



ADVANCED CONSULTING PARTNER

The professionals at House of Brick offer strong business critical systems expertise with a focus on cloud and hybrid architecture and migration, license optimization, performance tuning, and DR/HA solution development.

House of Brick has been helping customers architect their Oracle environments for over 20 years. Like any infrastructure choice for Oracle, answering key architectural questions lays the groundwork for success. Here are some of the questions customers need to ask when considering AWS for their Oracle workloads.

WHAT ARE MY OPTIONS FOR LICENSING ORACLE ON AWS?

Customers spend much more on Oracle license and maintenance than the underlying infrastructure, so the impact on Oracle licensing should always be the first consideration when evaluating a platform change for your Oracle products. Compared to running Oracle on-premises, there are additional options available for licensing Oracle on AWS.

AWS Deployment Option	SE Bundle in AWS	Oracle Cloud Policy	Core-Based License	ULA
RDS	✓	✓	✗	✓
EC2 Compute	✗	✓	✗	✓
VMware Cloud on AWS	✗	✓	✓	✓
Dedicated Hosts on EC2	✗	✓	✓	✓
EC2 Bare Metal Instance	✗	✓	✓	✓

Source: *Licensing Oracle on AWS: Opening a Window Wide to the Cloud*

- Virtual CPU Licensing** – Oracle’s Cloud Licensing Policy allows licensing in EC2 and RDS by vCPU (processor core factor does not apply). It counts 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. This option is available for Oracle running both in EC2 or RDS. This is typically twice as expensive as traditional processor licensing however, due to the processor core factor table not applying. Keep in mind that AWS offers an “Optimize CPU” feature to disable virtual CPUs on RDS or EC2 instances in order to control licensable virtual CPUs.

- RDS License Included Option** – Customers have the option of bundling Oracle Standard Edition as part of the fee for RDS. This is almost always cost advantageous for customers, as the licensing is on-demand for a low price and involves signing no agreements with Oracle.
- Traditional Core Licensing** – Using AWS Dedicated Hosts and Bare Metal Instances in EC2 creates the possibility of using traditional per-core based Oracle software licensing. This can also be very cost advantageous.
- Unlimited License Amendment (ULA)** – Using a ULA in AWS EC2 or RDS is permitted, but most recent Oracle contracts do not allow cloud usage to count for ULA certification at the end of the agreement.

SHOULD I CHOOSE RDS, EC2, OR VMWARE CLOUD ON AWS?

AWS provides a number of options that are cost effective, performant, and highly available. As with any infrastructure platform decision for Oracle, the best option depends on operational goals and the nature of the applications.

- EC2** – This provides a traditional, self-managed, virtual machine on which Oracle software can be installed. Customers have multiple OS choices and very few feature limitations. In addition to regular virtual EC2 instances, there are options in EC2 for both Dedicated Hosts and Bare Metal Instances.
- RDS** – Offers a complete managed database service with options for included database licensing. Feature and version options are more limited compared to EC2, but still suitable for the majority of Oracle-based workloads.
- VMware Cloud ON AWS** – Allows customers with Oracle running in an on-premises VMware environment to extend their workloads to the VMware Cloud on AWS and vMotion between their onsite environment and AWS cluster.

HOW CAN I OPTIMIZE MY ORACLE PERFORMANCE ON AWS?

Leveraging the strengths of the cloud requires a different approach to performance tuning. Given how inexpensively additional RAM or disk may be tactically applied to performance issues, Oracle database tuning in the cloud is an exercise in determining when it is appropriate to increase resource

allocations versus analyze and tune application SQL statements. All the traditional Oracle tuning tools are usable in the same manner in the cloud, but additional AWS services such as CloudWatch are invaluable for tracking system load metrics. Combining a cloud savvy approach with traditional Oracle performance tuning strategies allows for excellent Oracle performance in a public cloud environment.

HOW CAN I MIGRATE TO AWS WHILE MINIMIZING DOWNTIME?

Navigating the options available for migrating an Oracle database to AWS RDS or EC2 can be tricky, but House of Brick's experience shows that there are really two high level approaches:

- For business critical production workloads, the best practice is to utilize a replication tool to synchronize the database data to the cloud without impacting service levels. Oracle's Data Guard or GoldenGate are sometimes used for this, but Amazon's Database Migration Service (DMS) is often an easier, and less expensive, alternative.
- Non-production workloads, or production workloads that are not 24/7, can be migrated with more straightforward backup/restore, or export/import, strategies for moving the database to the cloud.

WHAT ARE MY ALTERNATIVES TO ORACLE RAC?

While House of Brick has successfully implemented Oracle RAC in the VMware Cloud on AWS, we find that for most customers, all of the functionality and features offered by RAC either are not needed or can be duplicated using alternative strategies in the cloud. They include:

- The high availability of RAC, allowing service to persist with only a brief interruption during server failure, is an automatic feature of all EC2 or RDS instances in AWS. Any workloads that fail due to hardware will be automatically restarted on another host. In addition, for workloads that can tolerate almost zero downtime, RDS offers a Multi-AZ option to maintain a standby copy of a database that can be failed over automatically (and nearly instantly) in the case of an outage.
- The scalability of RAC is far less important in a cloud environment where additional CPU/RAM/disk resources are only a few clicks away. The ability to scale Oracle instances up or down in size on-demand is a more powerful scalability tool than the ability to expand a RAC cluster.
- Zero downtime rolling patching, an important RAC feature for 24/7 business critical databases, can be accomplished with Oracle GoldenGate and standby instances.

sales@houseofbrick.com | houseofbrick.com
877.780.7038 | 402.445.0764

WHAT IF I AM CONSIDERING MOVING SOME OF MY WORKLOADS OFF OF ORACLE?

Moving workloads from Oracle to an open source database engine can be a source of great cost savings. However, planning such a migration takes careful preparation as not only must the data be moved, but often application refactoring and schema refactoring are required as well. Using Amazon's Schema Conversion Tool (SCT), an assessment report can be run against an Oracle database to determine the degree of schema modification that may be required.

WHERE CAN I LEARN MORE?

Blog: Options for Running Oracle on Amazon RDS

White Paper: Migrating Critical Oracle Workloads to the Cloud Using VMware Cloud on AWS

Blog: Licensing Oracle on AWS: Opening a Window Wide to the Cloud

Presentation: Designing Critical Oracle Database Solutions in AWS

Blog: Running Oracle in EC2? Leverage AWS' New Optimize CPUs Feature

Presentation: Optimize Your Oracle Licenses on Amazon Web Services

Blog: Oracle RDS Best Practices for Backup

WHAT IF I NEED HELP?

For two decades, House of Brick Technologies has led the industry in architecting and optimizing Oracle and SQL Server based business critical systems. We can help with the following services provided on Amazon EC2, Amazon RDS, and VMware Cloud on AWS.

- Cloud Readiness Assessment
- Business Critical Database Architecture Optimization
- Database Licensing Services (Oracle & SQL Server)
- Migration Services - Cloud and On Premises

HAVE MORE QUESTIONS?

Send them our way by emailing sales@houseofbrick.com today.