

IAITAM ACE 2025

ITAM - Another Brick In The Wall

Oracle Database Licensing Demystified

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MELISSA CORTALE
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- Leading Oracle License Expert – A frequent speaker on Oracle licensing at industry conferences and trade shows across the country and globe such as IATAM ACE Conferences.
- Ms. Cortale has been working with Oracle licensing for 15 years, starting out as a Technology Sales Manager in the NY metro region where she won numerous top sales awards at Oracle.
- Noticing a gap in the market for Oracle License knowledge, Ms. Cortale joined the world of Software Asset Management in 2013 with a focus to help clients find savings, reduce risk, and optimize investments with Oracle.
- Negotiated 400+ Oracle transactions and saved over \$100 million dollars for clients across the country and globe in the commercial and government sectors.



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Why care about the Oracle Database?



The Oracle Database is EXPENSIVE!

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Oracle Licensing Levels

1. Full Use

- Least restricted license offered by Oracle.
- Customer can use for internal or external systems.
- Oracle typically provides support to customer.

2. Limited Use

- Restricts license to be used only in certain instances (i.e. DR, test/dev, or specific applications).
- Typically, lower cost than Full Use Licenses.

3. Application Specific Full Use (ASFU)

- Restricted license specific to a given ISV application.
- Typically distributed and supported by ISV partner.

4. Embedded Software License (ESL)

- Most restricted license offered by Oracle to OEMs.
- Handled by Oracle ISV/Embedded Team.
- Oracle is embedded in ISVs applications.



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Environments to License

Development

- Set up, customization, and modification of software is done in a development environment.
- Any person doing development work using the software must be licensed.
- Typically licensed via Named User Plus metric.

Test/Staging

- Test/staging environments are used to verify that new or customized code runs properly.
- Any Oracle software used in test/staging environment must be properly licensed with a full use license under an Oracle Master Agreement (OMA).
- Typically licensed via Named User Plus metric.

Production

- The environment used by end users for business or other operations.
- All programs used in the production environment must be properly licensed based on the applicable license metrics under an Oracle Master Agreement (OMA).
- Typically licensed via Processor.



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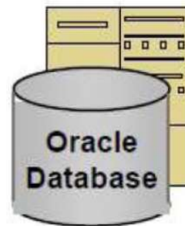
Primary License Metrics for Oracle Technology Products

Named User Plus - Metric

- Environments where users and/or devices can be easily counted
- Cost effective when number of users is low

Processor - Metric

- Environments where users cannot be easily identified or counted, such as Internet-based applications
- Based on the server where the database is installed and/or running



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Oracle Core Factor Table

Core Factor Table - Used to calculate the number of Oracle licenses required for Database, Options, and other Technology products.



Link to Core Factor Table:

<https://www.oracle.com/contracts/docs/processor-core-factor-table-070634.pdf>

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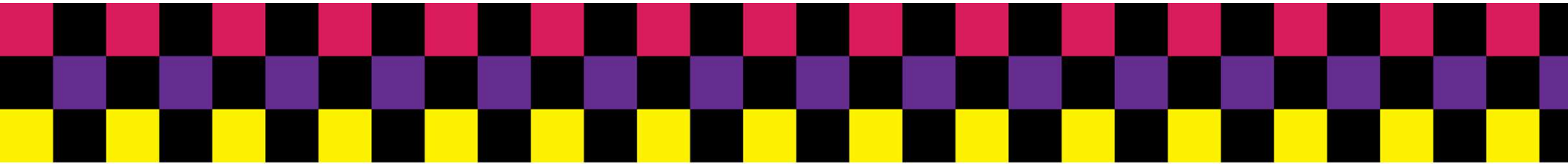
ORACLE

Oracle Processor Core Factor Table
Effective Date: March 16, 2009

Vendor and Processor	Core Processor Licensing Factor
Sun and Fujitsu UltraSPARC T1 processor (1.0 or 1.2 GHz)	0.25
Only named servers including: Sun Fire T1000 Server, SPARC Enterprise T1000 Server*, with 6 or 8-core 1.0 GHz UltraSPARC T1 processor	
Sun Fire T2000 Server, SPARC Enterprise T2000 Server*, with 4, 6, or 8-core 1.0 GHz, or 8 core 1.2 GHz UltraSPARC T1 processor	
Sun Netra T2000, 1.0 or 1.2 GHz UltraSPARC T1 processor	
SPARC T3 processor	0.25
Sun and Fujitsu UltraSPARC T1 1.4 GHz	0.5
Only named servers including: Sun Fire T2000 Server and SPARC Enterprise T2000 Server*, with 8-core, 1.4 GHz UltraSPARC T1 processor	
Sun T6300, 1.4 GHz UltraSPARC T1 processor	0.5
AMD Opteron Models 13XX, 23XX, 24XX, 32XX, 41XX, 42XX, 43XX, 61XX, 62XX, 63XX, 83XX, 84XX or earlier Multicore chips	0.5
Intel Xeon Series 56XX, Series 65XX, Series 75XX, Series E7-28XX, E7-28XX v2, Series E7-48XX, E7-48XX v2, Series E7-88XX, E7-88XX v2, Series E5-24XX, Series E5-26XX, E5-26XX v2, Series E5-46XX, E5-46XX v2, Series E5-16XX, Series E3-12XX, E5-26XX v3, E5-24XX v2, E5-16XX v3 and E5-16XX v2 or earlier Multicore chips	0.5
Intel Itanium Series 93XX or earlier Multicore chips (For servers purchased prior to Dec 1st, 2010)	0.5
Intel or AMD Desktop, Laptop/Notebook, or Notebook Multicore chips	0.5

Sun UltraSPARC T2+	0.5
SPARC64 VII+	0.5
SPARC64 X, SPARC64 X+	0.5
SPARC T4 processor	0.5
SPARC T5	0.5
SPARC M5	0.5
SPARC M6	0.5
Sun and Fujitsu SPARC64 VI, VII	0.75
Sun UltraSPARC IV, IV+, or earlier Multicore chips	0.75
Sun UltraSPARC T2	0.75
HP PA-RISC	0.75
IBM POWER5+ or earlier Multicore chips	0.75
All Single Core Chips	1.0
Intel Itanium Series 93XX (For servers purchased on or after Dec 1st, 2010)	1.0
Intel Itanium Series 95XX	1.0
IBM POWER6	1.0
IBM POWER7, IBM POWER7+	1.0
IBM POWER8	1.0
IBM System z (z10 and earlier)	1.0
All Other Multicore chips	1.0





Calculating Oracle Licenses

Important facts to know where Oracle Programs are installed and/or running:

1. Total Number of Cores

- Number of servers
- Number of CPUs per server
- Number of Cores per CPU

2. Type of CPU/Chip (i.e. Intel Xeon 5650, SPARC T3, AMD 4120, IBM POWER 6, etc.)

To Calculate Oracle Processors:

Step 1: Calculate Total Cores

Total Cores = # Servers x CPUs per server x Number of Cores per CPU

Step 2: Multiple Total Cores by Oracle Core Factor

Oracle Processors = Total Cores x Core Factor

- ❖ Note: Systems can be licensed by Oracle Processor or Named User Plus. Named User Plus minimums are based on Oracle processors. Therefore, you always need to calculate the Oracle Processors first!



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Core Factor at Work

Total Cores = # Servers * CPUs per server * Number of Cores per CPU
Oracle Processors = Total Cores * Core Factor

Example 1:

1 Database Enterprise Edition (EE) Server, 1 CPU, six-core SPARC T3 processor

Answer:

Total Cores = # Servers * # CPUs * Cores = $1 * 1 * 6 = 6$

Oracle Processors = Total Cores * Core Factor = $6 * \underline{0.25} = 1.5$ (round up)

Oracle Processors = 2

CPU 1
6 Core
SPARC T3

Database EE Server

Example 2:

1 Database EE Server, 4 CPUs, dual-core AMD 6276 processor

Answer:

Total Cores = # Servers * # CPUs * # Cores = $1 * 4 * 2 = 8$

Oracle processors = Total Cores * Core Factor = $8 * \underline{0.5} = 4$

Oracle Processors = 4

CPU 1 2 Core AMD 6276	CPU 2 2 Core AMD 6276
CPU 3 2 Core AMD 6276	CPU 4 2 Core AMD 6276



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Named User Definition

Named User Plus / Named User 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.

If non-human operated devices and human-operated devices are sending data to or receiving data from the Oracle Database, then all non-human operated devices and all human operated devices need to be licensed.

- If non-human operated devices such as sensors are sending data to or receiving data from the Oracle Database, then all devices need to be licensed.
- If human-operated devices such as bar code scanners are sending data to or receiving data from the Oracle Database, then all humans operating these devices need to be licensed.

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



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Calculating Named Users

Named User Minimums are calculated by multiplying the number of Oracle Processors by the minimum amount of Named Users for that particular product (Database Minimum = 25 NUP).

❖ Note: You must license whichever is greater: Actual Number of Users OR the Named User Minimums.

Example: Calculate the Minimum Named Users Plus required for 4 Oracle Processors of Database EE. (25 NUP Minimum per Processor for Database)

Answer:

Oracle Processors = 4

Named User Minimum = Oracle Processors * Named User Minimums for DBEE

Named Users Minimum = 4 * 25 = 100 NUP

This server can be licensed via the following options

- A. 4 Oracle Processors
- B. 100 Named User Plus - Minimum
- C. The actual amount of users accessing the DB (if greater than 100)



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Example: Named User Calculations

Example : Calculate the Minimum Named Users Plus required for 10 Oracle Processors of Oracle RAC (25 NUP Minimum per Processor for Database)

Answer:

Oracle Processors = 10

Named User Minimum = Oracle Processors * Named User Minimums for RAC

Named Users Minimum = 10 * 25 = 250 NUP

This server can be licensed via the following options

- A. 10 Oracle Processors
- B. 250 Named User Plus - Minimum
- C. Actual amount of users accessing the DB (if higher than 250)



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Oracle Database Editions

1. Oracle Standard Edition One – Least Functionality (No longer Sold by Oracle)
2. Oracle Standard Edition – No Longer Sold by Oracle
3. Oracle Standard Edition Two – Go Forward Standard Edition, more restrictions than previous Standard Edition
4. Oracle Enterprise Edition – Most Functionality & Most Expensive



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Database Options vs. Features

Database Feature:

- Free - Included in the database license price
- Different database editions, have access to different features

Examples:

- Dataguard - EE only
- Flashback Query - SE1, SE, EE
- Oracle SQL Developer – SE1, SE, EE
- Application Express – SE1, SE, EE
- Automatic Workload Management -SE, EE
- Fine-Grained Auditing - EE only
- Enterprise Manager Console – SE, EE

Database Option:

- Additional cost to the database license price
- Only available for Enterprise Edition.
- Can be triggered by Command Line.
- Metric of Option, must match metric of Database

Examples:

- Real Application Cluster (RAC)
- Partitioning
- Active Dataguard
- Advanced Compression
- Enterprise Manager Packs (i.e. Diagnostic, Tuning)



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Database Options - Challenges

- Oracle has no license keys.
- Database Administrators can easily deploy options inadvertently.
- Some Options get installed with the database and can't be removed.
- Database Options like management packs can be easily triggered by command line using AWR Reports or SQL Tuning.
- Database Options can be costly and can cost more than the database itself in some instances.
- Database Options use is one of the biggest “gotcha’s” that come up in an Oracle audit.



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Database Options - Strategies

- Database Administrators should closely monitor their Oracle database usage to ensure they are only using the features and functionality in which they have licenses.
- This monitoring should become part of standard DBA process and any new DBA's coming into the organization should be aware of license constraints.
- Database Administrators should look into disabling management packs in which they know they do not have entitlements to further prevent inadvertent usage.
- Each organization should perform an annual check of their Oracle Database Options usage either internally or bringing in an external firm to do a 3rd party compliance check. The cost of doing this check often outweighs the potential costs of getting hit with a compliance bill from Oracle.



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Data Recovery Licensing

Types of Database Recovery:

1. Backup

- RMAN used to copy physical database structures, such as control files, redo logs, and data files.
- Can be stored on server, storage, disk drive, or tape.
- No additional licensing necessary.

2. Failover (<10 days/year)

- Nodes arranged in a cluster and share one disk array (SAN or NAS), one common resource pool.
- Production acts as primary node, when fails, surviving node acts as primary node.
- Software: Oracle Failsafe, Veritas, HP Service Guard, Linus Heartbeat.
- Oracle permits to run software on unlicensed spare to up to 10 separate days in a calendar year. Not 240 hours, 2 hours Tuesday, 3 hours on Wednesday = 2 days. If exceeds 10 days, must license spare.
- Only one failover node per cluster at no charge, additional nodes need license.



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Data Recovery Licensing (cont'd)

3. Standby

- One or more copies of primary database maintained on standby servers.
- As primary database is modified, logs are shipped to standby database(s).
- If primary database fails, standby becomes activated.
- Software: Oracle Dataguard, Custom Scripts.
- Both primary and standby database must be fully licensed with the same metric and same database options.

4. Remote Mirroring

- Mirroring of storage unit or shared disk arrays.
- The Oracle data files, executables, binaries are replicated to mirrored storage unit.
- Examples: EMC SRDF, Veritas Volume Replicator
- Both primary and remote mirrored databases must be fully licensed with the same metric and options.

5. Testing

- For testing physical copies of backups, your license includes the right to run the program on an unlicensed server (including a server in a cloud environment) for up to 4 four times, not exceeding 2 days per testing, in any given calendar year.
- This does **NOT** cover any other data recovery method - such as remote mirroring - where the Oracle program binary files are copied or synchronized.



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Oracle's Partitioning Policy

Oracle considers two types of Partitioning:

1. **Soft Partitioning:** Segments the operating system using OS resource managers.

Examples Include: Solaris 9 Resource Containers, AIX Workload Manager, HP Process Resource Manager, Affinity Management, Oracle VM, and **VMware**.

Important Note: 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.

2. **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, etc.

Examples Include: Physical Domains (also known as PDomains, Dynamic Domains, or Dynamic System Domains), Solaris Zones (also known as Solaris Containers, capped Zones/Containers only), LPAR, Micro-Partitions (capped partitions only).

Only the technologies listed in Oracle's Partitioning Policy document are recognized as hard partitioned, no other technology or configuration qualify .



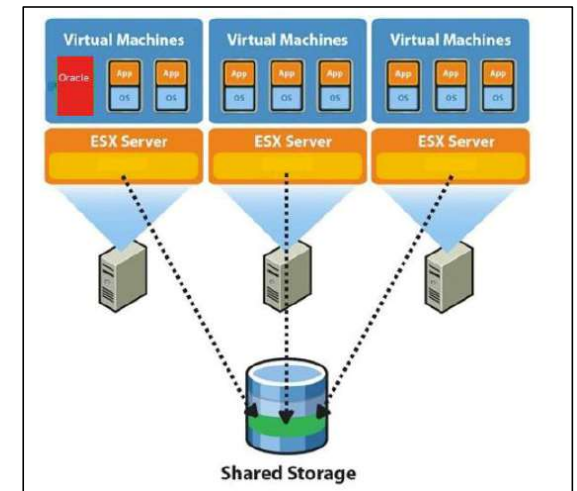
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Virtualization - Challenges

Challenge:

- When Oracle Programs are installed on **VMware clusters**, Oracle considers this a form of **soft partitioning** which results in extremely high processor counts and associated licensing costs. Oracle's stance will be to require licenses for an entire VMware farm regardless of how many Oracle virtual servers are actually running.
- Oracle sales teams enforce inconsistent policies when it comes to Oracle running on non-Oracle virtualization software which confuses customers and leaves open areas of risk.
- Many IT shops use VMware extensively and want to run Oracle software on VMware the same as they do for all of their other software and applications.
- Unfortunately, Oracle **MUST** be deployed and handled differently on VMware than any other software or application due to its licensing policies.



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Virtualization - Strategies

- ❖ There is no one size fits all.

Some approaches to virtualization and Oracle are as follows:

- Install the Oracle Programs on standalone physical servers without any virtualization technology.
- Install the Oracle Programs on an Oracle approved virtualization technology such as Oracle VM (OVM) or IBM LPARs and abide by conditions outlined in the Oracle policy documents.
- Install the Oracle Programs on an an approved cloud vendor (i.e. AWS, Azure, Oracle Cloud Infrastructure - OCI).
- Migrate off Oracle as platform.



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Virtualization – Strategies (cont'd)

Some approaches to virtualization and Oracle are as follows:

- Understand the risk, but choose to run Oracle on VMware and follow segregation techniques such as: storage segregation, network segregation, DRS and Affinity rules, logging.

➤ **Tip:** Get your entire organization (CIO, Legal, etc.) on board with VMware “segregation” plan.

- Work with Oracle on getting VMware/Virtualization “approvals” written into your contract.

➤ **Tip:** If a customer does come to an agreement with Oracle around VMware, get all concessions written on-record.

➤ **Tip:** Get concessions while negotiating **before** a large purchase, not after!



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Licensing on the Cloud

- Oracle has a cloud policy published: “***Licensing Oracle Software in the Cloud Computing Environment***”
 - Three Authorized Cloud Environments outside Oracle cloud:
 - **Amazon EC2 and RDS** - count two vCPUs as equivalent to one Oracle Processor license if multi-threading is enabled, and one vCPU as equivalent to one Oracle Processor license if hyper-threading is not enabled.
 - **Microsoft Azure** – count two vCPUs as equivalent to one Oracle Processor license if multi- threading is enabled, and one vCPU as equivalent to one Oracle Processor license if hyper- threading is not enabled.
 - **Google Cloud Platform** - count two vCPUs as equivalent to one Oracle Processor license if multi-threading is enabled, and one vCPU as equivalent to one Oracle Processor license if multi-threading is not enabled.
 - The Core Factor Table is not applicable.



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Licensing on the Cloud - Strategies

- Discuss the license repercussions of moving Oracle to cloud WAY BEFORE you plan to move Oracle to cloud.
- Plan out the cloud architecture prior to making a cloud vendor decision. In some cases, Oracle licenses requirements can more than double which may alter your cloud vendor decision.
- Determine technical viability of running Oracle in the cloud.
- Oracle only has 3 authorized cloud providers, AWS, Azure,& Google in addition to their own cloud offering (Oracle Cloud Infrastructure). If you are looking at other cloud providers, you may face additional challenges.



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Common Oracle Database Licensing Missteps

- Not licensing testing and development
- Not licensing Disaster Recovery according to Oracle policies
- Not adhering to Oracle's license core factor calculations and Named User policies
- Not following Oracle's Partitioning and Virtualization Policies
- Using Oracle Database Options without paying for the licenses
- Making Architecture changes (like moving to Cloud), without considering Oracle licenses



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QUESTIONS?



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