



IAITAM ACE

May 7-9, 2024 The M Resort  Las Vegas, NV

Oracle Database Licensing and Best Practices for
Optimal Usage

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Oracle Corporation

Software Investment Advisory (SIA)



Finding your IAITAM Oasis

- General Database Licensing Rules
- Partitioning
- Virtualization
- Cloud Computing
- Choosing the Right License Metric
- Calculating License Requirements
- Know The Oracle Programs
- Optimization Opportunities
- Use Cases For Available Licenses
- Oracle and Microsoft Partnership



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Software Investment Advisory – Value Add



Investment Economics

“How is our Oracle investment supporting the long-term goals of the business?”



Knowledge Transfer

“Can you help us understand our license and subscription terms and conditions?”



Entitlement Intelligence

“How do we find out the current state of our contractual agreements with Oracle?”



Cloud Investment Services

“What do we need to consider when moving parts of our existing environment to the cloud?”



Deployment and Consumption Optimization

“How do we find if our Oracle TCO is optimized across on-premises and cloud?”



Finding your ITAM Oasis

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Here are some scenarios where SIA can deliver real value:



Cloud Migration

Take advantage of all the benefits cloud has to offer. Get expert support to drive down IT costs, increase security and accelerate deployments. We can help you develop a cloud migration plan and give advice and guidance throughout your migration project.



Adoption and Rollout

We'll assess how you use your on-premises and cloud resources to help you maximize their value. With full FinOps cloud support, we'll compare your environment with best-practice models and show you how you can extract greater value from your Oracle investments.



M&A Integration

Use our actionable, data-driven insights to create a targeted plan for M&A technology integration based on a clear view of your enterprise. We'll help you generate efficiencies and make recommendations on how your Oracle investment can best support your M&A success.



Strategic IT Review

Learn where you can unlock more value from your investments to turbocharge long-term growth. You'll get detailed information about how and where Oracle is being used across your organization and highlight any areas to get more value from your Oracle investment.



Enterprise Agreements

Learn how new licensing structures and changes to existing infrastructure can deliver a better return on your investment. SIA can work with you to access your future needs and discuss what available Oracle solutions would provide the most value to your business.



*Finding your
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General Technology Licensing Rules

All environments where an Oracle Technology program is **installed and/or running** must be licensed

This includes:

- Production
- Development
- Test
- Standby



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General Technology Licensing Rules



- Processor
- Named User Plus (NUP)
- OCPU



- Full Use
- Restricted or Limited Use
- Application Specific Full Use (ASFU)
- Embedded Software Licenses (ESL)
- Limited use licenses for proprietary application hosting



- Perpetual
- Subscriptions In Cloud



- Software Update License & Support
- Extended Customer Support
- Advanced Customer Support



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Current License Metrics

- Processor
 - Used in environments where *users are uncountable*
 - Based on the number of *processors cores (EE)* or sockets (SE ,SE1 and SE2)* in the physical server where the Database is installed and/or running
- Named User Plus (NUP)
 - Used in environments where *users can be counted at the multiplexing front end*
 - Based on authorized users and non-human operated devices accessing the Database



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Processor License Definition

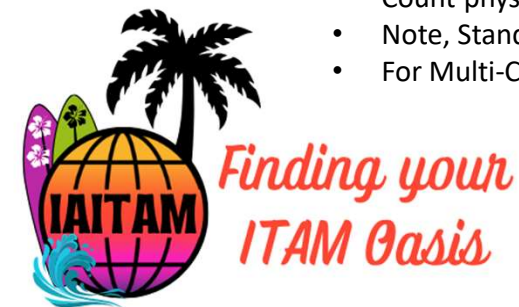
Processor: shall be defined as **all processors where the Oracle Programs are installed and/or running**. Programs licensed on a processor basis may be accessed by Your internal users (including agents and contractors) and by Your third party users. The number of required licenses shall be determined by **multiplying the total number of cores of the processor by a core processor licensing factor** specified on the Oracle Processor Core Factor Table which can be accessed at <http://oracle.com/contracts>. All cores on all multicore chips for each licensed Program are to be aggregated before multiplying by the appropriate core processor licensing factor and all fractions of a number are to be rounded up to the next whole number. When licensing Oracle Programs with Standard Edition 2, Standard Edition One or Standard Edition in the product name (with the exception of WebCenterEnterprise Capture Standard Edition, Java SE Subscription, Java SE Support, Java SE Advanced, and Java SE Suite), a processor is counted equivalent to an occupied socket; however, in the case of multi-chip modules, each chip in the multi-chip module is counted as one occupied socket.

Database Enterprise Edition

- Count total physical processor cores and apply core factor
- Total number of CPU cores * Core Factor = Number of Processor licenses required

Database Standard Editions(Database SE/SE1/SE2)

- Count physical, occupied sockets of the machine, no cores are counted or core factor applied
- Note, Standard Edition 2 may only be licensed for servers with a maximum of 2 CPU sockets
- For Multi-Chip Modules each chip is counted as an occupied socket



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Deployment Scenario: Stand Alone Server



Oracle Database Edition: Enterprise
License Metric: Processor

Oracle Database Edition	Stand Alone Server	Processor Make/Model	Physical Processors	Cores Per Processor	Cores Factor	Oracle Processor Licenses Required
						
Enterprise	Dell	Intel Zeon E5-2620	2	10	.5 =	?



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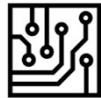
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Deployment Scenario: Stand Alone Server



Oracle Database Edition: Enterprise
License Metric: Processor

Oracle Database Edition	Stand Alone Server	Processor Make/Model	Physical Processors	Cores Per Processor	Cores Factor	Oracle Processor Licenses Required
						
Enterprise	Dell	Intel Zeon E5-2620	2	10	.5 =	10



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Named User Plus Licensing

Named User Plus: is defined as an individual authorized by you to use the programs which are installed on a single server or multiple servers, regardless of whether the individual is actively using the programs at any given time. A non human operated device will be counted as a named user plus in addition to all individuals authorized to use the programs, if such devices can access the programs. If multiplexing hardware or software (e.g., a TP monitor or a web server product) is used, this number must be measured at the multiplexing front end. Automated batching of data from computer to computer is permitted. You are responsible for ensuring that the named user plus per processor minimums are maintained for the programs contained in the user minimum table in the licensing rules section; the minimums table provides for the minimum number of named users plus required and all actual users must be licensed.

License **all individuals** and **non-human operated devices** accessing the program or the license minimum, **whichever is greater** regardless of whether they are using the program or not.



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Named User Plus Licensing

Minimums

DB Enterprise Edition	25	NUP per Processor *
DB SE and SE One	5	NUP
DB SE2	10	NUP per Server **
*Taking into account Oracle's Processor definition		
**Taking into account Oracle's Server definition		

Core Factor Rounding

If rounding is required, total all license requirements and then **round up**.

Example 1: 3 IBM P5 with 1 dual core chips each, licensing for Database EE

- Total Cores in the environment for IBM = $3 * 1 * 2 = 6$
- Current IBM licensing processor core factor of 0.75. $\Rightarrow 6 * 0.75 = 4.5 \rightarrow 5$ licenses?

Example 2: 1 Sun Fire server with 1 dual core chips each, licensing for Database EE.

- Total Cores in the environment for Sun = $1 * 1 * 2 = 2$
- Current licensing processor core factor of 0.75. $\Rightarrow 2 * 0.75 = 1.5 \rightarrow 2$ licenses?

Total license requirement is 6 Processors: $8 * .75 = 6$

- If I rounded up separately, it would have come to 7 Processors
- Minimum for DB EE would be $6 * 25 = 150$ Named User Plus
- If I rounded up separately, it would have come to 175 Named Users



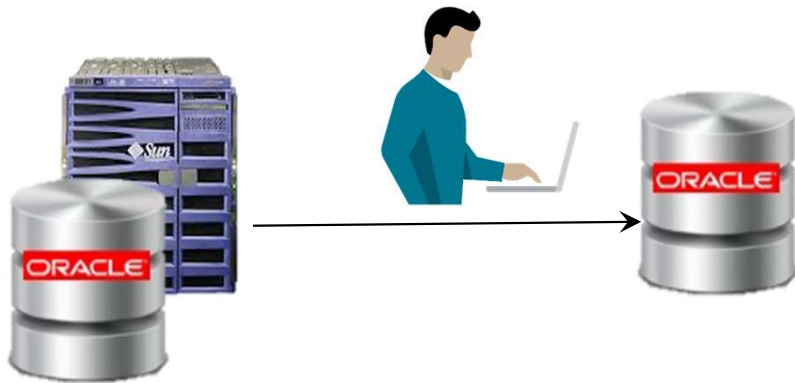
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Data Recovery

Backup



Backup Configuration

- Database **data** files of the primary database are stored on tape/disk media
- Data is restored from backup stored on media to the repaired production server

Licensing

If the customer restores the backed up data files onto **an alternative machine (a backup server)** while the production server is inoperative, the backup server must be fully licensed.

Right to run the program on an unlicensed computer

- for **testing physical copies of backups**
- for up to four times, not exceeding 2 days per testing, in any given calendar year
- Right is not applicable for any other data recovery method - such as remote mirroring - where the Oracle program binary files are copied or synchronized



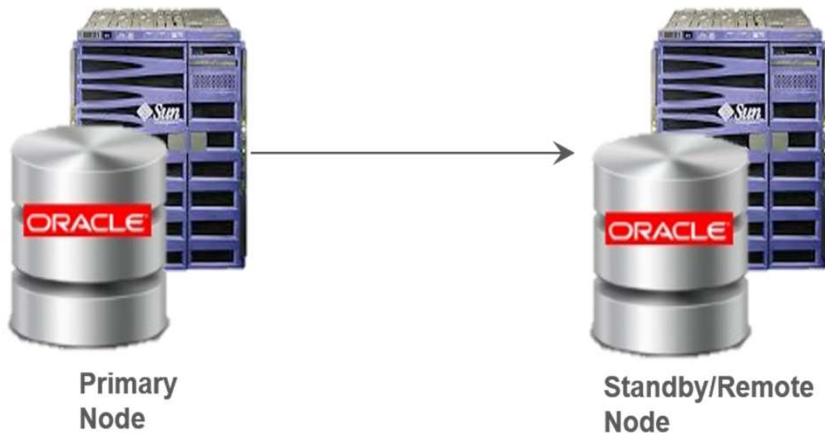
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Data Recovery

Copying, Synchronizing, Mirroring: Standby & Remote Mirroring



Standby/Mirroring Configuration

- Data (and optionally Oracle binaries) are **copied to or synched with** another server
- In case of failure of Primary Node, Standby/Remote Node acts as primary node

Licensing

All Oracle programs that are installed and/or running must be licensed per standard policies

- includes installing Oracle programs on the DR server(s) to test the DR scenario.

Licensing metrics and program options on Production and Data Recovery/Secondary servers must match



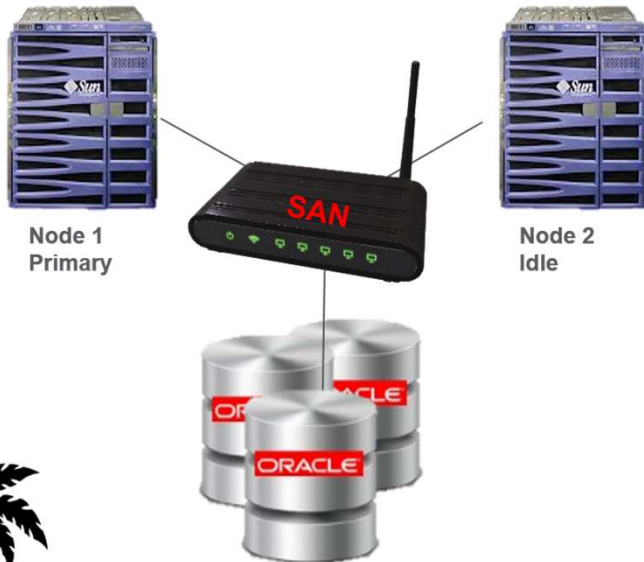
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Data Recovery

Clustered Environment (Failover)



Failover configuration

- Clustered Deployment of several machines
- Multiple Servers
- ONE Single Storage / SAN

Right to run programs on **ONE** unlicensed spare computer

- for up to a total of **ten separate 24-hour periods**/calendar year
- in a failover configuration where computers share **ONE** disk array in a single data center
- once the primary node is repaired, you must either switch back **or** designate that repaired server as the failover node (Switchback is not necessary)
- Same license metric must be used for Primary and Secondary Node



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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 called “segmenting.”
- Oracle Partitioning Policy

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:

<https://www.oracle.com/assets/partitioning-070609.pdf>

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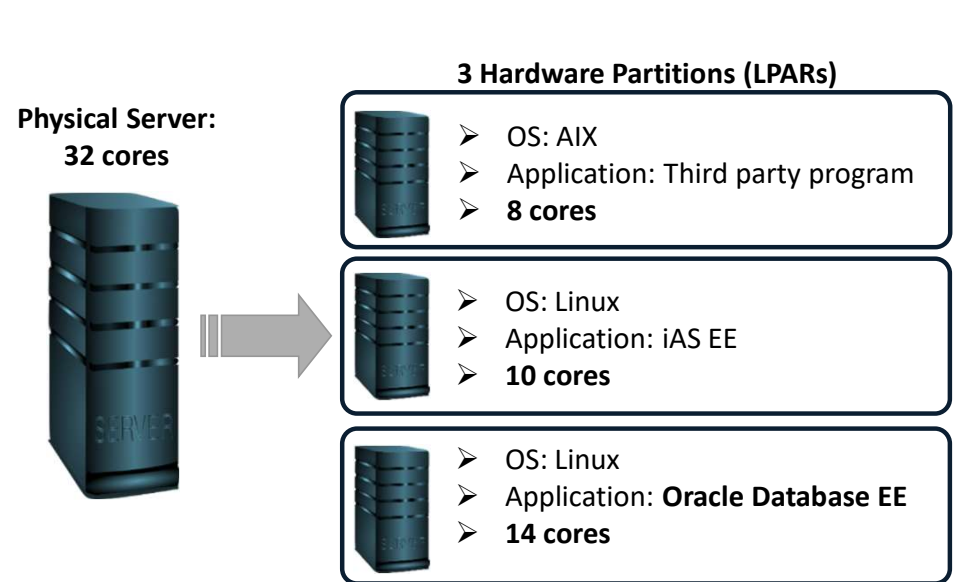


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Types of Partitioning – Hard Partitioning

- Physically segments a server into smaller systems.
 - physically independent server
 - self-contained server
 - typically with own CPUs, OS, separate boot area, memory, input/output subsystem and network resources
- Oracle lists certain technologies as hard partitioning
 - Examples: IBM LPAR, Oracle VM, Solaris Zones, etc.
 - **no other technology or configuration qualify**



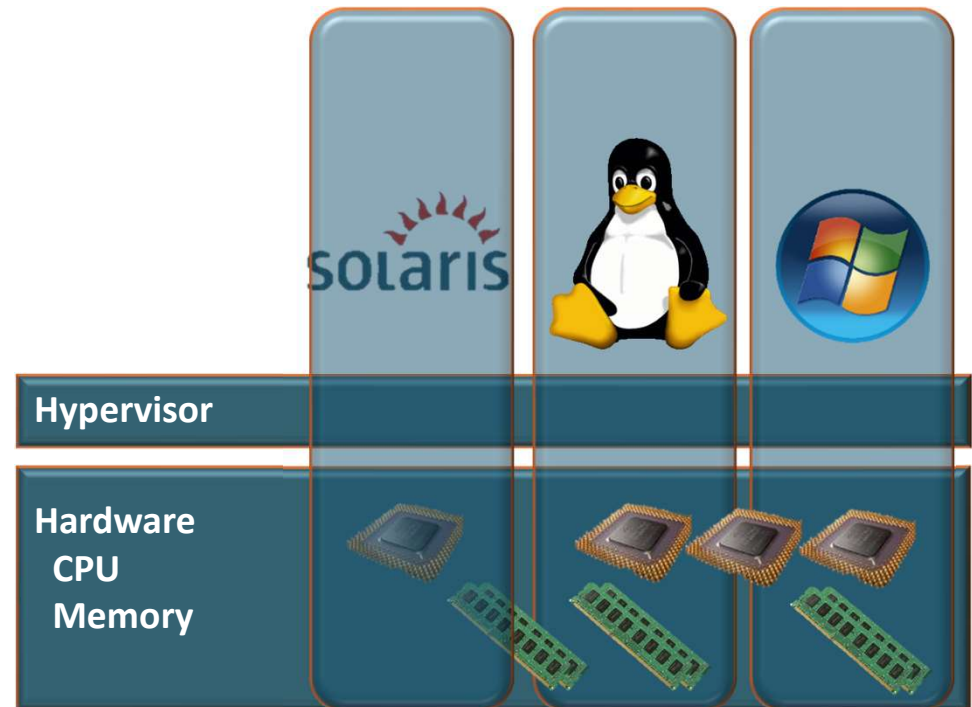
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Types of Partitioning – Soft Partitioning

- Segments the OS using OS resource managers (Hypervisor)
- The OS
 - limits the number of CPUs where an Oracle Program is running
 - by creating areas where CPU resources are allocated to applications within the same OS
- CPU capacity can be changed fairly easily
- Soft partitioning is not permitted as a means to determine or limit the number of software licenses required for any given server.



Examples: VMware, Oracle VM, etc.



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Oracle Licensing Policy – Virtualized Environments

- **Processor License Metric Definition**
Processor shall be defined as **all processors** where the Oracle programs are **installed and/or running**
- **Oracle Partitioning Policy**
 - **Hard Partitioning:** Oracle-approved hard partitioning technologies are permitted as a means to limit the number of software licenses required for any given server, *e.g., IBM LPAR, HP vPar, HP nPar, Fujitsu PPAR, etc.*
 - **Soft Partitioning:** Soft partitioning is not permitted as a means to determine or limit the number of software licenses required for any given server, *e.g., Solaris 9 Resource Containers, AIX Workload Manager, HP Process Resource Manager, Affinity Management, Oracle VM, and VMware.*



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Oracle Approved Third Party Cloud Vendors

Licensing Oracle Software in the Cloud Computing Environment consists of (2) Non Oracle cloud providers

- Amazon Web Services
 - a) Amazon Elastic Compute Cloud (EC2)
 - b) Amazon Relational Database Service (RDS)
- Microsoft Azure Platform

For the purposes of licensing Oracle programs in an Authorized Cloud Environment, Oracle customers are required to count vCPUs as follows:

- If hyper-threading is **enabled**, **two vCPUs** as equivalent to **one Oracle Processor** license
- If hyper-threading is **NOT enabled**, **one vCPU** as equivalent to **one Oracle Processor** license

Note: When counting Oracle Processor license requirements in Authorized Cloud Environments, the Oracle Processor Core Factor Table is not applicable.



<http://www.oracle.com/us/corporate/pricing/cloud-licensing-070579.pdf>

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Deployment Scenario: Authorized Cloud



Oracle Database Edition: Enterprise
License Metric: Processor

Oracle Database Edition	Cloud	vCPUs	Multi-threading	Oracle Processor Licenses Required

Enterprise	Amazon AWS	2	No	=	?
Enterprise	Microsoft Azure	2	Yes	=	?



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Deployment Scenario: Authorized Cloud



Oracle Database Edition: Enterprise
License Metric: Processor

Oracle Database Edition	Cloud	vCPUs	Multi-threading	Oracle Processor Licenses Required

Enterprise	Amazon AWS	2	No	1 Vcpu : 1 Proc =	2
Enterprise	Microsoft Azure	2	Yes	2 Vcpu : 1 Proc =	1



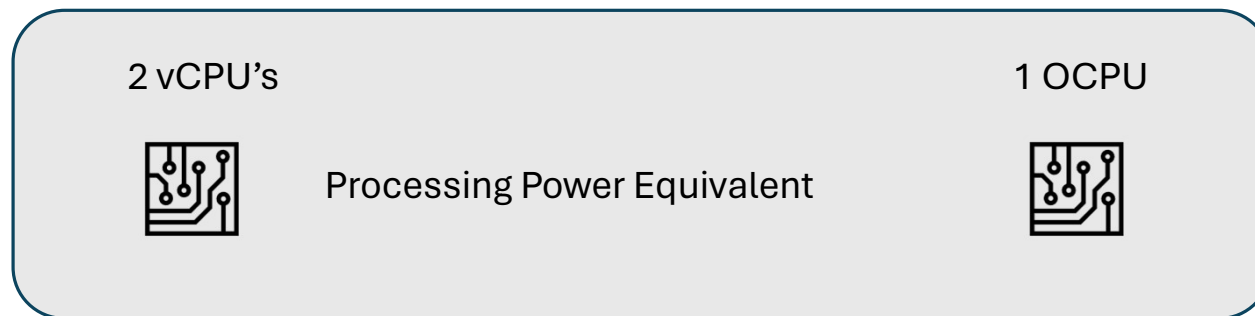
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Oracle Cloud Infrastructure (OCI)

Oracle OCPU

- An OCPU provides CPU capacity equivalent of one physical core of an Intel Xeon processor with hyper threading enabled.
- Each OCPU corresponds to two hardware execution threads, known as vCPUs



<http://www.oracle.com/us/corporate/pricing/cloud-licensing-070579.pdf>

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Deployment Scenario: Oracle Cloud



Oracle Database Edition: Enterprise
License Metric: Processor

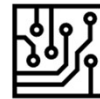
Oracle Database
Edition



Cloud



OCPUs



Oracle Processor
Licenses Required

Enterprise	Oracle OCI	2	=	?
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Deployment Scenario: Oracle Cloud



Oracle Database Edition: Enterprise
License Metric: Processor

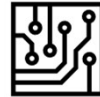
Oracle Database
Edition



Cloud



OCPUs



Oracle Processor
Licenses Required

Enterprise	Oracle OCI	2	2 OCPU : 1 Proc	=	1
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Oracle ECPU (Elastic Compute Processing Unit)

OCPU

- a physical measure of compute resources

ECPU

- an abstracted measure of compute resources based on the number of cores elastically allocated from a pool of compute and storage servers
- provides a consistent price metric independent of the underlying hardware (independent of exact make, model, or clock speed of the underlying processor)

NOTE: ECPU is the default pricing metric for new Autonomous Databases,

- Customers can optionally choose to create their new databases using the OCPU pricing metric until January 2025
- the OCPU billing metric has been retired on Autonomous Data Warehouse and Autonomous Transaction Processing as of January 2024
- it will be retired on Autonomous JSON Database and APEX Service soon thereafter



https://support.oracle.com/knowledge/Oracle%20Cloud/2998742_1.html
<https://www.oracle.com/a/ocom/docs/autonomous-database-ecpu-faq.pdf>

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Oracle ECPU (Elastic Compute Processing Unit)

Aside from only paying for what you consume, updating to the ECPU billing metric provides the following additional benefits:

1. 50% lower entry cost
2. Finer granularity for database scaling
3. Lower storage costs
4. Up to 87% lower costs with database consolidation
5. New features for Autonomous Database may only be available with ECPU's

Updating your Autonomous Database Serverless to the ECPU billing metric will have no impact to your service and incur no downtime.



https://support.oracle.com/knowledge/Oracle%20Cloud/2998742_1.html
<https://www.oracle.com/a/ocom/docs/autonomous-database-ecpu-faq.pdf>

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Choosing The Right Metric – Processor vs NUP

Environment Type

Unit Price

Visibility Of Users

Cost Analysis

Where to start:

Can I count the number of users?

- If Yes
 - Determine number of users
 - Calculate number of processor licenses required
 - Determine license minimums
 - Calculate number of NUPS required
 - Multiply cost of proc license by proc license requirement
 - Multiply cost of NUP license by NUP license requirement
 - Compare cost of processor license vs NUP license
- If No
 - Move to processor licensing



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Choosing The Right Model – BYOL vs License Included

License Availability	OCI Usage	Calculate Need	Cost Analysis
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Where to start:

Do you have available on premises license?

- If Yes
 - Calculate how many processor licenses you have available
 - Calculate how many OCPU's you need or are using
 - Apply 1 Processor license to each 2 OCPUs
 - Determine cost savings by using or switching to BYOL SKU
 - Direct workload owner to select or switch to BYOL SKU
- If No
 - Determine which is more cost effective (purchasing perpetual licenses and utilizing BYOL vs license included)



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Calculating License Requirements - Processor

Infrastructure Type

Data To Capture

Infrastructure Type	Processor Make/Model	# Processors	# Cores	Core Factor	# vCPUs	Multi Threading	# OCPUs
Stand Alone Server	👍	👍	👍	👍			
Soft Partitioned	👍	👍	👍	👍			
Hard Partitioned	👍	👍	👍	👍			
3 rd Party Authorized Cloud					👍	👍	
Oracle Cloud (OCI)							👍



Finding your ITAM Oasis

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Calculating License Requirements - NUPS

Infrastructure Type

Data To Capture

Infrastructure Type	Processor Make/Model	# Processors	# Cores	Core Factor	# vCPUs	Multi Threading	# OCPUs	Users*
Stand Alone Server	👍	👍	👍	👍				👍
Soft Partitioned	👍	👍	👍	👍				👍
Hard Partitioned	👍	👍	👍	👍				👍
3 rd Party Authorized Cloud					👍	👍		👍
Oracle Cloud (OCI)							👍	👍

*user = individuals and non-human operated devices

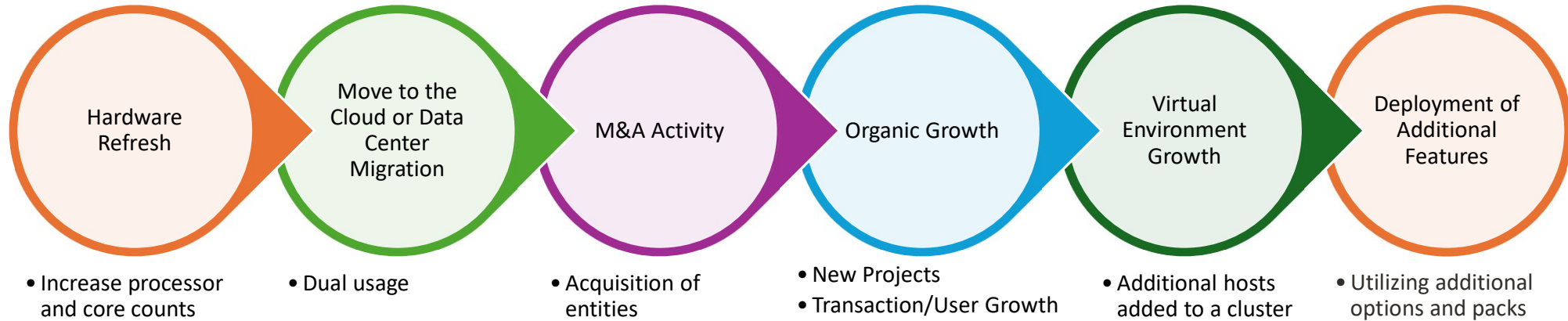


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License Demand Sources



Action If License Trigger Is In Scope

- Perform sizing activity on new hardware to determine licenses needed
- Determine future infrastructure sizes
- Identify expected start and end dates of migration
- Review agreements to determine impacts
- Identify if combined environments will run in parallel or will be consolidated
- Determine if acquired entity will leverage Oracle applications
- Request architecture for new environments and perform sizing activity
- Identify what is changing. (i.e. new vCenter, Cluster, Host, etc)
- Performing sizing activity on new hardware
- Identify which options/packs were deployed and license them at the same quantity as the database



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Support and Updates

Premier Support

(5years from general availability date)

Major product and technology releases
Updates, fixes and security alerts
Upgrade scripts
Certification with new third party product/versions.
24x7 via phone
My Oracle Support

22% of the license price

Extended Support

(Extends Premier Support for additional 3 years)

Major product and technology releases
Updates, fixes and security alerts
Upgrade scripts
NO Certification with new third party product/versions.
24x7 via phone
My Oracle Support

Year 1 +10%
Year 2 +20%
Year 3 + 20%
of Premier Support fee

Sustaining Support

(Indefinite Period)

Major product and technology releases
Technical Support
Pre-existing fixes for your solution
24x7 via phone
My Oracle Support

Back to original Premier Support fee



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Know The Oracle Programs

Unlimited License Agreement

Agreement that enables a customer to deploy an unlimited quantity of Oracle product(s) in the agreement for the term of the agreement with a certification of license usage, **no true up**, at the end of the unlimited deployment period

Oracle Support Rewards

- A program that enables customers to **earn support rewards** when using Oracle Cloud Infrastructure (OCI) services
 - 25% back in rewards for each \$1 spent
 - 33% back in rewards for each \$1 spent (when in a ULA)

Bring Your Own License

A program that enables customers to **leverage their unused perpetual licenses** in Oracle's cloud (OCI) at a discounted rate

- Oracle Database Service – Enterprise - \$0.4301 OCPU per hour
- Oracle Database Service – BYOL - \$0.1935 OCPU per hour
- Discount for BYOL SKU vs License included = 55%

BYOL to PaaS is inclusive of:

- Compute + Compute Support
- Automation

License Included PaaS is inclusive of:

- Compute + Compute Support
- Automation
- License Entitlement + License Support

Information on this slide is general in nature and there are many conditions that are required to be met before customers may take advantage of these programs.

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License Optimization Opportunities

Multiple Database On A Single Server

If you have multiple databases on a single server, validate if all databases on that server are using the same options/packs. If not, consider deploying all licensed options/packs as once a server is licensed, all databases installed can utilize all options/packs

Oracle Support Rewards

Migrate workloads to OCI to earn support rewards that can be applied to your perpetual license support

Bring Your Own License

If you have available licenses, you should investigate utilizing them in OCI to receive a significant savings as compared to the license included PaaS SKU's

OCI PaaS Included Options/Packs

PaaS on OCI includes a set of options/packs with each service.

- Data Masking and Subsetting
- Diagnostics Pack
- Tuning Pack
- Real Application Testing



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License Optimization Opportunities

Utilize Advanced Compression

By compressing the size of the database you can reduce database storage requirements/costs

Explore Exadata Consolidation Opportunities

If you already own Exadata's, investigate adding additional workloads. Exadata can support a significantly higher number of database instances when compared to commodity hardware

Leverage Pluggable Databases

19c includes 3 pluggable databases free with your Oracle Database Enterprise Edition License.

Evaluate What Is Running On VMware

Perform a cost analysis to compare number of licenses required for running Oracle Database Workloads in VMware vs on stand alone servers or in the cloud



Information on this slide is general in nature and there are many conditions that are required to be met before customers may take advantage of these programs.

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Use Cases For Available Licenses

Leverage BYOL on OCI

Use available licenses to reduce your cloud spend by:

- Moving existing workloads from on premises or third party clouds to OCI
- Switch existing workloads on OCI from License Included to BYOL SKU
- BYOL can also be leveraged for cloud native development on OCI

Converge – Move From Other Databases



Oracle Database supports JSON, Mongo-DB and other database architectures. Investigate opportunity to migrate from non Oracle databases to Oracle database.



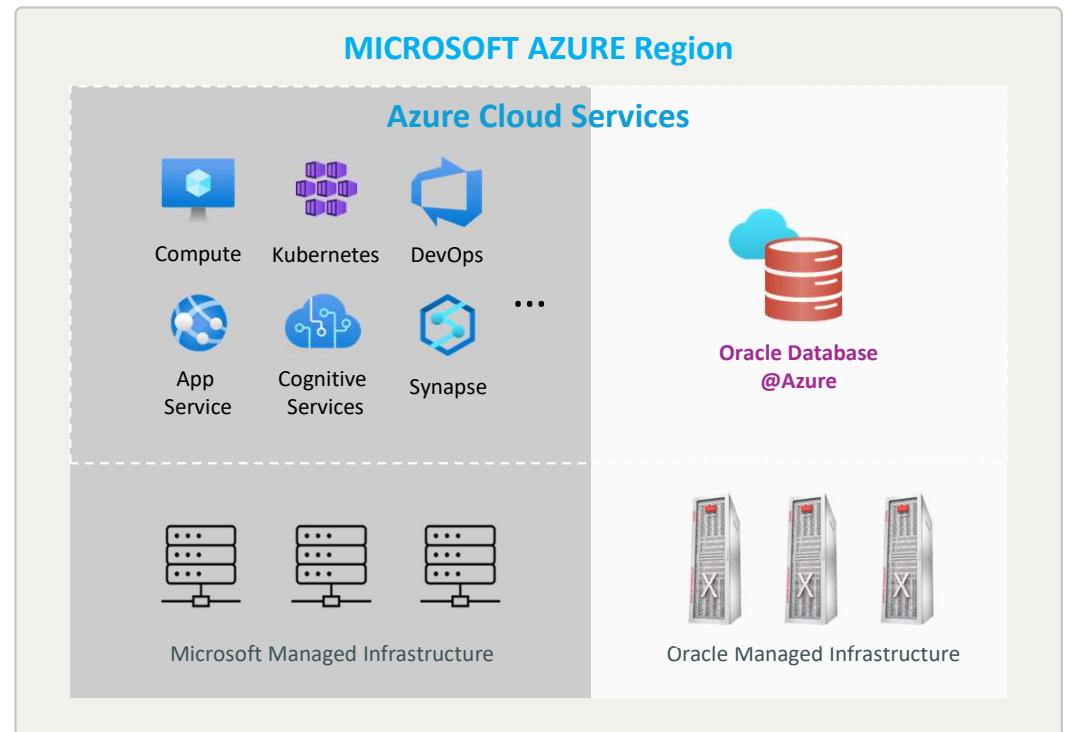
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Oracle and Microsoft Partnership

Oracle and Microsoft deliver
Oracle Database Services on OCI
in Microsoft Azure datacenters

Due to high demand, global footprint was
expanded to 15 Cloud Regions, most recently
Europe



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Oracle Database@Azure – Enabling Multicloud

Get the best of both Oracle and Microsoft in the cloud. Run mission-critical workloads requiring the highest performance and availability. Simplify purchasing with existing Oracle and Microsoft programs.

Microsoft Azure

Take advantage of your Microsoft Azure Consumption Commitment

Purchase through Azure Marketplace and use Azure commitments for Oracle Database@Azure

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Leverage your Oracle investments

Use Oracle Database BYOL, ULA, or purchase License-Included Database Services



Earn rewards to reduce your Oracle tech license support

Get \$0.25 to \$0.33 in Oracle Support Rewards for every dollar you spend on Oracle Database@Azure



https://www.oracle.com/contracts/docs/oracle_database_azure_credits_service_descriptions_v121123.pdf?download=false

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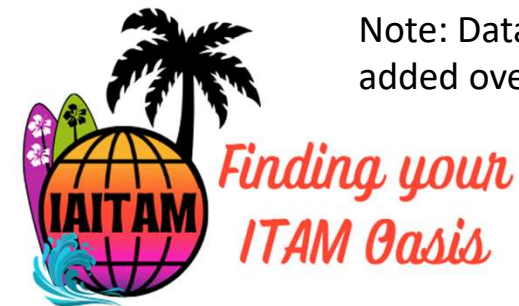
Benefits of Oracle Database@Azure

Run your workloads where you choose with fully managed Oracle database services running on OCI but inside Azure. Experience the highest level of Oracle Database performance, scale, and availability, as well as feature and pricing parity, with Oracle Exadata Database Service.

Migrate, modernize, and innovate with Oracle and Azure services using Oracle database services and Azure resources such as Azure Compute and Azure Kubernetes, with familiar application development tools and frameworks supported by Azure.

Simplify purchasing and operations. Purchase through the Azure Marketplace and use your Microsoft Azure Consumption Commitment (MACC). Monitor and troubleshoot with Oracle Database service logs, metrics, and events available directly in Azure.

Note: Database@Azure is currently available for the Exadata Cloud Service. Other services will be added over time.



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Connect with Me



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Social



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APPENDIX



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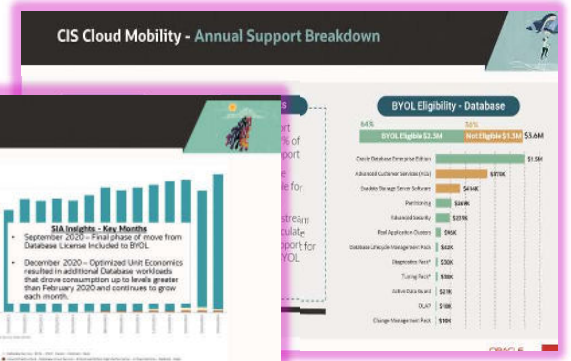
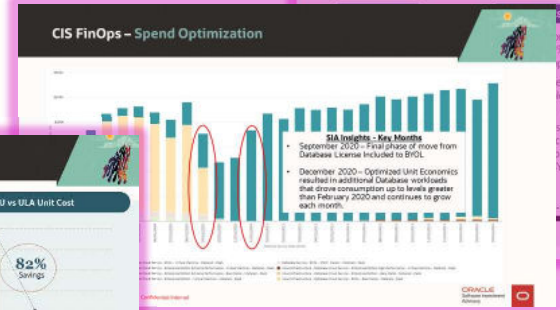
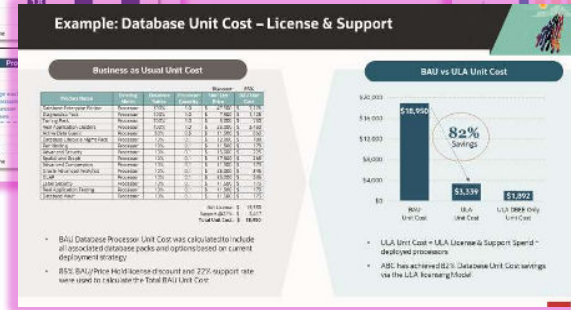
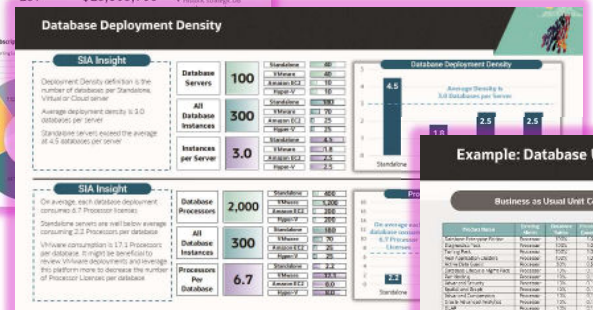
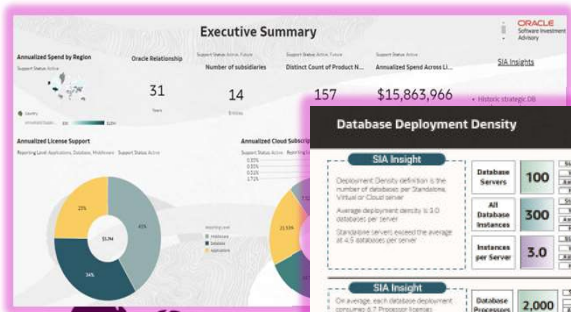
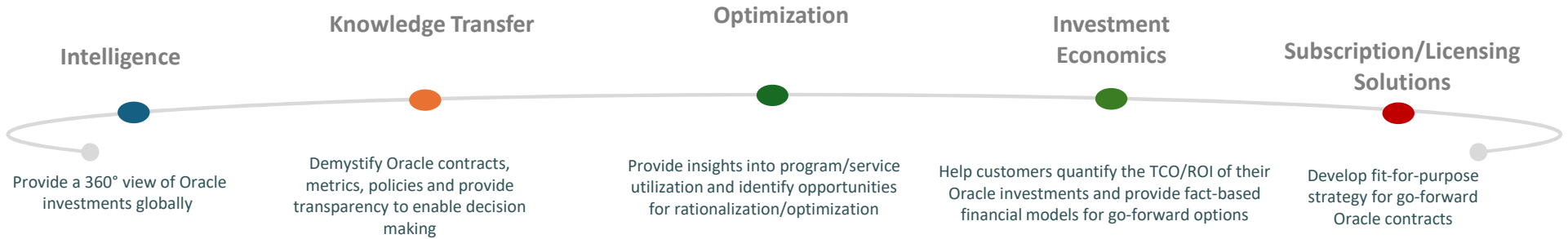
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Software Investment Advisory – Sample Customer Journey

How customers leverage SIA services to make decisions

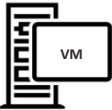


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Deployment Scenario – Virtualized – Soft Partitioning



Oracle Database Edition: Enterprise
 License Metric: Processor

vCenter	Cluster	Physical Server	Processor Make/Model	Physical Processors	Cores Per Processor	Cores Factor	Oracle Processor Licenses Required
---------	---------	-----------------	----------------------	---------------------	---------------------	--------------	------------------------------------

vCenter A	Cluster A	Dell	Intel Zeon E5-2620	2	10	.5	?
		Dell	Intel Zeon E5-2620	2	10	.5	?
		Dell	Intel Zeon E5-2620	2	10	.5	?
	Cluster B	Dell	Intel Zeon E5-2620	2	10	.5	?
		Dell	Intel Zeon E5-2620	2	10	.5	?
		Dell	Intel Zeon E5-2620	2	10	.5	?

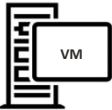
= ?



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Deployment Scenario – Virtualized – Soft Partitioning



Oracle Database Edition: Enterprise
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vCenter	Cluster	Physical Server	Processor Make/Model	Physical Processors	Cores Per Processor	Cores Factor	Oracle Processor Licenses Required
---------	---------	-----------------	----------------------	---------------------	---------------------	--------------	------------------------------------

vCenter A	Cluster A	Dell	Intel Zeon E5-2620	2	10	.5	10	
		Dell	Intel Zeon E5-2620	2	10	.5	10	
		Dell	Intel Zeon E5-2620	2	10	.5	10	
	Cluster B	Dell	Intel Zeon E5-2620	2	10	.5	10	
		Dell	Intel Zeon E5-2620	2	10	.5	10	
		Dell	Intel Zeon E5-2620	2	10	.5	10	
							=	60



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Oracle ECPU (Elastic Compute Processing Unit)

Aside from only paying for what you consume, updating to the ECPU billing metric provides the following additional benefits:

1. **50% lower entry cost** - The smallest Autonomous Database that can be provisioned with ECPUs is 50% less expensive (\$0.672 per hour vs \$1.3441 per hour with OCPUs).
2. **Finer granularity for database scaling** - Each incremental increase in ECPU database size is only \$0.336.
3. **Lower storage costs** - Autonomous Data Warehouse storage price reduced from \$118.40 to \$25.00 per TB per month, Autonomous Transaction Processing storage can be provisioned in increments of 1GB, with a minimum of 20GB.
4. **Up to 87% lower costs with database consolidation** - Elastic Resource Pools, available on ECPU ADB Serverless databases, help consolidate deployments leading to major cost savings.
5. **New features for Autonomous Database** may only be available with ECPU's

Updating your Autonomous Database Serverless to the ECPU billing metric will have no impact to your service and incur no downtime.



https://support.oracle.com/knowledge/Oracle%20Cloud/2998742_1.html
<https://www.oracle.com/a/ocom/docs/autonomous-database-ecpu-faq.pdf>

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Types of Partitioning – Hard Partitioning

Partitioning occurs when the cores on a server are separated (or partitioned) into individual processors. The individual processors are then assigned to a single Virtual Machine (VM), a group of VMs, or grouped and assigned to a VM. Sometimes this is called “segmenting.” There are several hardware and software virtualization technologies available which deliver partitioning capabilities, with varying degree of resource allocation flexibility.

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

Oracle Linux KVM *

Oracle VM Server **

(For KVM and VM Server, see next slide)



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Types of Partitioning – Hard Partitioning

Oracle Linux KVM *
Oracle VM Server **

Note:

- 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-partitioning1403135.pdf>



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Optimization Example: AWS or Azure vs OCI

Environment: 4 vCPUs with hyper threading enabled

- Installed Products:**
- Oracle Database Enterprise Edition
 - Data Masking and Subsetting
 - Diagnostics Pack
 - Tuning Pack
 - Real Application Testing

4 vCPUs

License Requirement on AWS or Azure

- | | |
|--------------------------------------|------------------------|
| • Oracle Database Enterprise Edition | (2) Processor Licenses |
| • Data Masking and Subsetting | (2) Processor Licenses |
| • Diagnostics Pack | (2) Processor Licenses |
| • Tuning Pack | (2) Processor Licenses |
| • Real Application Testing | (2) Processor Licenses |

2 OCPUs

License Requirement on OCI

- | | |
|--------------------------------------|------------------------|
| • Oracle Database Enterprise Edition | (1) Processor Licenses |
| • Data Masking and Subsetting | Free – Option Included |
| • Diagnostics Pack | Free – Pack Included |
| • Tuning Pack | Free – Pack Included |
| • Real Application Testing | Free – Option Included |



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Optimization Example: AWS or Azure vs OCI

Environment: 4 vCPUs with hyper threading enabled

License Savings

Support Savings

- Installed Products:**
- Oracle Database Enterprise Edition
 - Data Masking and Subsetting
 - Diagnostics Pack
 - Tuning Pack
 - Real Application Testing

71%

71%

Total License Cost:	\$164,000	Total License Cost:	\$47,500
Annual Support Cost:	\$36,080	Annual Support Cost:	\$10,450

4 vCPUs

2 OCPUs

License Requirement on AWS or Azure

License Requirement on OCI

- Oracle Database Enterprise Edition (2) x \$47,500 = \$95,000
- Data Masking and Subsetting (2) x \$11,500 = \$23,000
- Diagnostics Pack (2) x \$7,500 = \$13,000
- Tuning Pack (2) x \$5,000 = \$10,000
- Real Application Testing (2) x \$11,500 = \$23,000

- Oracle Database Enterprise Edition (1) X \$47,500 = \$47,500
- Data Masking and Subsetting *Free – Option Included*
- Diagnostics Pack *Free – Pack Included*
- Tuning Pack *Free – Pack Included*
- Real Application Testing *Free – Option Included*



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Optimization Example: AWS or Azure vs OCI

Environment: 4 vCPUs with hyper threading enabled

Oracle Support Rewards
Earned

BYOL OCPU Per Hour Cost: \$0.1935
 OCPU's Required: 2
 Hours Per Day: 24
 Days Per Year: 365



$$\$0.1935 \times 2 \times 24 \times 365 = \$3,390.12$$



$$\times 25\% =$$

\$874.53

Total License Cost:	\$164,000	Total License Cost:	\$47,500
Annual Support Cost:	\$36,080	Annual Support Cost:	\$10,450

4 vCPUs

2 OCPUs

License Requirement on AWS or Azure

License Requirement on OCI

- Oracle Database Enterprise Edition (2) x \$47,500 = \$95,000
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- Diagnostics Pack (2) x \$7,500 = \$13,000
- Tuning Pack (2) x \$5,000 = \$10,000
- Real Application Testing (2) x \$11,500 = \$23,000

- Oracle Database Enterprise Edition (1) X \$47,500 = \$47,500
- Data Masking and Subsetting **Free – Option Included**
- Diagnostics Pack **Free – Pack Included**
- Tuning Pack **Free – Pack Included**
- Real Application Testing **Free – Option Included**



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Optimization Example: AWS or Azure vs OCI

Environment: 4 vCPUs with hyper threading enabled

- Installed Products:**
- Oracle Database Enterprise Edition
 - Data Masking and Subsetting
 - Diagnostics Pack
 - Tuning Pack
 - Real Application Testing

License Savings

71%

Support Savings

73%

Total License Cost:	\$164,000	Total License Cost:	\$47,500
Annual Support Cost:	\$36,080	Annual Support Cost:	\$10,450 - \$874 = \$9,576

4 vCPUs

License Requirement on AWS

- Oracle Database Enterprise Edition (2) x \$47,500 = \$95,000
- Data Masking and Subsetting (2) x \$11,500 = \$23,000
- Diagnostics Pack (2) x \$7,500 = \$13,000
- Tuning Pack (2) x \$5,000 = \$10,000
- Real Application Testing (2) x \$11,500 = \$23,000

2 OCPUs

License Requirement on OCI

- Oracle Database Enterprise Edition (1) X \$47,500 = \$47,500
- Data Masking and Subsetting **Free – Option Included**
- Diagnostics Pack **Free – Pack Included**
- Tuning Pack **Free – Pack Included**
- Real Application Testing **Free – Option Included**



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