BROCADE FABRIC OS (FOS) 6.2 VIRTUAL FABRICS FEATURE FREQUENTLY ASKED QUESTIONS

Overview

The Brocade® Fabric OS® (FOS) 6.2 Virtual Fabrics feature enables a physical Storage Area Network (SAN) switch to be partitioned into multiple Logical Switches, each of which is assigned to a separate Logical Fabric. A Logical Switch and Logical Fabric are independent entities that are managed just like a physical switch or fabric. The Virtual Fabrics feature provides data, control, and management isolation for Logical Switches and Logical Fabrics using a standards-based implementation of the ANSI standard for Virtual Fabrics.

General Questions and Answers

Q   What is a Logical Switch?

A   A Logical Switch is an implementation of a Fibre Channel switch in which physical ports can be dynamically added or removed. After creation, it is managed just like a physical switch. Each Logical Switch is associated with a Logical Fabric. A Logical Switch can join an existing physical fabric just like any physical switch. In addition, Logical Switches in the same Logical Fabric can join together just like any physical switch. If two Logical Switches are in different Logical Fabrics, the Inter-Switch Links (ISLs) between them will segment and not join together.

Q   What is a Logical Fabric?

A   A Logical Fabric is an implementation of a Fibre Channel fabric with one or more Logical Switches participating in the fabric. A Logical Fabric has its own independent instance of fabric services, name server, zoning database, and so on. Events in one Logical Fabric are isolated from events in another. A Logical Fabric can be configured in any currently supported fabric mode—including Brocade Native (IM-0), McDATA Fabric (IM-2), and McDATA Open Fabric (IM-3) modes—and can connect to physical switches that are not using the Virtual Fabrics feature. Each Logical Switch is assigned a Fabric ID that identifies the Logical Fabric to which the switch belongs. When Logical Switches with the same Fabric ID are connected, they join into a Logical Fabric.

Q   What is a Default Switch?

A   This is a system-created Logical Switch that exists as long as the Virtual Fabrics feature is enabled. Any physical port supported by the chassis is initially allocated to the Default Switch, and it is managed just like a physical switch. For anyone who does not need to

create "user-defined" Logical Switches, no further configuration is required. The Default Switch can join any fabric just like a physical switch.

Q Can switches that aren't using the Virtual Fabrics feature join a Logical Fabric?
A   Yes. Brocade FOS and M-Enterprise OS (M-EOS) switches that aren't using the Virtual Fabrics feature can connect to a Logical Switch via ISLs and/or trunks. They will join the Logical Fabric associated with the Logical Switch as long as they have compatible configuration parameters, such as the same fabric mode (IM-0, IM-1, or IM-2), with the Logical Switch. Refer to the FOS 6.2 Release Notes for minimum supported release levels for FOS and M-EOS switches that are not using the Virtual Fabrics feature.

Q Can switches that aren't using the Virtual Fabrics feature connect to more than one Logical Switch?
A   Yes. However, caution is advised to ensure that all Logical Switches are in the same Logical Fabric and share a common Fabric ID. For example, unexpected behavior can occur if an M-EOS switch has ISL connections to two or more Logical Switches and any of them are in different Logical Fabrics. RAS log messages will be generated in most situations to alert administrators about an unsupported configuration.

Q Can user-defined Administrative Domains continue to be used with FOS 6.2?
A   Yes. The physical switch can use either user-defined Administrative Domains *or* Virtual Fabrics—but not both. This applies to all switches within a fabric. If any of the switches have user-defined Administrative Domains, none of those switches can connect to a Virtual Fabrics-enabled switch. If any switch in a fabric has the Virtual Fabrics feature enabled, none of the Logical Fabrics in which it is participating can include a switch with user-defined Administrative Domains. During switch upgrades to FOS 6.2, the Virtual Fabrics feature is disabled—allowing any existing Administrative Domain configuration to continue to be used after the upgrade.

Q Is it disruptive to add a Virtual Fabrics-enabled switch to an existing fabric?
A   No, this is non-disruptive. However, the fabric configuration parameters would need to be compatible, as is the case with any switch joining a fabric. See the FOS 6.2 Release Notes for information about compatible configuration parameter requirements when the Virtual Fabrics feature is enabled. Note that if a Virtual Fabrics-capable switch has Virtual Fabrics disabled, but the feature is enabled later, a switch reboot is required.

Q What is an XISL?
A   This is a special ISL that can carry traffic for multiple Logical Fabrics while maintaining traffic separation for each Logical Fabric. XISL connections are created between special user-defined Logical Switches, called Base Logical Switches—or simply, Base Switches.

Q What is the Base Switch?
A   A Base Switch is an optional user-defined Logical Switch. Base Switches provide common connectivity (at Layer 2 or Layer 3) shared by other Logical Switches. One Base Switch can be defined per chassis.

When Base Switches are connected (referred to as XISL connections), they form a Base Fabric. Traffic from multiple Logical Switches in a chassis can be carried over the Base Fabric, thereby maintaining traffic isolation by Logical Fabric.

Base Switches can also be configured to use IFL connections (EX_Port in the Base Switch to E_Port in a switch in the Edge Fabric). When configured this way, the Base Fabric becomes the Backbone Fabric for the Layer 3 Fibre Channel routing topology.

For a given Logical Fabric, either Layer 2 (XISL) or Layer 3 (IFL) connections can be used—but not both. If XISL connections are not used, Logical Switches in the same Logical Fabric use standard ISL connections that carry traffic for a single Logical Fabric.

Q Can XISL and IFL connections from a Base Switch be connected to the same Logical Fabric?

A No. The Base Switch creates a Layer 2 *or* Layer 3 connection for a given Logical Fabric, but not both at the same time. Although the Base Switch can simultaneously support both XISL (a shared ISL) and IFL connections (EX_Port to E_Port) for different Logical Fabrics, only one of these types can be used when connecting the Base Switch to a single Logical Fabric.

Q How many Logical Switches supporting FICON traffic with FICON Management Server (CUP) are allowed per physical switch?

A With the FOS 6.2 release, the maximum supported number is two Logical Switches.

Q Can Brocade FC8-48 blades be used for FICON traffic with Virtual Fabrics enabled?

A Yes. FOS 6.2 introduces new port addressing modes that allow all the ports in a Brocade FC8-48 blade to be used in Logical Switches running FICON traffic. However, the maximum number of ports per Logical Switch is restricted to 256 when running FICON traffic because this is the addressing limit of FICON.

For example, a Brocade DCX® Backbone with eight Brocade FC4-48 blades can be partitioned into two Logical Switches with each carrying FICON traffic and supporting FICON Management Server (CUP). One Logical Switch can have as many as 256 ports while the other would have the remaining 128 ports.

Q Can port addresses in each Logical Switch start at zero?

A FOS 6.2 offers the option to change the address assigned to any port. Each Logical Switch can be configured to use either "Fixed" addressing (the "legacy" behavior), "10-bit" addressing (the default when using the Virtual Fabrics feature), or "256-area" addressing, specifically intended for Logical Switches in FICON environments.

With 10-bit addressing and 256-area addressing, the port addressing in each Logical Switch can start at zero.

Q Does a Logical Switch have to use an XISL to connect to another Logical Switch?

A No. When a Logical Switch is created, there is an option to use XISLs in the Base Fabric. If this option is turned off, the Logical Switch will not use XISLs. In this case, connections

to another Logical Switch will use standard ISL connections. However, both Logical Switches must have the same Fabric ID, indicating that they are in the same Logical Fabric, or they will segment.

An example where a Logical Switch cannot use an XISL is when Integrated Routing is also used. With Integrated Routing, the Base Switch becomes a Backbone Fabric creating a Layer 3 connection to the Logical Switch, which is in an Edge Fabric. The Base Switch uses an EX_Port to connect to the Logical Switch, and the Logical Switch must be configured *not* to use XISLs. Otherwise, the IFL connection will not be allowed and RAS log messages will be generated. Although the Logical Switch can't use XISL connections in the Base Fabric, it can use ISL connections to create a Layer 2 fabric.

Q Can a Logical Switch running in IM-2 or IM-3 modes use XISLs?
A   No. XISL connections require the Logical Switch to run in IM-0 (Brocade Native) mode. In this case, Logical Switches running in IM-2 (McDATA Fabric) or IM-3 (McDATA Open Fabric) modes would use standard ISL connections just as they do today.

Q Can more than one Base Switch be defined per physical switch?
A   No. Each physical switch can have only one Base Switch.

Q When Virtual Fabrics is enabled, do I have to create any Logical Switches?
A   No. All physical ports in a Virtual Fabrics-enabled switch are automatically assigned to the Default Switch. The configuration and management of these ports do not change.

However, if Integrated Routing will be used on the switch, a Base Logical Switch is created to act as the Backbone Fabric. Only ports assigned to the Base Switch are in the Backbone Fabric. All other ports remain in the Default Switch and are part of the Edge Fabric containing the Default Switch. Using the Base Switch as the Backbone Fabric removes a previous requirement that, if a switch provided routing services, all ports in the switch were in the Backbone Fabric.

Q Are there any differences in how Fibre Channel Routing is used when I have Virtual Fabrics enabled?
A   Yes. When Virtual Fabrics is enabled, the Base Switch is used as the Backbone Fabric with EX_Ports and/or VEX_Ports. This removes the previous limitation requiring all ports in the physical switch to be in the Backbone Fabric. With Virtual Fabrics enabled, only those physical ports assigned to the Base Switch are in the Backbone Fabric. All other physical ports in the chassis are available for use in separate Layer 2 and/or Edge Fabrics.

One other requirement when Virtual Fabrics is enabled is the use of Integrated Routing. Integrated Routing allows any 8 Gbit/sec ports on the Brocade FC8-16, FC8-32, and FC8-48 blades or the Brocade 5100 and Brocade 5300 switches to be configured as an EX_Port.

Q Do you always have to create a Base Switch when the Virtual Fabrics feature is enabled?

A No. For example, a new Brocade DCX Backbone with FOS 6.2 will have the Virtual Fabrics feature enabled. By definition, this means that all ports in the Brocade DCX belong to the Default Switch. The Default Switch can use ports on port cards and/or ICL ports as ISL connections with frame trunking, DPS, and/or DLS to any other switch even though Virtual Fabrics is enabled. Administrators do need to create any other Logical Switches.

Q Can the Brocade FR4-18i card be used for Fibre Channel Routing when the Virtual Fabrics feature is enabled?

A No. Although the Brocade FR4-18i card can be installed in a Brocade DCX Backbone or Brocade DCX-4S Backbone when Virtual Fabrics is enabled, the 16 Fibre Channel ports must belong to the Default Switch and cannot be configured as EX_Ports. These Fibre Channel ports can be used only as E_Ports or F_Ports within the Default Switch.

Q Can the Brocade FR4-18i Gigabit Ethernet ports be assigned to the Base Switch and/or a Logical Switch?

A Yes. Any Gigabit Ethernet port can be moved from the Default Switch to either a Base Switch or Logical Switch. However, when assigned to a Base Switch, the Gigabit Ethernet port must be configured as a VEX_Port. When assigned to a Logical Switch (or used in the Default Switch), the Gigabit Ethernet port must be configured as a VE_Port.

The eight "logical ports" and associated tunnels within a Gigabit Ethernet port are assigned to only one Logical Fabric as defined by the Fabric ID of the Default, Base, or Logical Switch to which the Gigabit Ethernet port belongs.

Q Does a Logical Switch support NPIV?

A Yes. Any port on a Logical Switch supports N_Port ID Virtualization (NPIV) and can be connected to a Brocade Access Gateway or Host Bus Adapter (HBA) supporting NPIV.

Q Can a Logical Switch support IM-2 or IM-3 modes (McDATA Native or McDATA Open modes, respectively)?

A The Default Switch and user-defined Logical Switches can be configured in either IM-2 (McDATA Fabric) or IM-3 (McDATA Open Fabric) modes. However, the Base Switch can be configured only in IM-0 (Brocade Native) mode.

Q What FOS features are incompatible with the Virtual Fabrics feature?

A In FOS 6.2, Administrative Domains, port mirroring, and password/IP filter database distribution are incompatible. All other FOS features are compatible when the Virtual Fabrics feature is enabled. Future FOS releases might support Virtual Fabrics with some of these features.

Q Cisco has Inter-VSAN Routing (IVR). Does Virtual Fabrics provide similar routing services?

A Not in FOS 6.2. In FOS 6.2, there is support for Integrated Routing services which require external connections for EX_Port to E_Port IFL connections. A planned release of FOS is designed to support "Virtual Fabrics Routing" to provide internal routing (backplane) between Logical Switches within a chassis with no external IFL connection.

Q Is a FOS License required to use the Virtual Fabrics feature?

A No. Both the Logical Switch and Logical Fabric capabilities are available as base FOS features and do not require an additional FOS license.

Q How are licensed FOS features supported when Virtual Fabrics is enabled?

A Licensed features apply to the entire physical switch. Therefore, a licensed feature can be used by all Logical Switches within the physical switch.

Q With the optional Ports On Demand (POD) license, do all ports need to be enabled when using the Virtual Fabrics feature?

A No. The Virtual Fabrics feature works with any of the licensed ports and does not require all ports to be licensed in a switch.

Q Can you configure Logical Switches using Brocade DCFM?

A Yes. Although the command line interface can be used to completely manage the Virtual Fabrics feature, Brocade Data Center Fabric Manager (DCFM™) is the preferred tool for managing the Virtual Fabrics-enabled environment. DCFM simplifies the creation of a Logical Switch and port allocation/deallocation to a Logical Switch, and it provides an intuitive interface for managing a virtualized SAN. DCFM manages Logical Switches and Logical Fabric services (zoning, QoS, TI Zones, Top Talkers, and so on) just like it manages physical switches and fabrics. As a result, no additional training is required.

Q How are users assigned to management roles when Virtual Fabrics is enabled?

A Virtual Fabrics uses Role-Based Access Control (RBAC) for assigning users to management roles just like previous FOS releases. A new management role exists for managing the physical chassis. A user must have chassis management privileges to create or delete a Logical Switch and to allocate or deallocate physical ports to a Logical Switch. Users can be assigned different roles and responsibilities by Logical Switch and Logical Fabric. For example they could have a "User" role for one Logical Switch and an "Administrator" role for a second.

Learn More

Q How do I find out more about Virtual Fabrics?

A Contact your Brocade Sales Representative or OEM Partner for details.

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