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Cognizant Digital Business & Technology

Overcoming the multi-cloud divide with a cross-cloud solution

As more and more enterprises adopt a multi-cloud strategy as part of their overall digital transformation, they often discover that running applications across different cloud platforms introduces data transfer issues, leading to unacceptable latency. Oracle and Microsoft have changed all that with a cross-cloud solution that performs seamlessly across their platforms.

Executive summary

Not all cloud services are equal when it comes to supporting particular workloads, applications and business processes. For enterprises that run their business-critical application workloads in the cloud, there is often a lack of availability, performance and manageability features that force them to accept lower service levels and performance from their preferred cloud provider. These issues became so serious that Oracle and Microsoft formed a partnership to address them from both ends to provide a better experience for their joint clients. Their cross-cloud solution opens up new opportunities for those clients looking to either migrate their entire set of existing applications to the cloud or build new applications that leverage the best of Oracle Cloud and the best of Microsoft Azure.

The cross-cloud advantage

While multi-cloud strategies offer obvious benefits over single-cloud usage, a key problem still exists: Re-architect the solution or compromise on performance or reliability. Because different cloud providers use different strategies for performance and availability of the application stack, customers must choose from that cloud provider's available options. This particularly impacts enterprises that operate globally and/or require a higher degree of reliability of business-critical systems. Deploying applications across cloud providers causes severe latency and performance degradation.

Cross-cloud connectivity solves this problem using two distinct technologies. First, it eliminates dependency on cloud provider features and solutions and enables customers to choose the right cloud provider based on compatibility and certification of application and database technologies. Second, it uses a dedicated high-throughput pipeline to rapidly move data between the data layer and the application layer across cloud provider regions—keeping latency below two milliseconds.

Currently, this cross-cloud connectivity option exists only between Oracle Cloud infrastructure and Microsoft Azure. This paper will delve deeper into the details of the infrastructure connections and the operation of the cross-cloud connectivity solution.

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Cloud interoperability: How it got here, and what it means

In 2019, Oracle and Microsoft announced a cloud-interoperability partnership that enables its clients to migrate and run line-of-business and mission-critical enterprise workloads across Oracle Cloud and Microsoft Azure. The partnership enables joint customers to seamlessly migrate their entire set of existing applications to the cloud and build new applications, leveraging the best of Oracle Cloud (including Oracle Autonomous Database) and the best of Microsoft Azure while enjoying seamless interoperability. Normally, the prospect of migrating the most critical business applications to the cloud would be an unpleasant process that involved evaluating complex options, but for enterprises that implement the cross-cloud solution for Oracle Cloud and Microsoft Azure, it's a brand-new day.

Besides rapid migration of operations to the cloud, the Oracle and Microsoft partnership makes many new solutions possible, including multi-application cloud deployment and integration, multi-layered cloud data management and cross-cloud data analysis. These capabilities give Oracle Cloud and Azure clients the ability to:

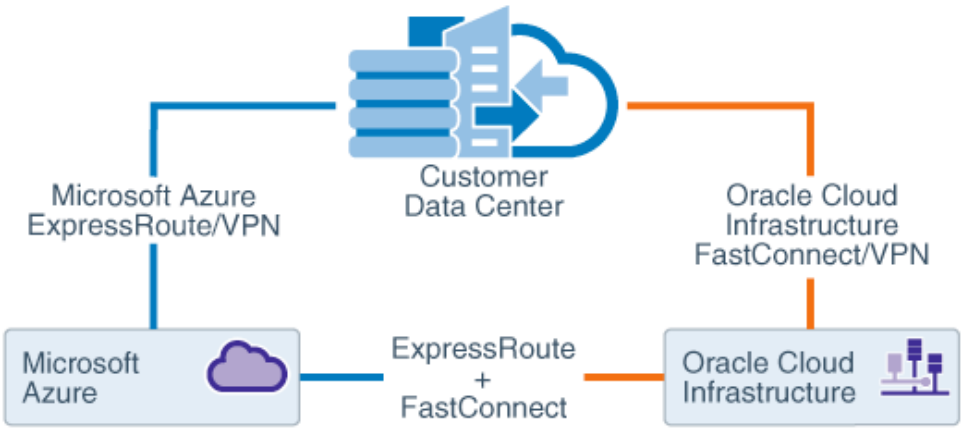
- **Move interdependent enterprise applications to the cloud.** Migrate on-premise applications to the cloud to take advantage of cloud scale, performance, costs and security while preserving application architectures, optimizations and interoperability.
- **Deploy custom and packaged applications across Oracle Cloud and Azure.** Leverage the capabilities of Oracle Autonomous Database, Oracle Database with Real Application Clusters (RAC) or Oracle Exadata on Oracle Cloud Infrastructure (OCI).
- **Develop cloud-native enterprise applications in Azure and Oracle Cloud.** Build and deploy high-performance, enterprise-ready modern applications using the cloud services from both companies, including Oracle Autonomous Database.

How it works

To deploy cloud workloads on Oracle Cloud and Microsoft Azure requires a secure, low-latency intercloud connection. This connection uses a secure and isolated connection between a FastConnect circuit in Oracle Cloud and an ExpressRoute circuit in Microsoft Azure.

- On the Oracle Cloud side, the FastConnect virtual circuit terminates at a dynamic routing gateway (DRG) which is attached to a virtual cloud network.
- In Microsoft Azure, the ExpressRoute connection ends at a virtual network gateway (VNG), which is attached to a virtual network (VNet).

Consider a custom application that uses a private database running in Oracle Cloud. The traffic from the application to the database routes through the VNG in Microsoft Azure to the DRG in Oracle Cloud. Traffic in the opposite direction routes through the DRG to the VNG. So, in both directions, the traffic never leaves the private network. And the resulting latency is only about 1.2 microseconds.



Test ground: Running Microsoft Power BI on Oracle Cloud Infrastructure

Background

Microsoft Power BI helps organizations harness enterprise data into actionable insights using dashboards and tiles to build visualizations. Power BI connects to hundreds of data sources using standard connectors and to nearly unlimited data sources using custom connectors. In this test, Power BI connects to a database running OCI.

Oracle Autonomous Data Warehouse (ADW) is OCI's cloud data warehouse service that eliminates the complexities of operating a data warehouse, securing data and developing data-driven applications. It automates provisioning, configuring, securing, tuning, scaling and backing up of the data warehouse.

Solution approach: Two different clouds, one application

As a systems integrator for both Microsoft and Oracle, Cognizant has devised optimal ways to run applications on Oracle Cloud to leverage this cross-cloud solution's full capabilities. The strategy is to set up the network foundation on both clouds, establish cross-cloud connectivity, and then use it to deploy application workloads.

Cognizant uses this cross-cloud solution to deploy the application on Microsoft Azure and OCI. Its four-step approach involves running the Power BI application in Azure compute services using data stored in Oracle ADW with connectivity established over a private and secured connection between ExpressRoute and FastConnect.

Step 1: Configure the network

Cognizant set up OCI and Azure Virtual Network with the required subnets. After setting up and configuring ExpressRoute, it created a FastConnect using "Microsoft Azure: ExpressRoute" as the partner.

Step 2: Deploy an instance of ADW

Cognizant created an autonomous database for the Oracle decision support services workload in the private subnet in OCI. After ensuring that ADW wasn't exposed to the internet, the database schema and tables were created and data loaded. The client credentials wallet was downloaded and configured for Microsoft Power BI running on Microsoft Azure.

Step 3: Build a VM for the Power BI application

Cognizant provisioned a Windows virtual machine (VM) with the certified configuration for the Power BI client, allowing traffic from OCI into the Azure network security group. After deploying the Power BI application it configured database connectivity using TNSnames and Power BI connectivity with ADW.

Step 4: Publish and test

After publishing the Power BI service and setting up the Azure-to-OCI interconnect, Cognizant's application team began their work and testing ensued.

Outcome:

Deploying Power BI on a cross-cloud database connectivity architecture was a seamless and simple process. During testing, the application team wasn't even aware that the workloads were running in a different cloud.

Customer benefits

Enterprises running mission-critical applications that use both Oracle and Microsoft technologies can definitely benefit from this cross-cloud solution made available by the Oracle and Microsoft partnership.

- **Connect securely:** Any traffic going over Azure ExpressRoute and OCI FastConnect passes over a private network. This interconnect configuration allows secure communication between workloads running in an Azure VNet and an Oracle VCN.
- **Migrate faster:** Accelerate cloud adoption by aligning the preferred cloud to the technology and migrate applications without re-architecting or compromising on performance, scalability and availability requirements.
- **Maximize ROI:** Continue to use current software licenses, investments, skills and data while meeting cloud adoption goals.
- **Innovate without compromise:** Build and deploy cross-cloud solutions across Oracle Cloud and Microsoft Azure quickly and easily with unified identity and network connectivity fully supported by both organizations.

Why you need it

Enterprises have many on-premise, mission-critical applications that depend on both Oracle and Microsoft technologies. But only Oracle and Microsoft provide a "connected cloud" technical alliance for their mutual cloud services. Integrated as a single unified cloud solution, it enables swift migration of on-premise applications and leverages a broader range of tools. The benefits of this are:

Reliable cross-cloud network performance
Get high availability from a secure, redundant 10 Gbps physical intercloud connection that bypasses the public internet

Innovation across clouds
Deploy fully supported, cross-cloud solutions across Oracle Cloud and Azure with unified identity, fast interconnect and collaborative support

Choice
Accelerate cloud migration of applications that span technology stacks without the need to re-architect solutions or compromise on performance or reliability

Maximized return on investment
Leverage and capitalize on existing investments and licenses, partnerships, skills and data while achieving cloud migration goals

Cognizant services and solutions

Cognizant is an authorized systems integrator for both Oracle and Microsoft—with expertise in modernizing enterprise on-premise Oracle applications and database workloads by migrating to Oracle Public Cloud Infrastructure or Oracle Private Cloud. The cross-cloud solution is unique to Oracle and Microsoft Azure and not applicable to other cloud providers.

Cognizant's Oracle Digital Infrastructure and Platform Service Portfolio spans technology advising services, database and engineered systems services, cloud infrastructure services and managed services.

Our application modernization services can help you achieve the agility required for an increasingly digital world, and we can help you integrate a combination of accelerators, platforms and strategic partners to modernize your core business applications.

Availability

To deliver the benefits of their cross-cloud interconnect solution to more customers, Oracle and Microsoft are making available a new set of capabilities and expanding access and availability to connected Oracle Cloud regions and Microsoft Azure regions. For the latest list of active regions, click here.

References

- Flexera, "Flexera 2020 State of the Cloud Report," https://info.flexera.com/SLO-CM-REPORT-State-of-the-Cloud-2020.
- Piotr Domek, "Going multicloud? These are the 6 biggest challenges," Nubeasoft, April 2021, https://www.nubeasoft.com/insights/top-six-challenges-with-multicloud-approach.

Cognizant has expertise in modernizing enterprise on-premises Oracle applications and database workloads by migrating to Oracle Cloud Infrastructure or Oracle Cloud@Customer.

About Cognizant

Cognizant (Nasdaq-100: CTSH) is one of the world's leading professional services companies, transforming clients' business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient businesses. Headquartered in the U.S., Cognizant is ranked 185 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at **www.cognizant.com** or follow us **@Cognizant**.

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