

Simplifying NAS Deployment with Brocade VCS

Brocade VDX 6740 deploys quickly and easily to create a robust network with minimal effort.



Operational Simplicity with Brocade IP Storage Network Deployments

New trends in storage technology and implementation are changing how storage is delivered to clients. These trends include automated provisioning, which has the potential to greatly improve operational simplicity. However, every IT manager knows that automating a single part of a system will only move operational bottlenecks. The entire system must be designed with this principle in mind to achieve the desired outcome. Modern storage solutions have shifted much of the automation bottleneck over to the network.

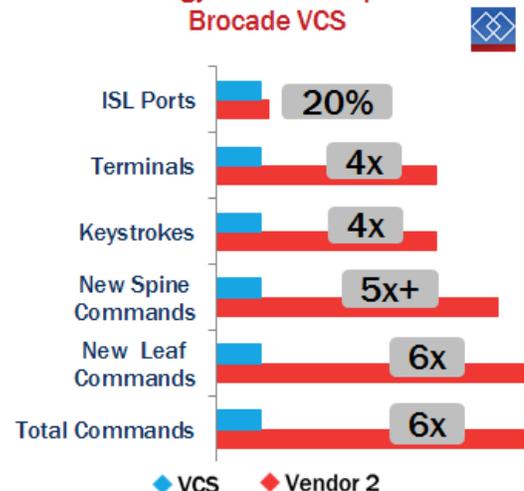
IP storage demands grow as business needs continue to call for more file, application, and data lake storage services. Rapidly changing business requirements are served by responsive automation on the modern NAS device, but without equally responsive network automation and operational simplicity, the storage system advantages may not be realized to their full capacity.

Fortunately, options now exist for automated networks to accelerate deployments of scalable IP storage solutions. The results presented in this report highlight the differences between Brocade's implementation of Brocade VCS fabric and a legacy IP storage network in a standard leaf-spine topology. We demonstrate the significantly reduced complexity of the Brocade technology and the advantages that it brings to the network and the datacenter.

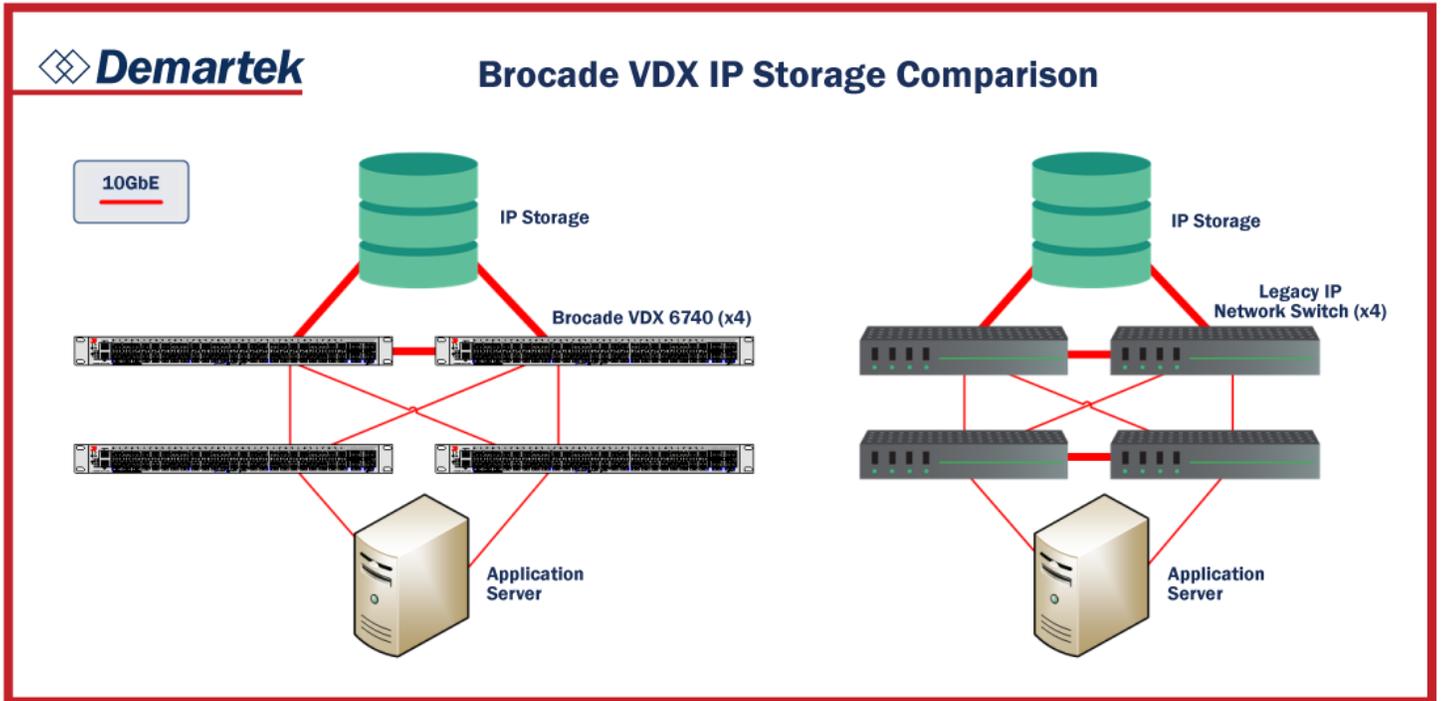
Key Findings

- > Brocade Network Operating System simplifies the process of deploying and maintaining IP storage networks by automating redundant and tedious manual tasks.
- > Brocade VDX switches in a Brocade VCS fabric simplify infrastructure deployment by automating switch-to-switch communications.
- > Brocade VDX switches and VCS fabric require fewer steps, fewer management interfaces, and fewer ports to support the same network infrastructure as legacy switching technology.

Added Complexity of Legacy Technology IP SAN Compared to Brocade VCS



Network Deployment Simplification with Brocade VCS



The leaf-spine topology is a common network design for delivering a scalable, reliable fabric to enterprise IP storage products and their clients. A four-node storage network, presented in the diagrams above, demonstrates the smallest leaf-spine topology possible with full redundancy. This configuration scales easily and can be considered a building block for larger scale deployments. However, the similarity between a Brocade fabric and a fabric built with legacy switching technology ends there. The implementation mechanics of a Brocade VCS fabric are considerably simpler than those of other vendors.

Brocade has taken a minimalist approach to the command line interface and administration functions of the VDX family of switches. At the heart of this strategy is the design of the operating system. Brocade Network OS and VDX switches work together to reduce command complexity, consolidate similar tasks on switches within the fabric, and automatically configure certain aspects of a network, driving down the manual

effort required to build and manage a functional IP fabric.

Comparison of Complexity Metrics

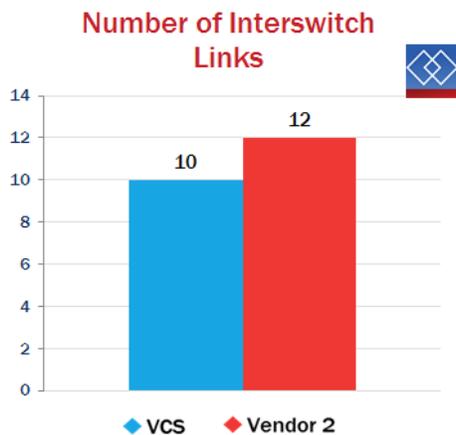
There is a deal of subjectivity in defining the concept of simplicity versus complexity. The method employed for this analysis recorded six metrics related to common IP storage network setup, configuration, and support functions for Brocade VCS and legacy switching technology. This report places these metrics into two categories we've called *Configuration and Scalability Benefits* and *Management Simplification*. To ensure a fair comparison, out-of-the-box switches with default, first-boot configurations and no pre-installation scripting or tools were employed to create the two networks.

Data center or network managers are invited to weigh the collected metrics as applicable to their own specific network administration experiences and requirements. However, the inescapable observation is that Brocade VDX switches and VCS fabric demonstrate much smaller

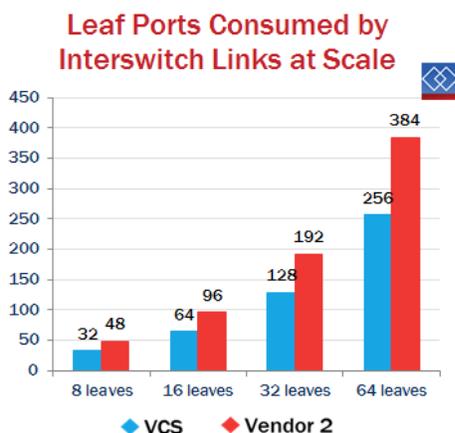
values for each measurement, and in this evaluation, smaller is better.

Configuration and Scalability Benefits

A Brocade VCS fabric presents all VDX 6740 switches as a single virtual chassis to network clients. VCS does not require connections between leaf switches in the fabric, unlike other switching products. This reduces the number of total connections between switches (aka interswitch links or ISLs) and the number of ports those ISLs require, while still maintaining fault tolerance within the fabric.



By not requiring ISLs between leaves, Brocade VCS consumes two fewer ports per leaf switch. This frees those ports to support an additional two storage clients per switch. This may not seem significant in a small fabric, but as the number of leaves scales up to support more storage clients, it becomes a very big deal.

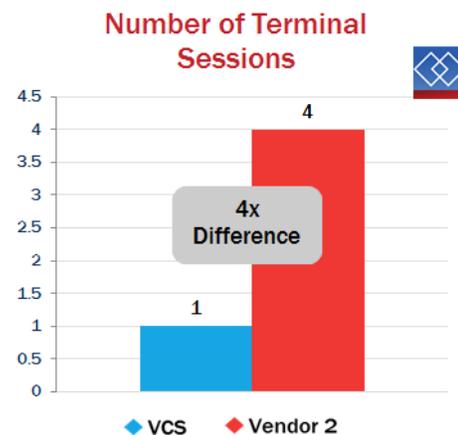


To scaling up to even eight leaves, a legacy fabric needs enough ISL ports to fill an entire 48 port switch. Scaling to a 64 leaf fabric, that storage network must either deploy the equivalent of eight switches for fabric administration or give up 384 potential storage clients. A same sized Brocade VCS fabric will either consume a third less ISL ports — more than two entire switches worth of ports — or support 128 more storage clients.

Management Simplification

Brocade Network OS simplifies fabric management by cutting the number of interfaces needed to administer all the switches in the fabric and including built-in automation to radically reduce the number of commands needed to build and manage the network. The savings in time and effort to administer the fabric should pay off in both employee productivity and increased uptime brought on by fewer errors in configuration and management activities.

Once a switch is added to the VCS fabric (through a single command per switch), that switch no longer requires a distinct terminal session to manage it. A Brocade VDX 6740 NAS network can be set up and administered through a single console session, as opposed to a separate session per switch as needed by other vendor products.

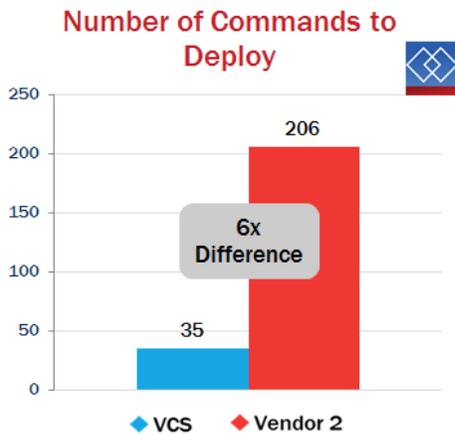


As more switches are added to the topology, the number of sessions needed to manage the Brocade switches remains at "one." A single session provides an easier management interface for the administrator,

Brocade VCS Simplifies IP Storage Networks

whereas multiple terminal sessions increase the potential for errors through the accidental issue of commands in a wrong window or tab. The criticality of such errors goes up for live networks supporting production storage traffic, where mistakes can impact reliability, Quality of Service, and even uptime.

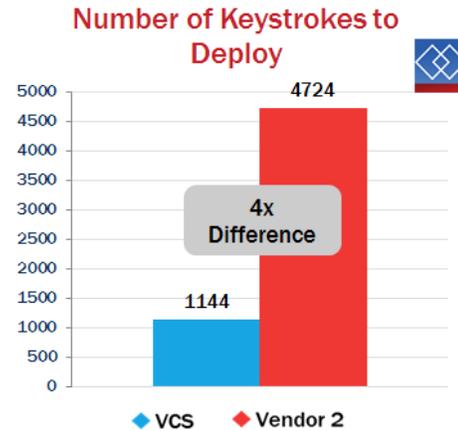
Continuing to build on the ease of management theme, Brocade Network OS cuts the number of commands needed to perform common tasks by automating obvious and redundant steps traditionally needed to execute those tasks. At the top of the list is the automatic recognition and configuration of ISLs between leaf and spine switches in addition to vastly simplified port configuration.



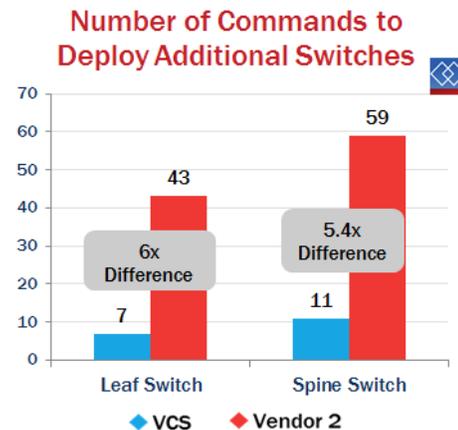
The four-node Brocade VCS network needed one sixth of the commands to deploy compared to classic technology. Each command entry consumes time. A complex command interface increases the amount of knowledge and skill required by the administrator. By lowering the level of specialization needed to perform the same function, Brocade customers save money by reducing personnel costs, training requirements, and enabling staff to accomplish more in less time.

Reducing the commands to individual keystrokes demonstrates that Brocade Network OS does not merely aggregate multiple commands into a single, long string of cryptic instructions and arguments. The combined command and keystroke reductions also limit mistakes. If we assume an equal chance of error for

every keystroke, there are fewer potential points of error insertion strictly due to fewer opportunities to miskey commands.



The advantages scale out with network size, whether for a large initial deployment or the gradual addition of leaf and spine switches to support growth over time. New Brocade VDX spines need all of eleven commands to be added to the topology, and leaves need a mere seven. Larger or growing networks reap the same benefits as our simple four-node design, but in a scale commensurate with network size.



An Additional Benefit—Brocade IP MAPS

It would be remiss to omit mention of Brocade's IP Monitoring and Alerting Policy Suite (MAPS) as a management tool that simplifies operational administration of a VCS fabric. IP MAPS is not included in the calculation of the complexity ratio because there isn't really anything to compare it to. It is included here as the "icing on the cake," so to speak — yet one more way in which Brocade makes the job of IP storage network implementation and management easier for the enterprise.

MAPS is an optional network health monitor that is supported on all Network OS devices. Available to use immediately out of the box, MAPS can be configured to monitor IP storage traffic on the fabric by protocol (such as NAS or iSCSI). The network or storage administrator can group ports and switches by function to set usage policies and limits or gain at-a-glance performance reporting. The alerting features will identify error types and counts, identify out-of-range conditions for policy compliance, and inform administrators of issues before they become performance impacting problems.

Conclusion

NAS and other modern storage systems are redefining the way storage is provisioned. Automation and operational simplicity enables companies to be more nimble as they address the rapidly changing requirements of the modern business world. A robust IP storage network must be just as simple to deploy and manage at scale, or network vendors risk their products becoming the complexity bottleneck in the data center.

Brocade VDX switches and VCS fabric compliment modern NAS and other IP storage systems by eliminating the bottlenecks inherent in traditional network deployment processes. Through built-in automation and logic, streamlined command interfaces, and a powerful monitoring and alerting suite, Brocade stripped away the minutiae to deliver a network fabric that is easy to install, straightforward to manage, and simple to scale.

Being many times more efficient to work with than the competition makes deploying IP storage networks with Brocade VDX switches and VCS a logical choice for businesses that need to implement new storage networks or upgrade legacy environments. Add in the bonus of IP MAPS, and supporting enterprise IP storage products on a Brocade-backed network makes business sense.

The most current version of this report is available at http://www.demartek.com/Demartek_Simplifying_NAS_Deployment_with_Brocade_VCS.html on the Demartek website.

Brocade is a registered trademark of Brocade Communications Systems, Inc.

Demartek is a registered trademark of Demartek, LLC.

All other trademarks are the property of their respective owners.