Chelsio T4 vs Emulex iSCSI

Chelsio T4 Unified Wire Network Adapters

Using Chelsio’s 10Gb Ethernet Unified Wire Network Adapters with the T4 ASIC, Chelsio delivers superior iSCSI SAN performance vs Emulex’s competing product. In iSCSI initiator SAN benchmark tests, the Chelsio T422-CR Unified Wire Adapter went head to head against the Emulex OCe11102-FX iSCSI SAN adapter. The results show a dramatic performance boost with Chelsio.

Performance highlights include:

- Chelsio’s T4 Adapter has ~1.8X the performance of Emulex OCe11102-FX for Read IOPs with 4K IO size
- Chelsio’s T4 Adapter has ~1.9X the performance of Emulex OCe11102-FX for Write IOPs with 4K IO size

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Chelsio T4</th>
<th>Emulex OCe11102-FX</th>
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</thead>
<tbody>
<tr>
<td>4K Read IOPs</td>
<td>91K</td>
<td>52K</td>
</tr>
<tr>
<td>4K Write IOPs</td>
<td>93K</td>
<td>49K</td>
</tr>
<tr>
<td>4K Read Throughput (MB/s)</td>
<td>356</td>
<td>205</td>
</tr>
<tr>
<td>4K Write Throughput (MB/s)</td>
<td>366</td>
<td>193</td>
</tr>
</tbody>
</table>

Setup & Data

The Topology

Chelsio USS iSCSI Target
Intel Core i7-2600K @ 3.40 GHz, 8 GB S320e-CR

10Gb/S

IBM x3650M3 / Intel Xeon E5507 @ 2.27 GHz, 6 GB T422-CR
**Configuration**

**Target**
- Motherboard/CPU: White box / Intel Core i7-2600K @ 3.40 GHz
- Memory: 8 GB of RAM
- 10G Interface: Chelsio S320e-CR (test uses only 1 port)
- Target Software: USS v2.0.0 build 122 running a 32 MB RAM disk

**Chelsio Initiator**
- Motherboard/CPU: IBM x3650M3 / Intel Xeon E5507 @ 2.27 GHz
- Memory: 6 GB of RAM
- OS: RHEL 6.1
- Initiator: Open-iSCSI (RHEL 6.1 in-boxed) with Chelsio PDU offload enabled
- Chelsio Card: T422-CR (test uses only 1 port)
- Chelsio Drivers: cxgb4 and cxgb4i drivers from unified driver v1.1.0.10

**Emulex Initiator**
- Motherboard/CPU: IBM x3650M3 / Intel Xeon E5507 @ 2.27 GHz
- Memory: 6 GB of RAM
- OS: RHEL 6.1
- Initiator: Emulex full offload
- Emulex Card: OCE11102-FX (test uses only 1 port)
- Emulex Driver Version: 4.0.323.0
- Emulex Firmware Version: 4.0.360.3
- Emulex HW Version: E3 A1

**Benchmark Software**
- Software: disktest version 1.1.12
- Command line: disktest -T 30 -K 8 -B XYZ -rw -f $RANDOM -l D -P A /dev/sdN
  where XYZ is the I/O size
  where rw: r is read; w is write
  where N is the device assigned to the iSCSI initiator

The I/O sizes used varied from 512 Bytes to 256 Kbytes with an I/O access pattern of sequential reads and sequential writes.

**Performance**

The graphs on the following page illustrate the benchmarking data obtained across various I/O sizes with both reads and writes.
iSCSI Initiator Performance – Chelsio T4

About Chelsio Communications

Chelsio is a leading technology company focused on providing high performance networking and storage solutions for virtualized enterprise data centers, cloud service installations, and cluster computing environments. Now shipping its fourth generation protocol acceleration technology, Chelsio is delivering hardware and software solutions including Unified Wire Ethernet network adapter cards, Unified Storage Server software, high performance storage gateways, unified management software, bypass cards, and other solutions focused on specialized applications.