

BROCADE USD-X



STORAGE AREA NETWORK

Create a High-Capacity, High-Performance Storage Network

HIGHLIGHTS

- Consolidate to reduce costs
- Combine and share storage resources across disparate networks
- Optimize bandwidth utilization
- Optimize performance regardless of distance
- Extend mainframe peripherals

The Brocade® USD-X is a high-performance platform that connects and extends mainframe and open systems storage-related data replication applications for both disk and tape, along with remote channel networking for a wide range of device types.

This multi-protocol gateway and extension platform interconnects host-to-storage and storage-to-storage systems across the enterprise—regardless of distance—to create a high capacity, high performance storage network using the latest high-speed interfaces.

In short, the Brocade USD-X:

- Supports Fibre Channel, FICON™, ESCON, Bus and Tag or mixed environment systems
- Fully exploits Gigabit ethernet services
- Delivers industry-leading throughput over thousands of miles
- Provides hardware based compression to lower bandwidth costs
- Offers one platform for all remote storage connectivity needs
- Shares bandwidth across multiple applications and sites



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APPLICATIONS

The Brocade USD-X enables mission-critical storage networking applications in both mainframe and open systems environments in order to protect your information or push data access out to the far corners of your enterprise, driving new business opportunities.

The product supports the following applications:

- Synchronous or asynchronous disk mirroring
- Backup/restore or Archive/retrieve
- Extended disk, tape or virtual tape
- Data migration and content distribution
- Shared storage
- Peripheral and Channel-to-channel extension

BENEFITS

The Brocade USD-X works at the core of storage network infrastructures in local, metro and wide-area environments to create a robust, scalable solution that integrates and fully exploits high speed channel and network technologies. The result: new levels of performance while enabling operational efficiencies and cost reductions.

Consolidate to reduce costs

The Brocade USD-X enables the consolidation of channel and network interfaces to fewer high-speed interfaces, reducing the complexity of your infrastructure and simplifying management. The Brocade USD-X's one-to-many networking capabilities allows a single high speed interface, such as gigabit Ethernet, to be spliced and routed to up to 32 destination IP addresses, with each destination having a portion of the bandwidth allocated to meet its specific application needs.

Combine and share storage resources across disparate networks

Possessing true configuration flexibility, the Brocade USD-X provides any-to-any connectivity, supporting Fibre Channel, FICON, ESCON and Bus-and-Tag device interfaces and a variety of network interfaces including OC-3 ATM, 10/100 Ethernet and Gigabit Ethernet. Channel interfaces can share the same network connections to allow the creation of efficient, flexible infrastructures.

Optimize bandwidth utilization

Brocade's USD-X supports multiple applications simultaneously, allowing bandwidth to be shared for improved utilization and reduced costs. In addition, significant compression ratios can be achieved depending on the compressibility of the data. This can more than double the capacity of existing bandwidth and delay investments in additional infrastructure. In addition, Adaptive Rate Limiting optimizes WAN bandwidth utilization by making use of all available bandwidth.

Optimize performance regardless of distance

The Brocade USD-X's intelligent software incorporates new features to dramatically improve network throughput and maximize the

efficiency of application execution whether across town or around the globe. These features include dynamic load leveling across all available bandwidth, automatic alternate path failover, network-based error detection and recovery, traffic prioritization, new and improved data compression, and pipelining.

Extend mainframe peripherals

The Brocade USD-X allows ESCON and Bus-and-Tag technologies to be supported over a variety of remote network infrastructures. Hosts and peripherals like printers, check sorters, and check imaging, can be located wherever it makes best business sense, anywhere in the world.

FEATURES

Reliability and Scalability

- Protected by auto fail-over, hot-swap and redundant components
- Independent data paths through the mid-plane switch
- Non-blocking mid-plane switch technology
- Multi-processor architecture
- Redundant, load sharing, hot-swappable power supplies
- Hot-swappable processors
- Optional Hot Spare system service monitor
- Gigabit per second capacity per blade, scalable from 1 to 12 channels and 1 to 8 WAN ports

Availability

- Any-to-any data pathing with intelligent I/O interface processors
- Traffic Management: Pipelining; Dynamic load leveling; Automatic alternate path routing; Traffic prioritization
- 32 bit end-to-end Cyclical Redundancy Check (CRC)

Serviceability

- Fully SNMP-managed by Brocade or enterprise manager client products
- Supports diverse server platforms including Windows NT, UNIX, OS/390, and z/OS

Standards and Interoperability

The **Brocade USD-X** is designed to conform to existing and emerging industry standards for maximum interoperability with storage network equipment.

Global Services

Brocade offers full lifecycle services, including consulting, implementation and integration, support, and managed services. These services help clients maximize existing investments, accelerate new technology deployment, and optimize the overall performance of their storage infrastructure.

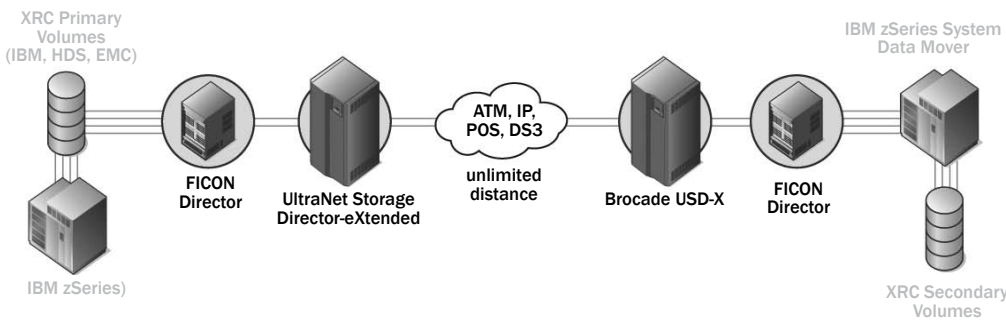
All Brocade products are supported by our 24x7x365 help desk and remote dial-in support. In addition, on-site hardware support and depot spares are available on some models. You can choose to engage Brocade experts for Change Management Services to

provide expert guidance for network configuration changes.

In addition, Brocade provides a Network Management Service to monitor and proactively respond to, and resolve, events related to your Brocade network. Access to daily reports and trend analysis information is available via a secure web portal for better-informed network decisions. If you choose to have Brocade provision your bandwidth, we'll monitor, respond to, and troubleshoot telecom-related issues as well.

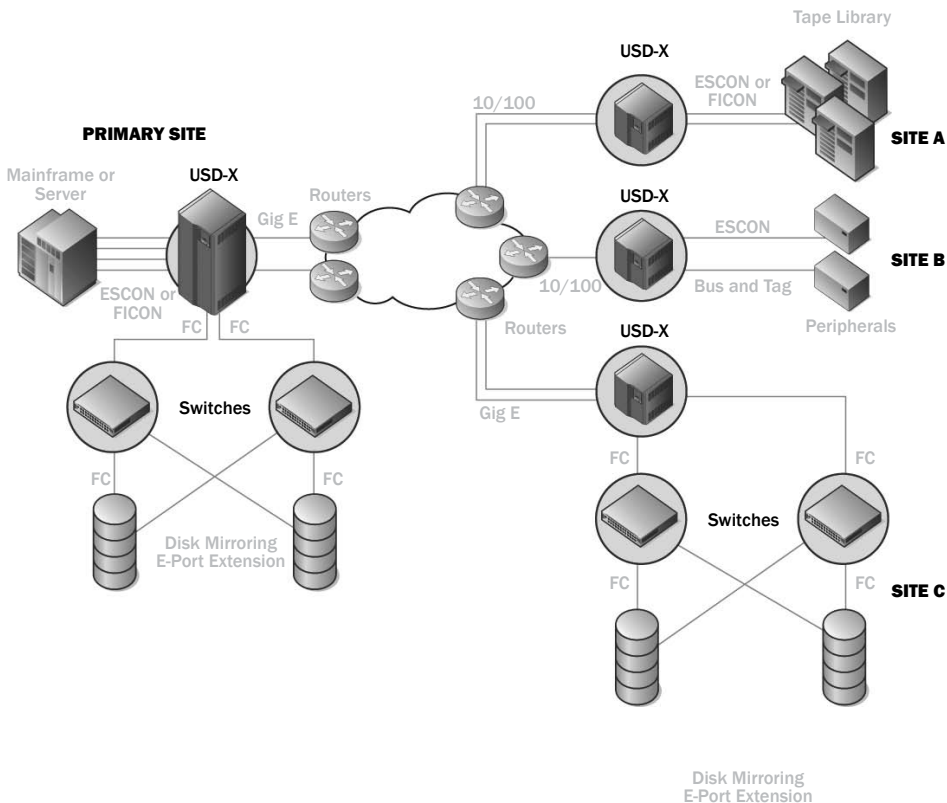
MAXIMIZING SAN INVESTMENTS

Brocade and its partners offer complete SAN solutions to meet a wide range of technology and business requirements. These solutions include education and training, support, service, and professional services to help optimize SAN investments. For more information, contact an authorized Brocade sales partner or visit www.brocade.com.



FICON extension with Brocade's USD-X

This diagram shows Brocade extending FICON cascaded switch connectivity, supported by zSeries processors.



Disk mirroring, tape vaulting, and device extension with the Brocade USD-X

The Brocade USD-X's one-to-many networking capabilities allows a single high speed interface, such as a gigabit Ethernet, to be spliced and routed to up to 32 destination IP addresses, with each destination having a portion of the bandwidth allocated to meet its specific application needs.

BROCADE USD-X SPECIFICATIONS

Physical specifications: 12-slot Director	
Height	43 in. (1092.2 mm)
Width	23.6 in. (599.4 mm)
Depth	36.2 in. (918.8 mm)
Weight	400 lbs. (181 kg)
AC voltage	90-240 VAC
Hertz	47-63 Hz
Phases	1
Maximum amps	110V/21A 220V/10.5A 208V/11.5A
Maximum Operating VA	2090 VA

Physical Specifications: 6-slot Director	
Height	19.25 in. (489 mm)
Width	23.6 in. (599.4 mm)
Depth	27.75 in. (705 mm)
Weight	200 lbs. (90.7 kg)
AC voltage	90-240 VAC
Hertz	47-63 Hz
Phases	1
Maximum amps	110V/10.5A 220V/5.25A 208V/5.75A
Maximum Operating VA	1045 VA

Physical specifications: 6/12-slot Director	
Input power requirements	90-240 VAC, 47-63 Hz
Operating temperature	40 °F–104 °F (5 °C–40 °C)
Operational relative humidity	5% to 80% (non-condensing)
Air flow	450 CFM (214 liters/second)

ESCON specifications	
IBM's Enterprise Systems Connection Architecture.	
Cable type	Optical multi-mode
Core diameter	50 microns or 62.5 microns
Cladding diameter	125 microns
Connector type	Multi-mode duplex ESCON connector

Bus and Tag specifications	
Compliant with OEMI FIPS-60 specification for Bus and Tag connectivity	
Block Multiplexor (Byte Multiplexor connectivity is not supported)	
Fibre Channel/FICON specifications	
Designed to meet FCIP, FC, FC-2 FC-BB-2, and FC-SB2 standards/emerging standards.	

Multi-mode/Short wave	
Cable type	Optical multi-mode
Core diameter	62.5 microns and 50 microns
Cladding diameter	125 microns
Numerical aperture	0.275
Attenuation (Max.)	1.5 dB/km @ 1310 nm 3.75 dB/km @ 850 nm
Operational wavelength	850 nm
Bandwidth (Min.)	160 MHz/km
Fiber count	Duplex

Length (Max.)	50 microns = 500 meters@ 100 MB/s 50 microns = 300 meters@ 200 MB/s 62.5 microns = 250 meters @ 100 MB/s 62.5 microns = 120 meters @ 200 MB/s
Connector type	Duplex LC
Line rate (Max.)	1.062 Gbit/sec
Output power	-5 dBm
Receiver sensitivity	-18 dBm
Input power (Max.)	0 dBm
Cable type	Optical single mode
Core diameter	9 microns
Cladding diameter	125 microns
Wavelength	1310 nm
Maximum distance	10 km
Connector type	Duplex LC
Line Rate (Max.)	1.062 Gbit/sec
Output Power	-6 dBm
Receiver sensitivity	-17 dBm
Input power (Max.)	-5 dBm

Ethernet 10/100 specifications	
The Brocade USD-X supports IEEE 802.3, ANSI 8802-3 Ethernet 10/100 standards.	
Cable Type	CAT5 UTP
Line Rate	100 Mb/s
Connector Type	RJ-45

Gigabit Ethernet specifications	
Supports full duplex Ethernet on each port and is designed to meet the following standards:	
IEEE 802.3z/802.3ab Gigabit Ethernet Standard	
IEEE 802.3x flow control	
IEEE 802.1p packet priority	

Multi-mode/Short wave	
Cable type	Multi-mode Fibre
Core diameter	50/62.5 micron
Cladding diameter	125 micron
Operational wavelength	850 nm
Line rate	1.25 Gbit/sec
Distance	550 m – 50/125 300 m – 62.5/125
Output power	-5 dBm
Receiver sensitivity	-20 dBm
Input power (Max.)	0 dBm
Connector Type	Duplex LC

Single-mode/Long wave	
Cable type	Single-mode Fibre
Core diameter	9 micron
Cladding diameter	125 micron
Operational wavelength	1310 nm
Line rate	1.25 Gbit/sec

BROCADE USD-X SPECIFICATIONS (CONTINUED)

Distance (Max.)	10 km
Output power	-5 dBm
Receiver sensitivity	-23 dBm
Input power (Max.)	0 dBm
Connector Type	Duplex LC
Copper Cable	CAT 5 UTP
Connector type	RJ-45
Line rate	1.25 Gbit/sec
Distance (Max.)	100 m

OC-3 ATM specifications

Designed to meet the following standards:

ATM Forum uni 3.0 and 3.1

ATM Forum AAL -5

ATM Forum UBR, VBR and CBR

ATM Forum af-phy-0062.00

ITU Recommendation I.432

ITU Recommendation G.703, G.704, G.707

OC-3 physical specifications

Cable type	Optical multi-mode
Core diameter	50 microns or 62.5 microns
Cladding diameter	125 microns
Connector type	Duplex LC
Distance (Max.)	2 km
Line rate	155 Mb/s
Wavelength	850 nm
Output power	-16 dBm
Receiver sensitivity	-33 dBm
Input power (Max.)	-12 dBm
Cable type	Optical single-mode
Core diameter	9 microns
Cladding diameter	125 microns
Connector type	Duplex LC
Distance (Max.)	40 km
Line rate	155 Mb/s
Wavelength	1310 nm
Output power	-3 dBm
Receiver sensitivity	-36 dBm
Input power (Max.)	-7 dBm

Regulatory compliance

FCC/EMC

Conforms with FCC Part 15 Class A subpart J (U.S.A) EN55022 Class A, EN55024, 1998, EN61000-3-2/3

Safety CUL 1950, EN6950 - IEC950

Management

SNMP-managed by Brocade or enterprise manager client products

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