Brocade VDX 8770 Switches

HIGHLIGHTS

- Transforms networks to deliver cloud scale, agility, and operational efficiency with Brocade data center fabrics
- Meets today's application demands with high performance and low latency
- Delivers 1, 10, 40, and 100 Gigabit Ethernet (GbE) wire-speed switching with auto-trunking Inter-Switch Links (ISLs) for non-disruptive scaling
- Enables connectivity for more than 1,000 server ports with scale-out fabrics, 10,000 ports with multifabrics, and 100,000 ports using multifabrics with overlays
- Maximizes network availability with efficiency and resiliency

Advanced Features Enable Data Center Transformation

The data center is evolving, driving requirements for infrastructure that can support dynamic growth in Virtual Machines (VMs), distributed applications, and Big Data, as well as the transition to cloud-based computing—without compromising performance. The Brocade® VDX® 8770 and the Brocade VDX family of switches deliver the performance, flexibility, scale, and efficiency essential to modern data centers, including cloud and highly virtualized environments.

Designed for the Most Demanding Environments

The Brocade VDX 8770 Switch is designed to scale and support complex environments with dense virtualization and dynamic traffic patterns—where more automation is required for operational scalability. Available in four-slot and eight-slot versions, the Brocade VDX 8770 is a highly scalable, low-latency 1/10/40/100 GbE modular switch.

The Brocade VDX 8770 delivers high-performance to support the most demanding data center networking needs. Key features include:

- Line-rate support for 1, 10, 40, and 100 GbE to satisfy current and future needs
- Packet forwarding performance of up to 11.42 billion packets per second

- 4 Tbps per slot line-rate design for substantial capacity and headroom (up to 32 Tbps capacity for the Brocade VDX 8770-8; up to 16 Tbps for the Brocade VDX 8770-4)
- 4-microsecond latency to assure rapid response for latency-sensitive applications
- Support for up to 384,000 MAC addresses per fabric for extensive virtualization scalability
- Multi-core CPUs within each line card to support two separate Brocade Network OS instances for high availability
- Efficient multipathing technology and virtual Link Aggregation Groups (vLAGs) to allow extremely large-scale deployments with the best-possible network utilization
- The flexibility to deploy data center networks ranging from hundreds of server ports using scale-out fabrics to over 100,000 ports using multifabrics with overlays

Figure 1: The Brocade VDX 8770-4 Switch supports up to 192 10 GbE ports, 108 40 GbE ports, and 24 100 GbE ports.

Figure 2: The Brocade VDX 8770-8 Switch supports up to 384 10 GbE ports, 216 40 GbE ports, and 48 100 GbE ports.

A Choice of Chassis with Multiple Line Cards

The flexible, modular switch design offers interconnection with other Brocade VDX 8770 Switches, Brocade VDX 6740 and 6940 fabric switches, traditional Ethernet switch infrastructures, and direct server connections. Modular four-slot and eight-slot chassis options are available

to match the switch to the needs of the organization. These include:

- **Brocade VDX 8770-4:** Supports up to 192 10 GbE ports, 108 40 GbE ports, 24 100 GbE ports (see Figure 1).

- **Brocade VDX 8770-8:** Supports up to 384 10 GbE ports, 216 40 GbE ports, 48 100 GbE ports (see Figure 2).

The Brocade VDX 8770 supports a variety of wire-speed line cards to offer maximum flexibility in terms of port bandwidth as well as cable and connector technology:

- **1 GbE:** 48×1 GbE line card provides up to 48 SFP/SFP copper ports.

- **10 GbE:** 48×10 GbE line card provides up to 48 SFP+ ports.

- **10 GbE-T:** 48×10 GbE line card provides up to 48 RJ45 ports.

- **40 GbE:** 12×40 GbE line card provides up to 12 40 GbE QSFP ports.

- **40 GbE:** 27×40 GbE line card provides up to 27 40 GbE QSFP ports.

- **100 GbE:** 6×100 GbE line card provides up to 6 100 GbE CFP2 ports.

Aggregation and Migration for Traditional Ethernet Environments

Organizations utilizing traditional Ethernet technology need sensible ways to scale and expand their networks, while enabling seamless migration to fabric-based technologies to support advanced virtualization. For organizations with traditional hierarchical Ethernet environments, the Brocade VDX 8770:

- Aggregates multiple traditional access-tier switches in an aggregation-tier fabric, with efficient multipathing capabilities at multiple layers to insulate core switches from unnecessary traffic
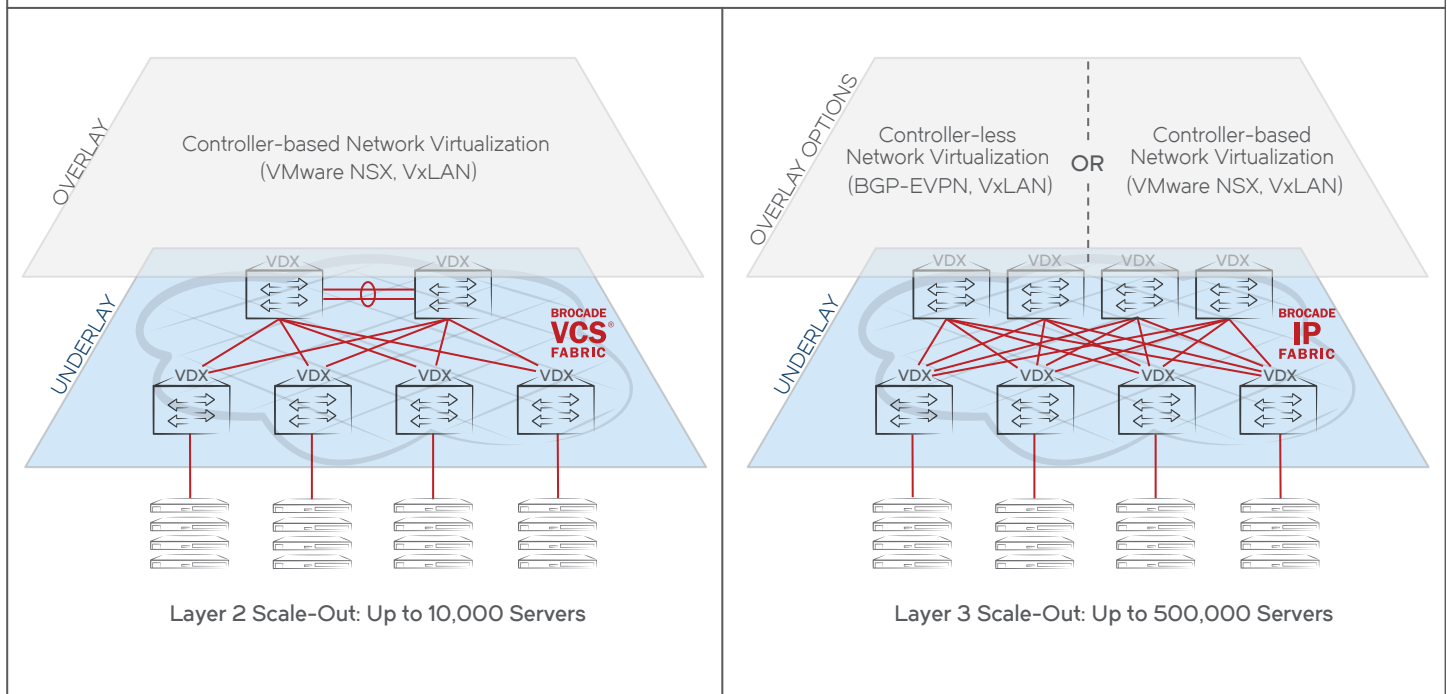
- Provides access-layer fabric capabilities in end-of-row or middle-of-row configurations

- Establishes a migration path for organizations to adopt and grow resilient and scalable Brocade data center fabrics

Brocade VDX 8770 Switches provide the advanced feature set that data centers require while delivering the high performance and low latency virtualized environments demand. Together with Brocade data center fabrics, these switches transform data center networks to support the New IP by enabling cloud-based architectures that deliver new levels of scale, agility, and operational efficiency. These highly automated, software-driven, and programmable data center fabric design solutions support a breadth of network virtualization options and scale for data center environments ranging from tens to thousands of servers. Moreover, they make it easy for organizations to architect, automate, and integrate current and future data center technologies while they transition to a cloud model that addresses their needs, on their own timetable and on their terms.

Transforms Networks to Deliver New Levels of Scale, Agility, and Operational Efficiency

Brocade VDX switches enable organizations to evolve their data center networks at their own pace, with full investment protection. As the foundation for several data center architectures, Brocade VDX switches support Brocade IP fabrics, Brocade VCS® fabrics, as well as network virtualization, including controller-based network virtualization architectures, such as VMware NSX, and standards-based (BGP-EVPN) controller-less architectures with Brocade BGP-EVPN Network Virtualization for architectural flexibility (see Figure 3).

Brocade Data Center Fabrics and Network Virtualization Options

OVERLAY

Controller-based Network Virtualization
(VMware NSX, VxLAN)

OVERLAY OPTIONS

Controller-less
Network Virtualization
(BGP-EVPN, VxLAN) **OR** Controller-based
Network Virtualization
(VMware NSX, VxLAN)

UNDERLAY

VDX VDX

BROCADE **VCS** FABRIC

VDX VDX VDX VDX

UNDERLAY

VDX VDX VDX VDX

BROCADE **IP** FABRIC

VDX VDX VDX VDX

Layer 2 Scale-Out: Up to 10,000 Servers

Layer 3 Scale-Out: Up to 500,000 Servers

Figure 3: Multiple network architectures offer the flexibility that can help organizations rapidly adapt to changing business conditions and traffic patterns.

For organizations seeking automated provisioning capabilities to improve IT agility, Brocade VDX switches, together with Brocade VCS Fabric technology, accelerate time to value through automated provisioning of network devices and network virtualization. Automated service and resource upgrades further reduce ongoing maintenance time and costs. High availability is achieved through non-disruptive In-Service Software Upgrade (ISSU) and self-healing fabrics.

Read more about Brocade data center fabrics.

Organizations that aim to automate the entire network lifecycle and integrate with cross-domain technologies to improve business agility—but lack sufficient engineering resources or training—can transform their networks with Brocade Workflow Composer™. Brocade Workflow Composer supports the Brocade VDX platform, enabling enterprise and cloud service provider IT organizations to bring network automation to IT operations (see Figure 4). Unlike other network automation solutions that require proprietary hardware platforms and focus solely on configuration management, Brocade Workflow Composer provides turnkey, customizable, or do-it-yourself network workflow automation for provisioning, validation, troubleshooting, and remediation of the entire Brocade

VDX platform—while integrating with tool chains and processes from other IT domains. Brocade Workflow Composer is powered by StackStorm, an open, extensible, and microservices-based framework that leverages the power of proven DevOps methodologies; popular open source technologies such as Puppet, Python, and Mistral; and a thriving technical community for peer collaboration and innovation to provide event-driven, cross-domain workflow automation.

Additionally, Brocade VDX switches offer programmability and interoperability options through a PyNOS Library and YANG model-based REST and Netconf APIs. Cloud orchestration and control
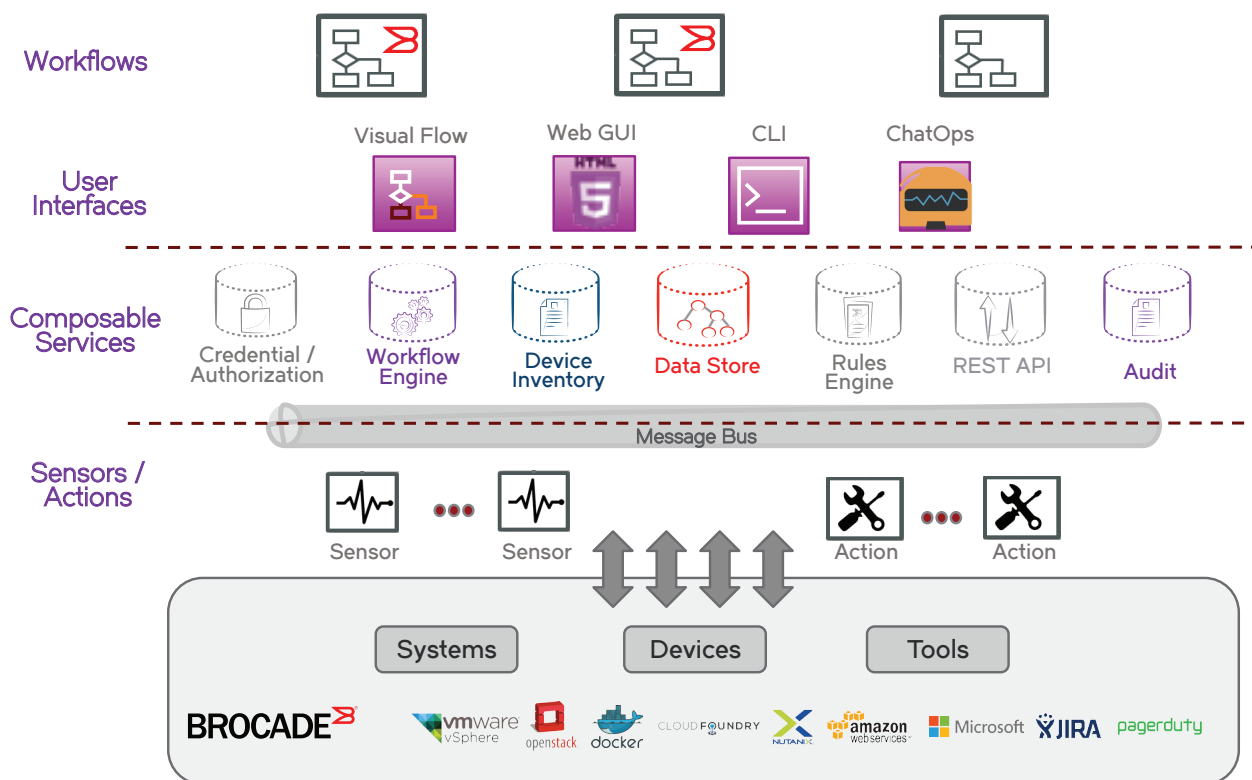
Figure 4: Brocade Workflow Composer brings workflow-centric, cross-domain network automation to IT operations.

through OpenStack and OpenDaylight-based SDN controller support enable full network integration with compute and storage resource provisioning and management.

Meets Today's Application Demands with High Performance and Low Latency

As data centers virtualize more of their servers and VM density per server increases, organizations will require higher bandwidth connectivity to support the explosion of data and application processing. With 1, 10, 40, and 100 GbE options, Brocade VDX 8770 Switches deliver the high-performance computing needed to keep up with the demands of a virtualized data center,

allowing organizations to reduce network congestion, improve application performance, and meet the capacity required by 10 GbE servers. The 40 GbE and 100 GbE uplinks can easily aggregate high-bandwidth traffic and reduce bottlenecks that occur when aggregating multiple 10 GbE or 40 GbE connections, keeping data center networks working at peak performance.

In a Brocade VCS fabric, Brocade VDX 8770 Switches also help maximize network utilization with hardware-based Brocade ISL Trunking. Organizations can create an 80 GbE Brocade ISL trunk by utilizing eight 10 GbE ports. In a Brocade VCS fabric, the Brocade ISL trunk is automatically formed between

two Brocade VDX 8770 Switches when they are linked together, allowing traffic to be equally distributed among all ports. This increases link efficiency and limits traffic disruptions, especially during high-traffic times. Also, 40 GbE and 10 GbE trunking is supported between Brocade VDX 8770, 6940, and 6740 Switches. Refer to the *Brocade VDX 8770 Hardware Reference Manual* for details.

Cloud and Big Data Environments Brocade VDX 8770 Switches deliver optimized buffer and latency and high performance to enable greater cross-sectional bandwidth for east-west traffic—exactly what cloud workloads demand. These switches offer the flexibility needed to scale out networks, deliver intelligence

to more effectively manage VM mobility, as well as provide an SDN-enabled and programmable infrastructure. In addition, Brocade VDX 8770 Switches offer an advanced feature set that non-virtual and Big Data environments require. With 10, 40, and 100 GbE options for designing oversubscribed or non-oversubscribed networks, high throughput, and optimized buffer and latency, the Brocade VDX 8770 is an ideal switch for Big Data applications.

Together with Brocade data center fabrics, Brocade VDX 8770 Switches can simplify network design and operations for both cloud and Big Data network fabrics. These switches deliver 4-microsecond port-to-any-port latency. Moreover, they offer an industry-leading 15 GB/module deep buffer, which provides the buffering capacity to handle increases in traffic, especially during peak times when ports are congested, allowing traffic to be distributed across the ports.

High Availability

The Brocade VDX 8770 provides high availability at the line-card level, an industry first. Line-card high availability allows the multi-core CPU within each line card to support two separate Brocade Network OS instances in an active/standby configuration. This enables hitless failover within each line card of the chassis. Even during an In-Service Software Upgrade (ISSU), there is no disruption because the line card does not need to completely restart while trying to sync with the new code version.

Support for Current and Future Application Needs

The Brocade VDX 8770 can be used to build a variety of VCS fabric topologies to support a wide range of scale and application requirements. Architectural options include:

- **Small-scale fabrics:** Can collapse access and aggregation tiers using the Brocade VDX 8770 as a port-dense, middle-of-row/end-of-row access switch.

- **Medium-scale fabrics:** Can utilize the Brocade VDX 8770 as a spine switch in combination with Brocade VDX 6740 and 6940 leaf switches to build highly scalable Layer 2/3 domains, complete with automatic and secure support for VM mobility.

- **Large-scale fabrics:** Can use the Brocade VDX 8770 homogeneously as both a leaf and spine switch or to aggregate multiple access-tier switches in full or partially meshed fabric domains with a logically flat network topology.

Optimizing East-West Traffic

Traditional data centers are architected with a rigid, three-tier tree topology optimized for the north-south traffic flow of client-server computing environments, compromising performance, increasing latency, and creating bottlenecks. With the increased prevalence of virtualization and distributed applications, data center network traffic is now predominantly east-west, or server to server. Brocade data center fabrics were designed and optimized to address these traffic patterns by moving traffic through any of the active paths and avoiding the multiple hops required in other tiered topologies.

The Brocade VDX 8770 and Brocade VCS fabrics offer benefits for today's most compelling and demanding applications, including:

- **Rich media:** Service providers and cloud providers require support for significant east-west traffic within their data centers, along with support for large numbers of VMs and VM mobility. Content providers with applications such as video on demand require support for significant amounts of north-south traffic. The Brocade VDX 8770 and Brocade data center fabrics are ideal for these applications, as they provide a low-latency, cut-through architecture and considerable throughput to enable balanced east-west and north-south traffic performance.

- **Big Data:** To realize business benefits from their unstructured data, organizations require seamless access to both compute and storage resources. High-performance computing environments process large amounts of data that drive significant east-west traffic patterns and require low latency for IPC interconnection. Big Data has emerged as a critical technology trend, and the Brocade VDX 8770 provides key advantages such as high-performance, line-rate 10 GbE, 40 GbE, and 100 GbE.

- **Mission-critical applications:** A wide variety of data center, cloud, and enterprise applications can take advantage of the Brocade VDX 8770, including ERP, Virtual Desktop Infrastructure (VDI), and collaboration applications such as Microsoft Exchange and SharePoint. The virtualization-aware networking characteristics of the Brocade VDX

8770 and Brocade data center fabrics, along with high-availability and essential security functionality, help ensure that critical data services function as intended while protecting vital data from corruption or loss.

Advanced Storage Support

Brocade VDX 8770 Switches provide advanced storage support with multiple storage connectivity options, including Fibre Channel over Ethernet (FCoE), iSCSI, and NAS. They also feature Data Center Bridging (DCB), which enables the reliable exchange of storage traffic over the LAN, eliminating packet loss when network congestion occurs and allocating bandwidth as needed to keep the network running efficiently. Moreover, Brocade 8770 Switches offer NAS Auto QoS intelligence to prioritize delay-sensitive IP storage traffic within the fabric and to help ensure consistent performance while decreasing latency.

Brocade Global Services

Brocade Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 20 years of expertise in storage, networking, and virtualization, Brocade Global Services delivers world-class professional services, technical support, and education services, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

Acquisition Options That Match Balance Sheet Objectives

Successful network deployments drive business forward, providing technical and financial agility. Brocade offers the broadest financing models, from traditional leasing to Brocade Network Subscription. Network-as-a-Service allows organizations to subscribe to network assets today then upgrade on demand, scale up or down, or return them with 60-day notification. Brocade Network Subscription plans can be structured to meet IASC guidelines for OpEx or CapEx treatment to align with financial goals. Learn more at www.nonetworkcapex.com.

Maximizing Investments

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, please contact a Brocade sales partner or visit www.brocade.com.

Brocade VDX 8770 Feature Overview

	Brocade VDX 8770-4	Brocade VDX 8770-8
Port-to-port latency (64-byte packets)	4 microseconds	4 microseconds
Form factor	8U	15U
Slots	4	8
Dimensions and weight	Width: 43.74 cm (17.22 in.) Height: 34.7 cm (13.66 in.) Depth: 66.04 cm (26 in.) Weight: 31.75 kg (70 lb) Weight (fully loaded): 86.18 kg (190 lb)	Width: 44 cm (17.32 in.) Height: 66.2 cm (26.06 in.) Depth: 66.04 cm (26 in.) Weight: 61.24 kg (135 lb) Weight (fully loaded): 165.55 kg (365 lb)
1 GbE SFP/SFP copper ports	192	384
10 GbE SFP+/RJ45 ports	192	384
40 GbE QSFP+ ports	108	216
100 GbE CFP2 ports	24	48
Power supplies	4 max	8 max
Cooling fans	2	4
Airflow	Side-to-back airflow	Front-to-back airflow

Brocade VDX 8770 Specifications

Scalability Information*

Connector options	1 GbE copper SFP options 10 Gbps SFP+ options: 1/3/5 m direct-attached copper (Twinax) 10 GbE SR and 10 GbE LR 10 GbE 10GBASE-T RJ45 40 GbE QSFP+ 100 GbE CFP2
Maximum VLANs	4,096
Maximum MAC addresses	384,000
Maximum IPv4 routes	352,000
Maximum IPv6 routes	88,000
Maximum ACLs	57,000
Maximum port profiles (AMPP)	1,024
Maximum ARP entries	128,000
Maximum members in a standard LAG	64
Maximum switches in a VCS fabric	48
Maximum ECMP paths in a VCS fabric	16
Maximum trunk members for VCS fabric ports	16

* Please refer to the latest version of the release notes for the most up-to-date scalability numbers.

Brocade VDX 8770 Specifications *(continued)*

Scalability Information* *(continued)*

Maximum switches that a vLAG can span	8
Maximum members in a vLAG	64
Maximum jumbo frame size	9,216 bytes
DCB Priority Flow Control (PFC) classes	8

Brocade VDX 8770 Modules and Line Cards

Management Module (half-slot)	• Multicore processor • 8 GB SDRAM, USB port • Console, management port, auxiliary service port (all RJ-45)
Flash memory support	• One 8 GB compact flash in each Management Module • Two 4 GB compact flash in each line card
1 GbE access (fiber/copper) line card	48-port SFP/SFP-copper
1 GbE/10 GbE access (copper) line card	48-port RJ45
10 GbE access or aggregation line card	• 48-port SFP+ (10 GbE/1 GbE) • 48-port RJ45 (10 GbE/1 GbE)
40 GbE aggregation line card	• 12-port QSFP+ module • 27-port QSFP+ module
100 GbE aggregation line card	6-port CFP2 module

Mechanical

Enclosure	19-inch EIA-compliant; power from port side

Environmental

Temperature	Operating: 0°C to 40°C (32°F to 104°F) Non-operating and storage: -25°C to 70°C (-13°F to 158°F)
Humidity	Operating: 10% to 85% non-condensing Non-operating and storage: 10% to 90% non-condensing
Altitude	Operating: Up to 3,000 meters (9,842 feet) Non-operating and storage: Up to 12 kilometers (39,370 feet)
Airflow	Brocade VDX 8770-4 • Maximum: 675 CFM • Nominal: 200 CFM	Brocade VDX 8770-8 • Maximum: 1,250 CFM • Nominal: 375 CFM

Power

Max power utilization†	Brocade VDX 8770-4: 3,250 W Brocade VDX 8770-8: 6,387 W
Power inlet	C19
Input voltage	200 to 240 VAC (Operating voltage range: 180 to 264 VAC)

---

* Please refer to the latest version of the release notes for the most up-to-date scalability numbers.
† Delivered power based on fully populated system with 10 GbE ports.

Brocade VDX 8770 Specifications *(continued)*

Power *(continued)*

Input line frequency	50/60 Hz
Maximum current	AC: 16.0 A max per power supply
	DC: 70.0 A max per power supply

Safety Compliance

- UL 60950-1 Second Edition
- CAN/CSA-C22.2 No. 60950-1 Second Edition
- EN 60950-1 Second Edition
- IEC 60950-1 Second Edition
- AS/NZS 60950-1

EMC

- 47CFR Part 15 (CFR 47) Class A
- AS/NZS CISPR22 Class A
- CISPR22 Class A
- EN55022 Class A
- ICES003 Class A
- VCCI Class A
- EN61000-3-2
- EN61000-3-3
- KN22 Class A

Immunity

- EN55024
- CISPR24
- EN300386
- KN 61000-4 series

Environmental Regulatory Compliance

RoHS-6-compliant (with lead exemption) Directive 2002/95/EC

NEBS-compliant

Standards Compliance

The Brocade VDX 8770 products conform to the following Ethernet standards:

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

The following draft versions of the Data Center Bridging (DCB) and Fibre Channel over Ethernet (FCoE) standards are also supported on the Brocade VDX 8770:

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

Brocade VDX 8770 Specifications *(continued)*

RFC Support

RFC 768	User Datagram Protocol (UDP)
RFC 783	TFTP Protocol (revision 2)
RFC 791	Internet Protocol (IP)
RFC 792	Internet Control Message Protocol (ICMP)
RFC 793	Transmission Control Protocol (TCP)
RFC 826	ARP
RFC 854	Telnet Protocol Specification
RFC 894	A Standard for the Transmission of IP Datagram over Ethernet Networks
RFC 959	FTP
RFC 1027	Using ARP to Implement Transparent Subnet Gateways (Proxy ARP)
RFC 1112	IGMP v1
RFC 1157	Simple Network Management Protocol (SNMP) v1 and v2
RFC 1305	Network Time Protocol (NTP) Version 3
RFC 1492	TACACS+
RFC 1519	Classless Inter-Domain Routing (CIDR)
RFC 1584	Multicast Extensions to OSPF
RFC 1765	OSPF Database Overflow
RFC 1812	Requirements for IP Version 4 Routers
RFC 1997	BGP Communities Attribute
RFC 2068	HTTP Server
RFC 2131	Dynamic Host Configuration Protocol (DHCP)
RFC 2154	OSPF with Digital Signatures (Password, MD-5)
RFC 2236	IGMP v2
RFC 2267	Network Ingress Filtering
RFC 2328	OSPF v2
RFC 2370	OSPF Opaque Link-State Advertisement (LSA) Option—Partial Support
RFC 2375	IPv6 Multicast Address Assignments
RFC 2385	Protection of BGP Sessions with the TCP MD5 Signature Option
RFC 2439	BGP Route Flap Damping
RFC 2460	Internet Protocol, Version 6 (v6) Specification (on management interface)
RFC 2462	IPv6 Stateless Address Auto-Configuration
RFC 2464	Transmission of IPv6 Packets over Ethernet Networks (on management interface)
RFC 2474	Definition of the Differentiated Services Field in the IPv4 and IPv6 Headers
RFC 2571	An Architecture for Describing SNMP Management Frameworks

Brocade VDX 8770 Specifications *(continued)*

RFC 2711	IPv6 Router Alert Option
RFC 2865	Remote Authentication Dial-In User Service (RADIUS)
RFC 3101	The OSPF Not-So-Stubby Area (NSSA) Option
RFC 3137	OSPF Stub Router Advertisement
RFC 3176	sFlow
RFC 3392	Capabilities Advertisement with BGPv4
RFC 3411	An Architecture for Describing SNMP Frameworks
RFC 3412	Message Processing and Dispatching for the SNMP
RFC 3413	Simple Network Management Protocol (SNMP) Applications
RFC 3587	IPv6 Global Unicast Address Format
RFC 3623	Graceful OSPF Restart—IETF Tools
RFC 3768	VRRP
RFC 4271	BGPv4
RFC 4291	IPv6 Addressing Architecture
RFC 4292	IP Forwarding MIB
RFC 4293	Management Information Base for the Internet Protocol (IP)
RFC 4443	ICMPv6 (replaces 2463)
RFC 4456	BGP Route Reflection
RFC 4510	Lightweight Directory Access Protocol (LDAP): Technical Specification Road Map
RFC 4601	Protocol Independent Multicast—Sparse Mode (PIM-SM): Protocol Specification (Revised)
RFC 4724	Graceful Restart Mechanism for BGP
RFC 4861	IPv6 Neighbor Discovery
RFC 4893	BGP Support for Four-Octet AS Number Space
RFC 5082	Generalized TTL Security Mechanism (GTSM)
RFC 5880	Bidirectional Forwarding Detection (BFD)
RFC 5881	Bidirectional Forwarding Detection (BFD) for IPv4 and IPv6 (Single Hop)
RFC 5882	Generic Application of Bidirectional Forwarding Detection (BFD)
RFC 5883	Bidirectional Forwarding Detection (BFD) for Multihop Paths
RFC 5942	IPv6 Neighbor Discovery
RFC 7432	BGP-EVPN—Network Virtualization Using VXLAN Data Plane
IPv6 Routing	
RFC 2545	Use of BGP-MP Extensions for IPv6
RFC 2740	OSPFv3 for IPv6

Brocade VDX 8770 Specifications *(continued)*

IPv6 Multicast

RFC 2710	Multicast Listener Discovery (MLD) for IPv6

VRRP/VRRPe

RFC 5798	VRRP Version 3 for IPv4 and IPv6

Brocade Network OS Software Capabilities

		VCS Fabrics	IP Fabrics
Software scalability	Maximum switches in a fabric	48	Unlimited
	Maximum ECMP paths in a fabric	32	32
	Maximum LAGs in a fabric	2,000	384
Layer 2 switching	Service Node Load Balancing BFD/ARP Optimizations	X	X
	Conversational MAC Learning	X	X
	Virtual Link Aggregation Group (vLAG) spanning	X	X
	Layer 2 Access Control Lists (ACLs)	X	X
	Edge Loop Detection (ELD)	X	X
	Address Resolution Protocol (ARP) RFC 826	X	X
	Private VLANs	X	
	Maintenance Mode/Graceful Traffic Diversion	X	
	Distributed VXLAN Gateway	X	
	Diagnostic Ports	X	
	IP Maps Support	X	
	L2 Loop prevention in an overlay environment		X
	High availability/In-Service Software Upgrade—hardware-enabled	X	X
	IGMP v1/v2 Snooping	X	X
	MAC Learning and Aging	X	X
	Link Aggregation Control Protocol (LACP) IEEE 802.3ad/802.1AX	X	X
	Virtual Local Area Networks (VLANs)	X	X
	VLAN Encapsulation 802.1Q	X	X
	Per-VLAN Spanning Tree (PVST+/PVRST+)	X	X
	Rapid Spanning Tree Protocol (RSTP) 802.1w	X	X
	Multiple Spanning Tree Protocol (MSTP) 802.1s	X	X
	STP PortFast, BPDU Guard, BPDU Filter	X	X
	STP Root Guard	X	X
	Pause Frames 802.3x	X	X

Brocade Network OS Software Capabilities *(continued)*

		VCS Fabrics	IP Fabrics
Layer 2 switching *(continued)*	Static MAC Configuration	X	X
	Uni-Directional Link Detection (UDLD)	X	X
	Transparent LAN Services	X	
	BUM Storm Control	X	X
Layer 3 switching	Border Gateway Protocol (BGP4+)	X	X
	DHCP Helper	X	X
	Layer 3 ACLs	X	X
	Multicast: PIM-SM, IGMPv2	X	X
	OSPF v2/v3	X	X
	Static routes	X	X
	IPv4/v6 ACL	X	X
	Policy-Based Routing (PBR)	X	X
	Bidirectional Forwarding Detection (BFD)	X	X
	32-Way ECMP	X	X
	VRF Lite	X	X
	VRF-aware OSPF, BGP, VRRP, static routes	X	X
	VRRP v2 and v3	X	X
	IPv4/IPv6 dual stack	X	X
	IPv6 ACL packet filtering	X	X
	BGP Additional-Path	X	X
	BGP-Allow AS	X	X
	BGP Generalized TTL Security Mechanism (GTSM)	X	X
	BGP Peer Auto Shutdown	X	X
	Multicast Refactoring	X	X
	IPv6 routing	X	X
	OSPF Type-3 LSA Filter	X	X
	Wire-speed routing for IPv4 and IPv6 using any routing protocol	X	X
	BGP-EVPN Control Plane Signaling RFC 7432		X
	BGP-EVPN VXLAN Standard-based Overlay		X
	Multi-VRF	X	X
	IP Unnumbered Interface		X
	Intersubnet Routing (Symmetric and Asymmetric)		X

Brocade Network OS Software Capabilities *(continued)*

		VCS Fabrics	IP Fabrics
Layer 3 switching *(continued)*	IP over Port Channel		X
	VRRP-E	X	X
	Fabric Virtual Gateway	X	X
	Static Anycast Gateway		X
	ARP Suppression		X
Automation and programmability	OpenFlow 1.3	X	X
	REST API with YANG data model	X	X
	Puppet	X	X
	Python	X	X
	PyNOS libraries	X	X
	Ansible	X	X
	VMware vRealize plugins	X	X
	DHCP automatic fabric provisioning	X	X
	Netconf API	X	X
Multitenancy and virtualization	TRILL FGL-based VCS Virtual Fabric feature	X	
	Virtual fabric extension	X	
	VM-Aware Network Automation	X	
	BFD for virtual fabric extension	X	
	Automatic Migration of Port Profiles (AMPP)	X	X
DCB	Priority-based Flow Control (PFC) 802.1Qbb	X	
	Enhanced Transmission Selection (ETS) 802.1Qaz	X	
	Manual configuration of lossless queues for protocols other than FCoE and iSCSI	X	
	Data Center Bridging Exchange (DCBX)	X	
	DCBX Application Type-Length-Value (TLV) for FCoE and iSCSI	X	
Fibre Channel/FCoE	Multi-hop Fibre Channel over Ethernet (FCoE); requires Brocade VCS Fabric technology	X	
	FC-BB5 compliant Fibre Channel Forwarder (FCF)	X	
	Native FCoE forwarding	X	
	FCoE to Fibre Channel Bridging	X	
	FCoE on Brocade VDX 8770	X	
	FCoE on QSFP+ port	X	
	Multi-hop Access Gateway Support	X	

Brocade Network OS Software Capabilities *(continued)*

		VCS Fabrics	IP Fabrics
Fibre Channel/FCoE *(continued)*	End-to-end FCoE (initiator to target)	X	
	FCoE Initialization Protocol (FIP) v1 support for FCoE device login and initialization	X	
	Name Server-based zoning	X	
	Supports connectivity to FIP Snooping Bridge (FSB) device	X	
	FCoE traffic over standard LAG	X	
	Interface Binding	X	
	Dual Personality Ports	X	
	Logical SANs	X	
High availability	ISSU L2 and L3	X	X
	BFD	X	X
	OSPF3-NSR	X	X
	BGP4-GR	X	X
	Management Module Failover	X	X
Quality of Service (QoS)	ACL-based QoS	X	X
	Eight priority levels for QoS	X	X
	Class of Service (CoS) IEEE 802.1p	X	X
	DSCP Trust	X	X
	DSCP to Traffic Class Mutation	X	X
	DSCP to CoS Mutation	X	X
	DSCP to DSCP Mutation	X	X
	Random Early Discard	X	X
	Per-port QoS configuration	X	X
	ACL-based Rate Limit	X	X
	Dual-rate, three-color token bucket	X	X
	ACL-based remarking of CoS/DSCP/Precedence	X	X
	ACL-based sFlow	X	X
	Scheduling: Strict Priority (SP), Deficit Weighted Round-Robin (DWRR), Hybrid Scheduling (Hybrid)	X	X
	Queue-based Shaping	X	X
	Flow-based QoS	X	X
Management and monitoring	Logical chassis management	X	
	IPv4/IPv6 management	X	X
	Industry-standard Command Line Interface (CLI)	X	X
	Netconf API	X	X

Brocade Network OS Software Capabilities *(continued)*

		VCS Fabrics	IP Fabrics
Management and monitoring *(continued)*	REST API with YANG data model	X	X
	Brocade VDX Plugin for OpenStack	X	X
	Link Layer Discovery Protocol (LLDP) IEEE 802.1AB	X	X
	MIB II RFC 1213 MIB	X	X
	Switch Beaconing	X	X
	Management VRF	X	X
	Switched Port Analyzer (SPAN)	X	X
	Telnet	X	X
	SNMP v1, v2C, v3	X	X
	sFlow RFC 3176	X	X
	Out-of-band management	X	X
	Remote SPAN (RSPAN)	X	X
	RMON-1, RMON-2	X	X
	NTP	X	X
	Management Access Control Lists (ACLs)	X	X
	Role-Based Access Control (RBAC)	X	X
	Range CLI support	X	X
	UDLD	X	X
	OpenStack Neutron ML2 plugin	X	X
	Python	X	X
	Puppet	X	X
	Distributed Configuration Management	X	
	Maps switch health monitoring	X	
Security	Port-based Network Access Control 802.1X	X	X
	RADIUS (AAA)	X	X
	TACACS+	X	X
	Secure Shell (SSHv2)	X	X
	BPDU Drop	X	X
	Lightweight Directory Access Protocol (LDAP)	X	X
	Secure Copy Protocol	X	X
	Port Security	X	X

Brocade VDX 8770 Ordering Information

See the Brocade VDX Transceiver Support Matrix for optics and cable ordering details.

SKU	Description
BR-VDX8770-4-BND-AC	4-slot chassis with three Switch Fabric Modules, one Management Module, two fans, two 3,000 W power supply units AC
BR-VDX8770-4-BND-DC	4-slot chassis, three Switch Fabric Modules, one Management Module, two fans, two 3,000 W power supply units DC
BR-VDX8770-8-BND-AC	8-slot chassis, six Switch Fabric Modules, one Management Module, four fans, three 3,000 W power supply units AC
BR-VDX8770-8-BND-DC	8-slot chassis, six Switch Fabric Modules, one Management Module, four fans, three 3,000 W power supply units DC
XBR-VDX8770-4	4-slot chassis, no Switch Fabric Modules, no Management Modules, two fans, no power supply units
XBR-VDX8770-8	8-slot chassis, no Switch Fabric Modules, no Management Modules, four fans, no power supply units
BR-VDX8770-48X1G-SFP-1	48×1 GbE, SFP module, no optics
BR-VDX8770-48X10G-SFPP-1	48×1/10 GbE, SFP/SFP+ module, no optics
BR-VDX8770-48X10G-T-1	48×1/10 GbE, RJ45 module, no optics
BR-VDX8770-12X40G-QSFP-1	12×40 GbE, QSFP+ module, no optics
BR-VDX8770-27X40G-QSFP-1	27×40 GbE, QSFP+ module, no optics
BR-VDX8770-6X100G-CFP2-1	6×100 GbE, CFP2 module, no optics
BR-VDX8770-MM-1	Management Module
BR-VDX8770-SFM-1	Switch Fabric Module
XBR-FAN-FRU	Fan FRU for 4- and 8-slot chassis
XBR-ACPWR-3000	3,000 W power supply unit AC
XBR-DCPWR-3000	3,000 W power supply unit DC
BR-VDX8770-LIC-FCOE	FCoE feature chassis license
BR-VDX8770-LIC-VCS	VCS feature chassis license
BR-VDX8770-LIC-LAYER3	Layer 3 feature chassis license
BR-VDX8770-LIC-ADV	Advanced feature chassis license (includes Layer 3, FCoE, and VCS licenses)
BR-VDX8770-LIC-UPG	Upgrade license from VCS, FCoE, or Layer 3 features to Advanced license

BROCADE