

10G Ethernet Delivers Most Cost-Effective MPI Performance

10GbE Dramatically Improves HPC Performance vs.1GbE

Analysis reveals that MPI applications can benefit from a 10x increase in network bandwidth, improved latency and power efficiency by upgrading to Solarflare 10G Ethernet and Platform MPI. This improvement can be realized in High Performance Computing and other performance-critical MPI applications.

Unlock the Performance of Multi-Core Servers

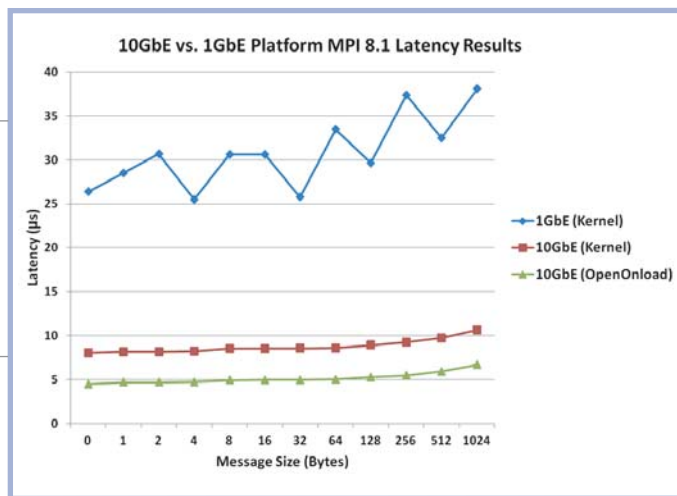
Multi-socket servers housing multi-core processors produce highly compute-intensive processing nodes, each containing 40 or more CPU cores. All these compute cycles drive the need for increased I/O bandwidth. Simply adding gigabit Ethernet (1GbE) connections does not scale well, requires more expensive servers with additional PCIe slots and increases port, cable and configuration complexity. 10G Ethernet, with its higher bandwidth, lower latency and simplified management, is a significant step forward in unlocking today's server processing power.

10GbE Reduces HPC Run Times

Message Passing Interface (MPI) benchmark results utilizing Platform MPI 8.1 reveal that a 10GbE network reduces latency by 70%, from 26µs to 8µs, when compared to a 1GbE network. Additionally, Solarflare's 10GbE server adapter operating with OpenOnload application acceleration middleware further reduces MPI latency by 44%, to 4.5µs. Solarflare's OpenOnload® accelerates both TCP and UDP applications with 100% POSIX sockets compatibility requiring absolutely no host software modifications, specialized network stacks, or new network protocols; and runs over standard Ethernet requiring absolutely no special hardware.

10G Ethernet reduces latency by 83%

Upgrading to 10GbE dramatically improves MPI benchmark performance



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10GbE Is A Better Value Than 1GbE

Clearly 10GbE has 10x more bandwidth than 1GbE, but what may not be obvious is that 10GbE operating with Solarflare Open-Onload can reduce Platform's MPI interconnect latency by 83%.

On a bandwidth-adjusted basis 10GbE provides 7x better power efficiency, meaning for every watt consumed, 10GbE provides 7x higher bandwidth, which enables greater scalability for a given power & cooling investment. Normalizing for bandwidth per port, 10GbE networking is less expensive than 1GbE when comparing switch and adapter port costs.

	1Gb Ethernet	10Gb Ethernet
Bandwidth	1 Gbps	10Gbps
MPI Latency	26 μ s	4.5 μ s
Power Efficiency (Gbps/W)	0.17	1.2
Price Per Gbps/Port	\$193	\$53

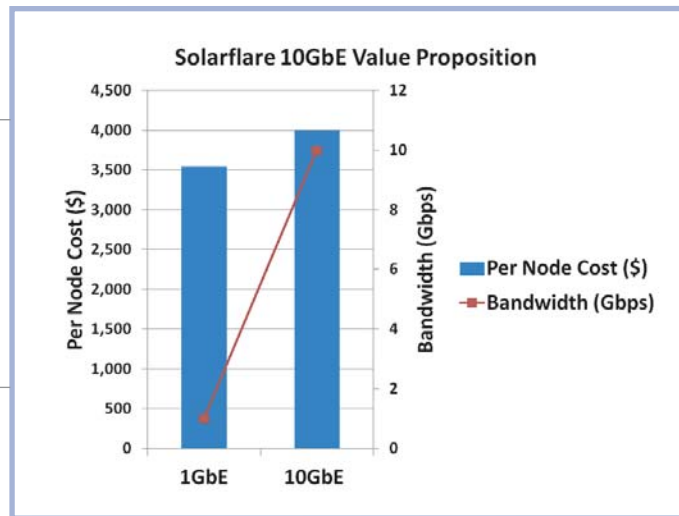
Six Reasons to Migrate to 10GbE Over Other Technologies

1. 10GbE preserves software and hardware investments
2. No need to modify host application software
3. No need to add special networking hardware
4. 10GbE is plug & play compatible with 1GbE
5. 10GbE supports structured Cat5E cabling already installed in the data center
6. 10GbE leverages Ethernet's declining cost curve

10x Bandwidth For A Small Incremental Investment

For a compute cluster powered by dual-socket, six-core servers and connected via high-density top of rack switches, the figure below illustrates that a small incremental investment in server, switch and adapters yields a 10x return in bandwidth per node.

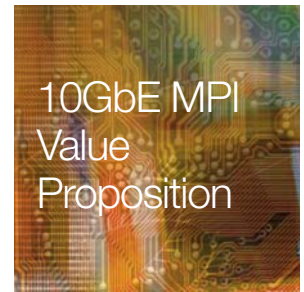
When it's time to deploy a High Performance Computing cluster, there is no better return on investment than 10G Ethernet.



Platform Computing, an IBM Company and Solarflare 10GbE HPC Value Proposition Summary

Platform Computing and Solarflare comprise the best HPC value for the following reasons:

- 10GbE delivers a significantly superior ROI – 10x bandwidth for a small incremental investment
- 10GbE dramatically reduces latency, resulting in improved HPC compute cluster performance
- Platform MPI processes more HPC jobs per day with higher bandwidth
- 10GbE greater power efficiency reduces data center power & cooling costs
- Platform Computing and Solarflare enable less expensive HPC on a bandwidth-adjusted basis



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