AHV: Virtualization for the Hybrid Cloud

Sven Wolf, Sr. Systems Engineer
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Building the Enterprise Cloud OS

Virtualization Kernel + Enterprise Features + Amazing Management = Cloud OS Foundation
PRISM Multi-Cluster und Hypervisor Management

EINE Konsole für
- Infrastruktur HCI
- Virtualisierung AHV
- Security FLOW
- Container KARBON
- Multi-Cloud Self Service Portal CALM

VM Operations
- Multi-hypervisor

Orchestration / Automation
- REST API
- CLI
Nutanix runs Nutanix!

- 100% der Nutanix Produktions-IT auf AHV
- 7 Datacenter
  - 3 DCs in Kalifornien
  - 4 Globale Standorte (BLR, AMS, SEA, DUR)
- 35 Cluster
- 315 Hosts
- 5300 VMs
- Zentral verwaltet mit Prism Central

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AHV – Komplexität vereinfacht

- Affinity Rules
- High Availability
- Rolling Upgrades
- Virtual Networking
- Image Management
- Analytics
- Rest APIs / CLI

- Hot Add of CPU/RAM
- Live Migration
- Data Path Optimization
- Converged Backup and DR
- Intelligent Placement & Scheduling
- Support for nVidia GPUs
- Cross-Hypervisor Migration & DR
- Self Service & Automation

- CPU compatibility
- DR Orchestration
- Microsegmentation
- Audit & Logging
- RBAC
Breite OS Unterstützung

Windows
• Windows Server 2008-2019
• Windows 7-10

Linux
• RedHat, CentOS, Oracle 6.4-7.5
• SLES 11-15
• Ubuntu 12.04-18.04
• Debian 8.5, 9.4
• FreeBSD 9.3-11.1
High Availability (HA)

ALWAYS ON

Default: Best Effort VM Restarts

Optional: Reserved Segments
Acropolis Dynamic Scheduler (ADS)

HANDS-FREE

- Hot Spot Remediation
- VM Initial Placement
- Affinity Rules Control
AHV Turbo

BLAZING FAST

- Multi-queue, multi-threaded
- Unleashes new HW: Optane, 3DXpoint, 40GB, RDMA
- Zero-configuration upgrade
- 300K+ IOPS per VM

LEGACY
- 80K IOPS max.

AHV TURBO
- 160K IOPS per thread
Hot Add vCPU and Memory

EXTENDABLE

- Hot-Add Memory, vCPU
- Non-disruptive to running VMs
- Compatible with modern OSes
GPU Support

GPU Passthrough

- Allows VM to have full access to GPU
- PCI passthrough enforces security and isolation
- User configures GPU type and number – AHV Scheduler matches VM GPU requirements at VM power on time
- Powered on VMs with GPU assigned are not live migratable and so user is asked if they want to power off for 1-click AHV and BIOS upgrade operations

vGPU

- A slice of a GPU dedicated to a VM
- GPU commands passed to GPU after being filtered through nVidia’s Grid driver
- Slightly less performant due to extra driver layer
- Much higher VM density per GPU, up to 16 to 1
Central Image Service

**CENTRALIZED**

- Fault-tolerant, highly available
- Disk images and ISOs
- QCOW, QCOW2, VHC, VMDK
AHV Use Cases

- Business Critical Applications
- VDI
- Remote and Branch Office
- Messaging, Collaboration and UC
- Dev/Test
- Big Data
- Server Virtualization and Private Cloud

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Use Case: SAP

SAP NetWeaver Applications and any DB

- Business Suite Production
- Business Suite Non-Production
- Other Application Servers
- S/4HANA App. Servers

Nutanix Cluster on NX, Lenovo HX, Dell EMC XC or HPE or Cisco

SAP HANA

- HANA Non-Production
- HANA Production

If HANA > 2.3TB

Nutanix Cluster on SAP HCI Certified Hardware List

Virtualized or Bare Metal Appliance

HANA HCL Appliance

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### Data Protection

<table>
<thead>
<tr>
<th>Feature</th>
<th>Notes</th>
<th>RPO</th>
<th>RTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Resiliency</td>
<td>Cluster-wide distributed file system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- RF2 or RF3 at container-level</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Node-, Block- and Rack-awareness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Availability</td>
<td>Restart of VMs at host failure</td>
<td>Zero</td>
<td>Near</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Zero</td>
</tr>
<tr>
<td>Time Stream</td>
<td>Local Snapshots with Self-Service Restore Option</td>
<td>Min.</td>
<td>Min.</td>
</tr>
<tr>
<td>Cloud Connect</td>
<td>Backup to AWS or Azure</td>
<td>Hours</td>
<td>Hours</td>
</tr>
<tr>
<td>Remote Replication</td>
<td>Asyncronous Replication</td>
<td>Min.</td>
<td>Min.</td>
</tr>
<tr>
<td></td>
<td>- Application consistend (≥ 60 min.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Near-Sync (≥ 1 min.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Multi-Site Replication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro Availability</td>
<td>Synchronous Replication, Active-Active Datacenter</td>
<td>Zero</td>
<td>Near</td>
</tr>
<tr>
<td>DR Orchestration</td>
<td>Runbooks/Orchestration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Party Backup</td>
<td>Application/Item Level Restore, Diff. Media</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Über 60 Lösungen validiert!

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VM Migration zu AHV – Convert Cluster

Settings

General
Cluster Details
Configure CVM
Convert Cluster
Expand Cluster
Licensing
Life Cycle Management
Remote Support
Upgrade Software

Convert Cluster

To provide a smooth hypervisor conversion experience you need to fulfill the following requirements.

AVAILABLE HYPERVERSORS

AHV

VM BOOT OPTIONS

Preserve power state of user VMs

Cancel  Convert Cluster

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VM Migration zu AHV – Xtract
VM Migration zu AHV

Migration Plans

VMs can be grouped into plans and migrated in batches. Plans can be scheduled to run immediately or in the future.

<table>
<thead>
<tr>
<th>PLAN NAME</th>
<th>VMS</th>
<th>DATA SIZE</th>
<th>MIGRATED DATA SIZE</th>
<th>ELAPSED TIME</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW-Test</td>
<td>1</td>
<td>14.9 GiB</td>
<td>17.9 GiB</td>
<td>3 Hours 20 Minutes</td>
<td>Migration In Progress</td>
</tr>
</tbody>
</table>

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Live Demo
Vorteile AHV

- Volle Integration in PRISM Oberfläche
- Sicher
- Performant
- Enterprise Features
- Unterbrechungsfreie Full-Stack Upgrades
- Breites Partner Eco-System
- Einfache Migration zu AHV
- Ohne zusätzliche Kosten für Software/Support
KARBON

- Schlüsselfertige K8s Umgebung
- Persistant Storage für Container
- Sicher und Supported
- Einfache Upgrades

Introducing Karbon

Nutanix's Managed Kubernetes service

Before enabling Karbon, make sure that any cluster on which you plan to use has 128 MiB of memory available.

You can find the documentation here.

Enable Karbon
• One-Click App Provisioning
• Application Lifecycle Management
• Multi-Cloud Orchestration
• Self-Service Portal
• Pre-integrated Blueprints
FLOW

- Native Virtual Networking & Security in AHV
- VM Microsegmentation
- Application Discovery & Visualization
- Network Automation and Service Insertion
- Secure VDI User Segmentation
Fragen und Antworten
Weiterführende Links & Hinweise

**Sessions**

14:00-15:00
AHV Hands-On
Raum Spectrum B

14:00-14:45
Nutanix DR Best Practices
Raum Spectrum A

14:00-14:45
Multi-Cloud Management und Automatisierung mit CALM
Raum Spectrum C

15:15-16:15
FLOW Hands-On
Raum Spectrum B

16:00-16:45
Best Practices für SAP HANA
Raum Spectrum A

**Veranstaltungen**

Für Endkunden:
07.03.2019
[Technology Bootcamp](#)
Office 129 ½ in Darmstadt

Für Partner:
19.-20.02.2019
Nutanix Consulting Partner Installation (NCPI) Bootcamp
Rhein-Main Gebiet

**Links**

The Nutanix Bible
Nutanix Community & Blog

Whitepaper:
AHV Enterprise Cloud Solution
AHV Best Practices
AHV Tech Note
AHV Networking
Best Practices: SAP HANA on Nutanix
Oracle on AHV
XenDesktop on AHV
Calm Tech Note
Flow
Beyond .NEXT – Continue the conversation

Follow Nutanix Nation on Twitter
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http://next.nutanix.com/
Danke!

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