

Optimizing SAN Performance & Availability: A Financial Services Customer Perspective

Skip Bacon, CTO, Virtual Instruments Brad Dart, Sr. Storage Analyst, Bank of Montreal

About Virtual Instruments

- Leader in Fibre Channel SAN monitoring & analysis
 VirtualWisdom SANInsight
- Leader in Virtual Infrastructure Optimization
- Spin out from Finisar: June 2008
- Well-funded



- Fast growing: Year-over-year 2010 revenue up 150% over 2009
- Key partnerships:







The Virtual Infrastructure Challenge: Maintaining Performance & Availability SLAs

- Increasing server & storage virtualization limits visibility, increases complexity
- Data growth >50%/year leading to heavy investments in SAN infrastructure.
- Increase in physical infrastructure adds exponential complexity & business risk. Results in over-provisioning.
- Heterogeneity in a virtualized environment exacerbates the challenges





The Keys to SAN I/O Optimization

- Monitor the I/O traffic not just the devices
- Provide real-time I/O and latency feedback into load-balancing and capacity planning decisions
- Vendor-independent visibility
- Actionable correlation across server, network & storage domains



An example solution

Real-time SAN I/O visibility to optimize performance & availability



Challenge	The Ideal Optimization Solution Should:
Resolve sev 1 & 2 problems faster	 Act as an automated storage admin which constantly looks for problem areas and alerts to issues Provide extensive correlation of metrics to application latency to quickly identify problem areas
Maintain high performance	 Measure Exchange Completion Time to accurately assess the effect of SAN related configuration changes, component health, virtualization
Proactively reduce downtime	 Identify opportunities to replace failing hardware components before they affect applications Ensure multi-pathing is properly configured and find unbalanced paths
Maximize SAN utilization	 Measure actual effect of cache to reduce over-buying Identify under-utilized links
Lower storage costs	Easily identify tiering opportunitiesValidate tiering meets performance SLAs
Increase use of Server Virtualization	 Provide full path (VM to LUN) visibility to substantially reduce risk Provide I/O performance & utilization data for better load balancing Improve consolidation ratios by correlating configuration changes with application latency



Common factors affecting SAN Availability & Performance

- CRC Errors
- Code Violations
- Class 3 discards
- Link Resets
- Logins/Logouts
- Loss of sync
- Loss of Signal
- Link Failures
- Queue Depths
- SCSI reservation conflicts





An Example: Exchange Completion Times

Ex**Sequge** Constant Interest in the second s





Using Exchange Completion Times to Uncover Problems



Using Exchange Completion Times to Uncover Problems





Virtual Instruments Customer Example

Brad Dart, Senior Storage Analyst

Problem, Performance & Capacity Management







Bank of Montreal Overview

- BMO Financial Group established in 1817
- HQ in Toronto
- A top 5 Canadian bank w/ 38,000 employees
- Currently serve 11 million personal, commercial, corporate and institutional customers
- Since 1984, Chicago-based Harris Bank has been a member of BMO Financial Group
- TSX, NYSE: BMO





Bank of Montreal Storage Infrastructure

- 2.5+PBs of open systems storage
- 12 Tier 1 arrays, 11 Tier 2 arrays
- 20% (~500TB) has been virtualized
- 40% (~1PB) has been replicated over DWDM links
- 3 data centers w/ SAN storage
- 6 fabrics, 22 directors, 5600 ports









Questions

• What are your key SAN related challenges?





Questions

- What are your key SAN related challenges?
- How is BMO addressing these challenges?





Questions

- What are your key SAN related challenges?
- How is BMO addressing these challenges?
- What are the benefits of these approaches?







The Leader In SAN & Virtual Infrastructure Optimization

THANK YOU