Oracle Partitioning Policy

Topic: Server/Hardware Partitioning

What is Partitioning?

"Partitioning" occurs when the CPUs on a server are separated into individual sections where each section acts as a separate system. Sometimes this is called "segmenting." There are several hardware and software virtualization technologies available that deliver partitioning capabilities, with varying degree of resource allocation flexibility.

The purpose of this policy document is to define which of these partitioning technologies is deemed to be Soft, Hard or an Oracle Trusted Partition, and under what conditions Oracle permits them as a means to determine or limit the number of Oracle Processor licenses required for a given server, i.e., to license a sub-capacity of total physical cores as an exception from the contractual Oracle Processor definition. Oracle may modify the definitions and conditions specified in this document from time to time.

Why Partition?

Database Administrators (DBAs) often partition servers to achieve the following benefits:

- Ability to run multiple operating systems, or multiple versions of an operating system, on the same server
- Ability to improve workload balancing and distribution by managing processor allocations across applications and users on the server
- Ability to leverage hardware models such as "Capacity on Demand" and "Pay As You Grow."

Types of Partitioning

There are two main types of partitioning available:

Soft Partitioning:

Soft partitioning segments the operating system using OS resource managers. The operating system limits the number of CPUs where an Oracle database is running by creating areas where CPU resources are allocated to applications within the same operating system. This is a flexible way of managing data processing resources since the CPU capacity can be changed fairly easily, as additional resource is needed.

Examples of such partitioning type include: Solaris 9 Resource Containers, AIX Workload Manager, HP Process Resource Manager, Affinity Management, Oracle VM, and VMware.

Unless explicitly stated elsewhere in this document, soft partitioning (including features/functionality of any technologies listed as examples above) is not permitted as a means to determine or limit the number of software licenses required for any given server or cluster of servers.

Hard Partitioning:

Hard partitioning physically segments a server, by taking a single large server and separating it into distinct smaller systems. Each separated system acts as a physically independent, self-contained server, typically with its own CPUs, operating system, separate boot area, memory, input/output subsystem and network resources.

Oracle-approved hard partitioning technologies as listed in this section of the policy document are permitted as a means to limit the number of software licenses required for any given server or a cluster of servers. Oracle has deemed certain technologies, possibly modified by configuration constraints, as hard partitioning, and no other technology or configuration qualify. Approved hard partitioning technologies include: Physical Domains (also known as PDomains, Dynamic Domains, or Dynamic System Domains), Solaris Zones (also known as Solaris Containers, capped Zones/Containers only), IBM's LPAR (adds DLPAR with AIX 5.2), IBM's Micro-Partitions (capped partitions only), vPar (capped partitions only), nPar, Integrity Virtual Machine (capped partitions only), Secure Resource Partitions (capped partitions only), Fujitsu's PPAR. All approved hard partitioning technologies must have a capped or a maximum number of cores/processors for the given partition.

Using IBM processors in TurboCore mode is not permitted as a means to reduce the number of software licenses required; all cores must be licensed.

IBM Power VM Live Partition Mobility is not an approved hard partitioning technology. All cores on both the source and destination servers in an environment using IBM Power VM Live Partition Mobility must be licensed.

Oracle Linux KVM or Oracle VM Server may be used as hard partitioning technology only as described in the following documents:

- Oracle Linux KVM, only if specific cores are allocated per the following document:
    - https://www.oracle.com/a/ocom/docs/linux/ol-kvm-hard-partitioning.pdf
- Oracle VM Server for x86, only if specific cores are allocated per the following document:
    - http://www.oracle.com/technetwork/server-storage/vm/ovm-hardpart-168217.pdf
- Oracle VM Server for SPARC, only if specific cores are allocated per the following document:
    - http://www.oracle.com/technetwork/server-storage/vm/ovm-sparc-hard-partitioning-1403135.pdf

Oracle Solaris Zones may be used as hard partitioning technology only as described in the following document:

- http://www.oracle.com/technetwork/server-storage/solaris11/technologies/os-zones-hard-partitioning-2347187.pdf

Oracle Trusted Partitions for Oracle Engineered Systems

For approved Oracle Engineered Systems, (see table below), Oracle permits the use of Oracle VM Server (OVM) or Oracle Linux KVM as a means to limit the number of Oracle Processor licenses required, i.e., to license a sub-capacity of total physical cores. Oracle's Trusted Partitions policy also requires use of Oracle Enterprise Manager, with the exception of Private Cloud Appliance X9-2 and later, as described below – if both of these conditions are met, the partition is deemed a 'Trusted Partition.'

Approved list of Oracle Engineered Systems eligible for Trusted Partitions

Oracle Engineered System	Version requirement
Exalogic Elastic Cloud	running 2.x or higher Exalogic Elastic Cloud Software
Exalytics In-Memory Machine	running Exalytics Base Image 1.0 for Oracle VM
Private Cloud Appliance	running 1.0 or higher Oracle Private Cloud Appliance controller software
Exadata Database Machine	running 12.1.2.1.0 or higher Exadata Storage Server Software

For the purposes of licensing Oracle programs in a Trusted Partition, two (2) virtual CPUs (vCPU) are counted as equivalent to a physical core. Licenses must be procured in increments of 2 physical cores.   The customer is required to license the highest number of vCPUs running at any given time (highwater mark), however they are not required to license more than the total number of physical cores in the machine. Hyper-threading must be enabled for processors when using Trusted Partitions.

The licensing rules for Trusted Partitions varies across the supported Engineered Systems listed in the table above. For information on Trusted Partitions on Exadata (including minimum cores to be licensed), please see Oracle Exadata Database Machine Licensing Information User's Guide. The minimum for all other engineered systems is two (2) physical cores.

Requirements for Oracle Enterprise Manager

For virtual machines to participate under Oracle Trusted Partition based licensing, they need to be monitored by Oracle Enterprise Manager, except for Private Cloud Appliance 3.01 and later. This means that the Oracle Enterprise Manager agent should be deployed on the guest operating system running on those VMs. For details on how to configure trusted partitioning, refer to the My Oracle Support Note Doc ID 2814712.1

For Private Cloud Appliance X9-2 and later, a different mechanism is used to support Trusted Partitions. For details on how to configure trusted partitions on that system, refer to the My Oracle Support Note Doc ID 2833293.1

Capacity on Demand

Oracle recognizes a practice in the industry to pay for server usage based on the number of CPUs that are actually turned on – the "Capacity on Demand," or "Pay as You Grow" models. Oracle allows customers to license only the number of cores that are activated when the server is shipped. Capacity on Demand is also available on certain Oracle Engineered Systems. Check with your Oracle sales representative for more information.

Note: Oracle does not offer special licensing terms for server usage models where the number of CPUs used can be scaled down or their usage varied – the "Pay Per Use" or "Pay Per Forecast" models.

Customers should check with their applicable hardware vendors to determine whether soft and/or hard partitioning is available on their servers.

Topic: Containers and Kubernetes Clusters

Containers and Kubernetes Clusters

Oracle Programs may be running in containers (e.g. Docker containers) that leverage the Linux kernel and Linux container technologies. These containers may be running in physical or virtual hosts, possibly in Kubernetes nodes in Kubernetes clusters. The purpose of this section of this policy document is to define under what conditions Oracle requires licenses for these hosts or Kubernetes nodes that may run Oracle Programs in such containers. This section of this policy document does not apply to Solaris Containers, Solaris Zones or Windows Containers.

Once a container image (e.g. a Docker image) containing Oracle Programs has been pulled to a host, or to a Kubernetes node in a Kubernetes cluster, (either a virtual machine or a physical machine), that host or Kubernetes node must be licensed for the Oracle Programs for the number of processors on that host or Kubernetes node. If the host or Kubernetes node is a physical machine, the number of processors on that host or Kubernetes node equals the

number of processors on that physical machine. If the host or Kubernetes node is a virtual machine, then the number of processors on that host or Kubernetes node is subject to the guidelines documented in this Partitioning Policy.

To limit the number of nodes in Kubernetes clusters, please refer to the following document:

- https://www.oracle.com/a/tech/docs/running-and-licensing-programs-in-containers-and-kubernetes.pdf