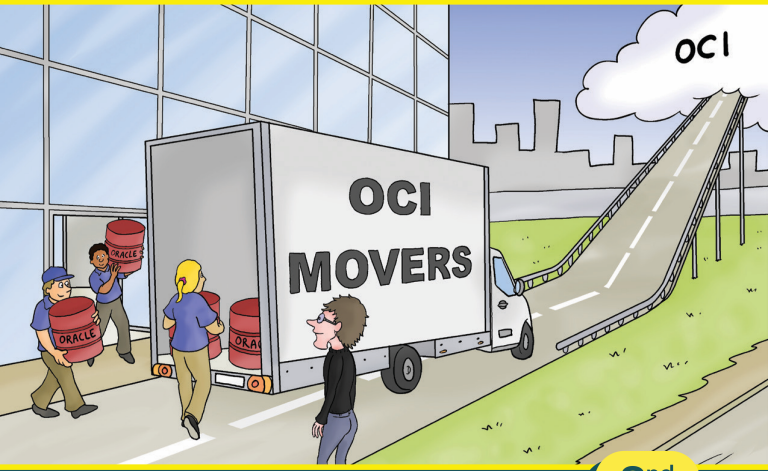
ConversationalGeek

Conversational Oracle Data Migration to OCI

Greg Altman (Enterprise OCI Architect)



Learn about:

- Why consider moving Oracle data to OCI in the first place
- Practical steps that can be taken to assist in a successful migration of your Oracle data

2nd MINI Edition

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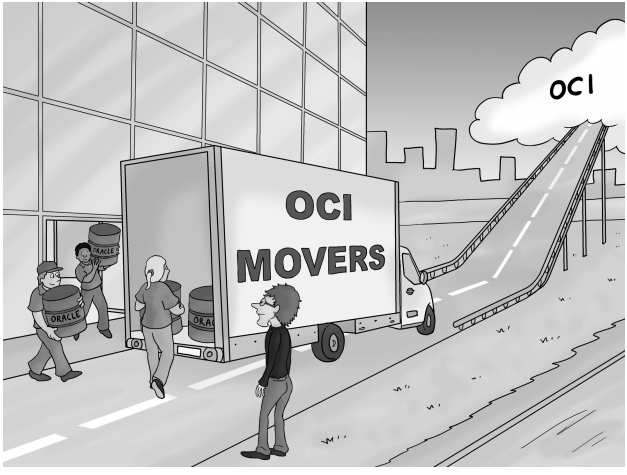
by Greg Altman



ConversationalGeek®

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Author:	Greg Altman
Project and Copy Editor:	Nick Cavalancia
Content Reviewer(s):	Karen Spencer
	Jessee Tipton
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The “Conversational” Method

We have two objectives when we create a “Conversational” eBook. First, to make sure it’s written in a conversational tone so that it’s fun and easy to read. Second, to make sure you, the reader, can immediately take what you read and include it into your own conversations (personal or business-focused) with confidence.

“Geek in the Mirror” Boxes

We infuse humor and insight into our books through both cartoons and light banter from the author. When you see one of these boxes it’s the author stepping outside the dialog to speak directly to you. It might be an anecdote; it might be a personal experience.

Within these boxes I can share just about anything on the subject at hand. Read ’em!

Why move Oracle data to the cloud?

"*They just found out we're moving our Oracle data to OCI.*"

Databases (Oracle or otherwise) have long resided on-premises. Organizations have largely relied on local infrastructure to host their Oracle databases for many reasons. But in recent years, the opportunity to take advantage of the cloud *for*

Oracle workloads has presented itself, allowing organizations to take advantage of the scalability, availability, processing power, and adjacent services the cloud has to offer. This has led to the need for organizations to determine whether moving their Oracle data to the cloud would be advantageous.

In this eBook, I'll focus mainly on Oracle Cloud Infrastructure (OCI), with its' hundreds of products and services delivered over the internet and billed according to usage – and discuss the *why* and *how* of moving your Oracle database there.

But let's first finish the 'low hanging fruit' in the conversation around "Why Oracle in the cloud?" Like all discussions of cloud vs. on-prem, the hardware and hardware maintenance cost must be factored in. Most conversations start and end at the cost, but there is much more to be gained by moving your Oracle data to the cloud.

The most significant benefits are scalability, flexibility, and big data analytics – and the stats below about the current state of data housed in Oracle help to make the case:

- 85% of on-premises databases are overprovisioned due to having to buy hardware and predict data growth over the next several years. Cloud resources (like CPU, memory, and storage) can scale up and back as needed.
- Replicating Oracle data to OCI allows access to services like IoT processing and analytics. This enables you to combine data from multiple sources, including IoT and unstructured data, to gain deeper insights.
- 80-90% of all digital data is unstructured (CIO).[1] Text messages, images, emails, videos, and social media posts are all unstructured. Using OCI, you can build DataWarehouses or DataLakes to consolidate your data from multiple sources.

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[1] https://www.cio.com/article/220347/ai-unleashes-the-power-of-unstructured-data.html

A data lake on OCI is tightly integrated with your data warehouses, analytics, and other OCI services, such as machine learning tools.So, there are definitely benefits to moving Oracle data into the cloud… but what about Oracle Cloud Infrastructure specifically?

Why move Oracle data to OCI?

As you probably already know, there are a few major public cloud players, including Microsoft Azure, Amazon AWS, Google Cloud, and Oracle Cloud Infrastructure. Of these, Azure and AWS battle back and forth between the largest. However, Oracle's OCI has been named a Visionary in Analytics & Business Intelligence (ABI) by Gartner for four years in a row. Let's focus on OCI to keep things a little simpler and look at some details that provide some context around why Oracle's Cloud is a solid choice:

1) At last count, Oracle has over 22,000 infrastructure customers, and that number continues to grow[2].

2) Oracle Security solutions are architected across the entire suite of cloud services.

3) Geographically diverse data centers – 48 Cloud Regions in 24 countries

4) Oracle aims to achieve 100% renewable energy use in all data centers by 2025.

Beyond hardware savings and security, flexibility is another significant benefit to moving your data to OCI. DBAs today are rarely afforded the luxury of managing only one type of database. Oracle Cloud offers the flexibility of running not only Oracle but also MySQL, or other relational or NOSQL databases. This is in addition to the

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[2] Forbes - https://www.forbes.com/sites/patrickmoorhead/2023/02/08/oracle-cloudmaking-all-the-right-moves-in-2022

myriad of real-time analytics allowed by having your data in the Oracle Analytics Cloud.

84% of DBAs manage more than one database platform, and 27% of DBAs oversee more than 100 databases[3].

High-speed data movement solutions tools like Quest's SharePlex offer the ability to quickly ingest large amounts of transactional data into your cloud data warehouse; speed is king in the modern world. Gone are the old days of batching up your transactions for the day, uploading to an online service, and then processing the data for use. Your competition is scaling up and moving fast, and so should you.

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[3] Quest, "Database Professionals Look to the Future: 2020 Trends in Database Administration" (2020)

Even if you are happy with your Oracle online transaction processing, you can offload the reporting, business intelligence, and other analysis to the cloud. This will reduce the load on your production databases and servers and allow the BI team to work with their own copy of the raw data. However, for the analysts to offer the most useful information to business leaders, the data must be available as close to real-time as possible.

I'm sure some of you are thinking, "It takes BI too long to process it for them to need real-time data replication." When your data is housed in OCI, a more comprehensive array of tools opens for your business analysts and data scientists. In addition to the tools available within OCI, such as Oracle's AutoML (machine learning), Oracle's partnership with Azure allows using Azure tools on your Oracle data. For example, you can connect to Oracle Analytics Cloud from Microsoft Power BI and visualize Oracle Analytics content. Alternatively, you can connect the Azure Synapse Analytics with Oracle Exadata Cloud service running on OCI. This multi-cloud capability enables your analysts to use their choice of tools.

Many of the big data tools scale down as well as up. Too many enterprises fail to fully utilize their available data because they think, “We’re too small to have Big Data.”

In addition to the benefits of OCI having your data in one place, there are also significant IT resilience benefits.

IT resilience is essential to business continuity because businesses fail when data stops flowing. Our goal as data professionals is to prevent that single point of failure leading to disruption of data and business. Traditionally this has been done with two data centers in an active/active matrix. As mentioned earlier, this approach doubles the hardware cost.

Not only is there flexibility in what databases you use, but there is also flexibility in how you handle your migration to the cloud. It doesn’t have to be, and probably shouldn’t be, a “big bang” all-at-once

conversion. Why not start with a hybrid solution? You can replicate your data to a cloud database, get comfortable with the tools and then slowly retire your backup data center, for example. This allows you to utilize tools in OCI without sacrificing the investment already made in local hardware.

Making the move!

Once the decision is made to "go cloud," the real work begins. How do you pull this off without data loss or downtime?

All IT professionals are risk-averse, and DBAs are the most risk-averse of all, for good reasons! The integrity and availability of the business' data is our responsibility, so we must tread carefully in an undertaking like a migration. So, it's necessary to consider how your Oracle data will be migrated through a few lenses.

What could go wrong?

Migrating and upgrading databases and associated software applications have historically been synonymous with risk, downtime, and long

weekends at the office for database administrators. The Infrastructure Teams are on high alert until the process is over, then resume normal operations with an eye out for glitches and anomalies. A stressful process for everyone, even if everything goes well, but disaster is literally a keystroke or mouse click away. Even a minor error could take days to recover from, while you have angry users ringing the phone off the hook and a business that is losing revenue.

This sounds like the stuff of nightmares, but sadly, database migrations and upgrades have almost always been risky and stressful. What if it didn't have to be that way? What if you could complete your operational goals with zero downtime and zero data loss without impacting the flow of business?

Planning is key

Let's start by revisiting some nightmare-inducing pitfalls and see how to avoid them. Some say there are 5 or 8 or 10 reasons migrations fail. There really is only one – poor planning. Poor planning leads to poor execution, causing issues like downtime and data loss. Unfortunately, there is a parallel path that can cast your migration in a poor light, and that is poor communication. Even if the migration goes well

from a technical standpoint, failing to communicate the process plan or failing to report progress effectively can lead to the perception of failure by business leaders.

What constitutes a good plan? In addition to the obvious parts of mapping the migration steps, testing is critical.

Test, test, then test again.

Ideally, before the actual migration, you'll be able to create a test environment to test your applications thoroughly before making changes to the production environment. Some organizations try to save time by limiting testing, which increases the risk of failure. A better approach to testing is to replicate the activity on production databases, with the volume and variety of transactions that would take hours of work to duplicate. Use replication for at least two days as the only form of test against the instance. Then run read-only tests to check your reports and queries for accuracy and compatibility. Finally, begin to implement some of the new features and bring in some early adopters from the BI team to begin integrations.

Prepare for failure

The other critical portion of a good plan is to have a fallback plan in case something terrible happens. In the instance of migration to the cloud, this is the strength of a hybrid approach. If there is a problem getting the data flowing, you haven't changed your current production databases. Just remember – fail forward if possible.

When you set out to make your plan, one of the first things to consider is the tools at hand to accomplish the task. What 'traditional' tools do you have, and are they enough? Do you need an enterprise solution?

Planning for the right tools

The traditional Oracle migration methods can accomplish your data migration to the cloud, provided you have lots of time. The old export and import method may work for seeding the initial data, but how good is it when it's out of date before the upload is done? Oracle Data Pump was designed to speed up the process, but it's still too slow. Additionally, it only works from Oracle Database to Oracle Database, reducing the flexibility of the

databases mentioned earlier. Other traditional tools like Oracle RMAN and Oracle Data Guard can also accomplish the initial seeding but again fail to manage the ongoing replication with the speed needed for real-time analytics.

All of this adds up to one thing – new tools are needed. So, what do you need to look for in a replication tool?

Searching for the perfect toolset can be daunting. It's usually easier if you have a sort of bucket list of things that a good toolset must have, as well as a more narrowly defined list of features that would be 'nice to have.'

The toolset you choose must have a list of features that look something like this:

- Simple to implement and use.
- Monitoring and reporting of replication.
- Platform agnostic so that you can utilize the same tools for replicating from on-premises

databases on various platforms like Windows, Linux, or others.

- Multiple cloud replication targets allowing for true multi-cloud scalability.

- Automated methods of conflict resolution to compare and repair live tables.

- Resynchronization tool also helps in case of losing connectivity with the source database. Ideally, it should be able to do the resync while new data is flowing in.

- Of course, a decent tool will also have good support for those times when, against all your planning, you wind up in the weeds.

The Big Takeaways

Migrating your data workloads to the cloud is a big undertaking with big potential payoffs. Business leaders are asking for more analytics, and they want them in real-time. At the same time, database professionals are increasingly concerned about the exponential growth of data and how to store and analyze this data securely. A cloud solution will help to solve these problems.

Oracle Cloud Infrastructure enables flexibility as well as a wide variety of tools that allow DBAs to use the best tool for the job at hand. Not just database flexibility but also the ability to reduce hardware costs, all while improving IT resiliency and business continuity.

The actual move to the cloud can be daunting. Many companies get paralyzed at this point for fear of downtime or, worse, data corruption. One key to moving forward is to have a good plan with a failback option and a rigorous testing phase. The other big key is to invest in proper tooling. This is

not something that you can have your DBAs script up in their spare time!

A proper toolset is not just for the initial migration but should also manage ongoing replication between your on-prem data store and your cloud data. It should enable you to automate the process of conflict resolution and be able to manage this on live data tables without data loss. To round it out, a good solution should have a support team that can understand your issues and help you find solutions, not just read from a “Have you tried rebooting?” script. Ideally, you can check most of these things off with a single comprehensive tool or at least a suite of tools.

SharePlex by Quest: A better way to quickly move your Oracle data into Oracle Cloud Infrastructure (OCI)

What if you had access to a solution that supports multiple pathways in OCI and provides an insurance policy against downtime? One that would give you the flexibility you need to do more with your Oracle data by leveraging the Azure ecosystem and moving your data to maximize its value.

With SharePlex, Oracle data can be continuously replicated to Oracle databases in OCI to maximize its benefits with lower cost and risk. Specific replication use cases include:

- Moving Oracle data continuously into OCI SQL Database for access to Microsoft system-provided business intelligence tools and lower-cost reporting solutions.

- Leverage OCI services, like Oracle Analytics Cloud.

- Assisting with Oracle upgrades and migrations (e.g., from on-prem 19c to cloud-based 23c) by replicating live changes in production to a holding queue, and then replaying the transactions post-upgrade on the upgraded Oracle instance.

- Speed up the implementation of your multi-cloud initiatives by simplifying the process of moving Oracle data continuously between different cloud providers (like Amazon AWS and Microsoft Azure).

Easily achieve high availability, increase scalability, integrate data, and offload reporting with this flexible solution that supports multiple business use cases. Move your data – not your budget – with affordable database replication.

Learn more at
www.quest.com/products/shareplex

Learn More Now

View additional resources – no registration required.

Take the next step toward accelerating your move to the Oracle Cloud Infrastructure. Oracle ACE Janis Griffin and migration expert Clay Jackson show how SharePlex® by Quest® makes it easy.

Simplify your journey to the Oracle cloud with a cost-effective, cloud-based database replication and migration solution.

Read more about SharePlex for Oracle Cloud.

Oracle data has been on-prem forever. But new advances in the cloud give reason to either replicate or migrate this data to OCI. In this eBook we'll look at the reasoning behind migrating Oracle data to OCI and tell you how.

About Greg Altman

Greg Altman has 30 years of experience in infrastructure management, certifications in Microsoft server and Azure, a blog at TheHoundTech.com, and two Iron Butt certifications for long distance motorcycle rides (so far).