EMULEX®

COMPETITIVE BRIEF

CONNECTIVITY

IBM 10GbE Virtual Fabric Adapters Provided by Emulex vs. Intel X520 Adapters

End of the Basic NIC

Emulex commissioned an independent survey of 1,529 IT leaders across North America and Europe with a focus on issues, trends and challenges facing data center personnel and IT organizations with specific emphasis on data center networks.

The central theme from the study is IT departments are concerned about how to keep pace with demand for increased throughput:

- 81 percent of survey participants said that growing demand for network bandwidth is one of the most critical issues facing data centers
- 70 percent said that improving I/O performance in the data center was a "high" or "very high" priority

The first part of the solution is migration to 10Gb Ethernet (10GbE). However, it's more than just bandwidth. The era of the basic NIC is over. Data center administrators are looking for 10GbE solutions that also optimize virtualization and convergence. The second part of the solution is IBM Virtual Fabric technology and network adapters provided by Emulex.

Using IBM adapters based on Emulex award-winning 10GbE converged networking technology, data centers can now standardize on a single platform for IBM System x®, IBM Flex System™ and IBM BladeCenter® servers that fully leverages IBM Virtual Fabric. This competitive brief provides details for comparing IBM virtual fabric adapters (VFAs) provided by Emulex with Intel X520 adapters that are also available for IBM systems.

Carve Up 10GbE Bandwidth with Unique Support for IBM Virtual Fabric

The same independent survey showed server virtualization was the #1 trend driving the need for increased I/O, with 69% rating it "very significant" or "extremely significant".

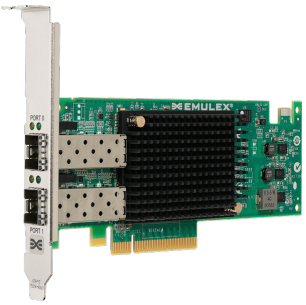
In addition to increased throughput, the ability to allocate specific bandwidth for virtual machine migration, management and high-demand virtual machines is critical. IBM VFAs provided by Emulex offer provide the most comprehensive support for IBM's virtual fabric technology, allowing each physical port to be partitioned into four virtual NICs (vNICs) that can be used to support virtualization functions and individual applications. Up to 64 vNICs can be allocated per server.

IBM VFAs provided by Emulex have exclusive support to carve up 10GbE bandwidth using IBM's virtual fabric mode. Designed to work with specific IBM 10GbE switches, virtual fabric mode enables bi-directional bandwidth allocation and throttling with the ability to dynamically reconfigure bandwidth with no server reboot. IBM VFAs provided by Emulex also support switch independent mode which is compatible with all 10GbE switches.

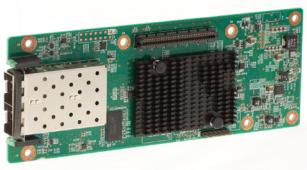
At a Glance

Why choose IBM 10GbE VFAs provided by Emulex

- Carve up bandwidth with unique support for IBM Virtual Fabric
- Add iSCSI and FCoE with full protocol offload using Features on Demand
- Support broadest range of IBM servers with common drivers and management
- Maximize 10GbE throughput with outstanding NIC performance



IBM Dual Port 10GbE SFP+ VFA III
Provided by Emulex (IBM P/N 95Y3762)



IBM Dual Port 10GbE SFP+ Embedded Adapter
Provided by Emulex (IBM P/N 90Y6456)

IBM 10GbE VFA II for IBM BladeCenter HS23
Provided by Emulex (IBM PN 81Y3120)

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IBM VFAs provided by Emulex support other key technologies to fully optimize virtualized servers, including:

- VMware NetQueue
- Microsoft Virtual Machine Queue
- Single root I/O virtualization (SR-IOV) with Microsoft Hyper-V (Windows Server 2012), VMware vSphere 5.1, Xen Hypervisor and Linux Kernel-based Virtual Machine (KVM).

From a management perspective, IBM VFAs provided by Emulex are the only 10GbE adapters with both a VMware vCenter Server plug-in and support for the VMware vSphere Web Client, allowing IBM VFAs provided by Emulex to be discovered and managed throughout the data center from a single console. This saves time and provides the capabilities to fully optimize 10GbE networks.

The table below shows that when it comes to virtualization, one of the key drivers for 10GbE, IBM VFAs provided by Emulex beat the Intel X520 hands down.

	IBM VFAs Provided by Emulex	Intel X520
vNIC Virtual Fabric Mode	Yes	No
vNIC Switch Independent Mode	Yes	No
VMware vCenter Server Plug-In	Yes	No
vNICs per Port	4	N/A
vNICs per Server	Up to 64	N/A
SR-IOV	Yes	Yes
VMware NetQueue	Yes	Yes
Microsoft Virtual Machine Queue	Yes	Yes

True Convergence from a Leading Fibre Channel Provider

The survey also showed 78 percent of IT leaders expected their storage and data networks would inevitably converge into a single unified network. IBM VFAs provided by Emulex fully support NAS, iSCSI and Fibre Channel over Ethernet (FCoE) so data center administrators can choose the storage options that best meet their requirements. IBM VFAs provided by Emulex also provide unique iSCSI and FCoE connectivity with full protocol offload using IBM Features on Demand (FoD). This enables data centers to add network storage support when and where needed using a simple update process. With protocol offload, CPU resources are used for applications, not I/O.

Over 1.5 million Emulex FCoE-enabled ports were installed in the last year. For data centers that are moving to FCoE, Emulex delivers proven storage area network (SAN) technology with over 12 million ports installed. Emulex was the first company to develop Fibre Channel host bus adapters (HBAs) and provides enterprise-class reliability, interoperability and management that storage administrators count on every day.

The table below shows that when it comes to convergence, IBM VFAs provided by Emulex are the logical choice. Not only do these adapters support protocol offload for better CPU efficiency, they also ensure interoperability with your existing SAN with drivers and management applications that have been proven by enterprises throughout the globe.

	IBM VFAs Provided by Emulex	Intel X520
Features on Demand	Yes	No
iSCSI with CPU Offload	Yes	No
FCoE with CPU Offload	Yes	No
Proven Fibre Channel Stack	Yes	No
NAS	Yes	Yes
Centralized Management	Yes	No

Broad IBM Portfolio Support

IBM VFAs provided by Emulex are available across a wide range of IBM System x, Flex System and BladeCenter servers. These include integrated, embedded, LAN-On-Motherboard (LOM) and add-on adapters. With this broad portfolio, organizations can simplify deployments with common drivers and management.

The table below tells more of the story. IBM VFAs provided by Emulex are available in more form factors than Intel allowing you to standardize on one I/O supplier, one driver stack and one management application. Add the fact that FC HBAs provided by Emulex are available on all lines of IBM servers and it's clear that if you want simplified management, Emulex offers the best solution.

	IBM VFAs Provided by Emulex	Intel X520
System x Flex Adapters	Yes	No
System x BladeCenter Adapters	Yes	Yes
System x Tower and Rack Adapters	Yes	Yes
Unified management	Yes	No

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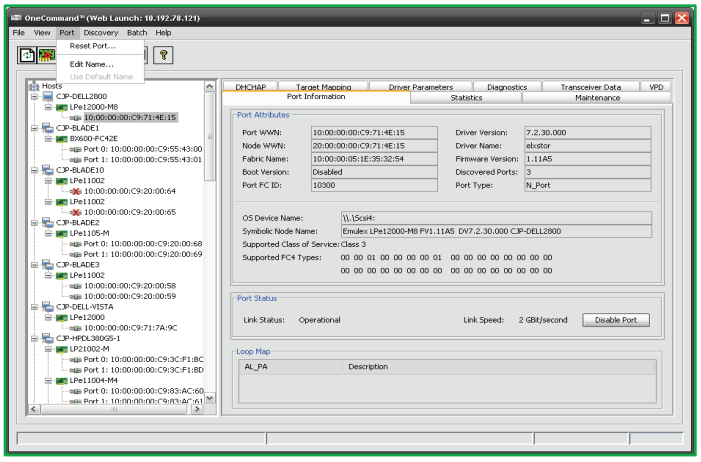
OneCommand Manager

Emulex OneCommand® Manager enables management of all VFAs and FC HBAs provided by Emulex on a wide range of supported operating systems.

- Discover, manage and troubleshoot across the enterprise from a single console
- Improve availability and increase productivity

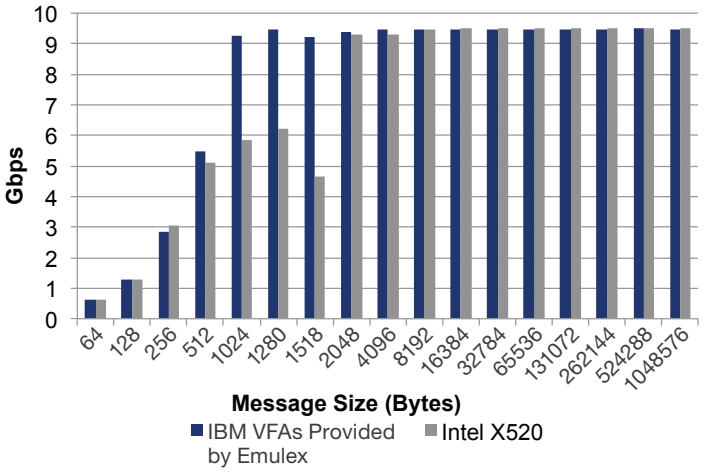


Optimal NIC Performance

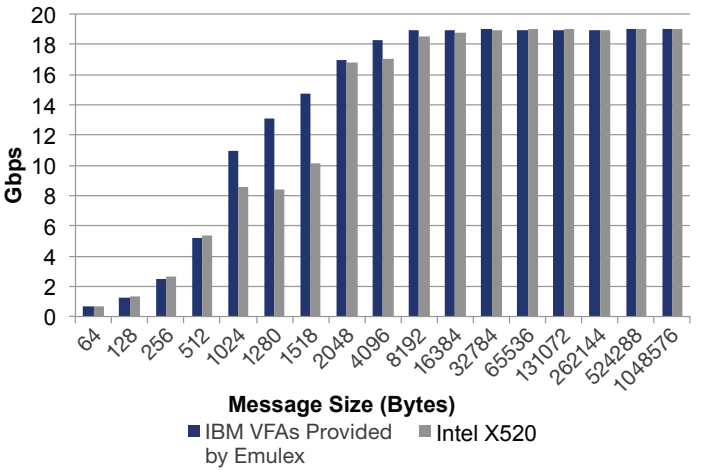
Third-generation IBM 10GbE adapters provided by Emulex enable full 10Gb per second bandwidth with throughput that is on par with all competitive products. A full performance evaluation is beyond the scope of this competitive brief, but the following charts show a comparison of 10GbE adapters from Emulex and Intel X520 adapters with single-port and dual-port tests.

As shown in these tests, 10GbE adapters provided by Emulex deliver performance that is better at some message sizes, and overall equivalent, when compared to Intel X520 adapters. Using 10GbE adapters provided by Emulex, you can fully leverage your investment in a high-performance 10GbE network.

One Port, Uni-Directional, Standard Frames



Two Ports, Uni-Directional, Standard Frames



Conclusion

If you're implementing 10GbE, there is one clear choice for IBM servers. IBM VFAs provided by Emulex provide optimum virtualization, convergence, management and performance. You can standardize on the Emulex VFA platform for IBM and simplify deployment and management across System x rack, Flex System and BladeCenter servers.

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