Demystifying Data Integration for the Cloud

ORACLE

Table of Contents

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Introduction

Cloud computing is a vision that is increasingly turning to reality for many companies. Enterprises, both small and big, are evaluating cloud computing and, in increasing numbers, are moving their IT infrastructure to the cloud. As a matter of fact 91%[1] of IT organizations allocate at least some portion of their budget to the cloud as they continue to focus on service responsiveness and cost flexibility. Depth of deployment has also increased, with more than 33%[1] of companies allocating at least 6% of spending to cloud solutions-- up from just 23% in 2014. Forrester Research[2] predicts that, by the year 2020, enterprises will be investing more than $241 billion in cloud computing each year – that's six times what they're spending today. But where does that leave our current investments for information management solutions, our existing relational data stores, data warehouses, business intelligence systems, and business applications that consume data? What impact will cloud have on the world of connecting your data sources?

The benefits of cloud computing range from lower data center costs, to significantly reduce environmental impact, to the ability to capture more of the opportunities that markets present through increased agility in resource deployment and dramatically reduced time to market. While the promised benefits of cloud computing can be immense, achieving them requires much more than simply connecting via an adapter to a software-as-a-service (SaaS) offering. These may be useful steps towards moving to a cloud computing blueprint, but on their own do not deliver cloud computing for the whole enterprise and its associated benefits. When embarking on a cloud journey organizations face multiple challenges in data movement and access. Some of the key ones are:

- How to move the data in legacy systems to the cloud environment without interrupting business operations?

- How to integrate multiple SaaS apps with different standards for analytical or transactional systems

- How to ensure timely data movement between cloud and on-premises systems to support business requirements

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1 Source: CEB's IT Budget Benchmark https://www.executiveboard.com/blogs/results-from-the-it-budget-benchmark-2014-2015/

2 Source: April 21, 2011 *Sizing The Cloud Understanding And Quantifying The Future Of Cloud Computing* by Stefan Ried, Ph.D. and Holger Kisker, Ph.D. with Pascal Matzke, Andrew Bartels, and Miroslaw Lisserman

- How to ensure data quality when moving data between on-premises systems and cloud

Because of these variety of challenges, it is more productive to look at the ways of transforming the way we think of our current information management architectures and develop an enterprise-wide strategy for cloud computing.

The Promise of Enterprise Cloud
How important are the following perceived benefits to your organization?

Use Cases

■ Agile Development & Testing   ■ Platform Standarization & Consolidation

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Greater business agility	89%
Better use of resources	88%
More rapid implementation of business models	87%
Lower capital expense	87%
Fewer operational issues	81%
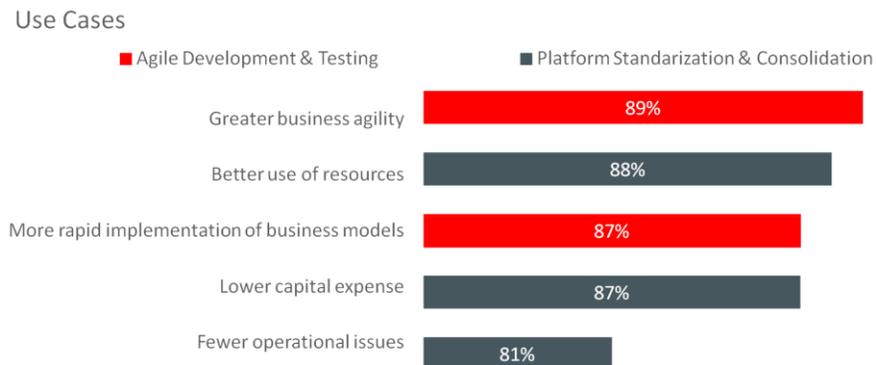
Figure 1: benefits of cloud, based on Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

In this paper we'll outline the key areas where Oracle's data integration products deliver critical capabilities in addressing the above mentioned challenges with solutions including:

- Cloud Database Integration

- Data Integration for Cloud Apps

- Data Integration for BI/Analytics in the Cloud

- Data Integration for Private / Managed Cloud

Oracle's Data Integration Offering

Oracle offers an integrated data integration platform with comprehensive capabilities including real-time and bulk data movement, high-performance transformation, bi-directional replication, metadata management, data services, and data quality for customer and product domains.

Oracle Data Integrator offers high-performance bulk data movement and transformation across heterogeneous sources and targets. With its unique, next-generation Extract Load and Transform (ELT) technology it delivers higher performance and lower cost of ownership compared to traditional ETL solutions. It is integrated tightly with other Oracle data integration products for end-to-end solutions.

Oracle GoldenGate offers real-time data integration, transactional data replication, and online data comparison across heterogeneous systems. Oracle GoldenGate enables real-time business intelligence for improved business insight, query offloading to maximize OLTP performance, zero-downtime data migration, disaster recovery, and active-active database synchronization for continuous availability.

Oracle Enterprise Data Quality delivers a complete, best-of-breed approach to party and product data resulting in trustworthy master data that integrates with applications to improve business insight. Oracle's data quality products provide powerful data profiling, cleansing, matching, monitoring capabilities, and unparalleled ease of use.

Oracle Enterprise Metadata Management helps harvest metadata from Oracle and third-party technologies to explore, report, analyze, and govern your organization's metadata.

Oracle Data Service Integrator provides data virtualization capabilities to quickly develop and manage federated data services for accessing single views of disparate information.

Oracle Big Data Preparation Cloud Service offers an interactive set of services that automate, streamline, and guide the process of data ingestion, preparation, enrichment, and governance without costly manual intervention.

Figure 2: Oracle offers comprehensive data integration and governance via integrated, best-of-breed family of products

As we will describe in the upcoming sections, Oracle supports cloud deployments with a variety of use cases. Its key differentiator in the market is that the same technology, architecture, and products that customers deploy on premises, can be used in cloud environments.

Figure 3; Oracle's key differentiator for data integration in the cloud is that the same products and architecture can be used

Cloud Database Integration

While businesses are making new economic investments in public cloud computing, they continue to rely heavily on their existing on-premise IT investments and their own private cloud deployments. This strategy of straddling between the two infrastructure types poses its own set of challenges.

To integrate data between public cloud and private data center solutions, organizations face two major challenges. First, they must be able to rapidly load data to cloud-based databases and run processes in a timely fashion. Second, that data must be kept synchronized – often in real time, or near real time.

Oracle Data Integrator and Oracle GoldenGate can connect your on-premise enterprise systems and the cloud environment by moving data in bulk or as real-time transactions across geographies and heterogeneous systems. These capabilities not only support ongoing data movement and ensure timely data access between systems, but also the initial consolidation effort to cloud databases. You can leverage Oracle GoldenGate and Oracle Data Integrator for consolidating to public or private cloud databases without interrupting operations.

Zero Downtime Consolidation to Database Cloud

Consolidation of your databases and data stores is an important step to take to be able to receive the full benefits of cloud computing. Oracle GoldenGate, with its real-time data integration capabilities, and Oracle Data Integrator, with its bulk data movement and transformation capabilities, provide you with the ability to seamlessly consolidate your data to public or private database cloud.

One of the key hurdles in consolidating systems is the impact on business operations. Especially for mission-critical systems any downtime can be detrimental to the business e.g. by causing revenue loss, SLA penalties, and damaging customer satisfaction etc. Oracle GoldenGate's real-time data integration capabilities minimize any impact on business operations during the consolidation and migration effort. Through real-time data movement Oracle GoldenGate allows immediate switchover from their existing system to the new environment in the cloud. This can be implemented when the new system is ready—without ever denying access to the

application. Since the source application can continue to operate, the IT teams have the flexibility to test the system as long as they need to.
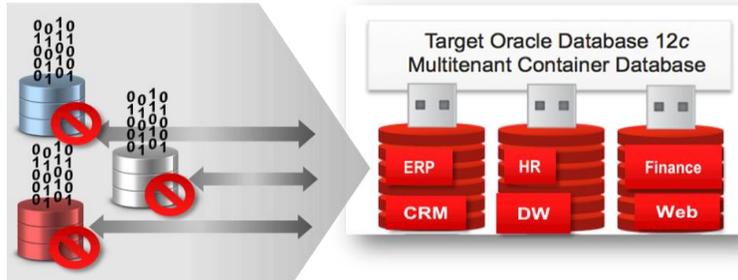
Figure 4: Oracle GoldenGate's bidirectional real-time data replication enables zero downtime database consolidation

Oracle Data Integrator and Oracle GoldenGate can both be used for migrating to Oracle Database or Oracle Exadata from database appliances and other major systems. Oracle GoldenGate 12c is optimized for Oracle Database 12c and allows very efficient, high performance real-time data capture from and delivery to Oracle Database 12c including its new multitenant architecture. Oracle GoldenGate 12c offers deep integration with Oracle Database that no other data replication vendor can offer. Oracle GoldenGate enables zero downtime migration from all major open system databases and mainframes including HP NonStop, IBM DB2 (for z, for i, for LUW), Informix, Sybase ASE, SQL Server.

Data Synchronization Between On-Premises and Cloud Databases

After you consolidate your systems and move to the cloud environment, Oracle Data Integrator and Oracle GoldenGate can integrate on-premise enterprise systems with the cloud databases to ensure critical data in either side is accessible for end users and related systems.. Oracle's data integration products support both Oracle, and non-Oracle cloud environments such as Amazon.

Support for Oracle Database Cloud Service

Using Oracle Data Integrator's powerful high volume data loading capabilities, customers can perform initial load to Oracle Database Cloud Service. Oracle Data Integration products are tightly integrated platform to deliver the fastest bulk data loading and real-time data movement tools on the market for Oracle environments— on premises or cloud. This unified and highly-flexible solution reduces integration costs with automated, scalable and repeatable data integration mechanisms. Customers do not need to write their own codes and struggle with connecting non-Oracle systems to the Oracle Database Cloud environment.

Figure 5: Oracle Data Integration products enable data loading and synchronization with Oracle Database Cloud.

Support for Non-Oracle Cloud

Amazon RDS customers can use Oracle GoldenGate for real-time data integration and replication for their Oracle Databases. Oracle GoldenGate supports Oracle Database on Amazon RDS as a source or target, and enables zero-downtime migration and upgrades, active-active database synchronization, disaster recovery and data protection, and cross region replication. Amazon RDS customers can use Oracle GoldenGate in various configurations. Below is a list of common scenarios taken from Amazon Relational Database Service User Guide Appendix for using Oracle GoldenGate with Amazon RDS.[3]

1. An on-premises Oracle source database and on-premises Oracle GoldenGate hub, that provides data to a target Amazon RDS DB instance
2. An on-premises Oracle database that acts as the source database, connected to an Amazon EC2 instance hub that provides data to a target Amazon RDS DB instance
3. An Oracle database on an Amazon RDS DB instance that acts as the source database, connected to an Amazon EC2 instance hub that provides data to a target Amazon RDS DB instance
4. An Oracle database on an Amazon EC2 instance that acts as the source database, connected to an Amazon EC2 instance hub that provides data to a target Amazon RDS DB instance
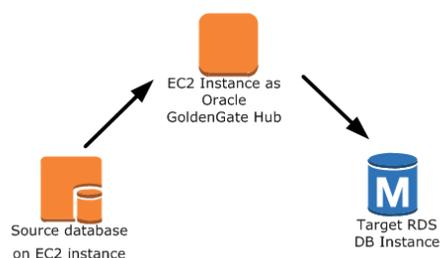

Figure 6: Depiction of Amazon RDS scenario 4

5. An Oracle database on an Amazon RDS DB instance connected to an Amazon EC2 instance hub in the same region, connected to an Amazon EC2 instance hub in a different region that provides data to the target Amazon RDS DB instance in the same region as the second EC2 instance hub.

Other Oracle Data Integration products are also used in Amazon and Microsoft cloud environments. For example several customers have already implemented Oracle Data Integrator to load data from their on-premises applications and databases into Amazon Redshift. Data can then be transformed using ODI's native E-LT architecture directly on Amazon Redshift.

Integration for Cloud Applications

Cloud application integration is growing quickly in importance. Industry experts often cite integration as one of the barriers to adoption of cloud services, especially for apps that need to exchange messages and data. Computerworld's 2014 survey with IT professionals with public and private cloud experiences revealed an 11% increase in interest in technologies for cloud integration over the previous year. These organizations want to

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3 Source: Amazon Relational Database Service User Guide Appendix Using Oracle GoldenGate with Amazon RDS

http://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/Appendix.OracleGoldenGate.html

avoid rigid point-to-point connections between cloud-based services and on-premises infrastructure, which often ignore well-established integration principles. Custom interfaces among cloud apps are difficult to maintain and tricky to upgrade when endpoints change.

When it comes to enterprise applications and systems of record, synchronization between on-premises and cloud-based apps must be orchestrated in a consistent way. Customers need a simple yet powerful cloud integration platform that includes out of the box adaptors for Oracle Apps as well as for third-party cloud apps like Workday, NetSuite, and Salesforce.

Oracle offers a simple yet powerful Integration Cloud Service, which integrates to and runs on the cloud, to connect on-premises apps, Oracle Cloud and 3rd party SaaS apps via out-of-the-box connectors. Integration Cloud Services is a secure, performant, and highly available platform that supports mission-critical integrations. To speed time-to-value, it is pre-integrated with Oracle SaaS applications and offers best-in-class SaaS connectors to accelerate integration with your other cloud assets. A standards-based software development kit (SDK) and library of pre-built, customizable connectors simplify integration chores. By offering end-to-end visibility with comprehensive drill-down capabilities and real-time insight into key performance indicators on a visual dashboard, it enables to easily monitor these integrations.

For customers that want to run their integration operations on premises, Oracle SOA Suite provides cloud Integration for on-premises and SaaS applications. As with Oracle Integration Cloud Services, Oracle SOA Suite supports both Oracle Coud and 3rd Party SaaS. Oracle SOA Suite provides a single solution for integrating applications regardless of deployment location (public cloud, private cloud, and on-premises). Having a universal integration platform is much simpler than managing multiple middleware platforms and toolkits, many of which use proprietary languages.

Data Integration for Cloud Applications

One of the top challenges that many organizations face when implementing cloud-based architectures is being able to load terabytes of data from their network into cloud applications such as Salesforce.com, Sales Cloud, Service Cloud or Eloqua. This requires accessing information from heterogeneous sources and then bulk loading this data consistently across the firewall to a cloud environment. To deliver data between firewalls, the bulk load solution needs to support modern web-services style integrations which can be delivered via HTTP, also known as data-access services. For example, an organization that is moving its customer relationship management (CRM) functionality in to a SaaS CRM application would need to do an upfront bulk upload of all the customer data currently residing in various applications – both packaged and custom applications – into the SaaS CRM application. In addition to the ability of moving data, in bulk, at extreme performance, the underlying data integration platform also needs comprehensive connectivity to interact with the existing on-premise business applications.

Tightly integrated with Oracle SOA Suite, Oracle Data Integration product family provides data loading and real-time data replication capabilities between on-premises and cloud applications. Oracle Data Integrator is able to transfer large volumes of data using database or application APIs, and integrates with Oracle Enterprise Data Quality to provide trusted, high-quality data. Oracle GoldenGate offers database-level real-time data integration between on-premises systems and SaaS applications.

Oracle Data Integration is also at the core of Oracle Cloud Applications. SaaS apps such as Sales Cloud or Cloud HCM use Oracle Data Integrator as their embedded solution for high-volume data movement requirements, while Oracle GoldenGate and Oracle Data Integrator are used together to migrate customers from

on-premises application deployments to Oracle Cloud Apps. Many Oracle Cloud users offload reporting from production systems using Oracle GoldenGate's real-time, heterogeneous data replication capabilities. The solution delivers real-time reporting for Oracle Cloud Applications without impacting performance in transaction processing. Oracle Enterprise Data Quality is an integral part of Oracle Cloud Applications such as Sales Cloud or Social Data and Insight Cloud.

Figure 7; Oracle's data integration products enable real-time and bulk data movement between on-premises and SaaS applications.

Data Integration from Cloud SaaS to Data Mart / Enterprise Data Warehouse

In hybrid IT environments, analytical systems need to be integrated with all relevant data sources wherever they may be deployed: public cloud and managed cloud. Incorporating critical data from SaaS applications allows more complete understanding of your business and better decision making. You may also need to synchronize reference data or master data you have on premises with SaaS apps.

Oracle's data integration offering enables you to use a single platform for loading SaaS data to your on-premises data marts or data warehousing solutions. It supports Oracle and major non-Oracle systems as source or target. Leveraging real-time data synchronization between on-premises and cloud environments, you can keep your reporting/data warehousing environment in synch with the changes happening the in the SaaS applications and support timely, and enhanced decision making for your business. The solution allows maximizing the value of SaaS investments with flexible and fast data integration. Oracle's solution includes integrated data quality capabilities for trusted data. Oracle's offering is differentiated in the market with its ability to provide efficiencies with high-performance delivery, and to lower cloud integration costs with shared design time tools, runtimes, and metadata.

Figure 8: Oracle Data Integration products allow native integration with cloud-based applications.

A great example for this SaaS integration for data warehousing is Yalumba Wine Company. It is a fast growing company in Australia. It was in need of introducing a more modern standard to the existing manufacturing processes to meet globalization demands, overall time-to-market, and better operational efficiency objectives of product development. The Yalumba Wine Company worked with a partner, Bristlecone to develop a unique solution whereby Oracle Data Integrator is leveraged to pull data from Salesforce.com and JD Edwards, in addition to their other pre-existing source systems, for consumption into their data warehouse. They have emphasized the overall ease of developing integration workflows with Oracle Data Integrator. The solution has brought better visibility for the business users, shorter data loading and transformation performance to their data warehouse with rapid incorporation of new data sources, and a solid future-ready foundation for their organization. Moving forward, they plan on leveraging more from Oracle's data integration portfolio.

Data Integration for BI/Analytics in the Cloud

Organizations that leverage cloud-based BI infrastructures for analytics face additional complexity when integrating on-premises resources with their cloud-based BI environment as the cloud environment can be significantly different than their on-premises analytical architecture, standards, and requirements . They strive to find tools to natively perform ETL or ELT transformations and data quality operations in cloud-based BI solutions. Many of them lack a unified platform that provides mature data loading and transformation capabilities for both on-premises and cloud-based BI environments. Using different solutions for cloud makes enterprise integration processes unnecessarily complicated and costly in time and money.

To enable a robust and simple approach Oracle offers a unified data movement, transformation and data quality platform that runs natively on Cloud BI/analytics platforms, including Oracle Database Cloud Service and Amazon Redshift. It enables optimized transformations with E-LT architecture leveraging the power of the target database or big data engine. It also allows organizations to standardize on a single data integration platform for both on-premises and cloud BI environments, enabling faster and cost-effective solutions.

Oracle offers comprehensive metadata management, data lineage, data impact capabilities to empower users with cloud data governance. Its best of breed products are non-intrusive, reliable, and high-performance to support strict performance, reliability, and speed requirements of your systems.
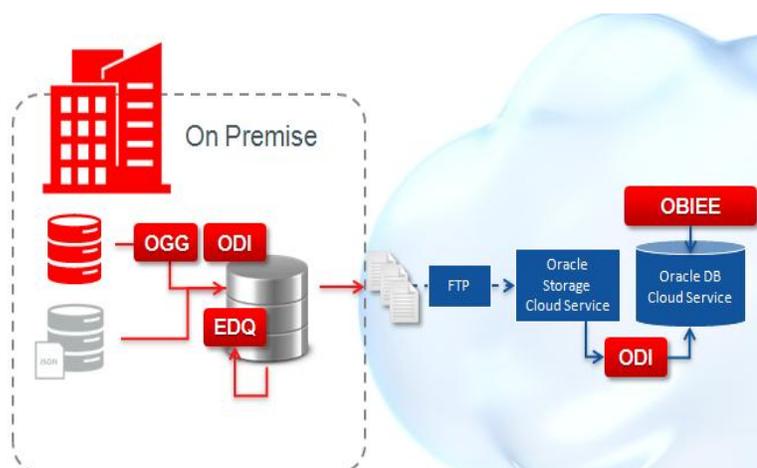

Figure 9: Oracle's data integration products offer a single, integrated platform for on-premises and cloud BI solutions

Query Offloading for SaaS Analytics

In today's fast-paced world demanding fast and timely decision making, users need real-time reporting for critical SaaS applications. When they run the reports directly on the production databases, it typically creates overhead and degrades production system performance. The best solution is to create a replica of the production database in the cloud and dedicate that to reporting activities, which we mentioned earlier as a best practice approach in Oracle Cloud environments.

Oracle's data integration solutions provide initial load and real-time data movement capabilities ensuring production databases and their copies stay in-sync. In addition, Oracle's data integration products offer superior usability and reduce projects' costs by helping automate tedious tasks such as interacting with ever-changing applications API, orchestrating complex data integration processes or optimizing data loads into a cloud infrastructure.

Data Preparation and Enrichment for Big Data Analytics in the Cloud

A sad but true reality of big data projects is that about 90%[4] of the effort is spent on data preparation, leaving very little time to perform meaningful analytics. When we consider that vast volumes of data comes in from multiple differing formats and sources, in variety of forms (structured, unstructured, or semi structured), and mostly inconsistent or incomplete, it is no wonder that data stewards spend majority of their time to get the data ready for meaningful analysis. In some cases new data sets can take weeks or months to process before any analysis, requiring manual coding. A key way to unlock the potential of Big Data, is to minimize the time it takes to prepare data.

Oracle Big Data Preparation Cloud Service addresses this critical goal. Big Data Preparation Cloud Service is a Web-based tool that provides an interactive set of services that automate, streamline, and guide the process of data ingestion, preparation, enrichment, and governance without costly manual intervention. It comes pre-integrated with multiple cloud storage services including Oracle Storage Cloud Service. It also supports various targets and publishing formats provide maximum flexibility in distributing the ready to analyze data across the enterprise.

In the background, it uses a machine-learning driven recommendation engine, semantic-based data classification and natural language processing algorithms to intuitively guide the user. It is designed for line of business users without the need to have technical resources to perform data preparation and enrichment. As a result, it lowers costs in data intensive projects by reducing the amount of time and resources required to ingest and prepare new datasets for downstream IT processes.

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4 **Source: Thomas H. Davenport, Wall Street Journal, May 21, 2014 http://mobile.blogs.wsj.com/cio/2014/05/21/taming-the-data-plumbing-problem/**
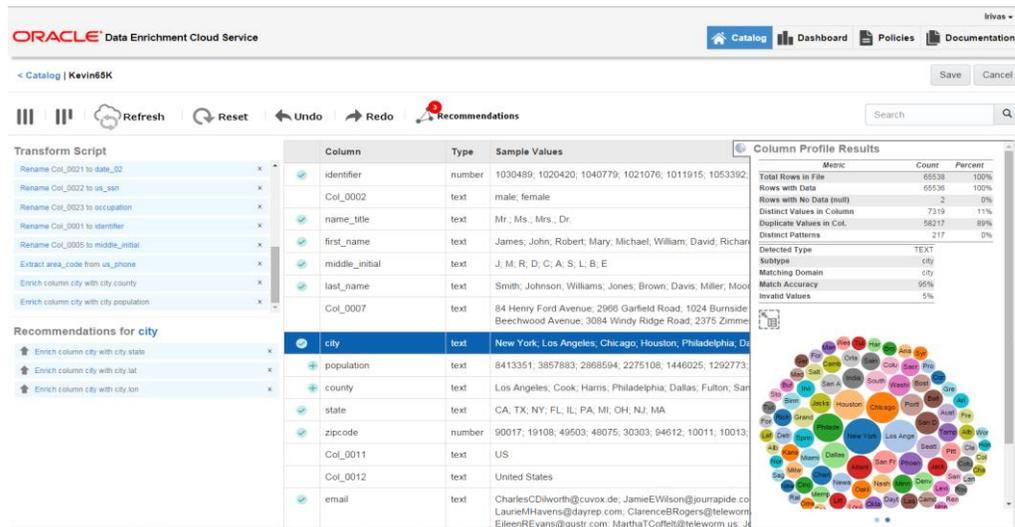
Figure 10: Oracle Data Enrichment Cloud Service is a simple, scalable and automated solution that allows to perform big data analytics faster, more efficient, and with better insight

Data Integration for Private or Managed Cloud Environments

While public cloud adoption is growing at high speed as we mentioned in the introduction section, many organizations still deploy mission-critical systems in private cloud environments in their own data center, or in managed cloud environments, where a vendor hosts and manages the environment. Data integration and synchronization play also a critical role in private and managed cloud environments because legacy systems need to be consolidated to the new environment, and kept in-synch with related systems. Additionally, organizations that build platform as a service (PaaS) environments need to think beyond integrating application services and supplement that that with data access, transformation, and data quality services.

Due to supporting various and larger groups of end users and systems, availability and performance requirements are typically more stringent in cloud architectures. A comprehensive and flexible high availability architecture with reliable real-time data replication capabilities supports the changing needs of the business.

Zero Downtime Consolidation

As in public cloud initiatives, downtime is one of the key hurdles for consolidating to private or managed cloud architectures. Oracle GoldenGate's heterogeneous and real-time data replication capabilities enable businesses to consolidate mission-critical systems without interrupting operations. Oracle GoldenGate's bi-directional replication capabilities enable companies to keep the old system in synch with the new private cloud environment after the switchover, which provides failback option to the old system if there is any issue in the new environment. This is a great method for minimizing risks during the consolidation effort.

For example, Fedex has built private database cloud architecture. They are rehosting approximately 480 databases in 5 data centers onto a standard architecture with Oracle RAC running on Linux. The company has been using Oracle GoldenGate to consolidate database schemas without interrupting operations as well as for zero downtime database maintenance.

Data Services for Private Platform as a Service

For companies that decide to deploy private cloud architectures, and decide to put a standardized middleware platform in place as part of "platform as a service (PaaS)", Oracle's data integration portfolio provides comprehensive capabilities from bulk to real-time data movement, transformations, data quality, data services and data virtualization. Oracle Data Integrator and Oracle Data Service Integrator provide data services for SOA and BPM solutions that enable agile application delivery and shared data services for organizations.
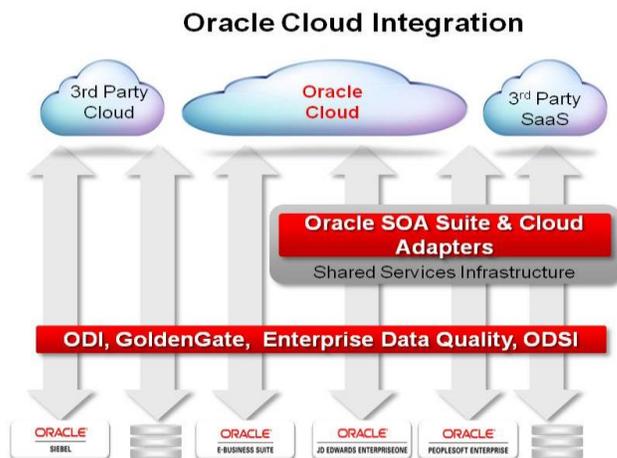
Figure 11: Oracle Data Integration products work with Oracle SOA Suite for shared services infrastructure in PaaS initiatives.

High Availability for Database Cloud Environments

Businesses are facing increased pressure to meet end-user expectations for 24/7 system and data availability and provide higher service levels than competitors. These expectations must be met whether database services are provided on premises or in the cloud. Businesses need to ensure that critical applications can operate continuously in the cloud, by transparently absorbing the broad range of potential outages that can profoundly impact productivity, revenue and customer goodwill.

Oracle Maximum Availability Architecture (MAA) represents the industry's most comprehensive set of integrated database high availability and data protection technologies and best practices. MAA addresses every conceivable cause of downtime – from component failures to site outages to natural disasters that can impact a large geographic region – enabling organizations to meet the most stringent service level agreements (SLAs). MAA also eliminates planned downtime, a growing concern among most enterprises, which routinely perform system upgrades, patching, migration and other maintenance activities. The latest MAA capabilities, introduced with Oracle Database 12c, include technologies that completely mask outages from applications and users, enabling zero downtime and zero data loss operations for mission-critical databases and applications.

Oracle MAA prescribes four standard reference architectures that are built upon a common platform to efficiently address the full spectrum of SLAs for HA and data protection. Key MAA technologies include:

» Zero Data Loss Recovery Appliance – the industry's first backup and recovery appliance that achieves zero data loss database recovery with minimal backup overhead while scaling to support up to thousands of databases across an enterprise.

» Oracle RAC – the industry's only active-active clustered database solution that delivers continuous availability in the event of database instance and server failures. Oracle RAC also enables online capacity expansion and planned maintenance.

» Active Data Guard – which provides comprehensive disaster protection, with real-time physical replication and fast failover to an active standby database to immediately resume service should a cluster, site, or geographic region be impacted an unplanned outage. An active standby database provides the strongest possible data protection, while also enabling a high return on investment by offloading read-only workloads and backups from the production database. Active Data Guard with Oracle Database 12c also offers zero data loss protection across any distance without compromising database performance. Active Data Guard can be used for high availability and disaster recovery by replicating data between different regions within the cloud.

» Oracle GoldenGate – the industry's premier logical replication solution, enables full active-active database replication and online (zero downtime) maintenance, upgrades and cross-platform migration / consolidation across database clouds. The flexibility of Oracle GoldenGate makes it the ideal solution for replicating data in hybrid cloud deployments, for example where a source database resides on-premises and the replication target resides in the cloud, in addition to replicating between regions within the cloud. The power of Oracle GoldenGate replication even enables zero downtime for the most challenging types of planned maintenance, such as application upgrades that modify back-end database objects. Oracle GoldenGate replication achieves this by enabling transformations that accommodate differences in database objects between different versions of an application.

All MAA capabilities are tightly integrated with Oracle Database, Oracle engineered systems, and with each other to provide Oracle-optimized continuous data validation, corruption protection and HA. To further reduce risk and complexity, the entire architecture can be centrally monitored and managed from a single console by using Oracle Enterprise Manager Cloud Control. Learn more about Oracle Database 12c Maximum Availability Architecture here:: **Oracle MAA Reference Architectures - The Foundation for Database as a Service** .

Conclusion

There are several challenges in integrating on-premises and cloud environments including consolidation, database synchronization, SaaS integration for on-premises BI/data warehousing solutions, as well as enabling data feeds from on-premises systems to analytical systems in the cloud. Comprehensive and smart integration strategy allows companies to unlock the potential value of their cloud investments.

With flagship products Oracle Data Integrator and Oracle GoldenGate, Oracle provides a single, unified data integration platform that addresses above challenges with real-time and bulk data movement, high-performance data transformations, data quality, metadata management, data services and data virtualization capabilities.

Oracle's comprehensive solution allows end users to perform zero downtime consolidation to cloud databases, initialize and synchronize data for SaaS applications, feed on-premises data marts and data warehousing solutions with timely data from SaaS apps, and load data from on-premises applications and data stores to cloud-based BI/Analytics systems. It also supports private PaaS solutions with data access, transformation and data quality services for shared services infrastructure and maximum availability for the private cloud environment.

Oracle's data integration solution for cloud reduces risks involved with moving to cloud and maximizes the value of existing cloud database or SaaS investments. It also reduces implementation time and costs by enabling organizations to standardize on single, high-performance, easy-to-use data integration platform for both on-premises and cloud environments.

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