TECHNICAL BRIEF - **DECEMBER 2017**

VMWARE VSAN TOP 10 OPERATIONAL TIPS

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Setup and Configuration Tips

vSAN provides powerful capabilities that can be customized to the uniqueness of your environment. Before you get started, you need to look at the best configuration, and operational processes to make sure that you are getting the most out of your investment. These tips will help make sure your cluster is setup for the best performance, availability and easy of operations.

Tip #1 - Use Multiple Policies

Use multiple Storage Policy Based Management (SPBM) policies with vSAN. Rather than change a policy that may be assigned to a large number of VMs, create a new policy instead. Moving smaller groups of Virtual Machines to that policy will let you control the rebuild and capacity overhead associated with policy changes done *en masse*. When changing policies, also consider the free space required to maintain the existing policy, as well as the mirrors of data created to fulfill the new policy also. More information can be found here:

- Blog: vSAN Operations: Maintain Slack Space for Storage Policy Changes

Tip #2 - Use the vSAN EasyInstall, vSAN Config Assist, and vSAN VMware Update Manager (VUM) baselines

These tools are useful to install, deploy, and also to update ESXi, drivers, and firmware for controllers to the current and supported baselines. vSAN easy install makes a simultaneous VCSA and vSAN setup quick. Following the initial setup, Configuration Assist will guide you through typical setup tasks, such as configuration vMotion and High Availability. This tool on selected platforms also allows for critical driver and firmware patching. VMware Update Manager allows you to check what the newest certified and verified version of vSphere and vSAN is that your server will support. Even if your host shipped with an older version, these tools will help you get up to a health configuration baseline for hardware, server, and vSAN. A Video that walks through this setup end to end can be found here:

- Demo: Easy Install and Configuration Assist

Tip #3 - Test Accurately

When testing a vSAN cluster, make sure to do accurate testing. HCI bench is a free wrapper for the industry standard VDBench. It can automate consistent benchmarks with multiple Virtual machine workers. HCI bench yields far more realistic test results than vendor-specific tooling, or benchmark tools only designed to run in a single virtual machine or with a single disk. Make sure that your failure testing is testing what you think it is. Pulling a hard drive from a

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running cluster will trigger an absent device. The vsanDiskFaultInjection.pyc script can be used to simulate a true physical device failure. This script can be found in the vSAN Failure Testing document. Some blogs and videos that can help include:

- HCI Bench Homepage
- Blog: What to Expect From HCI Bench
- Blog: Use HCI Bench Like a Pro
- YouTube: vSAN 6.6.1 Performance Diagnostics with HCI bench
- Document: vSAN Failure Testing

Tip #4 - Keep Appropriate Slack Space

Slack space is critical for rebalances, rebuilds, host failures, and policy changes. 20-30% free is a good starting point. More information can be found in the slack space section of the vSAN Design and sizing guide.

Tip #5 – Reboot and shutdown (Carefully)

Rebooting hosts should not be considered a standard step for troubleshooting vSAN. Use maintenance mode before rebooting or shutting down a host to prevent object unavailability. If experiencing issues, call support before rebooting as some logs and traces may not persist through a reboot. You can press ALT + F11 on the console of ESXi to monitor vSAN during a host boot.

- Blog: vSAN Maintenance Mode
- Improving Visibility of Host Restarts

Tip #6 - Configure Disk Groups and Cache Devices for Performance

For environments with higher performance requirements, consider using two or more disk groups. Consider SAS or NVMe for cache devices. SATA SSD's lack the advanced features of SAS or the more advanced NVMe for maintaining low latency at peak performance demand. Consider using NVMe and SAS instead of SATA when performance consistency and peak demand are a concern. In many cases going from one to two disk groups will double performance. For updated guidance on all flash cache sizing See the following:

- Blog: Designing vSAN Disk Groups
- StorageHub - DiskGroups

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Networking Tips

A storage platform is highly dependent on its network for performance and availability. VMware's mature networking stack enables unparalleled visibility, control, and availability. The following tips will help you configure vSAN for highly consistent and predictable operations.

Tip #7 - Use the Virtual Distributed Switch (vDS)

The vDS license is included with all VMware vSAN editions. This also includes the Network IO Control (NIOC) feature. NIOC enables traffic shaping to prevent vMotion or other traffic from using excessive bandwidth and impacting the performance of storage traffic. If you are not using dedicated physical interfaces for vSAN and vMotion this feature should be turned on. With NIOC Avoid configuring limits or reservations. Considering configuring CDP or LLDP for send and receive, as this can enable faster network configuration troubleshooting. Additional information in the following blogs goes deeper into vSAN vDS configuration choices

- Blog: Why use a vDS with vSAN?
- Blog: Designing vSAN Networks with Dedicated and Shared Interfaces

Tip #8 – Use Dedicated and Isolated VMKernel ports

Isolating storage traffic provides a benefit for performance as well as security. Consider different VLANs and subnets for clusters that are running different security or compliance requirements.

- Blog: Designing vSAN Networks with Multiple Interfaces
- Document: vSAN Network Design

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Monitoring Tips

vSAN offers unparalleled visibility into performance, health, and capacity utilization. Making sure to use these tools correctly is important for preventing problems.

Tip #9 – Use vSAN Health Check

Use the vSAN health check, early and often. There are dozens of tests, with new ones being released, that will check your environment for known issues. If you do not understand what an alarm is telling you to do, use the "Ask VMware" button.

- Blog: vSAN 6.6 Online Health Check
- Blog: vSAN Performance Service
- Document: vSAN Online Health Check

Tip #10 – Use LogInsight and CEIP

These tools give both you and VMware's Global Support organization unparalleled yet secure visibility into what is going on in your cluster. If using an ESXi install on an SD or USB device, make sure the logs are redirected. LogInsight gives you powerful dashboard, and alarm capabilities. This will let you truly understand what is going on inside your hosts at a low level.

- Demo: LogInsight Content Pack for vSAN
- Document: vSAN Log Locations

The Customer Experience Improvement Program sends VMware performance telemetry, health UI status, and cluster configuration information to enable VMware support and engineering help you more quickly and diagnose issues in your environment. This feature also allows for vSAN engineering to push out new health checks to your environment that are relevant to your configuration, as well as use the vSAN Performance Diagnostics Service. Consider enrolling in the Skyline proactive support program. This innovative support program allows for proactive support capabilities.

- Demo: vSAN 6.6 Performance Diagnostics
- Link: VMware Skyline Support Technology

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