

OneConnect™

PERFORMANCE REPORT CARD

Emulex OneConnect OCe10102 offers superior performance to QLE8152

- **267%** better Fibre Channel over Ethernet (FCoE) IOPS
- **13%** greater FCoE transfer rates
- **68%** superior iSCSI IOPS
- **25%** better iSCSI transfer rates
- **84%** greater iSCSI CPU efficiency
- **37%** better TCP/IP transfer rates
- **374%** greater TCP/IP CPU efficiency

Protocol	Attribute	Emulex (OCe10102)	QLogic (QLE8152)
FCOE	IOPS (@512 Block Size) (F1)	100% (919268 IOPS)	27% (250131 IOPS)
	IOPS (@4K Block Size) (F1)	100% (275390 IOPS)	84% (232071 IOPS)
	R/W Transfer Rate (4K Block Size) (F2)	100% (1086 MB/sec)	88% (955 MB/sec)
iSCSI	IOPS (@4K Block Size) (F3)	100% (281176 IOPS)	59% (167281 IOPS)
	R/W Transfer Rate (@4K Block Size) (F4)	100% (1226 MB/sec)	80% (976 MB/sec)
	CPU Efficiency (IOPS per % CPU) (F5)	100% (1700 IOPS/% CPU)	54% (920 IOPS/% CPU)
TCP/IP	R/W Transfer Rate (@4K Message Size) (F6)	100% (11.3 Gb/sec)	73% (8.3 Gb/sec)
	CPU Efficiency (MB per % CPU) (F7)	100% (2.91 MB/% CPU)	21% (.613 MB/% CPU)

Note: Percentage is based on a quotient of the competitors performance divided by Emulex's performance. For example, IOPS at 512 Block Size for QLogic would be 250131/919268 which equals 27%. The same benchmark for Emulex would be 919268/919268 or 100%.

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DEFINITIONS

IOPS

I/O Operations Per Second (also known as IOPS) are often referred to as small-block I/Os. They generally range in size from 512 byte to 8k and are a staple of database, e-mail and supercomputing applications. IOPS have a known performance profile of raising CPU utilization from a combination of CPU interrupt and wait times.

Transfer Rates

A transfer rate is the amount of data that can be transferred on a specific technology in a specific time period. In storage testing, the transfer rates are usually described in megabytes or gigabytes per second; MB/s and GB/s respectively. Transfer rate is critical to many applications, but some primary examples are: backup and restore, continuous data protection, RAID, video streaming, file copy and data duplication.

CPU Efficiency (based on IOPS)

This metric examines the ratio of IOPS divided by average CPU utilization. This ratio illustrates the efficiency of a given technology in terms of CPU utilization. Higher numbers of CPU efficiency show that the given technology is friendlier to the host system's processors. Higher bandwidth or IOPS with lower CPU utilization is the desired result. This is important, as users are trying to maximize their investments, and CPU utilization.

CPU Efficiency (based on transfers)

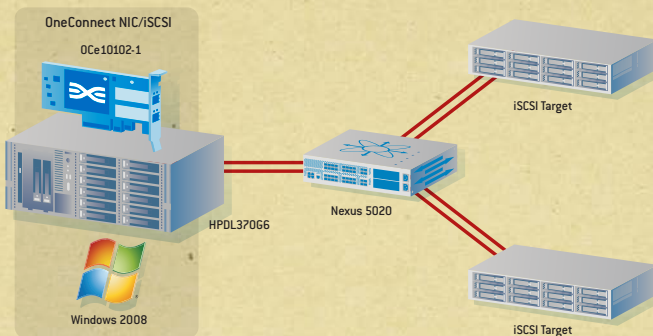
This metric examines the number of transfers that can be completed based on one percentage of the server CPU capacity. This is important to users who are trying to maximize their investment, and CPU utilization is much better spent on hungry applications.

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BENCHMARK DETAIL

F1-F4, F6: Documented in "IT BrandPulse: Unified Data Center Networking —Emulex Unveils First in New Class of UCNAs."

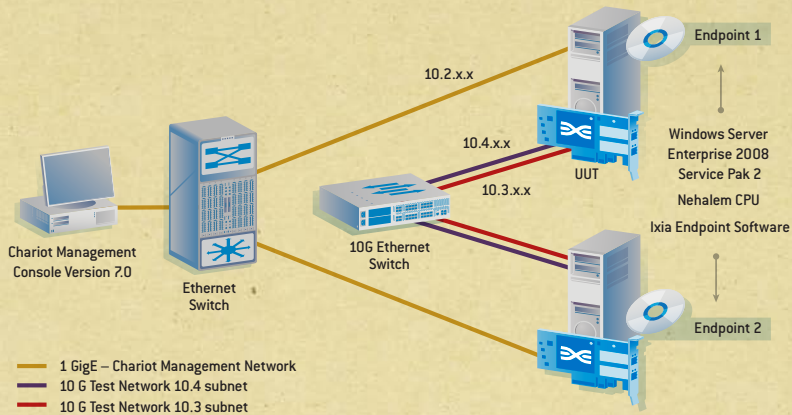


F5: Benchmarks performed by Emulex. Test Server was HP DL370G6, 2x Intel X5570 CPU, GB RAM, Windows 2008 x86. Test application was Iometer 7.4.2006 with standard block device load scripts. Switch was a Cisco Nexus 5020. Targets were two iSCSI target servers each with 2x OCe10102-I NICs, iSCSI target mode serving RAM memory LUNs.

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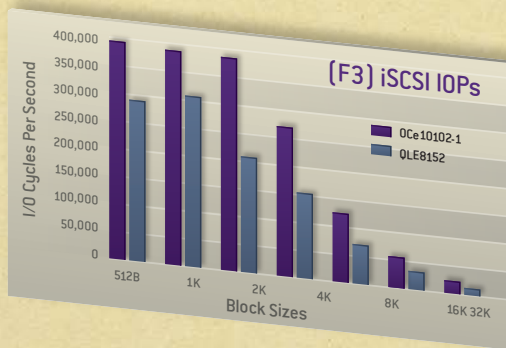
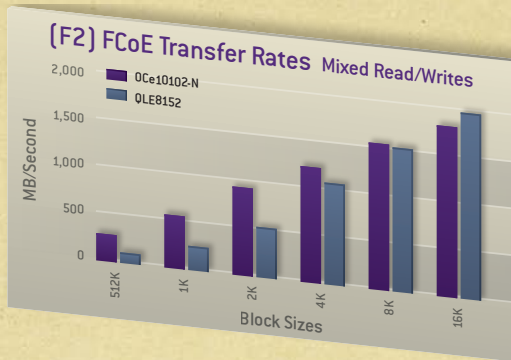
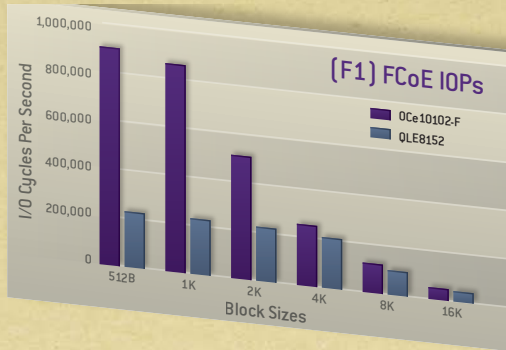
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BENCHMARK DETAIL

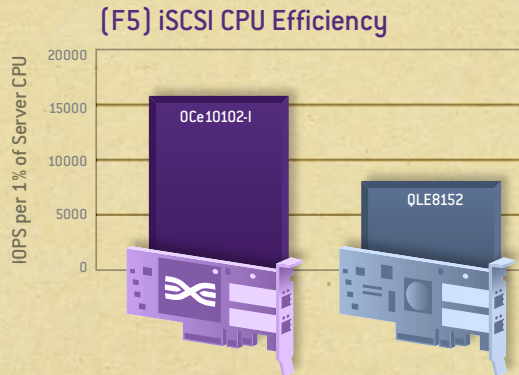
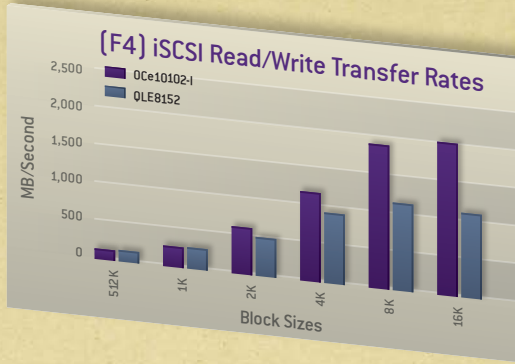


F7: Benchmark performed by Emulex using Chariot Management Console Version 7.0. Endpoint 1 and EndPoint 2 using Nehalem CPU running Windows Server Enterprise 2008 SP2. Chariot Management operations are only performed on 10.2.x.x network out of band. Operation flow is from Chariot Management server --> Endpoint 1 --> Endpoint 2. BIDI testing Chariot console initiates from both Endpoints 1 and 2, allowing Tx and Rx to happen simultaneously. Chariot tracks the number of timing records received from either Endpoint and reports the performance status back to the management

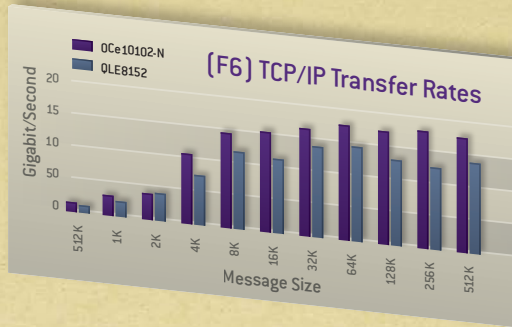
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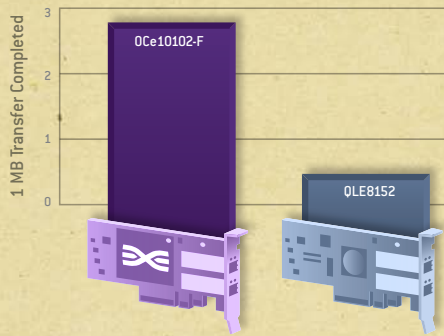
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(F7) TCP/IP CPU Efficiency



Based on 1% Server CPU



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