cont.)

Set switch configuration parameters

- Port names are displayed in the `portshow` output if not configured the port name will just show the port number
 - Configured port names will always overrides default port names
- SANnav and WebTools will both display the port name if configured
- Port name assignments do not reside in the configuration file
- Issuing `portcfgdefault` causes any configured port name to reset to default

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CLIs for Default Port Name: Default port names will be the port number:

Director

```
X7-4:FID128:admin> portshow 1/0
portIndex:    0
portName: slot1 port0
portHealth: HEALTHY
<truncated output>
```

Switch

```
G720:FID128:admin> portshow 0
portIndex:    0
portName: port0
portHealth: HEALTHY
<truncated output>
```

Set Syslog Server

Set switch configuration parameters

- The system logging daemon (syslogd) on hosts can receive system events and error messages from Brocade switches
- Configuring all switches and control processors to send syslogd messages provides the administrator with a fabric-wide view of logged events
- Syslog configuration is set using the `syslogadmin` command¹
 - `syslogadmin --set -ip`
 - `syslogadmin --remove -ip`
 - `syslogadmin --show -ip`
- Syslog records are tagged as belonging to a facility
 - Fabric OS supports the local1 through local7 facilities
 - The default facility is local7
 - Facility is changed on a switch using the `syslogadmin --set -facility` command
- Additional host configuration may be necessary, see server documentation

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Note: SANnav will register itself as a syslog server for any discovered fabrics.

Note: Up to six servers are supported.

`syslogadmin` Usage:

```
syslogadmin --show <args>
  -ip                      : Show all configured server ip
                             address or hostname
  -facility                : Show configured syslog facility
                             level

syslogadmin --set <args>
  -ip <ipaddress>          : Set syslog server ip address or
                             hostname
  -secure                  : Set optional secure mode for this ip
  -port                    : Set optional port number in range 1
                             to 65535
  -facility <level>        : Set facility level in range 0 to 7

syslogadmin --remove <args>
  -ip <ipaddress>          : Remove syslog server ip address or
                             hostname

syslogadmin --help          : Display help
```

See next notes slide for additional command examples:

```
SW1:FID128:admin> syslogadmin --show -ip
No addresses configured

SW1:FID128:admin> syslogadmin --set -ip 10.255.224.33
Syslog IP address 10.255.224.33 added

SW1:FID128:admin> syslogadmin --show -ip
syslog.1          10.255.224.33

SW1:FID128:admin> syslogadmin --set -facility 0
Syslog facility changed to LOG_LOCAL0

SW1:FID128:admin> syslogadmin --show -facility
Syslog facility: LOG_LOCAL0

SW1:FID128:admin> syslogadmin --remove -ip 10.255.224.33
Syslog IP address 10.255.224.33 removed
```

Role-Based Access Control

Set switch configuration parameters

- Role-Based Access Control (RBAC) is a role-based approach to restricting system access to only authorized users¹
 - RBAC introduced the distinction between a user account and the role assigned to the account
 - Each account has an administratively defined role
 - This distinction allows the switch to track login activity
- There are three main parts to RBAC based accounts:
 - **Account name:** Login name and password
 - **Role:** Grants or denies access to switch commands
 - **Permissions:** User defined roles can have assigned permissions

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Footnote 1: SANnav supports the creation of user accounts and roles. See the class called SANnav Management Portal User Accounts (course code: MPUA-220) for more information

Role-Based Access Control (cont.)

Set switch configuration parameters

- Fabric OS implements two classes of accounts:

- **Default accounts**

- Fabric OS v9.x active accounts are¹: admin, user
 - Admin account is used for configuration/observe permission
 - User account are used mostly for observe permission only
 - Each default account has a hard-coded set of permissions
 - The permissions define roles with privileges corresponding to the account name
 - For default accounts these privileges and account names cannot be changed
 - The accounts can be disabled if necessary

- **User-defined accounts²**

- 252 user-defined accounts available per switch
 - 32 simultaneous login sessions per switch (includes the default accounts)

– Accounts settings are viewed, configured and changed using the `userconfig` command³

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Footnote 1: In Fabric OS v9.x for security purposes the root and maintenance accounts are disabled by default.

Footnote 2: Multiple concurrent logins are supported. An admin role account can login up to two times, non-admin roles allow up to four logins per account.

Footnote 3: See next notes page for usage information for the `userconfig` command

Usage: userConfig

Valid roles for LF and Chassis: admin | user | switchadmin | zoneadmin | fabricadmin | basicswitchadmin | operator | securityadmin

--show [<username> | -a | -r <role name>]:
display current account information

--showlf <-l <LF_ID>> <-c>:
display account names corresponds to lf list

--add <username> -r <LF role> -l <LF_ID list> [-h <LF_ID>] [-c <chassis role>] [-d <description>] [-p <password>] [-x] [-at -access-time <HH:MM-HH:MM>]:
creates a new account

--delete <username>:
delete an existing account

--change <username> [-l <LF_ID list> -r <LF role>] [-h <LF_ID>] [-c <chassis role>] [-d <description>] [-e yes | no] [-x] [-u] [-at -access-time <HH:MM-HH:MM>]:
modify existing account attributes

--addlf <username> [-h <LF_ID>] [-l <LF_ID list> -r <LF role>]
[-c <chassis role>]
adds lfs to a user's lf list

--deletelf <username> [-h <LF_ID>] [-l <LF_ID list>] [-c]:
deletes lfs from a user's lf list

--help: display the userconfig synopsis

Account Passwords

Set switch configuration parameters

- Account passwords are changed using the `passwd` command

```
SW1:FID128:admin> passwd
Changing password for admin
Enter old password:
Enter new password:
Re-type new password:
passwd: all authentication tokens updated successfully
Saving password to stable storage.
Password saved to stable storage successfully.
```

- Passwords must meet password policy (defined using the `passwdCfg` command)
 - See notes for additional information

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Passwords can be changed locally on any switch. For the password database to be distributed to other switches in the fabric, the switches must be configured to accept the password database using the `fddCfg` command. The password database is distributed manually using the `distribute` command.

Any chosen password must satisfy the following password strength rules:

- The password contains the minimum required number of lowercase characters.
- The password contains the minimum required number of uppercase characters.
- The password contains the minimum required number of numeric characters.
- The password contains the minimum required number of punctuation characters.
- The password must be between *minlength* and 40 characters long. The *minlength* parameter is set using the `passwdCfg` command.
- The password may not contain the colon (:) character.
- The password must satisfy repeated and sequential character constraints.

If AAA authentication is enabled, users cannot change their own password. Administrators with the privilege to change passwords for other accounts may do so regardless of whether AAA authentication is enabled; all such password changes operate on the local password database.

Booting a Switch

Set switch configuration parameters

- fastboot
 - Use this command to perform a "cold reboot" (power off/restart) of the CP and bypassing POST (Power On Self Test) when the system comes back up¹
 - Bypassing POST can reduce boot time significantly
- reboot
 - Use this command to perform a "cold reboot" (power off/restart) of the control processor
 - This operation may be disruptive, and the command prompts for confirmation before executing
 - Preforms the POST unless `diagdisablepost` is configured (not recommended)
- haReboot
 - Use this command to perform warm reboot in the switch-based systems
 - On chassis-based systems, this command behaves similar to the `haFailover` command so that the standby CP becomes the active CP
- sysShutdown
 - Provides a graceful shutdown to protect the switch file systems

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Footnote 1: If POST was previously disabled using the `diagDisablePost` command, then `fastBoot` is the same as `reBoot`.

Configuration Backup

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Back up configuration

Configuration Files Overview

- Configuration files are an editable, executable listing of configuration settings made on a switch during initial setup, and subsequent configuration
- The configuration file is divided into three sections:
 - Header
 - Chassis
 - Switch sections for the switch and any logical switches that may be defined
- Run the command `configupload` with arguments¹:
 - all (All of the configurations including chassis and switches)
 - chassis (Chassis level configuration only)
 - switch (Switch configuration only in non-vf mode)
 - fid # (For the fabric (number #) only)
- Run the command with no arguments for interactive mode

Additional information in the notes

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Footnote 1: configupload Usage:

```
configupload [options] [<host>, <user>, <path>[, <password>]]<br/>[<filename>]
```

Options:

```
-all    all of the configurations including chassis and switches.  
-chassis    chassis level configuration only.  
-switch    Switch configuration only in non-vf mode.  
-fid # for the fabric (number #) only.  
-p      Protocol to use for upload. Valid options are  
        <ftp|scp|sftp>  
-cra    ChallengeResponseAuthentication. Use with SCP protocol  
-ftp    upload using FTP Protocol. Alternate for "-p ftp"  
-scp    upload using SCP Protocol. Alternate for "-p scp"  
-sftp    upload using SFTP Protocol. Alternate for "-p sftp"  
-local   upload using local file specified via <filename>  
-USB     upload local file from an attached USB device.  
-P      Port to use for upload. Valid range is 1 to 65535. Use  
        with SCP/SFTP protocol  
-vf     use the VF config file only instead of the normal config  
        file
```

Continued on next notes slide:

```
-U      upload local file from an attached USB device. Alternate
      for -USB.
-map   port2area addressing mode configuration files.
-force  Overwrite config file if it exists. Use with -local
```

Run this command without arguments for interactive mode.

Example Syntax:

```
configupload (defaults to interactive mode)
configupload -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -p scp [-P <port>] | -scp [-cra] [-P <port>]
      [<host>,<user>,<path>]
configupload -p sftp [-P <port>] | -sftp [-P <port>] [<host>,<user>,<path>]
configupload -all -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -all -p scp [-P <port>] | -scp [-P <port>]
      [<host>,<user>,<path>]
configupload -all -p sftp [-P <port>] | -sftp [-P <port>]
      [<host>,<user>,<path>]
configupload -fid # -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -fid # -p scp [-P <port>] | -scp [-P <port>]
      [<host>,<user>,<path>]
configupload -fid # -p sftp [-P <port>] | -sftp [-P <port>]
      [<host>,<user>,<path>]
configupload -s -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -chassis -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -chassis -p scp [-P <port>] | -scp [-P <port>]
      [<host>,<user>,<path>]
configupload -chassis -p sftp [-P <port>] | -sftp [-P <port>]
      [<host>,<user>,<path>]
configupload -switch -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -switch -p scp [-P <port>] | -scp [-P <port>]
      [<host>,<user>,<path>]
configupload -switch -p sftp [-P <port>] | -sftp [-P <port>]
      [<host>,<user>,<path>]
configupload -all -map -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -all -map -p scp [-P <port>] | -scp [-P <port>]
      [-cra] [<host>,<user>,<path>]
configupload -all -map -p sftp [-P <port>] | -sftp [-P <port>] [-cra]
      [<host>,<user>,<path>]
configupload -fid # -map -p ftp | -ftp [<host>,<user>,<path>[,<passwd>]]
configupload -fid # -map -p scp [-P <port>] | -scp [-P <port>] [-cra]
      [<host>,<user>,<path>]
configupload -fid # -map -p sftp [-P <port>] | -sftp [-P <port>] [-cra]
      [<host>,<user>,<path>]
configupload [-force] -local|-USB|-U [<filename>]
```

If <path> is not specified then config filename defaults to config.txt. Otherwise the specified path is used as is. Examples:/usr/home/myconfig.txt (config file is /usr/home/myconfig.txt) [no path supplied] (path is default path on FTP server and filename defaults to config.txt)

Note: Remote file may get overwritten if same filename is used

Configuration Files Overview (cont.)

- Sample switch configuration file, showing the three sections:

```
[Configuration upload Information]
Configuration Format = 4.0
Minimum Compatible Format = 3.0
Excluding Format = 0.0
date = Mon Dec 14 14:39:08 2020
FOS version = v9.0.0
Number of LS = 2
[Chassis Configuration Begin]

[fcRouting]
fcRoute.backboneFabricId:128
fcRoute.fcrState:2
fcRoute.sifl:0
<truncated output>

[Header]
[Chassis begins]

[MOTD]
chassis.motd:Place-MOTD-Here
[Chassis Configuration End]
date = Mon Dec 14 14:39:09 2020
[Switch Configuration Begin : 0]
SwitchName = G720
Fabric ID = 128
<truncated output>
[Banner]
Place-Security-Banner-Here
[End]
[Switch Configuration End : 0]

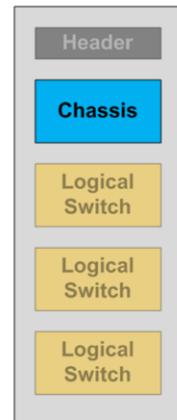
[Chassis ends]
[Logical switch 0 begins]
[Logical switch 0 ends]
```

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Chassis Section

- There is only one chassis section within a configuration file
 - Defines configuration for chassis components that affect the entire system — not just an individual logical switch
 - Components defined in the chassis area Fibre Channel routing (FCR), chassis configuration, license database, password policy, SNMP configuration, User Account Roles
 - The chassis section is included in the backup only if the `configupload -all` command is used
 - This is true even for non-Virtual Fabric modes
 - Without chassis-level admin permissions only the current logical switch information is available¹



Back up configuration

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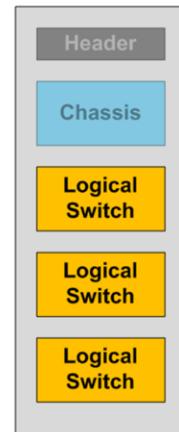
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Footnote 1: This is a role-permission only and this permission is applied to the user account through the `userconfig` command. The `-all` option requires the chassis role permission if Virtual Fabrics is enabled.

When performing a `configupload` you have a choice of uploading only the chassis configuration, or a specified FID, or both. Using the `-all` option captures both the chassis information and all logical switches defined in the chassis. If no logical switches are defined because VF-mode is disabled, then the chassis and switch configuration information is captured.

Switch Section

- There is always at least one switch section that contains:
 - A physical switch when Virtual Fabric (VF) mode disabled
 - The default logical switch (Virtual Fabric mode enabled)
- There are additional switch sections corresponding to each defined logical switch instance on a physical switch with VF mode enabled
- The following components are in each switch section of the configuration file:
 - Switch Name, Fabric ID, Boot parameters, configuration, zoning, defined security policies, active security policies, MAPS configuration, Banner configuration



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 Back up configuration

Configuration Backup Interactive -all Option Example

- Run the configupload command with no arguments will execute the command in interactive mode:

```
SW1:FID128:admin> configupload
Protocol (scp, ftp, sftp, local) [ftp]:
Server Name or IP Address [host]: 10.124.91.48
User Name [user]: edu_admin
Path/Filename [<home dir>/config.txt]: /configbackup/config_backup.txt
Section (all|chassis|FID# [all]):
Password: (hidden text)

configUpload complete: All selected config parameters are uploaded
```

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Switch Configuration Backup Interactive Example

- In this example a switch backup (FID=128, default logical switch was backed up)

```
SW1:FID128:admin> configupload
Protocol (scp, ftp, sftp, local) [ftp]:
Server Name or IP Address [host]: 10.124.91.48
User Name [user]: edu_admin
Path/Filename [<home dir>/config.txt]: /configbackup/FID128_backup.txt
Section (all|chassis|FID# [all]): 128
Password: (hidden text)

configUpload complete: All selected config parameters are uploaded
```

- This file would contain the header section and the switch section for this Logical switch only
 - The file does not contain the chassis section, nor any other switch sections

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Example output:

```
[Configuration upload Information]
Configuration Format = 4.0
Minimum Compatible Format = 3.0
Excluding Format = 0.0
date = Wed Dec 16 15:27:11 2020
FOS version = v9.0.0
Number of LS = 2
[Switch Configuration Begin : 0]
SwitchName = G720
Fabric ID = 128
<truncated output>
[End]
[Switch Configuration End : 0]
```



Back up configuration

Configuration Backup Interactive -vf Option Example

- Run the configupload command with the -vf will execute the a command in interactive mode to backup the VF information only (see example file in notes):

```
SW1:FID128:admin> configupload -vf
Protocol (scp, ftp, sftp, local) [ftp]:  
Server Name or IP Address [host]: 10.124.91.48  
User Name [user]: edu_admin  
Path/Filename [<home dir>/config.txt]: /configbackup/vf_cfg.txt  
Password: (hidden text)  
configUpload complete: VF config parameters uploaded
```

- (See notes for an example file)

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```
[Edu_configbackup]# cat vf_cfg.txt
# BROCADE
# VERSION 900
# PLATFORM 162
# SWITCHCONF
SYSTEM max
{
    ATTRIBUTE      SYS_NAME:sw0
    ATTRIBUTE      VF:1
}

SWITCH fcsw-0
{
    ATTRIBUTE      FID:128 SWNAME:G720 USR:400 DS:1 TID:1212979641
    SWNAME2: LF:0
    PIN           5
    PORTMAP       FC:[0-5,9-10,14-63]
}

SWITCH fcsw-1
{
    ATTRIBUTE      FID:87 SWNAME:switch_87 USR:400 GE: FICON_SW:1
    SWNAME2: LF:0 ADDR:1
    PIN           5
    PORTMAP       FC:[6-8,11-13]
}
```



Back up
configuration

Using configdownload Single Command Line Examples

- To download the current logical switch configuration file:

```
configdownload -ftp 10.124.91.48,user,logical_sw1.txt,password
```

- With chassis level admin permissions:

- To download all switch and chassis configurations, use the following command:

```
configdownload -all -ftp 10.124.91.48,user,all_chassis.txt,password
```

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Back up configuration

Backup and Restore Process

- To backup¹:
 - Upload the VF configuration with `configupload -vf`
 - Only do this step if VFs is configured
 - Then upload the normal configuration file with `configupload -all`
- To restore¹:
 - Disable the switch (`switchDisable` command)
 - If VFs is configured, download the VF configuration with `configdownload -vf`
 - Note: The order of the commands is very important: The VF section must be done first
 - Note: The switch auto reboots, even if VF was already enabled²
 - Download the normal configuration file with `configdownload -all`
 - These two commands must be run together to ensure compatibility

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Footnote 1: You can use the `configUpload -vf` or `configDownload -vf` command to restore configurations to a logical switch. The `-vf` option only restores the Virtual Fabrics configuration information (see notes two pages back for an example of the VF configuration file) on to a switch of the same model. The `configupload -all` will restore the chassis and the switches sections to the switch.

Footnote 2: Because some configuration parameters require a reboot to take effect after you download a configuration file, you must reboot to be sure that the changed parameters are enabled. Before the reboot the changed parameter is listed in the configuration file but it is not effective until after the reboot. On dual-CP platforms, you must reboot both CPs simultaneously for changes to take effect.



Back up configuration

Restoring Configuration: Configdownload

- Downloads ASCII text file from a source location to the switch
- Used to perform a restore after a switch replacement
- Boot parameters are not restored (switch name, IP, etc.)
- License keys only accepted if the boot.licid line = License ID¹

```
[Boot Parameters]
boot.name:SW1
boot.ipa:10.255.224.35
boot.licid:10:00:c4:f5:7c:41:4e:ca
boot.mac:10:00:00:05:1e:44:c0:00
boot.device:eth0
boot.gateway.ipa:10.255.224.62
```

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Footnote 1: The license ID for a system can be determined using the `license --show -lid` command, example:

```
G720:FID128:admin> license --show -lid
10:00:c4:f5:7c:41:4e:ca
```

Note: Configuration files from different models of switches or firmware versions may not be compatible.

The license ID can be seen in the backed up configuration file (look for chassis.licenseID)

```
chassis.licenseID:10:00:c4:f5:7c:41:4e:ca
```

Summary

- In this module we talked about several of the basic switch setting when installing a new switch such as:
 - Management port IP address
 - Domain ID
 - Time Zone
 - Switch Name
 - Registered Organization Name
 - Chassis Name
 - Port Speeds (if needed)
 - Port Names
 - Syslog Server
 - Configuration backups
- See appendix for additional information

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Thank You

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Virtual Fabric Considerations

- In a Virtual Fabrics (VF) environment, users are not allowed to reuse a fabric name that is already used by another logical switch
- In the case of a user attempting to configure a fabric name from a VF-disabled switch:
 - If one of the remote switches in the same fabric has VF enabled, and if the same fabric name is used in another partition of a VF-enabled switch then the operation fails with a RAS log message
 - 2019/04/28-16:40:46, [ESS-1009], 1310, FID 128, WARNING, B6510, Fabric Name Mismatch - local(blue) remote(test) - received from domain
- For more information on Virtual Fabrics see course: “Introduction to Virtual Fabrics” Course code: VF-220

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APPENDIX B: Fabric Name Conflicts

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Fabric Name Conflicts

- In an existing fabric, a fabric name change does not result in segmenting ISLs, rather the latest name is propagated to other switches in the same fabric
- When fabrics are merged, conflicting fabric names are not merged, the fabric name that was configured before the merge is retained on each respective switch
- In case of a conflict, you must choose the correct name and set the fabric name manually
 - Re-running the command from any switch in the fabric propagates the name fabric wide

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Two fabrics are merged with different fabric names configured.

```
SW1:FID128:admin> fabricshow
Switch ID    Worldwide Name          Enet IP Addr   FC IP Addr   Name
-----
1: fffc01 10:00:00:05:1e:d2:b3:00 10.255.248.34  0.0.0.0  >"G720_1"
2: fffc02 10:00:00:05:33:69:ba:95 10.255.248.18  0.0.0.0  "G720_2"
10: fffc0a 10:00:00:05:1e:d8:43:00 10.255.248.19  0.0.0.0  "G720_3"
The Fabric has 3 switches
Fabric Name: blue
```

```
SW2:FID128:admin> fabricshow
Switch ID    Worldwide Name          Enet IP Addr   FC IP Addr   Name
-----
1: fffc01 10:00:00:05:1e:d2:b3:00 10.255.248.34  0.0.0.0  >"G720_1"
2: fffc02 10:00:00:05:33:69:ba:95 10.255.248.18  0.0.0.0  "G720_2"
10: fffc0a 10:00:00:05:1e:d8:43:00 10.255.248.19  0.0.0.0  "G720_3"
The Fabric has 3 switches
Fabric Name: yellow
```

