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Oracle Database Support for Server Virtualization

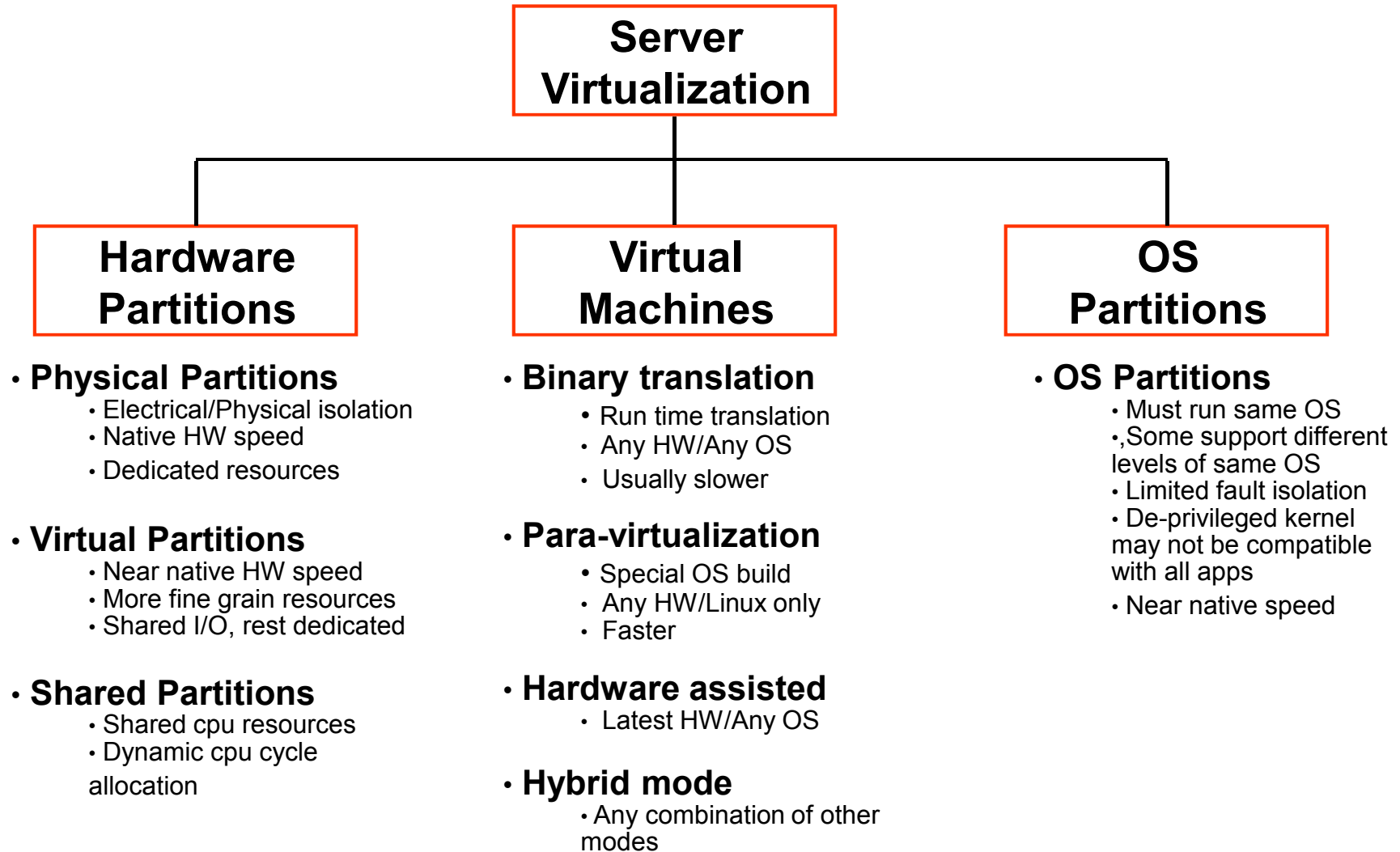
Updated December 7, 2009



Support Policy

- Server virtualization software allows multiple operating system instances to run on the same server. Oracle provides this functionality for x86 platforms with its Oracle VM offering. Several third parties also have offerings that provide similar functionality. This document describes support provided by Oracle for its software running in third party server virtualization solutions.
- Except as described in this document Oracle does not test or certify third party server virtualization solutions.
- For Oracle customers running supported third-party server virtualization solutions, which have been certified with Oracle Software products, Oracle will provide equivalent level support to what is available for the native hardware, and jointly work with the virtualization vendor to resolve any problems¹.
- For Oracle customers running other third-party server virtualization solutions which have not been certified with Oracle software products. Oracle will provide support for issues that are known to occur on the native OS, or can be demonstrated not to be a result of running on the server virtualization software. Oracle may request that the problem be reproduced on the native hardware.
- RAC only supported on validated configurations

Server Virtualization Technologies





Dynamic Operations

- **Available on native hardware**

- 1. CPU resources**

- Add/remove cpu(s)
- Increase/reduce cpu cycles

- 2. Memory resources**

- Add/remove memory

- 3. I/O resources**

- Add/remove I/O card
- Add/remove device

- **New capabilities**

- 1. VM migration**

- Online migration of a virtual machine

- 2. Save/Restore**

- Stop -> Save -> Restore
- Instant Save -> Restore

ISV Support Levels (Sx)

1. Static Configuration Support

- The program runs in a static virtual environment. Dynamic operations are not supported.

2. Dynamic Reconfiguration Safe

- The program does not fail as a result of resource changes (CPU, memory, I/O).

3. Dynamic Reconfiguration Aware

- The program is designed to recognize and dynamically adapt to resource changes (CPU, memory, I/O).

4. Optimized and integrated

- The program has been modified to deliver new or optimized capabilities in a virtualized environment.

Never
Changes



Infrequent
Changes



Frequent
Changes

Supported Virtualization Solutions

VENDOR	Product	Virtualization Type	Processor Platform	Operating System(s)	Hard Partition Licensing	Basic Support		Live Migration	
						DB	RAC	DB	RAC
Oracle	Oracle Virtual Machine	Virtual Machine (PV, HVM, Hybrid)	X86, X64	Linux	Pinned Only	Yes	Yes ^{2,3}	Yes ¹	Test
		Virtual Machine (HVM, Hybrid)		Windows	Pinned only	Test	No	Test	No
HP	nPar	Physical Partition	IA, PA	HP-UX	Yes	Yes	Yes	N/A	N/A
	vPar	Virtual Partition	IA, PA	HP-UX	Yes	Yes	Yes	N/A	N/A
	Integrity Virtual Machines	Virtual Machine	IA	HP-UX	Capped only	Yes	No	N/A	N/A
IBM	Dynamic LPAR	Virtual Partition	Power	AIX	Yes	Yes	Yes	Yes	Test
	Micro-partitions	Shared Partition	Power	AIX	Capped only	Yes	Yes	Yes	Test
	VIO Server	Shared I/O	Power	N/A	N/A	Yes	Yes	N/A	N/A
	WPAR	OS Partition	Power	AIX	No	Yes	No	No	No
	zVM	Shared Partition	zSeries	Linux	No	Yes	Yes	N/A	N/A
SUN	Dynamic System Domains	Physical Partition	Sparc	Solaris	Yes	Yes	Yes ²	N/A	N/A
	Logical Domains	Virtual Partition	Sparc	Solaris	No	Yes	Yes	N/A	N/A
	Local Solaris Containers	OS Partition	Sparc, X86, X64	Solaris	Capped only	Yes	Yes	N/A	N/A

1 - Supported with Oracle 11.1.0.7
 2 - Static support only.
 3 - PV mode only.

Save/Restore of a running database not yet supported.

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Not all Oracle database releases supported in each environment. Please check certify tab of metalink.oracle.com for release specific info

Special considerations for NUMA

- **NUMA is enabled by default with NUMA capable environments**
 - When the database detects multiple cells at startup, NUMA mode is automatically enabled
 - NUMA detection is based on H/W or OS APIs, depending on platform.
 - NUMA mode should never be used in shared cpu environments
- **NUMA can be disabled by setting the following init.ora parameters:**
 - `_enable_numa_optimization = 'FALSE'`
 - `_db_block_numa = 1`
- **When enabled ccNUMA imposes some restrictions on dynamic reconfiguration support, these are:**
 - Only cells visible at startup will be ccNUMA optimized, these are called base cells
 - Dynamic reconfiguration during startup and shutdown is not supported.
 - Dynamic reconfiguration during normal operations is limited as follows:
 - Cells, cpus and memory can be added anytime
 - Base cells must not be removed.
 - The last cpu on a base cell must not be removed.
 - Floating cells (added after last DB startup) can be removed.
 - Note: there is no way to distinguish between base and floating cells.
- **Automatic dynamic reconfiguration (i.e. as provided by WLM tools) must be disabled.**



Oracle VM - Single Instance Database Support

- **Configuration**
 - Oracle Database 10.2.0.3 and above
 - Guest OS : Oracle Enterprise Linux 4.x, 5.x
Red Hat Linux 4.x, 5.x
 - Support for both 32 and 64 bit
 - Oracle VM 2.1 and above
 - Support for both para-virtualized (PV) and hardware virtualized (HV) modes
 - Use PV drivers in both modes
- **Support for Windows guests and Live Migration is currently planned on Oracle Database 11.1.0.7 only once testing is completed.**



Oracle VM - RAC Database Support

- **Configuration**

- Oracle Database 10.2.0.4 or above
- Guest OS : OEL or RHEL 5.1 or above
- Support for 32 and 64 bit modes
- Oracle VM 2.1.5 or above
- Only para-virtualized mode supported
- Static mode support only
 - Live Migration, dynamic resource changes (CPU/Memory) currently not supported

- **Configuration Best Practices**

- Each RAC node must be deployed on a separate physical server for production environments
- Use physical block devices for database files
- CPU over-commit up to 2 times is supported but not recommended.