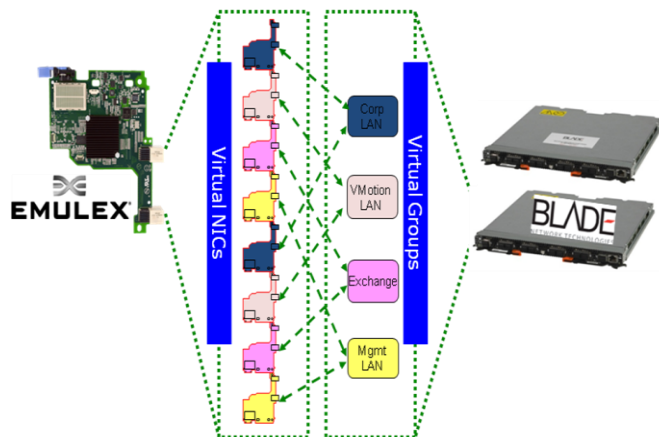


Powerful blade Virtualization that helps reduce IT costs and complexity, while providing unmatched investment protection.



## Next Generation IBM BladeCenter® Virtual Fabric



### Highlights

- Ability to reduce hardware costs 50-75%
- Ability to tailor bandwidth as required
- Reduce complexity of your virtualized environment
- Investment protection for the future (CEE) and shared IO

Today, data center managers are looking to increase hardware utilization to meet the growing needs of their organizations. Virtualization offers a very attractive value proposition for clients looking to address these requirements. The next-generation IBM® BladeCenter® HS22 server offers balanced processing and memory capabilities. This enables more VMs per server, but I/O is quickly becoming a bottleneck. Three key issues clients face from an I/O perspective are:

1. Clients need more than two ports per server. Six to eight are often needed for virtualized environments but this leaves no room for future expandability.
2. Clients need more than 1Gb, yet today most clients do not need full 10Gb bandwidth per port.
3. Clients are planning and preparing for network convergence as they deploy new technologies.

IBM BladeCenter Virtual Fabric helps address these issues and can also extend its value to non-virtualized environments. This solution, designed in partnership with BLADE Network Technologies and Emulex, can significantly reduce complexity and TCO by reducing switch costs up to 75%, reducing cable and adapter costs up to 50%, and

achieving better energy efficiency. At the same time, it provides clients the ability to allocate and adjust bandwidth based on actual requirements, while maintaining investment protection for the future with 10Gb and/or converged Ethernet infrastructures.

### Key considerations:

Do you require four or more NIC connections per server?

Are you looking for ways to reduce networking, operational and infrastructure costs?

Do you require more than 1Gb but less than 10Gb of bandwidth for your physical servers?

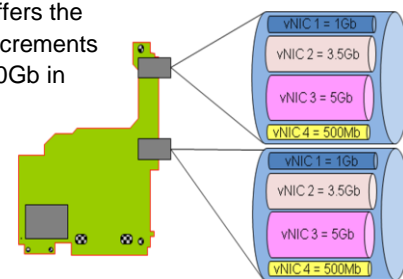
Are you looking for ways to improve operational efficiencies?

How long does it typically take to set-up and configure your virtual machines?

Is investment protection for converged networking important to your infrastructure?

### Ability to Tailor Bandwidth as Required

Many virtualized environments today have exceeded 1Gb bandwidth; and as clients exploit further consolidation on more powerful servers, bandwidth becomes even more critical. In addition the number of adapters and switches required for virtualization are adding significant cost and complexity. With the new Emulex Virtual Fabric Adapter, users have the ability to carve up two 10Gb Ethernet pipes into 2 through 8 virtual Ethernet NICs. The BNT 10-port 10Gb Ethernet Switch Module offers the flexibility to tailor bandwidth in increments of 100Mb up to a maximum of 10Gb in addition to dedicated bandwidth, physical separation of data and high availability.



### Easy Management

IBM has developed this solution to be both easy to deploy and easy to manage on a day to day basis. IBM plans to support programmable MACs through BladeCenter Open Fabric Manager which will allow clients to: reduce the amount of time it takes to configure blades; improve availability through automated failover action plans; and manage up to 100 chassis from a single login. BNT has plans to supplement this solution with a plug-in tool that will allow IT administrators to assign virtual groups; further simplifying management by, helping to

reduce the amount of time managing virtual NICs. In addition BNT, offers unique virtualization features like VMready and NMotion™. These features enable the network to be Virtual Machine aware so that the network can be configured and managed for virtual ports and easily migrate VMs across physical ports. VMready allows for a 'define once, use many' configuration that evolves as the server and network topologies evolve.

## Cost Savings

Hardware acquisition savings can quickly add up when clients are able to reduce the number of adapters, switches and cables they require for virtualization. While hardware costs are easy to quantify, it is also important to also consider operational cost savings in terms of energy, availability and management.

- Multiple adapters are no longer required. Emulex can support up to 8 virtual NICs on a single adapter. This is ideal for Ethernet today and for converged networking in the future via software license upgrade.
- Multiple switches are no longer required; allowing clients to reduce switches 50-75% by leveraging the BNT 10-port 10Gb ESM, which supports 1Gb, 10Gb, vNIC and Fibre Channel over Ethernet (FCoE).
- IBM's BladeCenter Open Fabric Manager allows clients to take hours or weeks out of IT management with its simplified address management capabilities.

## IBM BladeCenter Virtual Fabric Solution

- **Emulex Virtual Fabric Adapter (CFFh) for IBM BladeCenter (Part Number 49Y4235)**
  - Dual-port 10Gb adapter supporting multiple virtual I/O functions
  - 1Gb and 10Gb Auto-negotiation
  - Virtual NIC: Ability to carve up to 8 virtual NICs per adapter which appear as an individual adapter to the OS
  - Future Proof: planned upgrade path to FCoE and planned upgrade path for hardware iSCSI enablement
- **BNT 10-port 10Gb Ethernet Switch Module for IBM BladeCenter (Part Number 46C7191)**
  - 24-port switch with support for 14 ports to the blades and 10 ports of uplink bandwidth
  - Ability to support 1Gb and 10Gb Auto-negotiation today, with plans for CEE/FCoE in 4Q 2009
  - Ability to manage vNIC bandwidth, in addition to creating groups for simpler management
  - Enhanced virtualization management with SmartConnect with VMready planned for 4Q 2009
- **IBM BladeCenter Open Fabric Manager – Basic (Part Number 2019B1X)**
  - Slot-based I/O address assignment with the ability to pre-assign addresses prior to blade installation
  - Automatic re-assignment of blade swap (rip and replace functionality) – addresses assigned to specific slots
- **IBM BladeCenter Open Fabric Manager – Advance Upgrade (Part Number 4812S3X/4812S3D)**
  - Policy-based automation capabilities
  - Create standby pools using event action plans – defined failover or other planned server repurposing scenarios.
  - Manage virtual port creation and bandwidth allocation per virtual port (1Q 2010)
  - Failover between virtual NICs (1Q 2010)

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