Resolve Fibre Channel HBA Saturation on Hyper-V Workloads

Manage physical or virtual HBA port overload

As organizations shift to virtualized infrastructures, it’s important to have comprehensive tools that allow them to effectively manage and monitor the input/output (I/O) performance on virtual machines and their host servers. Microsoft® System Center Virtual Machine Manager 2008 provides this functionality when combined with a QLogic Fibre Channel (FC) Host Bus Adapter (HBA). The data center administrator, using System Center Virtual Machine Manager 2008, can monitor FC adapter utilization for both I/O per second (IOPS) and Data Throughput Megabytes per second (MBps) for both physical and virtual ports.

Situation

Increasing server consolidation results in multiple workloads exercising the capabilities of the host server FC adapter. High I/O workloads, such as Microsoft® SQL Server® data management software or Microsoft® Exchange Server e-mail messaging and collaboration software, may coexist with high throughput workloads, such as backup, on the same host running Microsoft® Hyper-V™ virtualization technology. This can easily overwhelm the capabilities of existing 4–Gigabit (Gb) FC adapters or even the newer 8–Gb FC adapters. The result is less than optimum I/O performance and reduced ability of the administrator to fulfill Quality of Service related service level agreements (SLAs). Specific scenarios related to suboptimum I/O performance include:

- Multiworkload I/O activity on a physical adapter port.
- Multiworkload I/O activity on N_Port ID Virtualization (NPIV)–enabled virtual adapter ports.
- Rate mismatched between an FC adapter and a FC switch in a SAN.

Solution

QLogic PRO–Enabled Fibre Channel HBA:

- Optimizes I/O performance for virtual workloads
- Mitigates FC HBA IOPS and Bandwidth saturation with automatic remediation
- Optimizes FC SAN link performance with alerts on rate mismatch
- Ensures optimal performance for Fibre Channel SAN–attached Hyper-V™ hosts

Technologies Used

- Microsoft® System Center Virtual Machine Manager 2008
- Microsoft® System Center Operations Manager 2007
- QLogic QLE24xx/QLE25xx FC HBA

For More Information

Go to www.qlogic.com or visit www.microsoft.com/scvmm.
Solution

The Qlogic PRO Enabled FC HBA provides the administrator with maximum flexibility in optimizing I/O performance on the SAN-attached Hyper-V hosts.

A PRO Tip is generated on the System Center Virtual Machine Manager console when a virtual or physical port’s (depending on the configuration used by the administrator) IOPS or Throughput Bps activity exceeds a configurable threshold level for a defined time trend/period. The threshold is a function of the adapter’s capacity. The workload is automatically migrated to another Hyper-V host on the SAN using System Center Virtual Machine Manager to determine the best target host as the migration destination. For example, if IOPS exceed 80 percent of 150,000 (capacity for a 4-Gb HBA) for two minutes, generation of a PRO Tip and migration is automatically initiated.

Representative SAN & LAN Topology

Additional PROTip Scenarios & Solutions

LINK SPEED IMPROVEMENT

The Fibre Channel HBA and Fibre Channel switch typically auto negotiate to the highest link speed that can be established for the particular connection.
Solution

The established Link speed is less than the maximum capability achievable by the Fibre Channel HBA in the server. A PRO Tip is generated suggesting Link Speed Improvement through a switch infrastructure upgrade. Remediation requires upgrading the switch infrastructure to match the capability of the HBA. For example with an 8 Gb FCA, and a 4 GB FC switch port capability, a PRO Tip is generated advising upgrade of the switch infrastructure.

HBA OPTIMIZATION RECOMMENDATION

The Fibre Chanel HBA is a 2Gb or 4Gb unit.

Solution

The installed Fibre Channel HBA is discovered to be less than 8Gb capable, the highest standard performance capability available in the market. A PRO Tip is generated recommending upgrade of the HBA and switch infrastructure to 8Gb.

Benefits

Benefits accrued to the data center administrator include:

- Optimized virtual workload performance in both latency-sensitive and bandwidth-sensitive applications.
- Fulfillment of SLAs for I/O-intensive virtual workloads.
- Dynamic and automated IT agility.

About Microsoft Virtualization Management Solutions

Microsoft System Center Virtual Machine Manager 2008 is a comprehensive multivendor virtualization management solution that enables easy and fast consolidation of physical servers and rapid provisioning of new virtual workloads. Another feature of System Center Virtual Machine Manager is performance and resource optimization (PRO) which helps ensure that physical resources within a virtualization environment are being managed efficiently and that virtualized workloads are meeting service level agreements.