

Choosing a Hypervisor

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Camiel Vanderhoeven | Chief Architect & Strategist

Vision

By linking the past to the future, we help OpenVMS users to protect and realize the full value of their application investments.

Mission

We combine leading edge technology and new industry standards with OpenVMS systems to provide our customers and partners with choice and opportunity to profitably prioritize business needs.

Agenda

1 OpenVMS and Virtualization

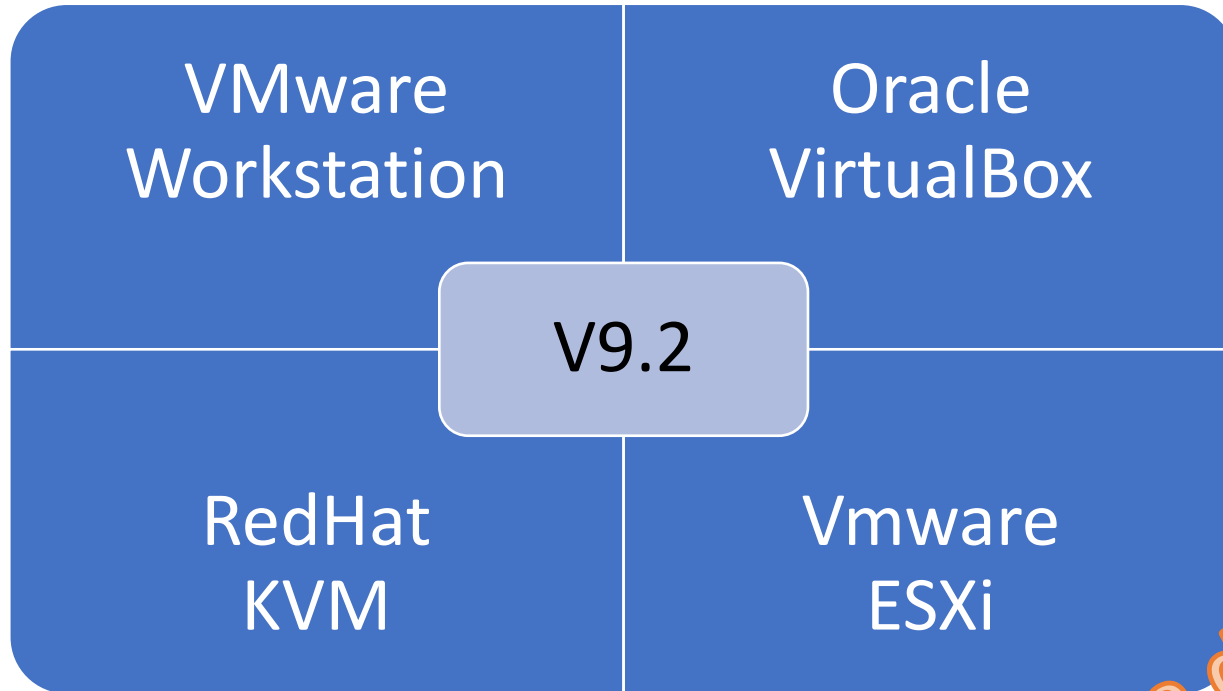
2 Hardware

3 Hypervisors

4 Clustering and Shared Storage

OpenVMS and Virtualization

OpenVMS and Virtualization



“Don’t be different”

OpenVMS and Virtualization

Vision:

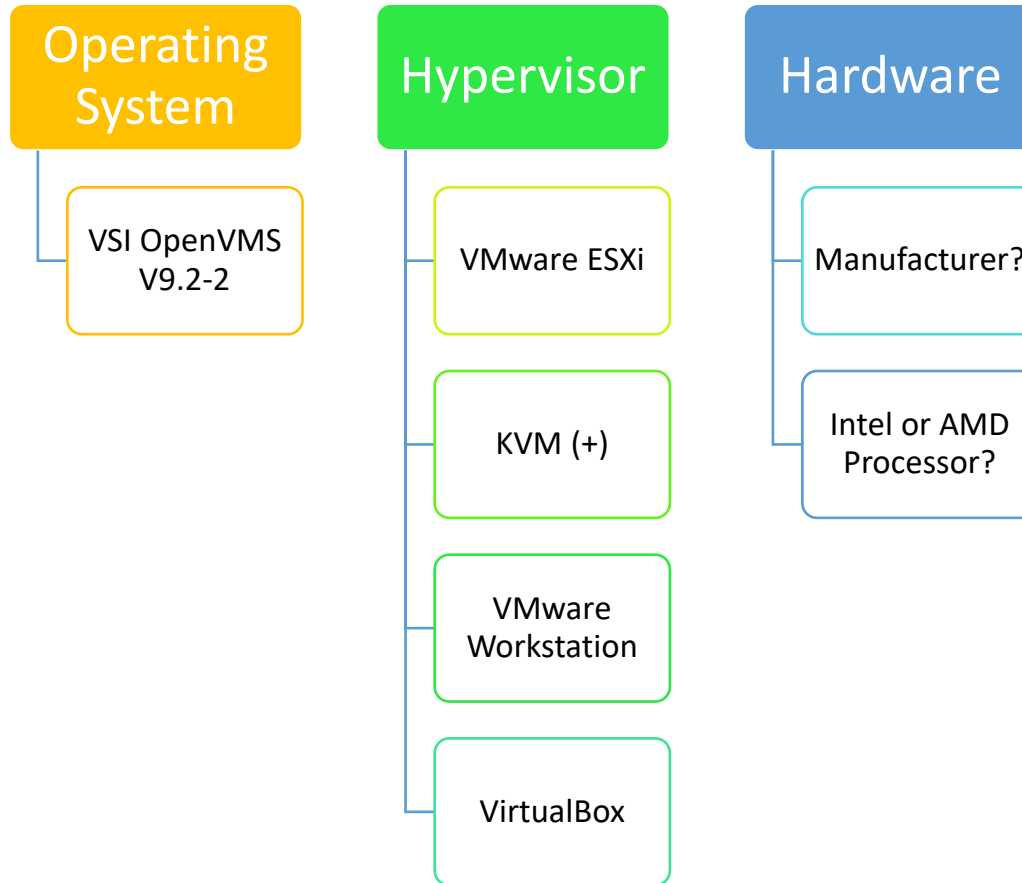
Get rid of HW altogether and run VMS out of the cloud

Offer OpenVMS in at least one prominent public cloud service

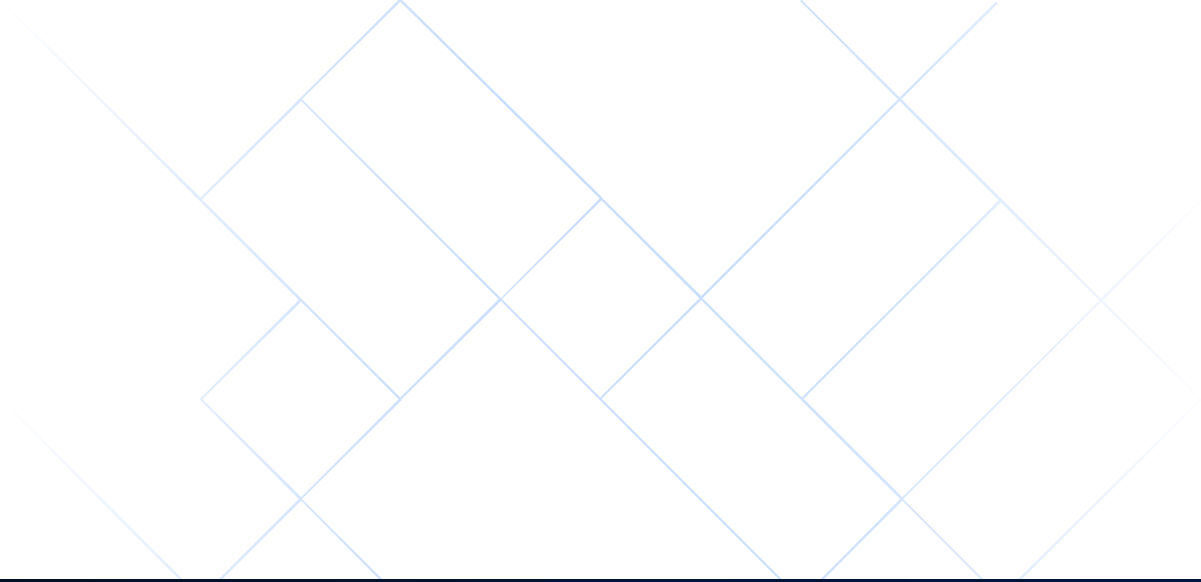
OpenVMS server no longer „the lonely box in the corner of the data centre“

“Don't be different”

Choices to be Made



Hardware



Choices: Hardware Manufacturer

Hypervisors mask most hardware differences from virtual machines.

In our lab, and on developer's test systems, we've run OpenVMS on x86 systems from numerous different brands.

So you can choose the same brand of server you already have for your other x86 systems.



Choices: Hardware Manufacturer

Hyper
mask
hard
differ
from v
mach

In our lab, and
on developer's

Exception: for FibreChannel
Passthrough in V9.2-3, we will
only support certain HPE
provided FibreChannel HBA's.

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brands.

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Choices: Processor

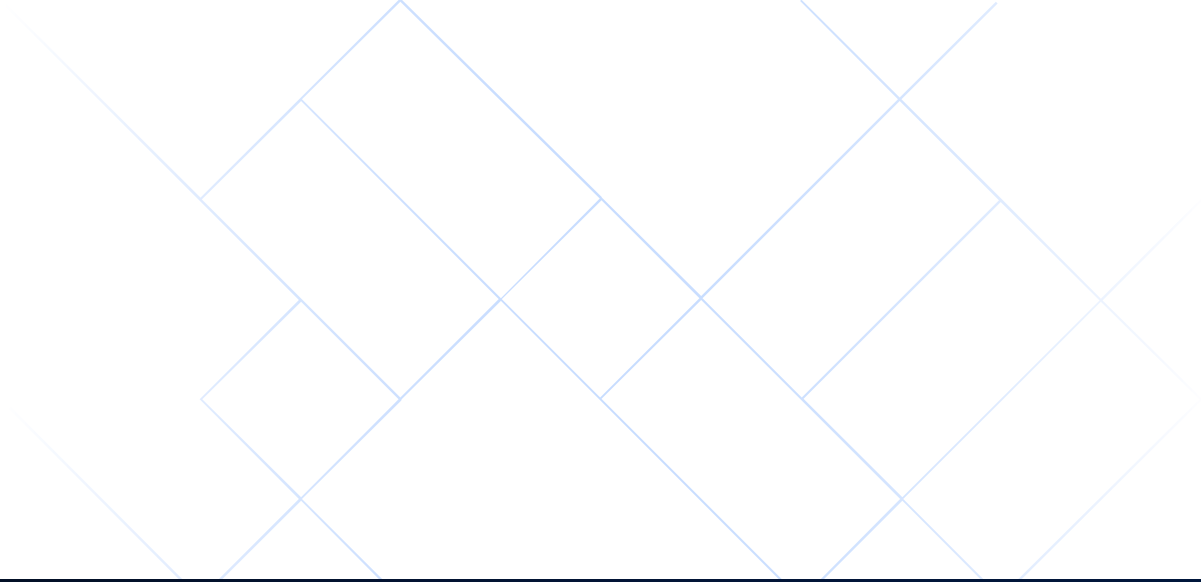
Practically all Intel and AMD x86 processors sold during the last decade are supported.

More recent processors have more capabilities that may provide a performance benefit for OpenVMS.

- OpenVMS adapts to processor capabilities by enabling different codepaths in `SYSTEM_PRIMITIVES`.

OpenVMS supports up to 64 CPU cores.

Hypervisors



Hypervisor Types

Type 1 (native)

- **VMware vSphere/ESXi**
- **KVM / Proxmox VE**
- XEN
- Microsoft Hyper-V



Faster



More
robust

Type 2 (operating-system based)

- **VMware Workstation, Fusion**
- **Oracle VirtualBox**
- Microsoft VirtualPC
- HPVM (Integrity)



Easier

Type 1 Hypervisors

VMware ESXi	“Plain” KVM	KVM “+” (Proxmox, Nutanix)
Paid, closed-source	Free open-source software. Paid support available from Redhat, Oracle, ...	Free open-source software. Paid support available from supplier
Easier to manage	Difficult to manage	Easier to manage
Limited Hardware Compatibility List	Supported on more different hardware	Supported on more different hardware
Little bit less performant	Slightly better performance	Slightly better performance
Clustering (HA, DRS), requires additional licenses	Limited clustering capability (based on vendor)	Clustering (HA, DRS)

Type 2 Hypervisors

VMware Workstation, Fusion	VirtualBox
Paid, closed-source	Free open-source software
Better performance	Worse performance
Little bit easier to manage	Little bit more difficult to manage

Why no Hyper-V Support?

Other hypervisors

- Provide emulated devices and controllers
- *Optionally* provide virtualized I/O interfaces
- OS can be booted with standard device drivers
- Virtualized I/O drivers can be developed and debugged in a running system

Hyper-V

- Does not provide emulated devices or controllers
- *Only* provide virtualized I/O interfaces
- New drivers must be developed before you can even boot



Oracle Licensing Considerations

If you are running Oracle Rdb or Codasyl on Oracle Linux KVM...

- You only pay the Oracle license cost for the number of CPU cores assigned to your Virtual Machine

If you are running Oracle Rdb or Codasyl on any other hypervisor...

- You pay the Oracle license cost for all the CPU cores in the host machine(s)

Security Considerations

No virtual machine is more secure than the hypervisor it runs on.

- VMware ESXi offers utilities to guarantee conformance with HIPAA, CJIS, PCI DSS, etc.
- For KVM, configuring Security Enhanced Linux makes the hypervisor more secure.
- For Type 2 Hypervisors, securing the host OS is very important.

Perhaps most important is to secure access to the OpenVMS console (OPA0).

- Use SSH, pipe or Guest Console (V9.2-3)

Clustering and Shared Storage

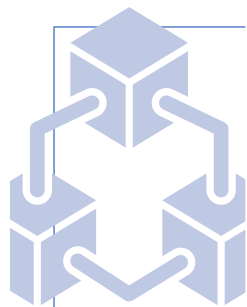
Clustering with X86

View of Cluster from system ID 1041 node: LOBSTA

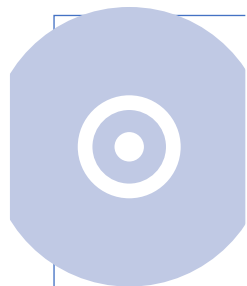
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SYSTEMS			MEMBERS		
NODE	HW_TYPE	SOFTWARE	VOTES	STATUS	TRANSITION_TIME
LOBSTA	HP rx2800 i4 (2.13GHz/24.0MB)	VMS V8.4-2L1	1	MEMBER	19-JUL-2023 17:59
GLX2	hp AlphaServer ES47 7/1150	VMS V8.4-2L2	1	MEMBER	10-AUG-2023 09:36
PTRBRO	HP rx2800 i2 (1.60GHz/5.0MB)	VMS V8.4-2L1	1	MEMBER	10-AUG-2023 06:54
UKLELE	HP rx2800 i2 (1.60GHz/5.0MB)	VMS V8.4-2L1	1	MEMBER	15-JUL-2023 14:17
BULOVA	VMware, Inc. VMware20,1	VMS V9.2-1	1	MEMBER	26-SEP-2023 22:53
BAXTER	HP rx2800 i2 (1.60GHz/5.0MB)	VMS V8.4-2L1	1	MEMBER	15-JUL-2023 14:58
HIKENH	HP rx2660 (1.67GHz/9.0MB)	VMS V8.4-1H1	1	MEMBER	15-JUL-2023 14:16
MTMERU	hp AlphaServer ES47 7/1150	VMS V8.4-2L2	1	MEMBER	15-JUL-2023 19:11
SWEETT	HP rx2800 i4 (2.13GHz/24.0MB)	VMS V8.4-2L1	1	MEMBER	9-AUG-2023 11:37
ANCHOR	VMware, Inc. VMware20,1	VMS V9.2-1	1	MEMBER	15-AUG-2023 23:20
MINION	VMware, Inc. VMware20,1	VMS V9.2-1	1	MEMBER	26-SEP-2023 22:02
ALDUIN	VMware, Inc. VMware20,1	VMS V9.2-1	1	MEMBER	26-SEP-2023 21:12
DRAGON	AlphaServer DS15	VMS V8.4-2L1	1	MEMBER	15-JUL-2023 17:53

Clustering with X86: Today



Clustering x86 nodes with Alpha and Itanium nodes works.



At this moment, accessing shared disks is only possible over MSCS.

Fibre Channel in V9.2-3

Direct access to shared SAN storage

- HPE 16 Gbit HBA
- Approved storage array
- VMware ESXi only
- Minimum 1 HBA per VM required
- No Boot Support

Fibre Channel beyond V9.2-3

Direct access to shared SAN storage

- HPE 32 Gbit HBA
- Approved storage array
- VMware ESXi or KVM
- Minimum 1 HBA per VM required
- Booting from SAN (shared system disk)

Investigating iSCSI

Direct access to shared SAN storage

- TCP/IP Based
- No additional restrictions on host
- VMotion and Live Migration possible
- Not compatible with current SAN storage

Thank you