



# BROCADE VDX 67XX SWITCHES FREQUENTLY ASKED QUESTIONS

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## Introduction

This document answers frequently asked questions about Brocade® VDX® switches and Brocade VCS® Fabric technology. For more information about Brocade VDX switches and Brocade VCS Fabric technology, visit [www.brocade.com/vcs](http://www.brocade.com/vcs).

## General Questions and Answers

### Product Portfolio

**Q What products comprise the Brocade VDX product portfolio?**

A Brocade VDX 6710, Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740 and 6740T Switches comprise the Brocade VDX portfolio, offering a network architecture solution that spans 1 Gigabit Ethernet (GbE)/10 GbE servers and traditional/cloud data center architectures. In addition, they support unified storage connectivity to Fibre Channel over Ethernet (FCoE), iSCSI, or NAS while providing bridging to Fibre Channel Storage Area Networks (SANs). All Brocade VDX switches support Brocade VCS Fabric technology as well as traditional Ethernet.

**Q What is Brocade VCS Fabric technology?**

A Brocade VCS Fabric technology is an advanced Ethernet fabric that allows IT organizations to create efficient data center networks that just work. Ethernet fabric architectures built on Brocade VCS Fabric technology offer unmatched Virtual Machine (VM) awareness and automation compared to traditional architectures and competitive fabric offerings. Backed by a 15-year heritage of proven fabric innovations, Brocade VCS Fabric technology enables IT agility and assures reliability, allowing IT organizations to transition gracefully to elastic, mission-critical networks in their virtualized data centers.

**Q What are the highlights of the Brocade VDX 6710?**

A The Brocade VDX 6710 is an Ethernet switch that supports Brocade VCS Fabric technology and can be deployed as a traditional Ethernet switch in the access layer. It supports 48 1 GbE RJ45 ports and six 1/10 GbE SFP+ ports, while offering cost-effective connectivity from 1 GbE servers to VCS fabrics. No Ports on Demand (PoD) or FCoE licenses are available for the Brocade VDX 6710. Organizations seeking to reap the benefits of Brocade VCS Fabric technology can enable it with an add-on VCS software license. The Brocade VDX 6710 runs a common image with the Brocade VDX 6720 and Brocade VDX 6730 Switches, and has aligned features.

**Q What are the highlights of the Brocade VDX 6720?**

A The Brocade VDX 6720 is an Ethernet switch that supports Brocade VCS Fabric technology and can be deployed as a traditional Ethernet switch in the access and aggregation layers. It is available in two configurations:

- 1U with 24 1/10 GbE SFP+ Data Center Bridging (DCB) Ethernet ports
- 2U with 60 1/10 GbE SFP+ DCB Ethernet ports

In addition, the Brocade VDX 6720 has a PoD license to enable additional Ethernet ports. An FCoE license can be added to enable FCoE functionality. Organizations seeking to reap the benefits of Brocade VCS Fabric technology can enable it with an add-on VCS software license. The Brocade VDX 6720 runs a common image with the Brocade VDX 6710 and Brocade VDX 6730, and has aligned features.

**Q What are the highlights of the Brocade VDX 6730?**

A The Brocade VDX 6730 is an Ethernet switch that supports Brocade VCS Fabric technology and can be deployed as a traditional Ethernet switch in the access and aggregation layers. It provides bridging from VCS fabrics to Fibre Channel SANs and is available in two configurations:

- 1U with 24 1/10 GbE SFP+ DCB Ethernet ports and eight 8 Gbps Fibre Channel ports
- 2U with 60 1/10 GbE SFP+ DCB Ethernet ports and 16 8 Gbps Fibre Channel ports

The Brocade VDX 6730 has a license structure similar to the Brocade VDX 6720—with a PoD license to enable additional Ethernet ports. The FCoE license also enables the Fibre Channel ports and includes the Fibre Channel optics. Organizations seeking to reap the benefits of Brocade VCS Fabric technology can enable it with an add-on VCS software license. The Brocade VDX 6730 runs a common image with the Brocade VDX 6710 and Brocade VDX 6720, and has aligned features.

**Q What are the highlights of the Brocade VDX 6740?**

A The Brocade VDX 6740 is an Ethernet switch that supports Brocade VCS Fabric technology and can be deployed as a traditional Ethernet switch in the access and aggregation layers. The Brocade VDX 6740 offers 48 10 GbE SFP+ ports and four ports of 40 GbE Quad Small Form-Factor Pluggable Plus (QSFP+). Each 40 GbE QSFP+ port can be broken out into four independent 10 GbE SFP+ ports, providing an additional 16 10 GbE SFP+ ports. The switch features low power consumption, consuming 2 watts per port.

In addition, the Brocade VDX 6740 has the option to turn on 24, 48, or 64 ports via a PoD license, allowing organizations to use the number of ports needed.

An FCoE license can be added to enable FCoE functionality. Likewise, organizations seeking to reap the benefits of Brocade VCS Fabric technology can enable it with an add-on VCS software license.

**Q What are the highlights of the Brocade VDX 6740T?**

A The Brocade VDX 6740T is an Ethernet switch that supports Brocade VCS Fabric technology and can be deployed as a traditional Ethernet switch in the access and aggregation layers. The Brocade VDX 6740T offers 48 10 GbE 10BASE-T ports and four ports of 40 GbE QSFP+. Each 40 GbE QSFP+ port can be broken out into four independent 10 GbE SFP+ ports, providing an additional 16 10 GbE SFP+ ports. The switch features low power consumption, consuming less than 5 watts per port.

In addition, the Brocade VDX 6740T has the option to turn on 24, 48, or 64 ports via a PoD license, allowing organizations to use the number of ports needed.

An FCoE license can be added to enable FCoE functionality. Likewise, organizations seeking to reap the benefits of Brocade VCS Fabric technology can enable it with an add-on VCS software license.

**Q Can I build a VCS fabric with a mix of Brocade VDX switches?**

A Yes. IT organizations can build a VCS fabric with just one type of switch or with a combination of Brocade VDX 6710, Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740/6740T Switches.

**Q Can you build a VCS fabric made of only Brocade VDX 6710 switches?**

A Yes. While a typical deployment would have a combination of Brocade VDX 6710 and Brocade VDX 6720 Switches, organizations can build a VCS fabric out of only Brocade VDX 6710 Switches. The ports connecting to the VCS fabric must be 10 Gbps ports.

**Q Do the Brocade VDX switches support standard Ethernet functionality without Brocade VCS Fabric technology?**

A Yes. The switches can be placed in “fabric” or “stand-alone” mode. In stand-alone mode, the switch functions as a standard Layer 2 Ethernet switch. Refer to the Brocade VDX data sheets for supported Ethernet protocols.

**Q Are 1 Gbps connections supported on all ports?**

A Yes. All Brocade VDX 6720, Brocade VDX 6730, and Brocade 6740/6740T switch ports support 1 Gbps and 10 Gbps link speeds. The Brocade VDX 6710 supports 1 GbE RJ45 ports and 1/10 GbE SFP+ ports.

**Q Does the server need an enhanced Ethernet port that supports DCB to connect into the Brocade VDX 6720 and/or Brocade VDX 6730?**

A No. The Brocade VDX 6720 and Brocade VDX 6730 support any 1 GbE or 10 GbE server connection. For LAN/SAN convergence and lossless Ethernet, a Converged Network Adapter (CNA) supporting DCB is required.

**Q Are any of the switch ports reserved for Inter-Switch Link (ISL) connections?**

A No. All ports on the Brocade VDX 6720, Brocade VDX 6730, and Brocade 6740/6740T Switches are the same. Any port can be used for a device connection, ISL fabric connection, or uplink to the next layer of the network. On the Brocade VDX 6710, only the 10 GbE ports can be used for ISL connections.

**Q The Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740/6740T Switches are designed for deployment at the top of each server rack. Can they also be deployed at the Middle- or End-of-Row (MoR/EoR) positions?**

A Yes. Both the Brocade VDX 6720 and Brocade VDX 6730 60-port models offer excellent port density in a 2U form factor. The Brocade VDX 6740 and Brocade VDX 6740T offer up to 64 ports in a 1U form factor, which can provide a high-performance aggregation switch in 10 GbE or blade server environments.

**Q Can the Brocade VDX switch airflow be reversed in the field?**

A Yes. For the 24-port Brocade VDX 6720, Brocade VDX 6730, Brocade VDX 6740, and Brocade VDX 6710, both power supplies with integrated fans need to be swapped out. For the 60-port Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740T, both power supplies and fan assemblies need to be swapped out.

**Q Do the Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740 Switches support multi-hop FCoE?**

A Yes. The Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740/6740T Switches support first hop and multi-hop FCoE.

## **Brocade VCS Fabric Functionality**

**Q What makes Brocade VCS Fabric technology better than traditional Ethernet architecture?**

A VCS fabrics take advantage of technology innovations in storage fabrics to improve the resilience and performance of data networks. For example:

- The elimination of Spanning Tree effectively doubles link availability and improves resilience without adding costs.
- Ethernet fabrics allow organizations to consolidate access and aggregation layers, greatly reducing the number of switches and associated hardware under management, and improving server-to-server traffic performance. Only Brocade VCS Fabric technology does this directly within the access layer without requiring changes to the core. Not only does this approach help preserve an organization's core investments, but by reducing server-to-server traffic that currently passes through the core, Brocade VCS Fabric technology might also reduce the need for additional investments in expensive core networking.
- Shared intelligence between switches in the fabric dramatically simplifies and automates fabric elasticity, scaling, and load balancing, and improves manageability.
- Ethernet fabrics provide fluid support for virtualization with embedded, hypervisor-agnostic automation of VM-network alignment—without additional management overhead.
- Both Brocade VCS Fabric technology and Brocade Network Advisor integrate with vCenter to provide further management granularity for VMware environments.
- Ethernet fabrics provide better performance and automation with familiar CLI management.

**Q How is traffic distributed and balanced throughout the fabric?**

A Once the Ethernet fabric has formed, equal-cost shortest paths within the fabric are automatically calculated. The shortest path will always be used to route traffic through the fabric. Between switches within the fabric, Brocade hardware-based ISL Trunking is used to maximize the bandwidth of two or more links, above 95 percent. If two or more connections exist between two switches in the fabric, the trunks will form automatically.

**Q How will Brocade VCS Fabric technology reduce broadcast storms? As Layer 2 networks grow, this is becoming more of an issue.**

A Brocade VCS Fabric technology enables the physical Layer 2 network to be large, but the network can still be segmented using VLANs to manage potential issues such as broadcast storms. Storms inside the fabric are minimized by not aging the MAC entry if that MAC is generating traffic in any part of the VCS fabric, and by synchronizing a newly joined switch with existing MAC forwarding information. That way, any hosts/networks connected to the new switch do not contribute to flooding due to unknown destination addresses.

**Q How does Brocade VCS Fabric technology improve virtualization management?**

A Brocade VCS Fabric technology provides two important virtualization features directly within the fabric: Brocade VM-Aware Network Automation and Automatic Migration of Port Profiles (AMPP). These hypervisor-agnostic capabilities allow IT organizations to build Ethernet fabrics anywhere in their data centers with lower management overhead than appliance solutions and other approaches that push VM connectivity orchestration higher into the management stack.

- **VM-Aware Network Automation:** Provides dynamic discovery, zero-touch configuration, and, in VMware environments, secure communication to VMware vCenter
- **Automatic Migration of Port Profiles (AMPP):** Simplifies management by dynamically migrating network policies as Virtual Machines (VMs) move throughout the VCS fabric

Please see the Virtualization section of this FAQ for further details about these features.

**Q What is Brocade VCS Logical Chassis?**

A Brocade VCS Logical Chassis allows organizations to manage an entire VCS fabric as a single switch, enhancing the overall availability and reliability of the network. This single point of management eliminates the need to manually configure and manage each switch, simplifying management, lowering operational costs, and reducing configuration errors. In addition, it enables organizations to push software upgrades across the fabric with a single command, accelerating deployment. VCS Logical Chassis also provides a single view of the fabric, allowing centralized monitoring and troubleshooting that minimizes time to repair network issues.

**Q Can a single Brocade VDX switch span more than one VCS fabric?**

A No. A Brocade VDX switch can participate in only a single fabric.

**Q How will the VCS fabric architecture interoperate across the full range of Brocade products—from server adapters and embedded blade server switches, to fixed switches and modular chassis solutions?**

A VCS fabrics can connect to any other Ethernet switch/bridge (including those from other vendors) using classic Layer 2 Ethernet protocols (such as LACP). To peer switches, a switch with VCS fabric capabilities looks and behaves like a transparent LAN switch.

**Q What is Auto Fabric Provisioning<sup>1</sup>?**

A Auto Fabric Provisioning allows organizations to automate the configuration of new switches added to the fabric. Simply plug in a switch to the fabric and it automatically downloads the right software image from the server. No manual configuration is required, reducing staging and deployment time.

### **Classic Ethernet/IP and Hybrid Architectures**

**Q Does a VCS fabric need to attach to a Brocade MLX Series aggregation/core router?**

A VCS fabrics can connect to any Layer 2 Ethernet device, and not just a Brocade MLX<sup>®</sup> Series router. The VCS fabric appears as a single logical Layer 2 element.

**Q If Multi-Chassis Trunking (MCT) is used to make two Brocade MLX Series routers appear as a single logical entity, what makes the VCS fabric appear as a single entity or logical chassis?**

A Similar to MCT, the vLAG service in a VCS fabric enables a LAG to originate from two or more different switches inside the fabric. vLAG enables the use of standard LACP to create the LAG, making it compatible with any Layer 2 switch that supports LACP.

**Q How does LAG in the VCS fabric work with Cisco VSS in a Catalyst 65xx switch?**

A Both vLAG in a VCS fabric and VSS in the Catalyst 65xx switches enable a LAG to originate from two different switches, virtualizing the network layers so standard LACP can be used. This functionality and architecture eliminate inactive links in the network to increase utilization. The same functionality can be enabled with the Brocade MLX Series router that supports MCT.

**Q How are servers connected to the VCS fabric?**

A Servers can be connected to the VCS fabric using the same methods to connect to any Layer 2 Ethernet switch. Because the VCS fabric behaves like a single switch, a server can be multi-homed to two different VCS fabric members for connection redundancy, and LAG can be used to make both connections active.

**Q Is multipathing available all the way to the server connection—and not just inside the VCS fabric?**

A Yes. One port in a server can be connected to one node/member in the fabric with another port connected to a different node/member—and those two connections can be aggregated (LAG) for active-active connectivity.

## Server Virtualization

**Q Why is it important that my physical network also be aware of Virtual Machines (VMs)? Isn't it sufficient that my soft-switches in the hypervisor are aware?**

A Many settings such as Quality of Service (QoS) and security are controlled in the physical network. If a VM moves to another host connected to a different switch in the VCS fabric, it is critical that the network policies are properly enforced on the destination switch. Without the entire fabric being aware of the VM, network connectivity could break.

**Q Do VMs also have network profiles? Is that information persistent in the fabric? Is it distributed?**

A VMs are associated with "port groups" that specify VLAN, MAC, and other network attributes. The network has a port profile that can be configured (ACL, QoS, VLAN, and so on). These are available so administrators can match the traffic from a port group to a switch port with the appropriate port profile.

**Q Today, in VMware environments, VMotion occurs on a separate, dedicated network. With 10 GbE VCS fabrics, does Brocade recommend that the data connection, service console, and VMotion occur on the same wire?**

A 10 GbE CNAs/NICs can support "logical channels" with ingress rate limits. This can be used to allocate bandwidth and prevent congestion. This would allow multiple traffic flows to coexist on the same physical link. Other considerations (such as security and availability) also apply and might require some traffic on physically separate network links.

## Configuration and Management

**Q Will Brocade VDX switches have to be placed in VCS fabric mode, or will this mode be enabled by default?**

A VCS fabric mode will be on by default. The switches can also be placed in stand-alone mode to make the switch behave like a standard Layer 2 Ethernet bridge.

**Q How many cables are needed to construct Inter-Switch Links (ISLs) in the VCS fabric?**

A The number of cables required for ISLs is not designated beyond the minimum requirement of a single cable between switches. Additional cables can be added dynamically as high availability and bandwidth needs dictate. The distributed intelligence of the VCS fabric architecture allows traffic to continue flowing when new links are added. In addition to SFP/SFP+ optical transceivers, the Brocade VDX switches support direct-attached copper to make forming fabrics cost-effective.

**Q How much setup and administration will TRILL require?**

A The Brocade implementation of TRILL does not require any administration. Fabric configuration and optimal paths are calculated automatically.

**Q What happens when I add/remove a switch in a VCS fabric? Is there any explicit action needed to make it visible?**

A Assuming that VCS fabric capabilities are enabled on the switch, the change occurs automatically. After the link comes up, using link-level discovery protocols, the fabric and incoming switch "handshake." Next, higher-level fabric discovery protocols come into

play. The fabric join process starts and, when that process finishes, the fabric configuration is distributed to the newly joined switch.

**Q Is fabric management distributed across all of the switches, or is it centralized? If the goal is a cloud architecture, why should I use distributed management?**

A “Distributed” management is in the context of a masterless architecture. Management of a VCS fabric requires a secure login to any switch in the fabric, not a specific master switch. This improves management availability and reduces risk.

**Q Do I need to set up and configure a management server in order to get VCS fabric capabilities?**

A No. The VCS fabric architecture is masterless, requiring no external servers or “master” switch to control the fabric.

**Q How is management access to the fabric controlled?**

A Access to management functions is defined by Access Control Lists (ACLs). Roles are used to identify management functions and who is authorized to perform them. Administrators can tailor the ACLs to match their desired model for management.

**Q Is there a separate OS/firmware that has to be loaded for the Brocade VDX switches to include VCS fabric functionality?**

A No. There is only one OS/firmware version for the Brocade VDX switches. Brocade VCS Fabric technology can be enabled and disabled via a command line entry.

**Q Can Brocade Network Advisor be used to manage the Brocade VDX switch family?**

A Yes. Brocade Network Advisor can be used to manage the Brocade VDX switch family along with other LAN/SAN products from Brocade. Use of Brocade Network Advisor allows administrators to gain true end-to-end visibility of all networks under management, from the campus to the SAN.

**Q How does Brocade Network Advisor work with Brocade VCS Fabric technology?**

A Brocade Network Advisor allows organizations to maximize their VCS Fabric technology investments. It is a simple yet powerful tool for defining and implementing network policies and services within VCS fabric domains. Key features include:

- **VCS fabric visibility:** Organizations gain end-to-end visibility, from the data center edge to hosts and VMs, as well as in the VCS fabric and at the individual node level.
- **Automatic Migration of Port Profiles (AMPP) management:** Brocade AMPP enables organizations to:
  - Create, read, inventory, delete, associate, and disassociate port profiles to VMs, simplifying port profile management for network administrators.
  - Rapidly associate between port profiles and VMware port groups managed by single or multiple VMware vCenter servers. This is particularly beneficial when thousands of VMs are involved.
  - Perform integrity checks of the port profiles across Brocade VDX switch configurations, either in the same fabric or across different VCS fabrics.



- **VCS fabric diagnostics:** Organizations can use this tool to visualize Ethernet fabric traffic paths, measure network latency, and perform fault isolation via hop-by-hop inspection to pinpoint bottlenecks.
- **VCS fabric monitoring:** Network administrators can leverage sFlow data across the VCS fabric to enable VM-level monitoring and to gain application performance insights.
- **VLAN management:** Brocade Network Advisor allows organizations to create, edit, and delete VLANs in bulk, reducing time spent on repetitive administrative tasks.

## Multi-tenancy and Virtualization

**Q How is Automatic Migration of Port Profiles (AMPP) triggered? What happens when a VM address appears connected to a new port in the fabric?**

A Each VM has a unique MAC address. The VCS fabric uses the MAC address to uniquely identify the VM and all the network traffic associated with it. The policy associated with that VM is applied at the ASIC level and is enforced accordingly throughout the fabric.

**Q Is AMPP supported only in VMware?**

A No. The Brocade implementation of AMPP is designed to be hypervisor-agnostic.

**Q What benefits does Brocade VM-Aware Network Automation provide?**

A Brocade VM-Aware Network Automation provides secure connectivity and full visibility into virtualized resources with dynamic learning and activation of port profiles. By communicating directly with VMware vCenter, Brocade VM-Aware Network Automation eliminates manual configuration of port profiles and supports VM mobility across VCS fabrics while providing protection against VM MAC spoofing. AMPP and VM-Aware Network Automation features enable organizations to fully align virtual server and network infrastructure resources, and realize the full benefits of server virtualization.

**Q What is Brocade VCS Gateway for VXLAN<sup>1</sup>?**

A Brocade VCS Gateway for VXLAN provides a solution that unifies both virtual and hardware architectures for a seamless transition to cloud architectures. By unifying the best of both worlds—physical and virtual—Brocade VCS Gateway for VXLAN enables the connection of physical devices to the virtual overlay network. By leveraging Brocade VCS Fabric technology, VXLAN allows large numbers of virtual domains to be created above existing networks. This enables organizations to efficiently use their current infrastructure while leveraging the benefits of VXLAN to support multi-tenancy and large-scale deployment of applications and Virtual Machines (VMs). In addition, Brocade VCS Gateway for VXLAN easily integrates with the VMware NSX Controller to leverage the power of virtualized environments.

**Q Is Brocade VCS Gateway for VXLAN available on all Brocade VDX switch models?**

A No. Brocade VCS Gateway for VXLAN is currently available on Brocade VDX 6740 and 6740T Switches.

**Q Does Brocade VCS Gateway for VXLAN integrate with the VMware NSX Controller?**

A Yes. Brocade and VMware have partnered to help organizations tightly integrate networking with the VMware platform, delivering a joint solution that removes the

roadblocks to achieving the benefits of virtualization and cloud architectures. Together, Brocade VCS Gateway for VXLAN and VMware NSX unify virtual and physical infrastructure while providing customer choice with the ability to support both overlay-based and native fabric-based solutions.

**Q What the Virtual Fabric feature<sup>1</sup>?**

A Virtual Fabric, a feature of Brocade VCS Fabric technology, is designed to address the scalability restrictions of traditional VLANs used for multi-tenant segmentation. It provides native, secure multi-tenant support for both physical and virtual application deployments. Managed centrally through Brocade VCS Logical Chassis, the Virtual Fabric feature simplifies and accelerates application deployment, and ensures policy consistency for each tenant regardless of how application components are distributed across the data center. VXLAN and VRF Lite are other options for network segmentation. To learn more, read *Multi-Tenancy Options in Brocade VCS Fabrics*.

## Licensing

**Q Do Ports on Demand (PoD) licenses come with optics like they do with Brocade Fibre Channel switches?**

A No. For the Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740 Switches, PoD licenses only activate DCB Ethernet ports and do not come bundled with optics. This is because there are many different cabling and optics options with the Brocade VDX 6720, Brocade VDX 6730, and Brocade VDX 6740 Switches.

**Q When is a VCS software license required on Brocade VDX switches?**

A The VCS software license is required for Ethernet fabrics of three or more switches. The VCS software license is not required for a pair of switches deployed in Top-of-Rack (ToR) configurations in classic Ethernet environments. This applies regardless of whether the switches are Brocade VDX 6710, Brocade VDX 6720, Brocade VDX 6730, Brocade VDX 6740, or a mix.

**Q For converged networks using FCoE, what licenses are required?**

A To run FCoE traffic through a Brocade VDX 6720, Brocade VDX 6730, or Brocade 6740 Switch, the VCS software license and the FCoE license are required.

<sup>1</sup>Brocade Network OS 4.1 is planned for release in 1H2014. Please refer to the current version of the release notes for the most up-to-date feature support.