Streamline Management for Mixed Workloads Across Multiple Clouds

vmware®

Introduction

When mixed workloads are managed on separate physical infrastructures, things can get complicated fast–but in a hyperconverged infrastructure, operational and management overhead become simpler.

SOLUTION OVERVIEW

Learn how running your workloads through VMware® vSAN™ allows you to consolidate them onto a single cluster for greater efficiency, savings, and improved resource utilization. With policy-based management, built-in monitoring, and rapid scaling, your IT teams will have everything they need to keep applications and services protected and running at peak performance.

CUSTOMER CASE STUDY

T-Mobile Czech Republic is expected to provide the best mobile performance in their region—and the technology backing it up has to deliver on that promise. Traditional, physical storage was inefficient and slowed down applications, devices, and service. In the case study, you'll learn how they solved these challenges and gained a new perspective on handling mixed workloads with software-defined storage. Using vSAN, they were able to streamline storage and management to relieve the burden on IT teams, lower costs across the board, and provide the performance their clients expected.

HYPERCONVERGED INFRASTRUCTURE FEATURED WORKLOAD

Deploy, Manage, and Monitor Mixed Workloads on VMware vSAN

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UNIQUE CAPABILITIES

- Simplify deployment and unify management with minimum operational overhead in a single vSAN HCI environment.
- Tailor your application demand and adjust with SPBM.
- Improve resource utilization through workload consolidation, from both performance and capacity considerations.
- Protect all of your application workloads with rich vSAN data services and high availability configurations.

Consolidate workloads within a single cluster on vSAN infrastructure

VMware vSAN™ provides hyperconverged infrastructure (HCI) for administrators and application owners to deploy and run their solutions tailored to the needs of the application. vSAN has been proven to accommodate various workloads; business-critical applications such as Oracle, Exchange, and SAP; as well as virtual desktop infrastructure and remote office/branch office with both performance and high availability considerations. Both homogeneous and heterogeneous applications can be consolidated within a single cluster on the vSAN platform, which simplifies management, improves operational flexibility, optimizes resource utilization, and reduces TCO.

Why mixed workloads on a single vSAN cluster?

Mixed workloads are usually managed using separate physical infrastructures based on the type of workload. Consolidating these mixed workloads on a single vSAN cluster helps minimize both operational and management overhead during the workload deployment and maintenance stages. Different workload virtual machines (VMs) can achieve VMware vSphere® vMotion® within a single larger vSAN datastore, with better flexibility and efficiency for VMware vSphere High Availability implementation. A single vSAN cluster also helps multiple workloads to be managed under the unified vSAN data services. With the one-time setup for vSAN data-at-rest encryption, the workload VMs and user data are consistently protected.

Agility through storage policy-based management

Storage policy-based management (SPBM) allows for an administrator to manage their storage-related settings on a per-VM basis, or even a per-virtual disk basis, and at an application level. Tailored for different demands of mixed workloads, each VM or virtual disk could be assigned with the specific storage configuration. An administrator can adjust the storage policy seamlessly to accommodate the workload changes at any time and under any circumstances. Multiple workloads may have different requirements of failure levels to tolerate, and the administrator can limit the I/O resource with the storage policy on some of the workload VMs to ensure the performance for other mission-critical applications.

Built-in monitoring for mixed workloads

vSAN provides VMware vRealize® Operations™, a built-in feature within VMware vCenter®, that is easy to deploy and requires no additional licensing:

- Delivers continuous performance optimization based on intent, efficient capacity management, proactive planning, and intelligent remediation for mixed workloads running on vSAN.

KEY BENEFITS

- Minimum deployment and operational overhead through a single vSAN cluster
- Agility through SPBM
- Built-in monitoring for application workloads
- Scalability with on-demand mixed workloads
- Reduced TCO through the HCI architecture

- Provides a unified management platform with application-to-storage visibility, especially for multiple workloads.
- Uses rich analytical tools to reveal hidden issues from the data collected, investigates complex technical problems, identifies trends, and adjusts resource allocation for different workloads.
- Frequently suggests corrective actions to help fix problems right away.

Scalability plan for mixed workloads

If the existing vSAN cluster is servicing a single workload, it is much easier to scale up or scale out for mixed workloads running on the same cluster. vSAN is designed for close-to-linear scalability, and administrators can plan adding similar workloads with a simple building block methodology. For workloads with different I/O patterns, administrators should plan for both performance and capacity considerations. It is recommended to prioritize the infrastructure resources for business-critical applications, and configure vSphere and vSAN limitations for VMs, wherever applicable.

Resiliency plan for mixed workloads

vSAN provides different storage levels of resiliency to protect the mixed workloads running on the same cluster. The default vSAN storage policy stores two replicas for each component with tolerance of one point of failure. Whenever a disk failure happens in the cluster, vSAN automatically handles the issue without user interference, and there is minimal performance impact on the mixed workloads. Depending on the protection requirement of the workload, users can customize the failure level to tolerate. When a failure happens in the cluster, vSAN performs the resynchronization operation automatically and intelligently, all while maintaining fair balance and guest VM traffic to ensure sufficient levels of performance.

Sample reference architecture

Administrators can deploy mixed workloads on vSAN with appropriate planning and design. I/O-intensive applications, such as database OLTP workloads, can be mixed with applications with capacity-oriented workloads; or bandwidth-focused applications, such as database OLAP workloads, with I/O limitations configured in vSAN storage policy. Note that vSAN has no specific limitations on type of mixed workloads running in the environment.

Figure 1 shows a sample reference architecture for mixed workloads of Microsoft SQL Server and Exchange running together on a single vSAN cluster. The two SQL Server VMs are running separately on two nodes of the vSAN cluster, while two other VMs are servicing Exchange mailbox services on two other nodes. Two domain controllers (primary and secondary) provide the Active Directory service for both applications. Administrators can individually customize workloads, as well as levels of performance or protection, all within vSAN storage policy. As the workload demands increase, SQL Server OLTP workloads may require more IOPS and lower latency, or, if the Exchange mailbox grows in capacity, administrators can easily scale up or scale out to meet the performance demand and increase the total capacity.

LEARN MORE ABOUT MYSQL AND vSAN

- *Virtual Blocks* – The VMware blog site for all topics related to storage and availability
- *StorageHub* – The one-stop location for all documentation on storage and availability

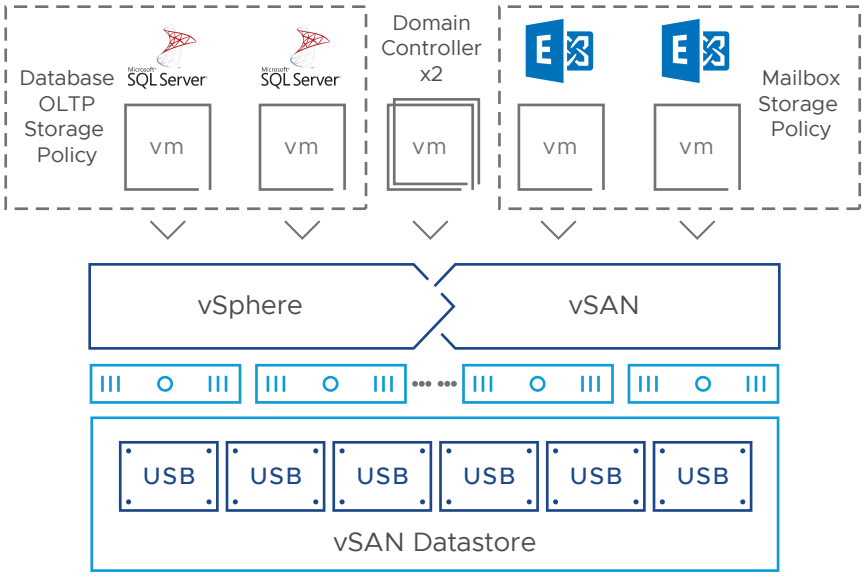


FIGURE 1: Sample mixed workloads on vSAN.

Summary

Mixed workloads on VMware vSAN allow workload consolidation with agility in management, scalability in performance, resiliency in protection, and reduction in TCO. vSAN provides flexible high availability options and rich data services for multiple workloads running on a single cluster. Administrators can easily scale up and scale out for future business demands with vSAN, and achieve balance of performance and protection for different workloads using vSAN SPBM.

See the *solution reference architecture* for more details about mixed workloads on vSAN.

FEATURED CUSTOMER CASE STUDY

T-Mobile Czech Republic

T-Mobile Czech Republic Reduces Costs And Increases Customer Satisfaction

with hyperconverged infrastructure powered by VMware vSAN

INDUSTRY
TELECOMMUNICATIONS, CLOUD, ICT, AND MANAGED SERVICES PROVIDER

LOCATION
HEADQUARTERS:
PRAGUE, CZECH REPUBLIC

KEY CHALLENGES
Reduce costs, simplify management, and increase agility

SOLUTION
VMware vSAN

T-Mobile Czech Republic, a member of the international telecommunications group Deutsche Telekom, celebrated its 20th year in operation in the Czech market in 2016. As an integrated operator, T-Mobile offers comprehensive information and communications (ICT) solutions to companies, organizations and individuals via a high-speed network and state-of-the-art technology innovations. With six million mobile customers, T-Mobile is the number-one operator in the Czech mobile market.

A long-time VMware partner, T-Mobile Czech Republic relied upon VMware solutions for internal IT needs, and in 2012 deployed VMware's virtualization technology for its public cloud offering.

The Challenge

Prior to deploying vSAN, T-Mobile experienced significant challenges with its physical storage. Dissimilar, non-scalable, and bulky hardware created a level of complexity, cost, and maintenance demands that burdened the organization and hindered its ability to remain flexible and meet the rapidly evolving needs of their customers.

"We were relying on physical servers, SAN/LAN networking, and external storage," explains Daniel Bajkai, Customer Solutions Designer. "Our customers wanted a storage solution that was simple and could grow on demand, and we needed a solution that could add capacity and performance as needs increased."

In addition to improving its ability to reduce complexity and simplify management, T-Mobile also saw an opportunity to attract new customers with a software-defined approach to storage that would allow private clouds to leverage the efficiency and performance of hyperconverged technology.

The Solution

T-Mobile deployed VMware vSAN to enable storage management from VMware's central management interface, vCenter. This unlocked the benefits of vSAN software-defined storage features without requiring an additional install, or deploying additional virtual machines (VMs) to manage storage. vCenter is used to manage T-Mobile IaaS and PaaS services and provide visibility into servers, switches and storage.

"WITH VSAN WE'VE REDUCED COMPLEXITY, SIMPLIFIED MANAGEMENT, AND ENABLED OUR ABILITY TO GROW MODULAR STORAGE ON DEMAND — THAT'S GOOD FOR BOTH US AND OUR CUSTOMERS. AS SOON AS A CUSTOMER SEESTHAT FEWER PHYSICAL COMPONENTS ARE NEEDED, IT BECOMES CLEAR THAT THE SOLUTION REQUIRES REDUCED ADMINISTRATION, LESS SPACE, AND LESS ENERGY. ALL THAT CONVERTS INTO LOWER COSTS."

VÁCLAV MOLÍK
HEAD OF CUSTOMER SOLUTIONS DESIGN

BUSINESS EVENTS

- Reduced complexity
- Ability to grow storage on demand
- Improved ease of management
- Increased customer satisfaction

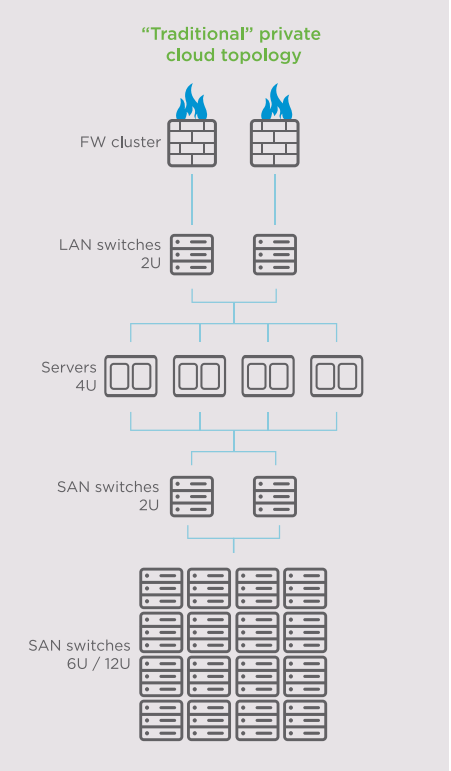
VMWARE FOOTPRINT

- VMware vSAN
- VMware vSphereENT+
- VMware vCloud Director

"Our operations team uses the vCenter dashboard for their daily tasks and controls. In the case of a component outage, the servers, switches, and storage send alarms to our NOC, who immediately contacts the ICT operations team to solve the problems," notes Václav Molík, Head of Customer Solutions Design. "vSAN enabled the seamless extension of virtualization to storage, creating a hyperconverged solution that works with our existing tools, skillsets, software solutions and hardware platforms."

Today, T-Mobile leverages vSphere ENT+ with vSAN in its private clouds where customers require dedicated resources.

"When customers outsource their on-premise IT to T-Mobile we are either putting them onto T-Mobile`s Public cloud (vSphereENT+) or Dedicated/Private cloud running vSphereENT+ and vSAN," says Daniel Bajkai. "Today all of our vSAN implementations are hybrid, with 2U servers and 3 disk groups per server. Also we have an installation where a vSAN hybrid cluster is used as a Disaster Recovery solution for the primary site. However, after the latest vSAN functionality improvements, the time has come to offer and build All-Flash environments as well."



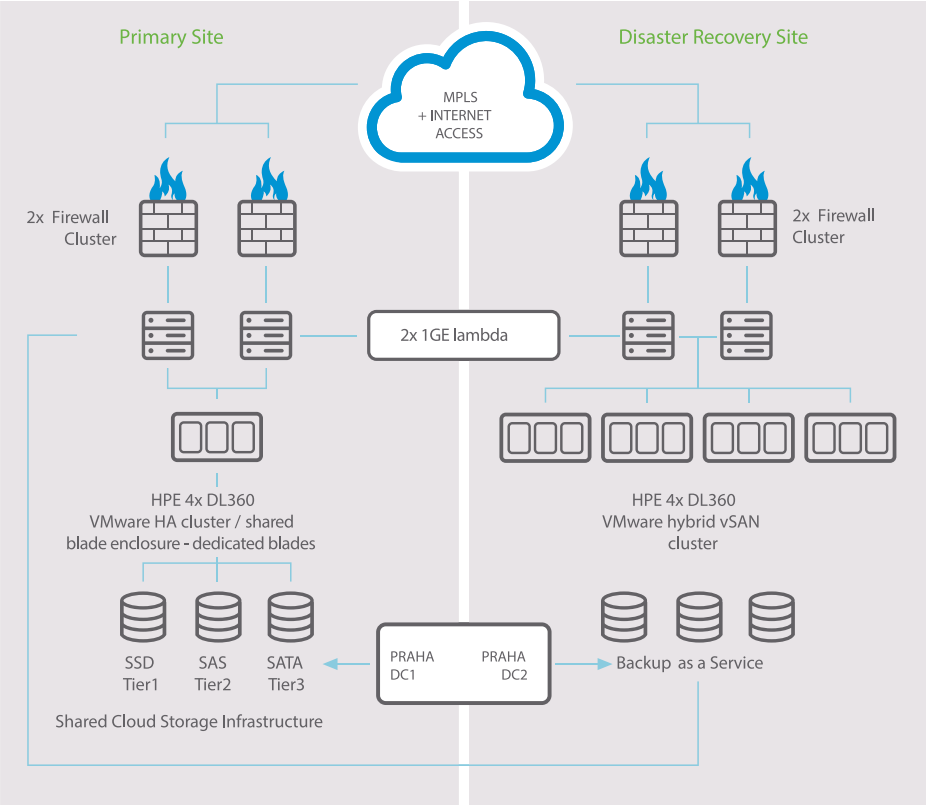
As a Cloud Provider, T-Mobile is using VMware Cloud Provider Program subscription licensing. The fact that vSAN is built into the vSphere kernel also implicitly means that no additional RAM resources must be allocated and licensed for "controller" VMs that would require tens of GB of additional RAM per server — as required by other HCI solutions.

Business Results and Benefits

T-Mobile immediately saw a decrease in costs with vSAN versus traditional storage. By shifting infrastructure to low-cost, high-volume server economics, and simplifying management with one integrated software stack, T-Mobile was able to achieve reduced rack space, reduced hardware power consumption, and reduced administration costs.

In addition, the increased data protection that T-Mobile can now provide to customers is also a welcome benefit. vSAN offers the industry's first native HCI security solution with data-at-rest encryption. Built right into vSAN, vSAN avoids the limited options and pricing premium of self-encrypting drives (SEDs).

"With even a "simple" vSAN—hybrid and not stretched cluster—the data is protected in a way that can be put somewhere in between one external SAN storage with two controllers and two external SAN storages with synchronous replication. With the parameter "failures to tolerate," this property of vSAN can be tweaked to provide even greater protection," says Daniel Bajkai.



vSAN delivers flash-optimized, secure storage with the industry's first native HCI encryption solution—at a fraction of the cost of traditional, purpose-built storage and less-efficient HCI solutions.

Looking Ahead

As T-Mobile Czech Republic looks ahead, vSAN and VMware solutions are key enablers of continued growth. In addition to exploring the deployment of NSX to complement its Security-as-a-Service offering, the ability to provide All-Flash vSAN with deduplication and compression is also an attractive option.

"As a large service provider with our own data centers, it's important that we stay up-to-date on the design and operations of VMware solutions, which is why we are active in workshops and labs to keep our team's skills at the leading edge," concludes Daniel Bajkai. "We are committed to looking ahead and evolving to meet customer needs, and vSAN will continue to be an important foundation for our software-defined infrastructure and the next-generation services we will provide."