VIRT1219QU

Architect Your Business
Critical Databases for Performance on Converged Infrastructure

Kannan Mani, HPE
Disclaimer

• This presentation may contain product features that are currently under development.
• 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 technologies or features discussed or presented have not been determined.
Kannan Mani

- WW Sr. Principal Product Manager & Architect – Enterprise Solutions, HPE
- 25+ years Enterprise Architecture and Oracle & SQL experience - Oracle RAC, ASM, Clustering, CRM, ERP, Business Intelligence, MS SQL Server, Performance and Scalable Enterprise Application Architecture, Benchmark and Performance, Technical solutions marketing and management, Virtualization and Cloud solutions.
- Data Management Solutions - Cloud Evangelist
- Microsoft Certified, Oracle ACE – Applications, DB
- VMware vExpert, VMware Certified Professional, Microsoft Certified System Engineer
- Author of Virtualizing Oracle Databases on vSphere (VMware Press Technology) with Don Sullivan – English and Chinese
- Recognized Speaker @ Oracle Open World, IOUG, VMworld, VMware Partner Exchange, EMC World and Webinars
- Industry recognized expert in Oracle and Virtualization technologies.
- Blog http://vmoracle.com
- LinkedIn https://www.linkedin.com/in/kannanmani
- Twitter @kantwit
Agenda

• Data landscape and Challenges
• Data Management – HPE VMware Solutions
  – HPE Hyper Converged
  – HPE Synergy
  – HPE Persistent Memory
  – Monster VMs with HPE Superdome X
• Support and Licensing
• Q&A
Data landscape and Challenges
The modern, data-driven enterprise organization

Data
Leverages all relevant data integrated across apps

People
Executives to line employees informed by all relevant data

Insights
Predictive analytics—proactive analytics apps on every platform

Achieves superior business outcomes
Inhibitors to becoming a data-driven organization

Database management is the cornerstone of data-centric foundations

Legacy architectures and infrastructure can’t handle the volume, velocity, or variety of today’s data

- 55% of decision makers lack complete information
- 51% of decision makers don’t receive the required information on time
- 24% of organizations use data for decision making all the time

Major factors hindering the use of data in decision making

Rigid, single-purpose infrastructures exist where mixed environments and workloads are needed

---

1"Delivering Data at the Speed of Business." Database Trends and Applications, April 2016.
Challenges in data management

**Escalating complexity**
- Database landscape
- Data growth
- Reduced performance

**High costs**
- Management
- Software licensing
- Missed opportunities

**Technology limitations**
- Aging infrastructure
- Scalability
- Availability
Business Critical Solutions

HPE & VMware
HPE’s Software-defined Data Center architecture and partner ecosystem

<table>
<thead>
<tr>
<th>Data Center Application Ecosystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Applications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Center Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded Management</td>
</tr>
<tr>
<td>Composable Infrastructure Management</td>
</tr>
<tr>
<td>Hybrid Cloud Management</td>
</tr>
<tr>
<td>HPE Cloud Service Automation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Center Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small and Midsize Business</td>
</tr>
<tr>
<td>Easy Connect Appliance</td>
</tr>
<tr>
<td>ProLiant Racks</td>
</tr>
<tr>
<td>ProLiant Towers</td>
</tr>
<tr>
<td>Hyper Converged</td>
</tr>
</tbody>
</table>

Composable Infrastructure ↔ HPE Synergy ↔ Fluid Resource Pools

Shared Engineering + Total Customer Experience and Quality + Customized Technical Services
Oracle and SQL Server solutions on HPE and VMware
HPE Hyper Converged Platform


SimpliVity for Microsoft SQL Server AlwaysOn Availability Groups

1. Best Practices for three Availability Groups architectures:
   A. High Availability (Synchronous)
   B. Disaster Recovery (Asynchronous)
   C. High Availability with Disaster Recovery

2. Accelerate failovers and minimize service disruptions for mission-critical applications

3. Mitigate service disruptions at the database level in the event of disasters or outages

4. Simplify failover and failback processes in multi-subnet environments
HPE Synergy and VMware Solutions
What’s available for Virtualization
VMware provisioning on Synergy with OneView

Today

OneView for VMware vCenter® 8.1

– Integration support for vCenter Server
– Health monitoring and alerting
– Deployment and grow cluster using ICSP
– Fabric visualization for VC network
– HPE Synergy Image Streamer support for VMware ESXi™

Coming soon

– ESX sizer
– Technical white paper for VMware on HPE Synergy and MS SQL Server 2016

HPE Synergy deployment time advantage
Provision 24-node VMware cluster*

* Physical operator time required to set up. BladeSystem and traditional rack values assume an administrator can reasonably work on 4 servers at once.
#1 VMmark 2.5.2—HPE Synergy 480 Gen9 Compute Module
10-node configuration demonstrates HPE performance engineering prowess

Why does it matter?
- VMware VMmark® 2.x captures the key performance characteristics of virtual platforms.*
- Each tile has a mail server, a web 2.0 database, web system, an e-commerce back-end database, front-end web layer, and an idle machine.*
- It is representative of real world environments running multiple workloads, and is hardware neutral.*

Key takeaways
- 41% better performance than the previous #1 result
- 20 more tiles / 160 more virtual machines (VMs) than previous #1 result
- No other vendor has exceeded an 8-node configuration—Synergy hits 10 nodes

Virtualization leadership with HPE Synergy 480 Gen9

VMware® VMmark® is a product of VMware, Inc. The competitive benchmark claims are based on having the #1 overall result with the HPE Synergy 480 Gen9 Compute Module configured as a 10-node system. VMmark 2.x results published as of 05-09-2017. All VMmark disclosures available at vmware.com/products/vmmark/results.html. See speaker notes for server configurations.

* FAQ for VMmark at vmware.com/products/vmmark/faq.html.
HPE Synergy is now certified for VMware vSAN
The first composable Infrastructure certified for vSAN

HPE Synergy—A perfect choice for vSAN

A core value prop of vSAN is that it aggregates all local storage disks—both SSD and HDD—available on the hosts (compute modules) into a single data store shared by all compute modules.

With traditional rack servers, compute and storage do not generally scale independently, but with HPE Synergy, you can scale storage and compute separately.

This makes it a perfect fit for vSAN solutions, allowing for storage capacity growth without requiring additional compute resources to host them.

Key Benefits:

- **Disaggregated storage and compute**
  - HPE Synergy with VMware vSAN provides the flexibility of thinly provisioning software-defined storage volumes, independent of compute resources.

- **High-Speed interconnect between frames**
  - HPE Synergy provides a flat east-west Ethernet topology. This allows iSCSI storage to be shared on a low-latency server-to-server connection, including between HPE Synergy frames.

- **Single infrastructure for any workload**
  - HPE Synergy helps enterprises run vSAN in a single infrastructure, addressing the needs of both traditional and emerging business applications.

See why HPE Synergy is a winning vSAN solution in the VMware blog

vSAN configuration details for our supported Ready Nodes visit the VMware vSAN Compatibility Guide for HPE
HPE Persistent Memory
HPE Gen10 Persistent Memory Portfolio
Performance of Memory – Persistence of Storage

HPE NVDIMMs
- HPE 16GB NVDIMM
- HPE 8GB NVDIMMs (Gen9)

HPE Scalable Persistent Memory
- Up to 1TB capacity at DRAM speeds

Slide best viewed in presentation mode
HPE Scalable Persistent Memory

Fastest performing persistent memory at terabyte scale

HPE Scalable Persistent Memory is an integrated storage solution that runs at memory speeds with terabyte capacity unlocking new levels of performance for your business workloads.

Ideal for:
- Enabling in-memory compute with persistence, faster checkpoints and restores, HTAP, software-defined storage caching tiers and any workload that could benefit from low-latency DRAM-level performance

Key Features:
- DRAM-level performance for fastest performing persistent memory
- Flexible capacity points with capacity up to 1TB
- Complete solution using DRAM for application performance, flash tier for persistence and backup power for moving data to persistent store
- Up to 13x reduction in database restart time preserving maximum uptime
- Up to 27x faster checkpoint operations enabling significantly faster business operations

---

1 HPE Internal Labs test. HPE Scalable Persistent Memory, restarting 1TB Database with MSFT SQL Hekaton prototype is as fast as restarting 200GB database, September, 2016. Up to 20x with SAS SSDs.
2 TPC-C Benchmark Throughput with Checkpoint (trans/sec). Calculated Time to Checkpoint and Restore a Docker Container running MySQL, compare Persistent Memory vs. SSD, March 31, 2017

Learn more: https://www.hpe.com/info/persistentmemory
HPE Superdome X and Monster VMs
Monster VMs with HPE Superdome X

HPE Superdome X
vSphere 6.0
240 Cores / 480 Threads
12 TB of RAM

IBM FlashSystem
20 TB of All Flash Storage

Scalability of 4 x 120 vCPU VMs on Single Server

<table>
<thead>
<tr>
<th>Number of VMs</th>
<th>vCPUs per VM</th>
<th>Virtual Sockets per VM</th>
<th>Total vCPUs Assigned on Server</th>
<th>Total Physical Threads On Server With HT Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>120</td>
<td>4</td>
<td>480</td>
<td>480</td>
</tr>
<tr>
<td>8</td>
<td>60</td>
<td>2</td>
<td>480</td>
<td>480</td>
</tr>
<tr>
<td>16</td>
<td>30</td>
<td>1</td>
<td>480</td>
<td>480</td>
</tr>
</tbody>
</table>

Support and Licensing
Oracle Support for VMware

- Oracle MyOracleSupport (Metalink) 249212.1 defines Oracle’s VMware support policy most broadly
  - “Oracle will only provide support for issues that either are known to occur on the native OS, or can be demonstrated not to be as a result of running on VMware”
  - VMware does not modify native OS
  - Oracle RAC included for 11.2.0.2 and above (Updated Nov 8, 2010)

- VMware support:
  - will accept accountability for any Oracle-related issue reported by a customer
  - will help drive the issue to resolution
  - [www.vmware.com/support/policies/oracle-support.html](http://www.vmware.com/support/policies/oracle-support.html)

- Oracle reserves the right to require reproduction of the problem on physical / virtual environments
  - on bare metal, if Oracle support suspects issue is caused by the underlying hardware then you can be requested to reproduce issue on another host.
  - is no different from the stance on virtualization with VMware. Key is to run certified OS on VMware
HPE Data Management Reference Architectures

- HPE Reference Configuration for Microsoft SQL Server 2016 on HPE Synergy composable infrastructure
- HPE Reference Architecture for Oracle 12c license savings with HPE 3PAR StoreServe All Flash and ProLiant DL380 Gen9
- HPE Reference Architecture for deploying Oracle 12c with HPE Synergy Image Streamer
- HPE Reference Architecture for HPE ProLiant DL580 Gen9 and HPE 3PAR StoreServ 8450: Consolidating multiple Oracle databases into a single instance Oracle database
- Improving Oracle Database performance with HPE Persistent Memory on HPE ProLiant DL380 Gen9
- HPE Reference Architecture for Microsoft SQL Server 2016 Operational Analytics on the HPE ProLiant DL580 Gen9
- HPE Reference Architecture for Microsoft SQL Server 2014 on HPE 3PAR Storage with Disaster Recovery

Check out all Data Management Reference Architectures: www.hpe.com/info/dm-RA
Thank You

kannan.mani@hpe.com
HPE Gen10 Persistent Memory solutions: Use Cases and Demos

- Reducing database storage bottlenecks
  - ORACLE OLTP
  - Reducing ORACLE Licensing Cost
  - SQL Server Tail Of Log
  - POSTGRES OLTP
  - redis Performance
  - redis Replication

- In-memory compute with persistence
  - HEKATON SQL Server Rapid Restart

- Virtualization
  - VMware ESXi
  - Linux VMware Guest
  - Windows VMware Guest
  - SQL Server VMware Guest

- Software-defined storage acceleration
  - Storage Spaces Direct

- Faster Checkpoints and Restores
  - MySQL Performance
  - docker Performance

- Faster HTAP – Transactions + Real Time Analytics
  - OLTP + OLAP = HTAP

- 3D Graphics and Data Processing
  - OpendTect

- Mail Server and Calendaring
  - Exchange

- Reducing Licensing Cost
  - Linux
  - SQL Server

- Performance
  - Windows
  - SQL Server

- Licensing Cost
  - VMware

- Software-defined storage
  - Acceleration

- Faster Checkpoints
  - Restores

- HTAP
  - Analysis

- Mail Server
  - Exchange

- Linux
  - Guest

- Windows
  - Guest

- SQL Server
  - Guest
Please fill out your survey.

Take a survey and enter a drawing for a VMware company store gift card.
Thank You

vmworld 2017

vmware