

## MAJOR FEATURES

One-fourth the price of alternative complex fabric switches

12 ports is the ideal sized switch for entry SANs

High performance 2 or 1Gb/s non-blocking switching

Field-proven ANSI standards-based interoperability

5x the reliability of alternative complex fabric switches

## Simple & Affordable SAN Storage Switching



InSpeed Model 355

Emulex

# Model 355

SAN Storage Switch

## Enabling a New Generation of Scalable Entry-level SAN Solutions

### Simply Affordable

Emulex SAN Storage Switches are the first and only family of storage switches specifically designed for entry-level Storage Area Networks (SANs), freeing smaller environments from the inefficiencies presented by direct attached storage. Now it is possible for businesses of all sizes to economically deploy SANs that are incrementally scalable and deliver increased performance—yet easy to implement and maintain. While other SAN switch vendors have offered re-purposed complex fabric switch products that are designed for the needs of large enterprises with a multitude of complex fabric services, Emulex SAN Storage Switches are designed to exclusively deliver a simple and affordable storage solution for companies that want the advantages SANs provide over direct attached storage like:

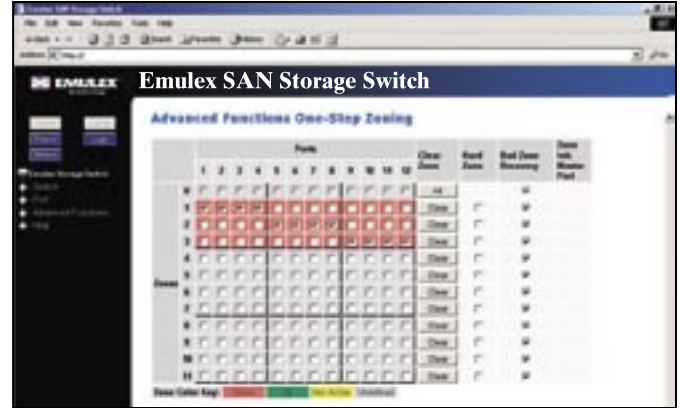
- *greater application availability*
- *higher performance between servers and storage devices*
- *improved storage asset utilization*
- *lower storage management and support costs*
- *incremental scalability to keep up with difficult to estimate storage growth*

The Emulex SAN Storage Switch Model 355 is a 1U, half-rack form factor 12-port non-blocking switch that is ideal for storage pooling and consolidation, high-performance shared tape library backup and recovery, server clustering, and streaming rich media applications.

Leveraging the performance and simplicity of its award winning and field-proven InSpeed technology, Emulex has created a new generation of 2Gb/s entry-level SAN storage switches that eliminate the interoperability issues, complexities and high costs associated with traditional fabric SAN switching.

Available to OEMs and select Resellers only

## Simply Affordable...



### **Affordable**

Not only is the Emulex SAN Storage Switch Model 355 priced as low as one-fourth as much as alternative complex fabric switches, its 12 ports deliver 50% more ports per unit. This means you can connect 50% more devices to an Emulex SAN Storage Switch than alternative 8-port switches, giving extra flexibility in environments where storage growth is difficult to estimate. Furthermore, the switch does not have the hidden costs for expensive software license keys, offsite education or special technical support and maintenance. Overall it offers a low risk entry point into SAN storage switching for the very first time, and delivers a field-proven Fibre Channel alternative to emerging iSCSI technologies that offer only half the performance and have yet to deliver complete and interoperable solutions.

### **Simple**

The Emulex SAN Storage Switch family is designed from its original concept to be simple from the time it is configured and ordered. Emulex's primary design goal was to eliminate the numerous optional software license keys and thousands of pages of confusing technical documentation commonly found in today's complex fabric switches. All features are fully

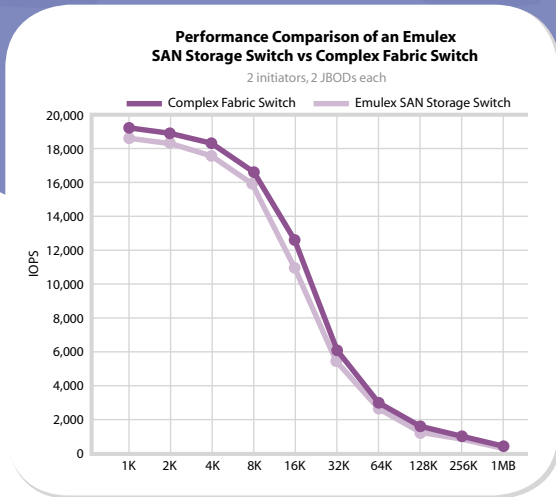


enabled into the base switch so configuration and ordering are easy with no SKU creep.

The Emulex SAN Storage Switch Quick Install Card has the switch productive in minutes; and the switch is based on robust field-proven ANSI standards based interoperability for painless and worry-free deployment.

A key design objective was to implement a highly intuitive integrated HTTP web server management interface that makes it simple to control even advanced features like One Step Zoning for the fastest storage pool partitioning, and Smart Settings that ensure the switch configuration is optimized for SAN performance and stability. Users no longer have to be SAN experts or attend expensive multi-day offsite technical education to know how to configure and deploy SAN solutions.

The delivery of 12 ports on the switch is no accident. Emulex commissioned multiple extensive market research studies with top-tier industry analysts to determine the true requirements users expect of entry-level SANs. These studies determined that 12 ports directly meet the needs of the broadest market opportunity as smaller SANs are deployed, eliminating the need to trunk and manage multiple 8-port switches or deploy expensive 16-port fabric switches.



### High Performance

Although simplicity and affordability were top design objectives, a SAN switch is only viable if it performs to expectations. And the Emulex SAN Storage Switch Model 355 performs as well, or better than any 2Gb/s fabric switch. As a matter of fact, Emulex SAN Storage Switches can even outperform complex fabric switches in smaller SAN environments where the overhead associated with longer fabric name addressing and serving is not beneficial.

Based on a wire speed non-blocking Crossbar switch core that dynamically handles multiple simultaneous conversations at 2 or 1Gb/s performance across all ports, the switch delivers a total bandwidth of 48Gb/s. And standard advanced features like Automatic Trunking fully multiply load-balanced bandwidth between switches with failover protection making cascading switches without performance degradation a reality in an affordable solution; and Fairness & Prioritization ensures devices communicating with each other have guaranteed access to all devices in the SAN, or explicitly gives prioritized access over other devices.

### Scalable

Users implement SANs to build an incrementally-scalable environment they can grow into. The Emulex SAN Storage Switch Model 355 supports entry-level SANs with hot-pluggable connection of up to twelve directly attached devices, and can easily be cascaded or trunked to other Emulex SAN Storage Switches to support a networked storage environment of up to eight switches and 126 total devices. And if storage needs grow beyond that, Emulex SAN Storage Switches seamlessly connect into any vendor's fabric switch via a standard FL\_Port to grow or attach into a

network that supports millions of devices. Now users can avoid the high extra cost of complex fabrics today and still have a scalable solution for tomorrow.

### Reliable

Reliability was also a key design focus because the less users have to troubleshoot, fix or reconfigure the SAN, the easier it is to use. The result is that the Emulex SAN Storage Switch Model 355 has 5x greater reliability than alternative fabric switches based on mean time between failures<sup>1</sup>. Because Emulex SAN Storage Switches are so simple and based on a single Emulex InSpeed SOC 320 with integrated SERDES, the number of parts subject to failure is low resulting in a highly reliable SAN storage switch. And it is designed so it can be implemented in a redundant failover manner to protect against unexpected system outages for high availability applications like server clustering.

The Emulex SAN Storage Switch Model 355 is the only switch on the market to automatically control disruptive SAN events and deliver the most stable SAN environment possible. Its advanced Stealth Intelligent Change Manager capability gives unprecedented control over network interruptions caused by health or configuration changes sent by initiator and target devices on the SAN. The Emulex-exclusive result is interruption-free backup and restore, and streaming rich media applications—no more risk that backups will abort midway through a long job, and streaming rich media will no longer lockup due to network changes or users joining or leaving the workgroup.

### InSpeed, It's Simply Affordable

Now you can see why the Emulex SAN Storage Switch Model 355 exclusively makes the advantages of networked storage a reality for businesses of any size, because nothing else matches its simplicity or affordability—key factors that have, until now, impeded wide-spread SAN adoption.

<sup>1</sup> The Emulex SAN Storage Switch Model 355 is specified to exceed 1 million hours MTTf using the Bellcore Parts Count Method. The 5x factor is compared to published MTBF values for the Brocade 2400/2800 specified for 194,000 and 187,000 hours respectively using the Bellcore TR322 Parts Count Method. Source: Brocade's SilkWorm 12000 High Availability Brochure.

# SPECIFICATIONS

## STANDARDS

### Fibre Channel Protocols:

FC-AL, FC-AL2, FC-PH, FC-PH2, FC-PH3, FC-PI, FC-PLDA, FCP

### Interoperability:

connects to any FC\_AL compliant device and any vendors fabric via FL\_Port

## ARCHITECTURE

### Fibre Channel Ports:

12

### Physical Interface:

hot-pluggable industry-standard optical SFP transceivers at all ports

### Scalability:

up to 8 switches and 126 SAN devices

### <sup>2</sup>Trunking:

automatic trunking fully multiplies inter-switch bandwidth with failover pathing and device prioritization

### Zoning:

One Step Zoning is port- or ALPA-based overlapping and port-based non-overlapping

### Stability:

Stealth Intelligent Change Manager automatically eliminates state and configuration change notification disruptions—zone and port-based management

### Integration:

Emulex InSpeed SOC 320 with integrated SERDES

### Redundancy:

resident backup firmware copy

## PERFORMANCE

### Port Speed:

2.125 or 1.0625Gb/s bi-directional (400MBps per port, full duplex)

### Switch Latency:

less than 1µSec with no contention, cut-through routing at 2Gb/s

### Performance:

full wire-speed switching

Aggregate Bandwidth: 48Gb/s

### Switch Core:

non-blocking Crossbar switch core dynamically delivers multiple concurrent port-port connections

### <sup>2</sup>Fairness & Prioritization:

ensures all devices have guaranteed access to all other devices, or explicitly have prioritized access

## PHYSICAL ATTRIBUTES

### Dimensions:

8.5" w x 1.57" h x 16" d  
(21.6cm x 4cm x 40.6cm)  
half-rack width, 1U height

### Weight:

7.0 lbs (3.2 kg)

### Mounting:

rack mount or tabletop

## MANAGEMENT

### Standard Management Software:

Intuitive Integrated Management Web Server with Smart Settings

### Access:

TELNET, http Web Server, SNMP MIB

### Physical Interface:

10BaseT Ethernet (RJ-45), RS-232 serial port

### Diagnostics:

power on self test, enhanced port health statistics and diagnostics; intelligent link recovery

## POWER REQUIREMENTS

### Nominal:

universal auto-sensing 100-240 VAC, 50/60 Hz, 0.5-0.3 amps

## ENVIRONMENTAL CONDITIONS

Operating Temperature: 0° to 40° C

Storage Temperature: -40° to 80° C

Humidity: 5-95% non-condensing

Operating Altitude: up to 15,000 feet

Storage Altitude: up to 35,000 feet

Operating Shock: 5g, 11ms 1/2 sine

Storage Shock: 30g, 11ms 1/2 sine

Operating Sine Vibration: 1g, 5-500 Hz

Operating Random Vibration: ISTA 2A

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SAN Storage Switch

## <sup>3</sup>AGENCY APPROVALS

United States Safety: NRTL

United States EMC: FCC Class A

Canada Safety: NRTL

Canada EMC: ICES-003 Class A

Europe Safety: EN60950

Europe EMC: EN55022, EN55024, CE

Japan Safety: IEC60950

Japan EMC: VCCI Class A

Australia Safety: AS/NZS 3260

Australia EMC: AS/NZS 3548, Class A

International Safety: IEC60950

International EMC: CISPR22, CISPR24

## OPTIONS & ACCESSORIES

The base Model 355 ships with a US power cord, serial cable and Quick Install Card. The Users Guide is available for download through a weblink within the embedded web management interface.

Rack mount kit and SFP transceivers are sold separately.

<sup>2</sup> Patent pending

<sup>3</sup> All agency approvals given with optical SFPs only

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