Overview

InfiniBand

High-performance application clusters require extreme performance from the cluster fabric in order to deliver breakthrough application performance. Fabric bandwidth, latency, and RDMA-based network and storage protocols have become critical enablers for leading application performance.

InfiniBand, which today delivers 40 Gigabit per second connectivity with application-to-application latency as low as 1 microsecond, has become a dominant fabric for high performance enterprise clusters. Its ultra-low latency and near zero CPU utilization for remote data transfers make InfiniBand ideal for high performance clustered applications.

RDMA and Application Latency

Moving data between applications over a traditional network can be time consuming and drain precious server resources. With traditional network technologies, data exchanges traverse the operating systems on both the source and destination servers, resulting in excessive application latency due to operating system calls, buffer copies, and interrupts.

InfiniBand provides a direct channel from the source application to the destination application, bypassing the operating systems on both servers. This channel architecture doesn’t just yield ultra-low application latency, but it also preserves server resources for application processing. The InfiniBand Host Channel Adapter and not the CPU is responsible for moving data from application to application.

Fabric Convergence

In addition to providing unrivaled access to remote application data, InfiniBand’s industry leading bandwidth enables fabric convergence, allowing all network, storage, and inter-process communication traffic to be carried over a single fabric. Converged fabrics aggregate the functions of dedicated, sole-purposed, networks and alleviate the associated expense of building and operating multiple networks.

Customer Benefits

Highest bandwidth and lowest latency fabric available

InfiniBand provides industry leading performance, delivering over three times the throughput of 10 Gigabit Ethernet with one-tenth of the application latency.

Preserving server resources for application processing

InfiniBand’s channel architecture eliminates the need for OS intervention in network and storage communication. This frees server memory bandwidth and CPU cycles for application processing.

Simplification of IT infrastructure and management

InfiniBand’s bandwidth and rich set of supported network and storage protocols make it an ideal fabric for delivering converged network services to high performance clusters. Fabric convergence eliminates the need to have servers provisioned with multiple network interfaces, eliminates the requirement for multiple leaf switches at the cluster level and reduces the number of expensive switch ports consumed in the data center core.

In addition to carrying all InfiniBand traffic, the Sun Network QDR InfiniBand Gateway Switch enables all InfiniBand attached servers to connect to an Ethernet LAN using standard Ethernet semantics. No application modifications are required for applications written to use standard Ethernet.

Industry’s only combined leaf switch and “LAN neutral” Ethernet gateway

The Sun Network QDR InfiniBand Gateway switch uniquely combines the functions of an InfiniBand leaf switch with an Ethernet gateway, which will not disrupt the operations and policies of existing LAN administration. The switch is ideal
Sun Network QDR InfiniBand Gateway Switch
Frequently Asked Questions
March 6, 2012

for top-of-rack deployment in server clusters or as a shared IO resource in larger systems.

**Frequently Asked Questions**

**What is the Sun Network QDR InfiniBand Gateway?**
The Sun Network QDR InfiniBand Gateway is a high-performance QDR InfiniBand Switch combined with an InfiniBand to Ethernet gateway.

**Do applications written to leverage an Ethernet network need to be modified to use the gateway?**
No. The gateway appears as a standard Ethernet NIC. Applications take advantage of the gateway functionality without any modification.

**Does the gateway change the way the installed LAN is administered today?**
No. The gateway does not appear as a foreign switch or router to the LAN and therefore, no modifications to network administration tools or methods are required.

**How is the gateway viewed by the Ethernet network?**
The gateway presents itself to the Ethernet fabric as a collection of Ethernet NICs.

**How many network ports and of what type are on the Sun Network QDR InfiniBand Gateway Switch?**
The front panel of the Sun Network QDR InfiniBand Gateway Switch has 36 QSFP connectors. The connectors are each dedicated to InfiniBand or Gateway functions as follows:

- The “left-most” thirty-two ports support QDR InfiniBand connectivity
- The two “upper right-most” ports support Ethernet connectivity
- The two “lower right-most” ports are covered with a plug marked “Do Not Remove”. No connections should be made to these ports.

**How can an Ethernet switch be connected to the Sun Network QDR InfiniBand Gateway Switch?**
The switch has two physical ports dedicated to Ethernet functionality. These ports can support up to four 10 Gb Ethernet connections each. Oracle provides “splitter” cables which fan out a single QSFP switch port to four LC connectors, which can connect to any standard transceiver supporting LC – SFP+. A QSFP transceiver is available to connect the “splitter” cable to the switch.

**What InfiniBand Host Channel Adapters are required to connect to the Sun Network QDR InfiniBand Gateway Switch?**
To take advantage of the Ethernet gateway functionality, either the Sun InfiniBand Dual Port 4x QDR PCIe ExpressModule Host Channel Adapter M2 or the Sun InfiniBand Dual Port 4x QDR PCIe Low Profile Host Channel Adapter M2 should be installed.

**What operating systems and hypervisors are supported for servers to connect to the Sun Network QDR InfiniBand Gateway Switch?**
Only hosts running the following operating systems and hypervisors are supported with the Sun Network QDR InfiniBand Gateway Switch:

<table>
<thead>
<tr>
<th>OS/Hypervisor</th>
<th>Version Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Enterprise Linux</td>
<td>OEL 5.5 and later</td>
</tr>
<tr>
<td>Oracle Solaris</td>
<td>Solaris 11 and later</td>
</tr>
</tbody>
</table>

The host operating system must support the Ethernet-over-InfiniBand (EoIB) protocol to take advantage of the Ethernet gateway functionality enabled by the switch. To support the EoIB protocol with Oracle Enterprise Linux, an updated version of the OFED software stack, termed “BXOFED”, is available for download at: [http://support.oracle.com](http://support.oracle.com)
What cables can be used with the Sun Network QDR InfiniBand Gateway Switch?

Oracle offers cables for connecting the InfiniBand ports on the switch to Oracle Sun InfiniBand Host Channel Adapters and Oracle Sun InfiniBand switches. Copper cables are available in lengths from 1 to 5 meters and optical transceivers and passive fiber cables are available for lengths of 10 meters or greater.

To connect the gateway to Ethernet switches, Oracle offers optical transceivers and “splitter” cables. These passive optical splitter cables have an MPO connector on the end connecting to the QSFP transceiver and four LC connectors on the “split” ends. The LC connectors connect to standard LC – SFP+ connectors.

To connect to Ethernet switches that support standard QSFP connectors, such as the ultra-dense Sun Network 10GbE Switch 72p, optical transceivers and passive fiber cables are available.

Is InfiniBand an open technology?

InfiniBand is an industry standard technology. The standard was developed by and is maintained by the InfiniBand Trade Association. Further information on the InfiniBand standards can be found at [www.infinibandta.org](http://www.infinibandta.org)

What is QDR?

QDR stands for Quad Data Rate. QDR InfiniBand delivers 40 Gigabits of raw bandwidth. The InfiniBand base rate is 10 Gigabits per second. QDR capable products deliver four times the base rate.

What workloads is InfiniBand best suited for?

Workloads, which require massive storage bandwidth, low-latency, and leverage RDMA to preserve server resources for application processing will realize unmatched performance when InfiniBand is utilized for the cluster interconnect.

What applications require InfiniBand’s performance?

Network intensive enterprise clusters requiring InfiniBand:

- Clustered applications and databases
- Oracle RAC
- Real-time data applications and transaction processing
- Cloud and virtual environments
- Technical computing

What kind of service and warranty is offered on the Sun Network QDR InfiniBand Gateway Switch?

The Sun Network QDR InfiniBand Gateway Switch warranty is 1 year, 2nd business day.

Where can I find product documentation for The Sun Network QDR InfiniBand Gateway Switch?

Documentation for the Sun Network QDR InfiniBand Gateway Switch can be found at:

[http://docs.oracle.com/cd/E26699_01/index.html](http://docs.oracle.com/cd/E26699_01/index.html)
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