



DATA CENTER

Miercom Rates Brocade DCX Backbone Best in Scalability, Throughput, and Energy Efficiency

Lab test supersedes and negates earlier 12/08 Miercom report
circulated by Cisco.

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BROCADE

EXECUTIVE SUMMARY

Miercom recently published the attached report providing an independent analysis of the Brocade® DCX® Backbone and competitive comparison with the Cisco MDS director-class switches (9513 and 9509). Testing focused on maximum aggregate throughput and scalability using 8 Gbit/sec traffic loads, along with real-world 8 Gbit/sec application traffic. In-depth analysis of power consumption, reliability, and management (Brocade DCX only) was also conducted.

Based upon these test results, *the Brocade DCX Backbone was rated best in scalability, throughput, and energy efficiency*, and proved to have “very effective high availability capabilities.” Brocade Data Center Fabric Manager (DCF™) was rated “an easy to use and comprehensive management tool.”

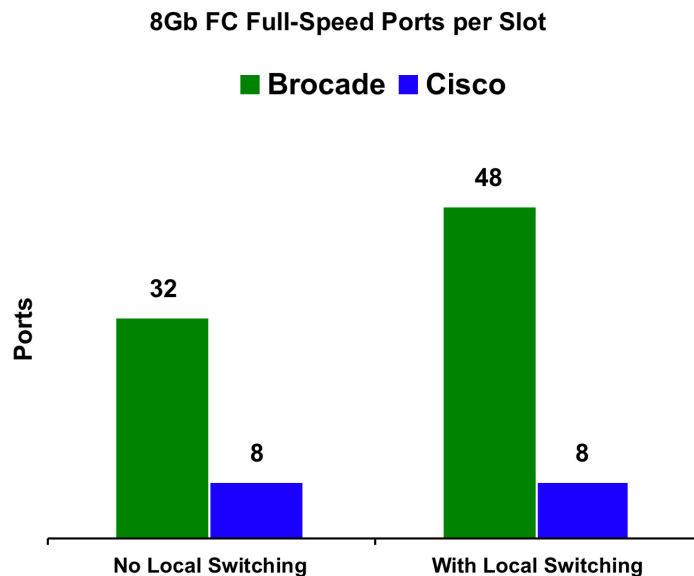
This test report also answered questions raised in a separate Miercom report produced for Cisco in December 2008, and negates preliminary findings being circulated by Cisco to mislead customers.

HIGHLIGHTS FROM THE FEBRUARY 2009 MIERCOM LAB TEST REPORT

The following are direct quotes from the Miercom Lab Test Report:

- “The Brocade DCX proved in testing to offer four times the number of ports that can be used for dedicated 8-Gbps line rate traffic simultaneously compared to the Cisco MDS 9513”
- “Brocade DCX passed the industry’s first 128 port full 8-Gbps Fibre Channel test without frame loss”.
- “The Brocade DCX proved more capacity than the Cisco MDS 9509 and 9513 on tests for overall aggregate throughput ...”
- The Brocade DCX “reflects an almost three times reduction in power consumption when compared to the Cisco MDS 9513.”
- “The Brocade DCX is clearly designed to exceed data center customers’ reliability expectations.”
- “... two DCX switches could interconnect using up to four ICLs with no ports sacrificed to provide capacity for up to 768 ports of 8-Gbps Fibre Channel.”
- “The DCX with two 48-port 8-Gbps blades delivered full line rate performance using the 256 Gbps slot-backplane bandwidth available combined with local switching.”
- “... DCFM (Data Center Fabric Manager) is an effective tool to assist administrators to optimize storage resources, maximize performance of the system and help maintain security.”

Comparing individual blade (line card) performance, Miercom also proved that the Brocade DCX can deliver several times the number of ports at full 8 Gbit/sec speed compared to the Cisco MDS directors, as shown in the graph below.



CISCO PROMOTES “FEAR, UNCERTAINTY, AND DOUBT” OVER TECHNICAL ACCURACY

Because Cisco is unable to compete on technical merit, they have resorted to spreading FUD using a preliminary 12/08 Miercom report produced for Cisco titled, “Performance Comparison of Cisco MDS 9509, MDS 9513, and Brocade DCX.” (An unapproved draft of the report was first circulated by Cisco in December. Miercom later released an approved version in January 2008.) Miercom noted an anomaly in their findings, however, questioning the observance of dropped frames when testing the Brocade DCX: *“At the time of publishing this report, we are investigating this anomaly and analyzing comments from test and measurement vendors.”*

This anomaly was due to the mode of testing using a Finisar Xgig FC Load Tester, specifically “Random OX_ID.” This mode incorrectly reports dropped or out-of-order frames when using Exchange Based Routing. Because the Brocade DCX utilizes Exchange Based Routing in its default configuration, the Random OX_ID test mode reports false-positive errors. Cisco recommended this mode to Miercom for their December lab tests. And we believe that they are likely aware of what the outcome would be, as dropped and out-of-order frames are also reported when testing Cisco MDS PortChannels (which also balances traffic using FC Exchanges). Note that MDS PortChannels was conveniently outside the scope of the earlier Cisco testing, yet these same false positives are consistently seen with Cisco switches.

Once Brocade became aware that Cisco was misleading customers with preliminary and incorrect findings, we pointed customers to a notice from Finisar stating that the correct test mode for equipment using Exchange Based Routing is “Fixed/Unique.” Further, Finisar has stated that using the Random OX_ID mode would report false-positive errors.

This document is available from the Finisar technical support library at: http://www.finisar.com/library1_6_2

As Miercom clearly states in the February test report, subsequent high-load stress testing over an 18-hour period using the same Finisar test equipment and the correct Fixed/Unique test mode proved that the Brocade DCX can drive all ports at full 8 Gbit/sec speed without frame loss and in proper frame sequence. *As Brocade has always stated, the findings noted in the 12/08 report for Cisco are meaningless.*

BROCADE DCX PROVIDES GREATER RETURN FOR ENTERPRISE DATA CENTERS

The performance, scalability, and energy efficiency advantages of the Brocade DCX Backbone over the Cisco MDS 9513 and 9509 are significant and, complemented by Brocade DCFM, enable enterprise data centers to:

- Achieve greater consolidation of servers, storage, networks, and data centers themselves
- Enable Broaden server virtualization through more (and more demanding) virtual machines on fewer physical servers, with higher resource utilization
- Scale fabrics much more efficiently and non-disruptively (with up to 768 ports at full 8 Gbit/sec speed in a standard rack) without increasing complexity and footprint
- Free up more power and cooling resources (with a 10x advantage based on Watts/Gbit/sec) for servers and storage arrays
- Reduce equipment, facility, overhead, and energy costs to a far greater degree

The Miercom February, 2009 Lab Test Report outlines testing methodology and results in detail. Among the numerous illustrations in the report, note that Figures 1 and 2 (and accompanying tables) reflect throughput based on Finisar units inclusive of raw data and Fibre Channel overhead, but exclusive of 8bit/10bit encoding. Brocade DCX slot bandwidth, chassis bandwidth, and per-blade throughput numbers reflect common industry practice, which includes raw data and 8bit/10/bit encoding, but excludes Fibre Channel overhead. Both formats are in accordance with the Fibre Channel specification.

The February 2009 Miercom Lab Testing Report can be accessed from the Miercom Reports page: <http://www.miercom.com>

Or from the Miercom Brocade page: <http://www.miercom.com/brocade>

More information on this subject, including a video of a 128-port 8 Gbit/sec Brocade DCX stress test, is available on the Brocade corporate Web site: <http://brocade.com/performance>

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