Native vSAN Data Protection: Safeguarding Virtual Machine Data on vSAN

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#vmworld #HCI1603BU
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This overview of new technology represents no commitment from VMware to deliver these features in any generally available product.

Features are subject to change, and must not be included in contracts, purchase orders, or sales agreements of any kind.

Technical feasibility and market demand will affect final delivery.

Pricing and packaging for any new features/functionality/technology discussed or presented, have not been determined.
Agenda

VMware vSAN Overview and Vision

Current Landscape of vSAN Data Protection solutions

Tech Preview - vSAN Native Data Protection
  • Overview
  • Deep Dive and Demo

Q & A
Digital Business Requires a Digital Foundation

Software-Defined Digital Foundation

- Common Infrastructure
- Common Operations
- Intrinsic Security
vSAN - the Common Infrastructure Model for The Digital Foundation

Natively integrated for mission-critical apps

Industry-leading deployment flexibility

Consistent operations edge to core to cloud

ALL AVAILABLE TODAY
vSAN Is Adding 100 Customers Per Week

>15,000 Customers
More than top 3 competitors combined

>70% YoY bookings growth
Innovation Continues to Drive VMware HCI growth

March 2015
All Flash
64 Node Cluster
2x Hybrid Speed

Sep 2015
Stretched Cluster
5min RPO
2-node ROBO

March 2016
Deduplication
Compression
RAID5/6
Quality of Service

Nov 2016
iSCSI Support
2-Node Connect
Large Drives

Apr/July 2017
Native Encryption
vSAN Config Assist
Cloud Analytics
Intelligent Operations
50% higher performance

April 2018
Modern UI
Native vRealize
FIPS 140-2
Adaptive Resync
Host Pinning
vSAN Applications Are Expanding

What applications do you run on vSAN today?

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDI</td>
<td>VMware Horizon</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>Citrix Xen Desktop</td>
<td>10%</td>
</tr>
<tr>
<td>Databases</td>
<td>Microsoft SQL Server</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>MySQL Databases</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>Oracle Databases</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>SAP</td>
<td>7%</td>
</tr>
<tr>
<td>Microsoft Applications</td>
<td>Microsoft SharePoint</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>Microsoft Exchange Server</td>
<td>26%</td>
</tr>
<tr>
<td>New Use Cases</td>
<td>NoSQL databases (Cassandra, etc.)</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Hadoop and other big data applications</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: TechValidate survey of 316 users of VMware vSAN
vSAN offers a range of capabilities to protect your data

Protection from Device/Host Failures
Data is distributed across several hosts for resilience to failure of storage devices or hosts

Protection from Rack Failures
Data is distributed across racks identified as separate fault domains for resilience against rack failures

Continuous Site Availability
Stretched clusters across two physical sites

Site Disaster Recovery
Site Recovery Manager + vSphere Replication

Protection from Data Corruption
Broad ecosystem of data protection vendors
vSAN delivers enterprise-grade 6-nines protection

99.9999% Availability

By distributing copies of data across devices, hosts, and racks, vSAN delivers continuous protection against one or two hardware failures.

Level of protection can be assigned on the fly and per-VM and per-VMDK using the Failure-to-Tolerate (FTT) policy.

With FTT=2, vSAN offers 6-9s availability which is less than 32 seconds of downtime per year.

Ability to define vSAN fault domains adds rack aware protection.

Source: https://www.vmware.com/hub/vmware/VMware-vSAN-technical-overview.html
With vSAN Stretched Clusters, you get continuous protection across two metro-distance sites

vSAN Stretched Cluster capability provides active-active continuous protection across two physical sites

Near-instantaneous seamless failover from one site to the other

Redundancy locally and across sites - with site failure, vSAN maintains availability with local redundancy in surviving site

Optimized site locality logic to minimize I/O traffic across sites
SRM and vSphere Replication offer replication across any distance

**SRM**
- Automation software to orchestrate application recovery and planned migrations across vSAN clusters
- Centralized recovery plans for 1000s of VMs
- Non-disruptive recovery testing
- Integrated with vSphere Replication

**vSphere Replication**
- Cluster-to-cluster host-level replication of individual VMs
- Wide variety of recovery point objectives (RPOs) - from 5 minutes to 24 hours
- Replication from vSAN to a remote DR cluster or to traditional storage
- Easy to administer – integrated with vSphere Client
- Network efficient: Compression over the wire, and transmits only changed data
vSAN has a broad ecosystem of backup solutions

Leading solutions certified specifically with vSAN
- Best-of-breed data protection solutions vetted through a vSAN-specific certification program
- Listed on VMware Compatibility Guide
- Identifiable with VMware Ready for vSAN logo

Broader ecosystem of vSphere-compatible solutions
- Choose from dozens of different backup vendors
- Software and support flexibility to match needs
vSAN Native Data Protection
Tech Preview
vsAN Native Data Protection
Policy-driven, snapshot-based local and remote protection

- Space-efficient, high-performance, native snapshots
- Protect VMs on vsAN from data loss or corruption
- Replicate to Archival Storage for backup and long term retention
- Replicate VMs to another vsAN cluster for DR or Migration
- Native data protection reduces TCO compared to stand-alone data protection solutions
vSAN Local Data Protection

- Space efficient VM snapshots stored locally on primary vSAN
- Crash & application consistent VM snapshots (Minimum RPO: 5 min)
- Low RTO ("instant") VM restore from data loss/corruption scenarios
- Instant VM cloning for test/development purposes
- Easily configure Data Protection via vSAN Storage Policy Based Management (SPBM)
Scalable, Efficient Native vSAN Snapshots

Universal Point-in-Time (UPIT) Snapshot Technology

- Natively built into vSAN storage
- Single vSAN Object for the running point and snapshots (i.e. no vmdk.delta files)
- Efficient address space mapping to synthesize views of snapshots
- I/O flows through a single vSAN object for all points-in-time resulting in consistent performance
- Facilitates instant restore of vSAN snapshot data
Application Consistent Snapshots

- Fully commit all transactions to disk before creating a snapshot for data protection
- Equivalent to Full Database Backups with >= 5 min RPOs
- Fully integrated with Microsoft VSS for Microsoft Applications: SQL Server, Exchange Server
- Non-windows App Consistency is through pre- and post- snapshot scripts through VMware Tools
Announcing vSAN Private Beta
Choice of Hosted Beta or Download Beta

vSAN Data Protection
Next-gen Snapshots
Policy-based Management
Local Protection
Snapshot Catalog
Native Recovery workflows

vSAN File Services
Native File Services
Unified Block and File
NFS Protocol

Cloud Native Storage
Block or File storage for containers
Storage Control Plane for PKS & Kubernetes
Native management in vCenter

Sign up at: http://www.vmware.com/go/vsan-beta
vSAN Native Data Protection

Demo
vSAN Native Data Protection – Demo Flow

1) Create Data Protection Rules in Storage Policies
2) Browse Snapshot Catalog
3) Restore multiple VMs Instantly
4) Monitor Protection Status of VMs
5) Monitor Historical Data Protection Metrics
Demo: Monitor the Protection Status of VMs
Cluster Wide Data Protection Status of VMs

<table>
<thead>
<tr>
<th>Name</th>
<th>Placement and Availability</th>
<th>Data Protection</th>
<th>Storage Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM4</td>
<td>Inaccessible</td>
<td>Unknown</td>
<td>DP Pol-with-archival</td>
</tr>
<tr>
<td>VM3</td>
<td>Healthy</td>
<td>Healthy</td>
<td>DP Pol-no-archival</td>
</tr>
<tr>
<td>VM6</td>
<td>Healthy</td>
<td>Unknown</td>
<td>DP Pol-no-archival</td>
</tr>
</tbody>
</table>
## Demo: Monitor the Protection Status of VMs

**Detailed Data Protection Status of Each VM**

<table>
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<tr>
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<th>Data Protection</th>
<th>Storage Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM1</td>
<td>Healthy</td>
<td>![ Archive inaccessible ]</td>
<td>![ DP Pol-with-archival ]</td>
</tr>
<tr>
<td>VM1_7/24/2017, 12:40 PM</td>
<td>Healthy</td>
<td>![ Not configured ]</td>
<td>![ vSAN Default Storage F ]</td>
</tr>
<tr>
<td>VM2</td>
<td>Healthy</td>
<td>![ Not configured ]</td>
<td>![ vSAN Default Storage F ]</td>
</tr>
<tr>
<td>VM3</td>
<td>Healthy</td>
<td>![ Healthy ]</td>
<td>![ DP Pol-no-archival ]</td>
</tr>
<tr>
<td>VM4</td>
<td>Healthy</td>
<td>![ Archive inaccessible ]</td>
<td>![ DP Pol-with-archival ]</td>
</tr>
</tbody>
</table>
Demo: Cluster Level Historical Data Protection Views

Correlate cluster storage consumption with snapshot creation activity
Demo: ESX Host Level Historical Data Protection Views
Correlate Host Resource issues to Potential Data Protection Activity

- vSAN displays vSAN Data Protection resource consumption via # of Consistency Groups and Snapshot Counts
- Exorbitantly high snapshot related activity could consume ESX Host CPU and memory resources
Demo: VM Level Historical Data Protection Views
Observe per VM Snapshot Utilization over time
Universal Point-In-Time Snapshots
Native Snapshots are more Scalable and Performant