ORACLE TRENDS IN 2021

IS YOUR DATABASE CLOUD-READY?

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INTRODUCTION

While cloud computing has been an Information Technology (IT) trend for many years, the adoption curve for moving business-critical applications to public cloud environments has been slower. As we evaluate trends in 2021, however, we are seeing a definite shift in the velocity of cloud adoption for enterprise applications, especially those running on a relational database such as Microsoft SQL Server, or Oracle.

This e-book will focus on some important issues related to running Oracle databases in the public cloud. This document is focused especially on key business and risk-management considerations for developing your Oracle cloud strategy, including answering key questions such as:

- *How does Oracle license compliance relate to the larger picture of proactive risk management in the cloud that includes industry-standard security monitoring, regulatory compliance, and configuration drift control?*

- *With options for running Oracle Standard Edition in AWS's managed RDS solution, what is the true cost of licensing between the License Included (LI) offering, and the bring your own license (BYOL) option?*

- *With so many differing opinions about how and when to apply Oracle's cloud policy to databases running in AWS, how can I find the truth about what it will take to license my software?*

Now's the time to develop your Oracle cloud strategy, starting with a clear picture of what's in your inventory. Is your database cloud-ready?

LEARN MORE ABOUT ORACLE STANDARD EDITION IN THE CLOUD

House of Brick has specialized in optimizing Oracle implementations for more than two decades. Many of our engagements start by building an initial business case for moving an Oracle environment from on-premises to public cloud. The low hanging fruit of potential cost savings is the Oracle licensing. Let's discuss how to find savings by leveraging Oracle Standard licensing in AWS. A more thorough assessment can reveal opportunities to convert some of your workloads on Oracle Enterprise to Standard thereby creating potential for reducing your licensing spend.

As with anything Oracle we need to first understand the options for license portability. According to Licensing Oracle Software in the Cloud Computing Environment, there are two important considerations:

- *Amazon EC2 and RDS – count two vCPUs as equivalent to one Oracle Processor license if hyper-threading is enabled, and one vCPU as equivalent to one Oracle Processor license if hyper-threading is not enabled.*
- *Oracle Standard Edition One and Standard Edition 2 may only be licensed on Authorized Cloud Environment instances up to eight Amazon vCPUs or eight Azure vCPUs*

Users can allocate each Oracle Processor license to 2 vCPU's in the cloud with a maximum of 8 vCPU's. Note that AWS RDS offers a 16 vCPU option that doubles the vCPU Capacity, but more on that when we get to the Licensed Included option.

We compared Bring Your Own License (BYOL) to License Included (LI) across 4 instance types on AWS RDS for Oracle. If you want to check it out for yourself, feel free to go to AWS's Pricing Calculator -> https://calculator.aws/#/createCalculator/RDSOracle .

Each of the instance types are:
- *Single Availability Zone*
- *OnDemand pricing*
- *Memory: 16 GiB*
- *Annual costs are calculated as such: hourly rate * 730 hours in a month * 12 months in a year*

Table 1 – Analyzing licensing costs for LI vs. BYOL for Oracle Standard Edition (SE 2)

Instance Type			Bring Your Own License (BYOL) vs. License Included (LI)					BYOL Analysis***				
	vCPU	Sockets	BYOL (hr.)	LI (per Hr.)	License Fee (per Hr.)	License Fee per Year	Required Licenses	Annualized License Fee	Per Hour License Fee	Savings with LI over BYOL	% Discount with LI over BYOL	License Savings for LI
db.r5.large*	2	1	$0.2330	$0.4820	$0.2490	$2,181.24	1	$9,840.83	$1.12	$0.87	78%	$7,659.59
db.r5.xlarge*	4	1	$0.4660	$0.9640	$0.4980	$4,362.48	1	$9,840.83	$1.12	$0.63	56%	$5,478.35
db.r5.2xlarge	8	2	$0.9320	$1.9280	$0.9960	$8,724.96	2	$19,681.67	$2.25	$1.75	56%	$10,956.71
db.r5.4xlarge**	16	4	$1.8640	$3.8560	$1.9920	$17,449.92	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
* According to Oracle Licensing, Authoried Cloud Environment instnces with 4 or fewer vCPU's are counted as 1 socket, which is considered equivalent to an Oracle processor license.
** Oracle Standard Edition 2 may only be licensed on Authorized Cloud Environment instances up to 8 vCPU's. AWS RDS allows for 16 vCPU's in RDS, there is no BYOL translation.
*** Oracle BYOL license is based on list price perpetual license purchase, plus 3 years of SULS annualized over 3 years and accounting for price increases in the 2nd and 3rd year for maintenance

In order to compare BYOL with LI, we had to calculate the BYOL license as a typical discount rate to retail and added 3 years of maintenance assuming 22% of base license for year 1 and a 4% increase in maintenance over years 2 and 3. The resulting number was annualized over 3 years.

As you can see from Table 1, there is tremendous licensing savings to be had. The range of savings can be between $7,659.59 and $10,956.71 each year in licensing alone. AWS RDS offers a 16 vCPU size that you can't get through BYOL because Oracle caps applying SE 2 licenses in the cloud to 8 vCPU.

Let's go one step further, because realistically Oracle workloads run consistently for a long time and evaluated BYOL with Reserved Instances. Public Clouds offer Reserved Instances which are a commitment for either 1 or 3 years and offer options of upfront and monthly expenses over the designated term. In exchange for the customer's commitment for a long-term relationship, they offer pricing discounts.

Table 2 is an analysis of a single instance type, db.r5.large and Reserved Instances over BYOL or even On-Demand pricing. Anecdotally, these ratios hold true for the other instances types that were provided in Table 1.

As you can see on the next page, Reserved Instances provide greater savings over BYOL than even the On-Demand pricing. The range appears to be between $8,360.39 - $8,885.99 per year in cost savings over BYOL if you are willing to commit to a longer time frame.

Table 2 – On Demand vs. Reserved Instance Cost Comparison

Single AZ Deployment	db.r5.large Price per Hour	Calculated License Fee	Annual License Fee***	Savings over BYOL
On-Demand DB Instances (LI)	$ 0.482	$ 0.249	$ 2,181.24	$ 7,659.59
On-Demand DB Instances (BYOL)	$ 0.233	$ 1.12	$ 9,840.83	

Reserved Instance 1-Year Term	Effective Hourly*	Upfront	Monthly**	License Fee	Annual License Fee ***	Savings over On-Demand Price	Savings over BYOL
No-Upfront	$ 0.304	$ -	$ 221.555	$ 0.169	$ 1,480.44	$ 700.80	$ 8,360.39
Partial Upfront	$ 0.289	$ 1,266	$ 105.485	$ 0.161	$ 1,410.36	$ 770.88	$ 8,430.47
All Upfront	$ 0.283	$ 2,482	$ -	$ 0.157	$ 1,375.32	$ 805.92	$ 8,465.51
Reserved Instance 3-Year Term							
Partial Upfront	$ 0.198	$ 2,596	$ 72.124	$ 0.112	$ 981.12	$ 1,200.12	$ 8,859.71
All Upfront	$ 0.194	$ 5,089	$ -	$ 0.109	$ 954.84	$ 1,226.40	$ 8,885.99

Notes:
*Effective hourly pricing is shown to help you calculate the amount of money
**This is the average monthly payment over the course of the Reserved
*** Annual license fee is calculated, effective hourly pricing * 730 hours in a month * 12 months in a year

There are tremendous opportunities to save money on your Oracle Infrastructure. The comparison of Oracle Standard Edition BYOL and Licensed Included demonstrates appreciable cost savings from licensing alone by moving to AWS. Further reductions in expenses can be realized when you take into consideration that you no longer manage the database server, the infrastructure and AWS will do the upgrades for you.

This licensing strategy is just the beginning. When you start to consider core capabilities of the Cloud like Availability Zones for geo-replication, Encryption and many more services, it makes you wonder if you even need Oracle Enterprise or RAC. At the very least you can minimize these licenses. ◆

FIVE FACTS YOU NEED (AND WANT) TO KNOW WHEN RUNNING ORACLE SOFTWARE IN AWS CLOUD

We're bringing the must know facts when running Oracle software, the how, when, and where to apply Oracle's cloud policy for licensing software in public cloud environments. It can be quite confusing, with all of the misleading messages but we are here to offer you guidance. We will discuss five easy facts you can apply today to your cloud strategy (please review all licensing material with your legal counsel first).

1 **If you are using AWS RDS – License Included (LI) for Oracle database standard edition, Oracle's cloud licensing policy does not apply to you.**

There are claims out there that when Amazon offers a 16 vCPU Oracle SE 2 License Included instance, that they and you are violating the rules of Oracle's cloud licensing policy that limits SE 2 to 8 vCPU. This is an incorrect claim. The cloud policy is a non-contractual document that applies only if you choose to use it. The only time an Oracle customer should choose to rely on this non-contractual document is if they have their own licenses that need to be applied to vCPU in Azure or AWS EC2 or RDS instead of the contractually permitted physical processors where the software is "installed and/or running." Thus, the cloud policy only applies for bringing your own license (BYOL).

2 **Your use of RDS-LI is governed solely by the AWS Service Terms, and not the cloud policy, or any license agreement you may or may not have with Oracle.**

Section 10.3.1 of the AWS Service Terms defines the terms and conditions that apply to your usage of AWS RDS – License Included for Oracle software. You do not have to be a previous Oracle customer with a valid license agreement for these terms to apply. That means that none of the terms and conditions in any Oracle license agreement apply to your use of RDS – LI.

3 **If you BYOL for Oracle in RDS, your license agreement still applies, and those licenses must have active current Software Update & License Support (SULS).**

In Section 10.3.2 of the AWS Service Terms regarding BYOL for RDS, it states (emphasis added) "*You must have a valid license with 'Software Update License & Support' for the Oracle Software you wish to run. The terms of your existing license and support agreement(s) with Oracle continue to apply to your use of the Oracle Software; and You must follow Oracle's current policies for licensing Oracle Database software in the*

cloud computing environment. The database instances using the Oracle Software with Amazon RDS reside in the Amazon EC2 environment."

There are three important points in that service definition:
1. For your already purchased Oracle licenses that you bring to apply to AWS RDS instances, you must have active support. If you have terminated support on all your Oracle licenses of a particular product, and potentially using a third-party support vendor, you may not apply those licenses to an RDS instance.
2. The terms of your existing license agreement (whatever they are) also apply to those licenses in RDS (BYOL only).
3. The conditions contained in Oracle's cloud policy document also apply to these BYOL licenses. This is especially important in counting how many licenses are required for particular RDS instance types.

4   If you are being audited by Oracle under the terms of your license agreement, this does not cover your RDS License Included instances.

Since the RDS-LI usage is governed solely by Section 10.3.1 of the AWS Service Terms, the typical Audit Clause included in every other Oracle contract does not apply. You do not have an agreement with Oracle, but rather your agreement is with AWS. The only somewhat applicable statement made in this section states, "*Notwithstanding anything to the contrary elsewhere in the Agreement, Oracle is an intended third-party beneficiary of the Agreement, but solely with respect to this Section 10.3.1 of these Service Terms.*"

This statement in the Service Terms does not make Oracle a party to the agreement you have with AWS. It only indicates that Oracle is benefiting from the money that you pay AWS for the RDS-LI service. If Oracle wants to audit your use of RDS-LI instances, that audit must come through AWS, and not directly from Oracle. If you have other Oracle licenses that you purchased and are using outside of RDS-LI, and Oracle invokes a software audit under the terms of your license agreement, then these RDS-LI instances would not be included in the scope of that audit.

If Oracle GLAS, Global License Advisory Services, (formerly known as LMS) bugs you about RDS-LI instances in an audit, you can tell them that those do not apply, and that they will need to go through AWS for more information. We have seen a lot of activity lately where salespeople are bugging organizations about RDS-LI. In this case, you need to carefully and privately evaluate anything that they say, but they have no contractual recourse except to go through AWS for a breach of the Service Terms. Let us know if you want our help pushing back on Oracle.

5   Even in a managed solution like RDS, it is still possible to enable enterprise features and get out of compliance.

With Oracle's software, they have built-in landmines that are very risky, namely the enterprise database options and packs. Most of them are enabled by default, and even in standard edition you can easily invoke enterprise features.

If you are having AWS manage your standard edition instances for you, it is still possible for your DBAs to do things that would enable an enterprise feature. This is why it is important if you are in the cloud to use a license compliance monitoring solution like the OpsCompass License Manager (OLM). We will closely monitor your database feature usage and alert on non-compliant events.

"With Oracle's software, the enterprise database options and packs are built-in landmines that are very risky - and can end up costly mistakes... which is why it's important to have an OLM solution for continuous monitoring"

The RDS solutions from AWS, whether License Included, or bring your own license, are a fantastic value to consider for your database needs. Don't be misled by the confusing statements flying around out there. At OpsCompass and House of Brick, we have helped thousands of organizations and defended our clients in hundreds of audits. Let us know if we can help you too. ◆

EXPANDING OUR INDUSTRY LEADING RISK MANAGEMENT SOLUTIONS

During the VMworld conference in 2017, the VMware Cloud on AWS solution was rolled out. Karine Semmer, then Director of IT Hosting Transformation and Modernization at Medtronic, spoke of her experience using the VMC on AWS in a pre-release trial. "The one challenge which I think many of you will recognize if you have done anything contractually around licensing, going from on-prem to cloud, that again is our more significant challenge. One that is true for the cloud industry." What Ms. Semmer identified in 2017 is still true today – uncontrolled license usage from software vendors like Oracle, Microsoft, and IBM, represent a costly and potentially even existential risk to organizations both on-premises and in the cloud.

> *"Uncontrolled license usage from software vendors like Oracle, Microsoft, and IBM, represent a costly and potentially even existential risk to organizations both on-premises and in the cloud."*

To illustrate the magnitude of the potential risk, let's consider running an Oracle database in AWS or Azure. Let's say that an organization is running all of their Oracle databases in the cloud using 500 virtual CPU (vCPU). With hyperthreading enabled, that requires 250 Processor licenses of Oracle Database Enterprise Edition.

Without knowing the potential impact, this organization's database administrator performs a DataPump export on all of the databases and enables the Compress-All flag, and also enables Encryption to keep the data secure. Since the organization does not own any licenses for the Advanced Compression, or Advanced Security database options, they are now out of compliance in their cloud usage. At Oracle's list price, this is a financial impact to the organization of over $8 million!

To address this risk, OpsCompass is providing a first-of-a-kind solution – the OpsCompass License Manager (OLM). OLM works on-premises and in the cloud to monitor critical software license compliance, such as Oracle databases and the licensable database features. By tracking all of the licenses that a customer has purchased, and actively monitoring the usage of the software, we will identify and alert on events where the usage exceeds the available entitlement.

As recognized by Gartner, OpsCompass is one of the industry's leading providers of Cloud Security Posture Management (CSPM) solutions. CSPM is vital for organizations deploying their applications to the cloud in order to ensure that vital security configurations are established and maintained. OpsCompass does this by

validating users' cloud configurations against industry-standard security controls and benchmarks such as CIS and NIST.

Security is only one of the risks that organizations need to be tracking in their cloud environments. OpsCompass has expanded solutions beyond CSPM to what we have called Cloud Security and Configuration Management (CSCM). This recognizes that it is also important to monitor resource configurations for regulatory compliance, to watch how configurations drift to ensure against runaway cloud costs, to implement accountability measures, and to provide actionable steps that our customers can take to resolve concerns. There is one risk profile, however, that no CSPM vendor, except for OpsCompass, is helping their customers address, and that is the risk of uncontrolled vendor licenses.

House of Brick, the global services division of OpsCompass, has more than 22 years of experience helping customers avoid the risks and costs associated with enterprise applications, such as those using Oracle database. The uncontrolled usage of Oracle database features is the single biggest cost and risk area that House of Brick's thousands of clients have faced in the hundreds of audits that we have defended. OpsCompass License Manager captures that extensive audit defense experience to actively and automatically watch the databases in the cloud, or on-premises, to ensure this risk is effectively mitigated.

Moving enterprise-critical workloads to the cloud brings many advantages. There are also significant risks in the cloud that must be addressed early in the migration process. OpsCompass products and services address these risks so that your cloud experience can be focused on enterprise success rather than worrying about disruptive and costly pitfalls. ◆

CONCLUSION

The public cloud represents an exciting opportunity for running your Oracle databases in a secure, elastic, and highly performant environment. As you have seen, however, there are critical concepts that must be fully understood when considering your cloud strategy for Oracle databases. We hope that this information is helpful in developing that strategy, and in having confidence that you understand the risks associated with taking advantage of the tremendous opportunities in the cloud.

CONTACTUS

It is important to maintain an Oracle environment that is safe, secure and able to scale. A comprehensive understanding is critical. OpsCompass and House of Brick pull together advanced professional services and innovative product solutions to give you clear visibility and management into the Compliance, Security and Licensing posture of your entire cloud portfolio. This enables our customers to scale without exceeding budgets or falling out of compliance with industry regulations.

To see how this works for your company, contact us or start a free trial or demo today.

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