Oracle Multicloud mit Azure

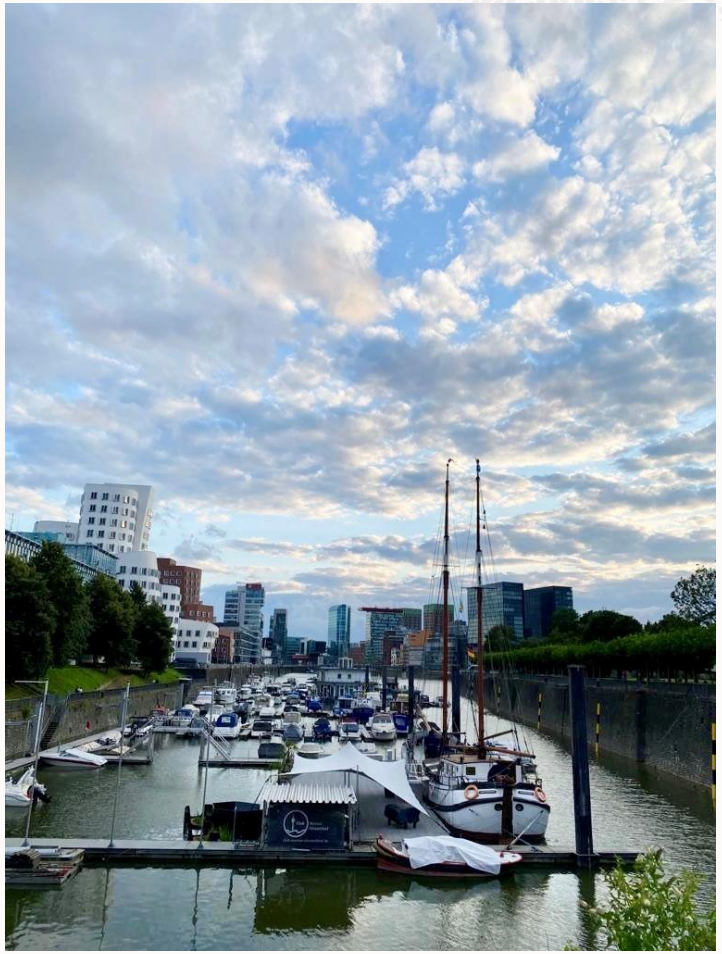
Verschiedene Projekterfahrungen

Silvia Behr

SOUG Day Spring – Multicloud – Now what?

April 17th, 2024

Multi Cloud



Oracle Multicloud mit Azure

Verschiedene Projekterfahrungen

1

Aufbau OCI Landing Zone

Struktur analog zur Azure Landing Zone vereinfacht den Betrieb.

2

Oracle Interconnect for Azure

Mission-critical Application mit Autonomous, MAA, geringer Latenz.

3

Oracle Database @Azure

Mission-critical mit Exadata Cloud Service und Fokus auf Latenz.

4

Ressourcen

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5

Zusammen fassung

Übersicht der Ergebnisse

Oracle Multicloud mit Azure

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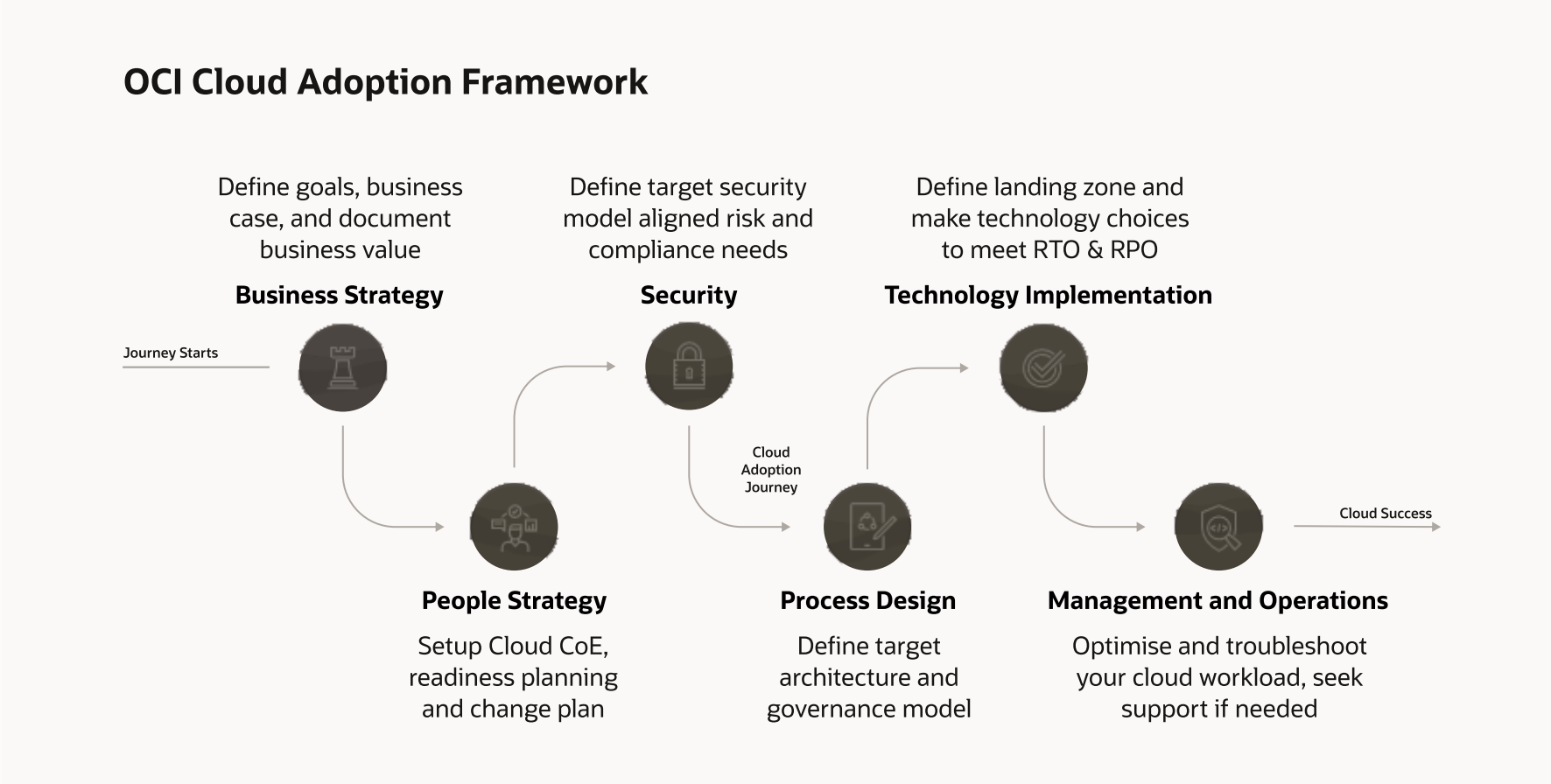
1

Aufbau OCI Landing Zone

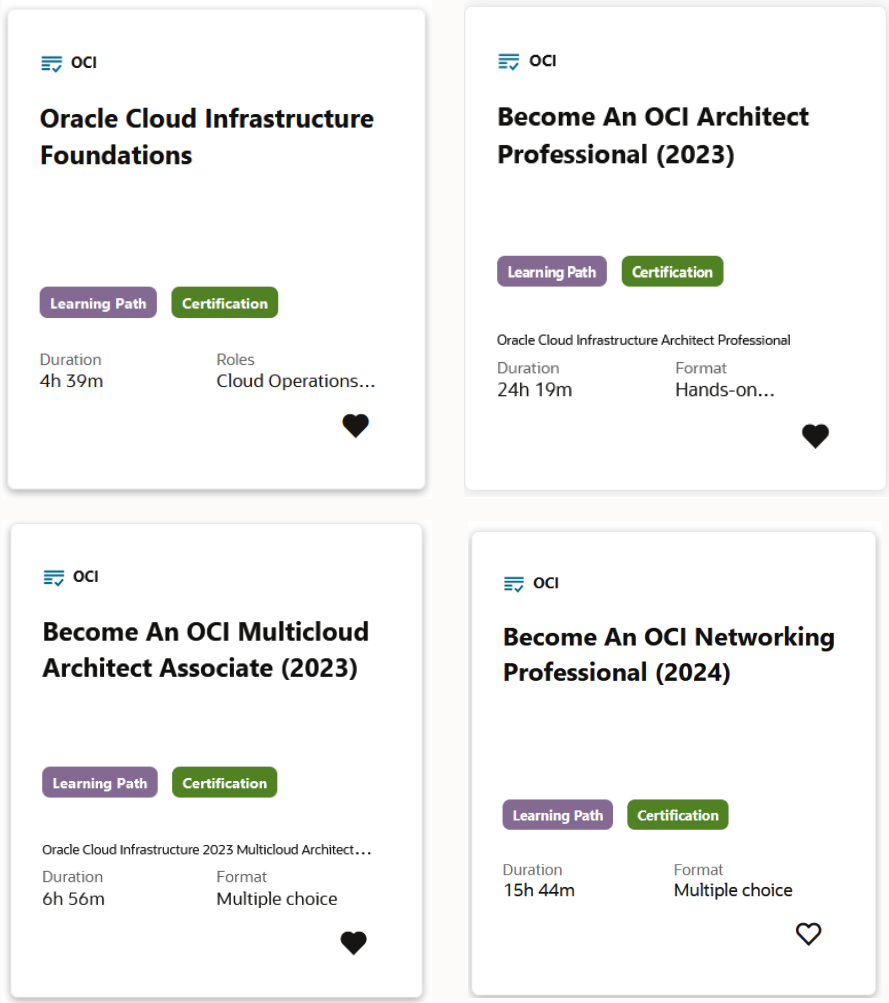
Struktur analog zur Azure Landing Zone vereinfacht den Betrieb.

Oracle Cloud Infrastructure Cloud Adoption Framework



OCI Grundlagen

Oracle Cloud Infrastructure Foundations Certification



Oracle Cloud Infrastructure for Microsoft Azure professionals

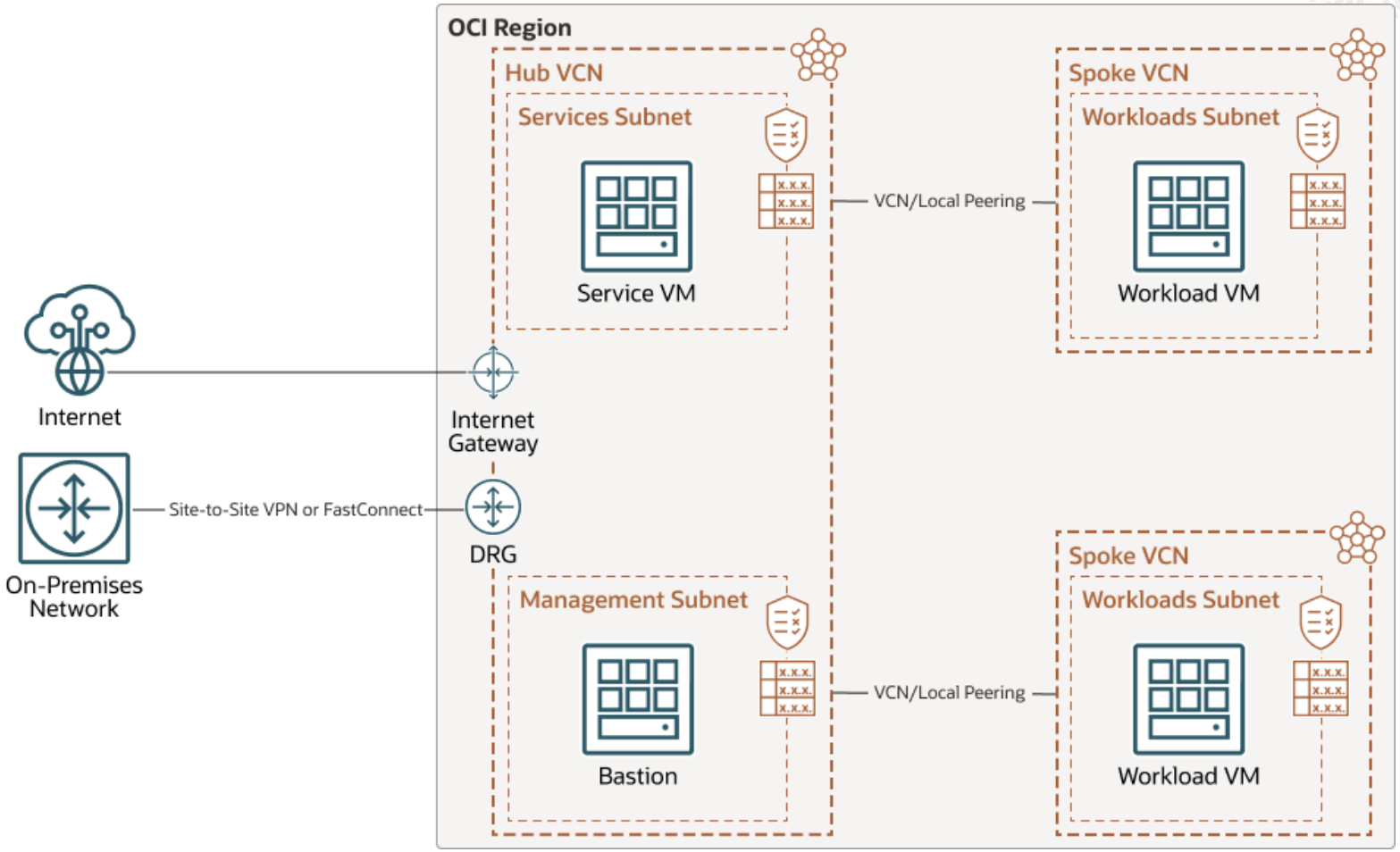
Azure's location terms and concepts map to those of OCI as follows:

Concept	Microsoft Azure	Oracle Cloud Infrastructure
Cluster of data centers and services	Region	Region
Abstracted data center	Availability Zone	Availability Domain
Hardware Grouping	Fault domains	Fault domains

Concept	Microsoft Azure	Oracle Cloud Infrastructure
Account	Account	Tenancy
Organizing resources	Subscriptions Resource Groups	Compartments
Metadata to resources	Tags	OCI Tagging (Free-form & Defined Tags)
Multiple accounts management	Azure management groups	Organization Management

Services	Microsoft Azure	Oracle Cloud Infrastructure
Virtual Network	Virtual Network	Virtual Cloud Network (VCN)
Dedicated Private Connectivity	ExpressRoute	FastConnect
Site-to-Site Connectivity	VPN Gateway	VPN Connect
DNS and Query Management	Azure DNS Azure Traffic Manager	OCI Domain Name System (DNS) OCI Traffic Management
Load Balancer	Azure Load Balancer Azure Application Gateway	OCI Load Balancing
Firewall	Web Application Firewall	Web Application Firewall
DDos Protection	DDoS Protection	DDoS Protection

Set up a hub-and-spoke network topology on OCI



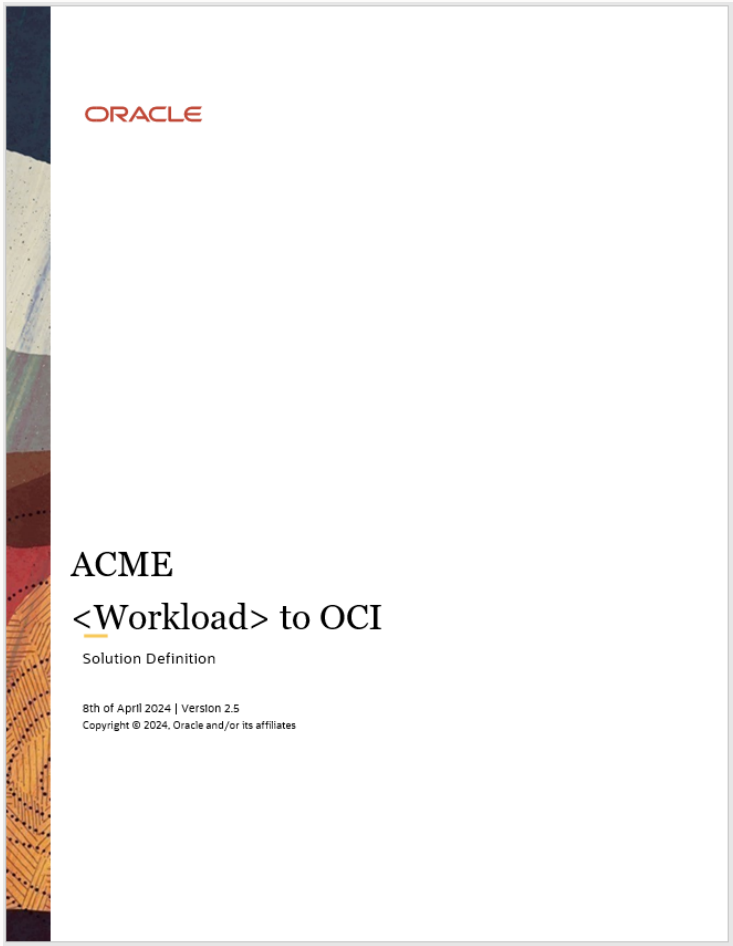
Klassifizierung der zu migrierenden Datenbanken

- Welche Business Bereiche und Systeme sollen migriert werden?
- System Cluster bei Abhängigkeiten
- Anwendungsspezifikation und Architektur

- Datenbank Spezifikationen
  - Umgebung, Plattform, Version, Optionen, Größe etc.
  - Pre-Migration Advisor CPAT unterstützt die Analyse

- HA/DR Architektur
  - RTO/RPO Anforderungen

Oracle Solution Definition



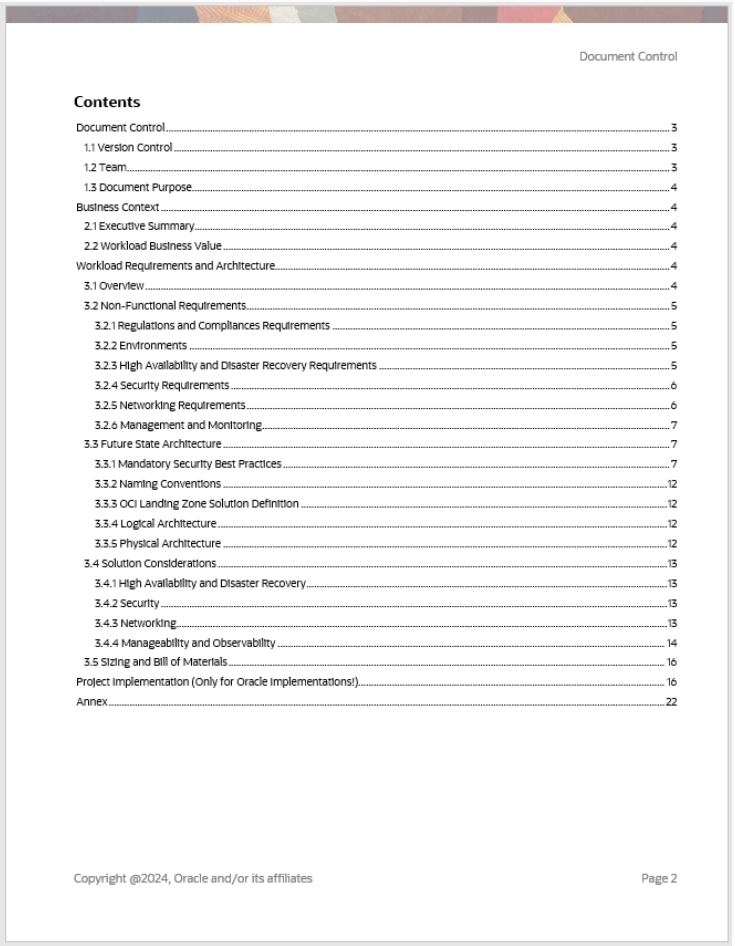
ORACLE

ACME

<Workload> to OCI

Solution Definition

8th of April 2024 | Version 2.5



Document Control

Contents

- ❖ Business Context
  - ✓ Executive Summary
- ❖ Workload Requirements and Architecture
  - ✓ Overview
  - ✓ Non-Functional Requirements
  - ✓ Current State Architecture
  - ✓ Future State Architecture
  - ✓ Solution Considerations

OCI Architecture Diagram Toolkits

- PowerPoint
- draw.io
- Visio

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Oracle Interconnect for Azure

Mission-critical Application mit Autonomous, MAA, geringer Latenz.

Multicloud Setup mit Oracle Azure InterConnect

- 2 Regionen in Europe und Asia
- OCI Fastconnect zu onprem Datacenter
- Oracle Azure InterConnect in beiden Regionen
- Hub/Spoke Architektur
- Abgestimmtes Setup
  - Security mit Firewall, OCI DataSafe etc.
  - Identity mit Azure Gruppen und OCI Rollen
  - Compartment Struktur für Security, Netzwerk und Business Bereiche für Produktion und Non-Prod
  - Betrieb mit Monitoring
- Oracle Autonomous Transaction Processing Serverless und Dedicated
- Platinum MAA mit Oracle Active Data Guard und OCI GoldenGate Service

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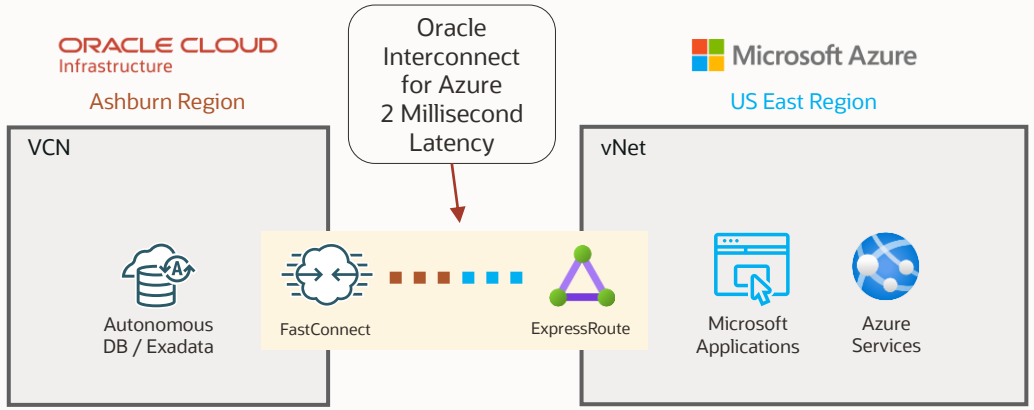
Oracle Database @Azure

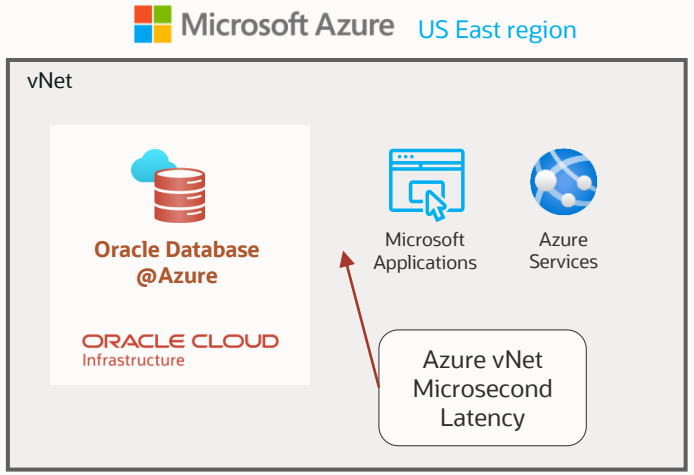
Mission-critical mit Exadata Cloud Service und Fokus auf Latenz.

Oracle Database@Azure optimiert die Latenz weiter

Oracle Database Service for Azure with Oracle for Azure Interconnect



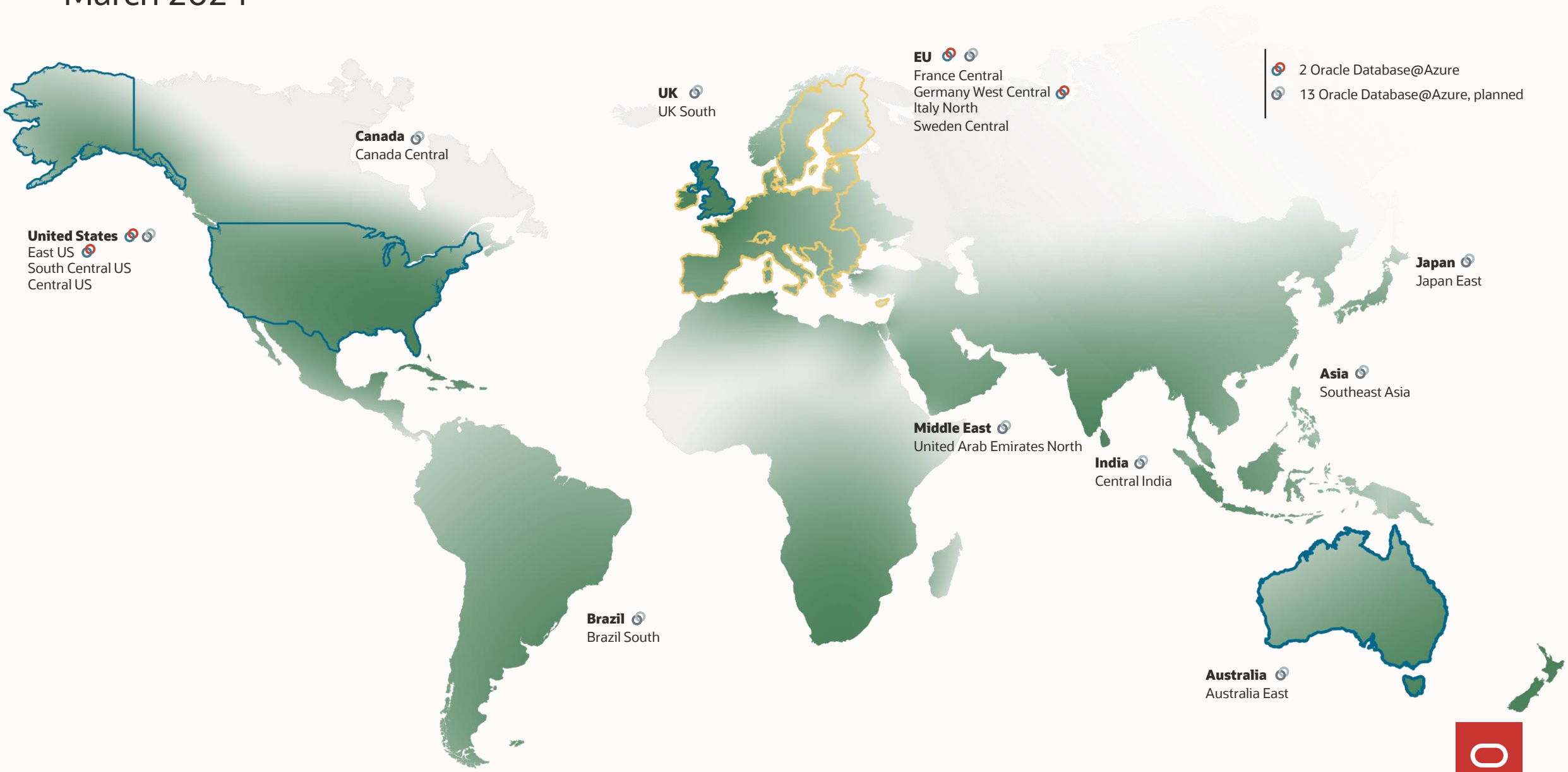
Oracle Database@Azure



- Lower latency, identical to other Azure services, enables even the most mission critical workloads
- Equivalent to Oracle database services in OCI
- Drawdown Azure commitments

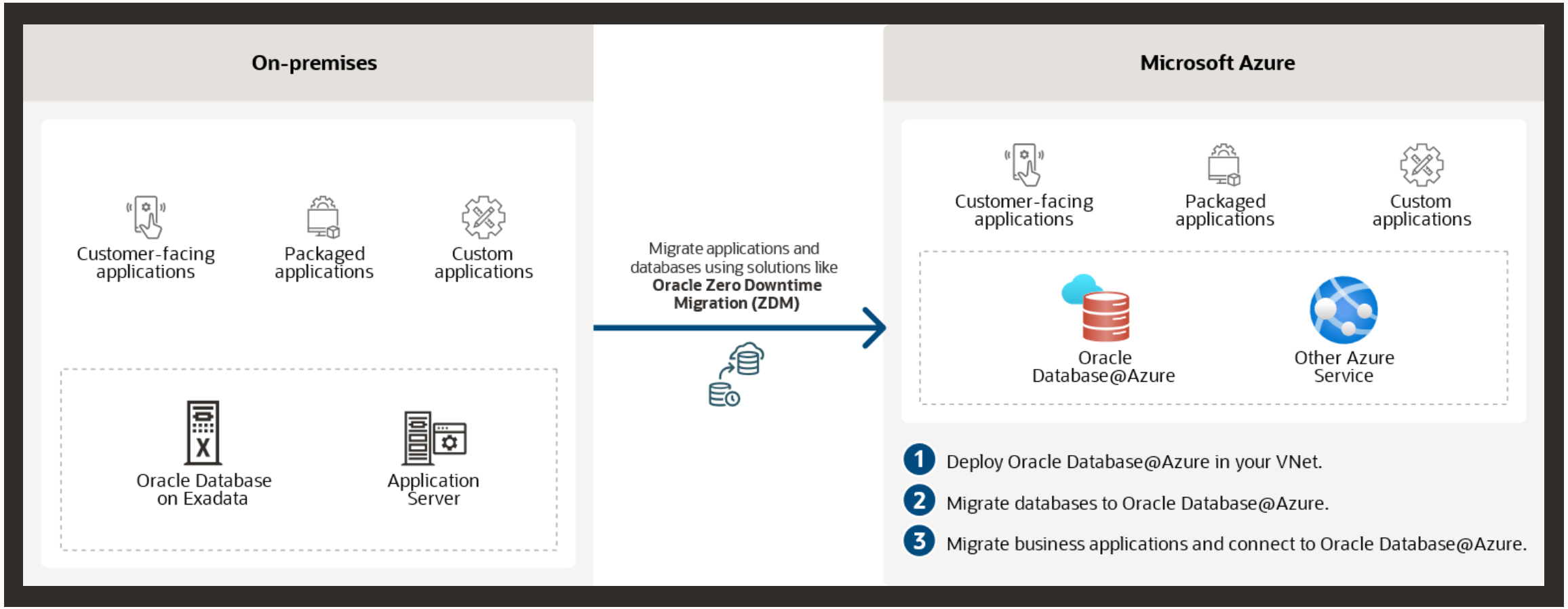
Oracle Database@Azure global footprint

March 2024

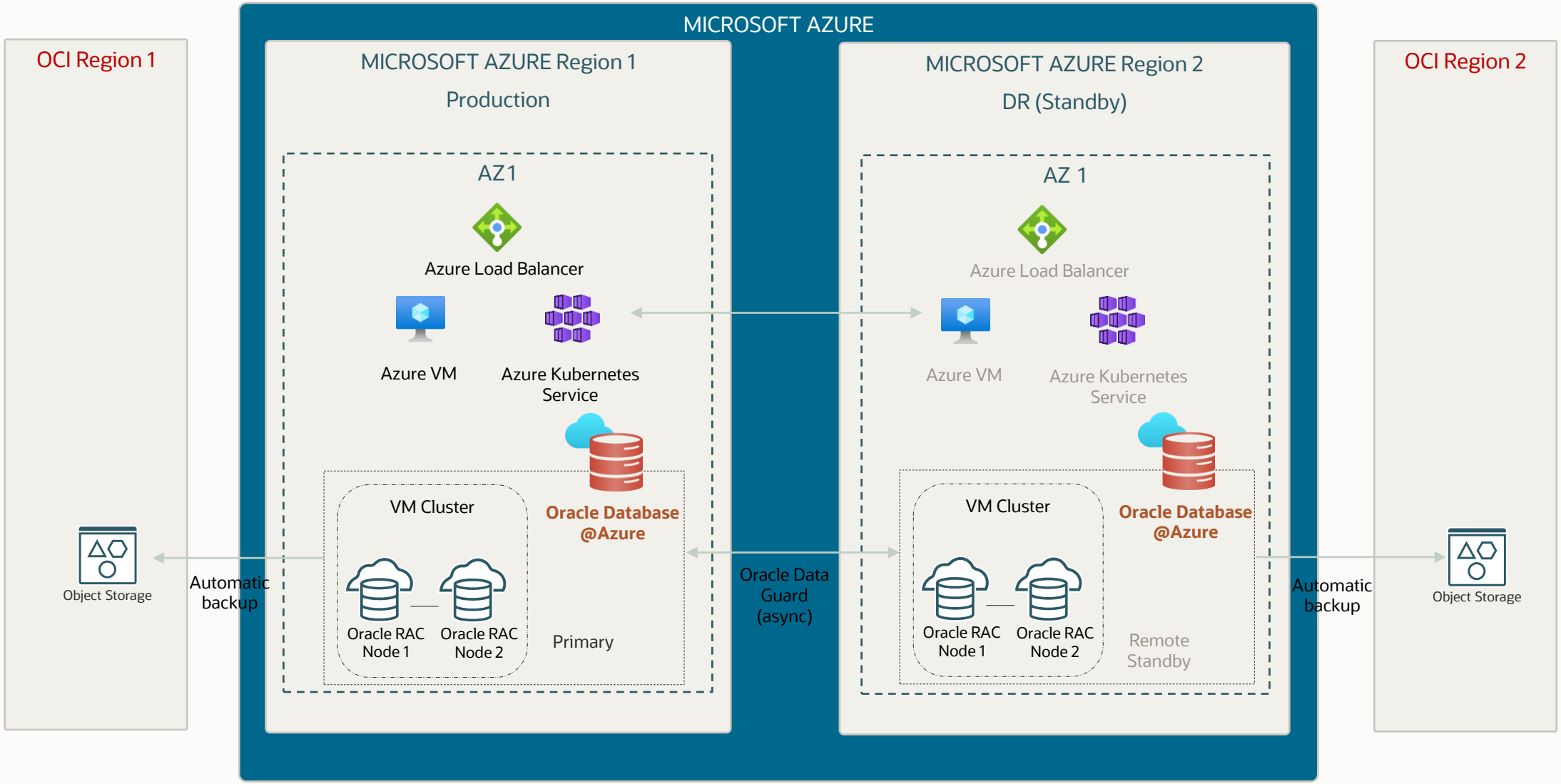


Szenario: Migration von On-premises zu Oracle Database@Azure

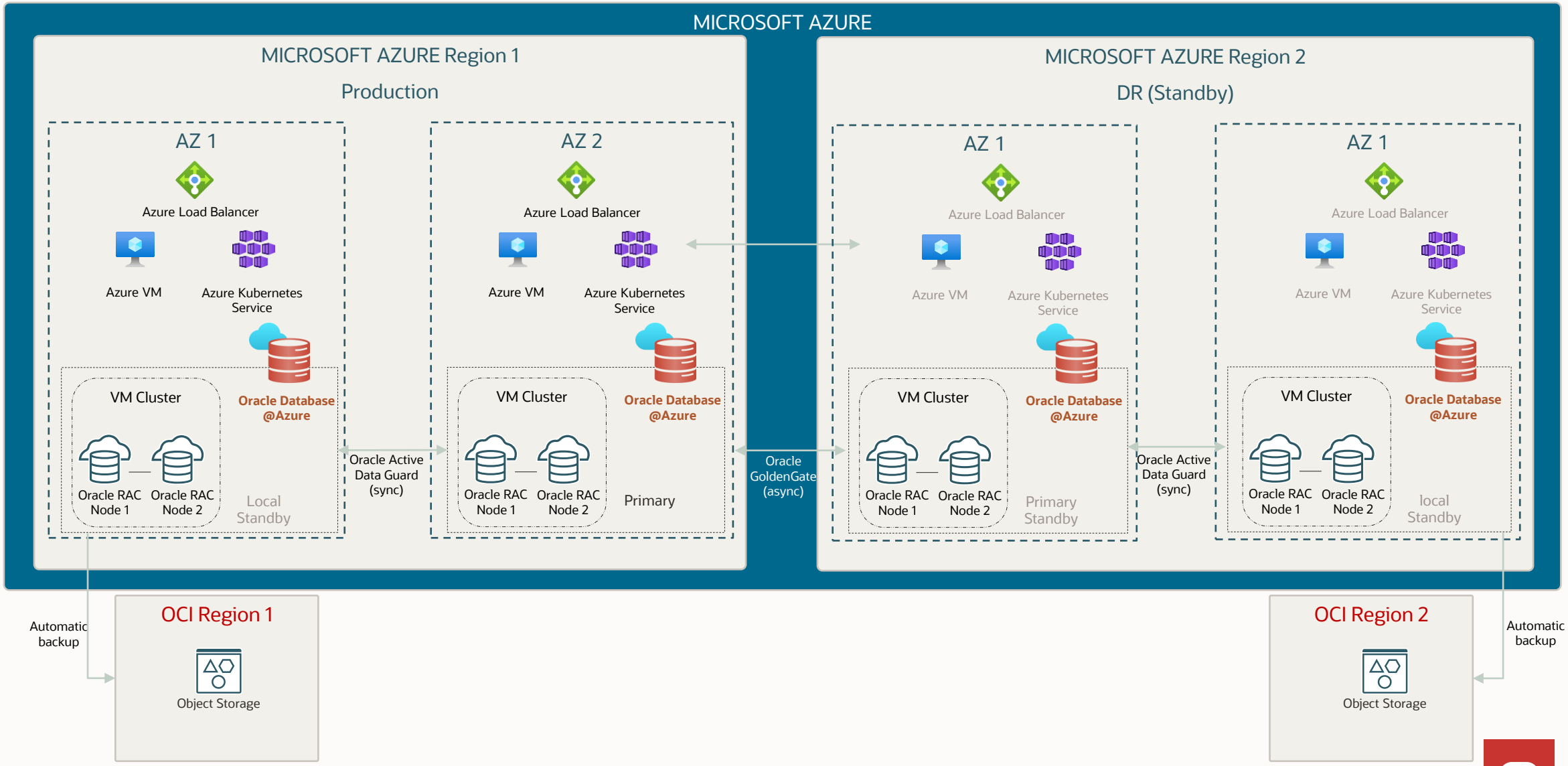
Mission-critical Oracle Database Workloads in Azure zur Verfügung stellen, wie mit Oracle Exadata on-premises oder auf OCI.
Kombination von Azure und Oracle Fähigkeiten für einen vereinfachten Betrieb. Migration mit bekannten Lösungen und Strategien.



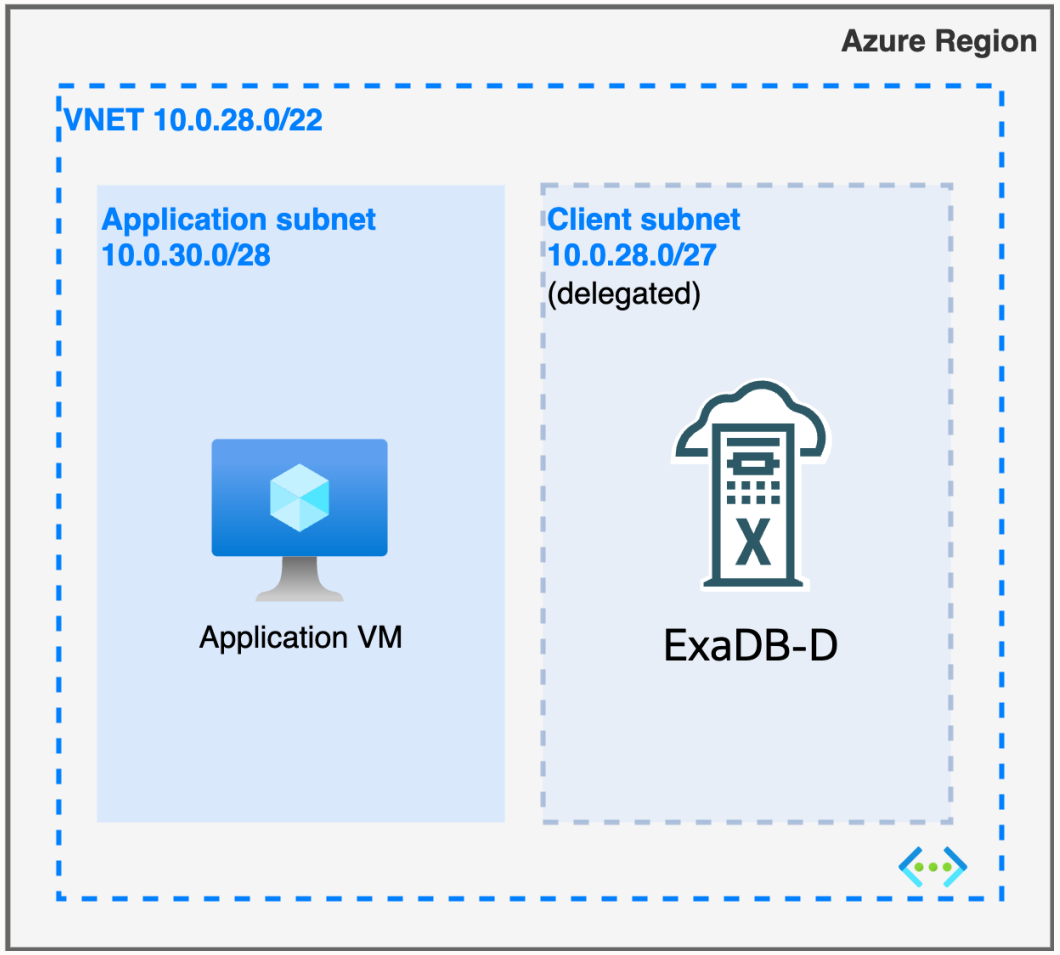
Geschäftskritische Hochverfügbarkeit über 2 Regionen



Geschäftskritische Hochverfügbarkeit über 2 Regionen mit je 2 AZ

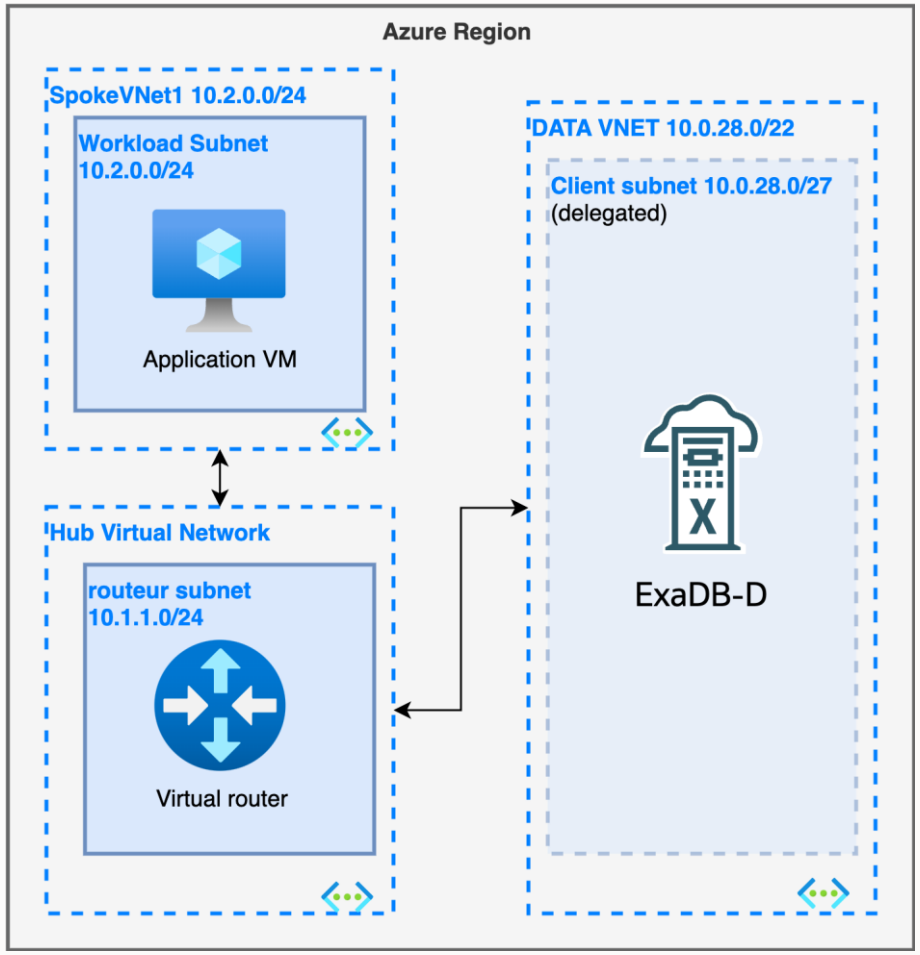


Local VNet topology



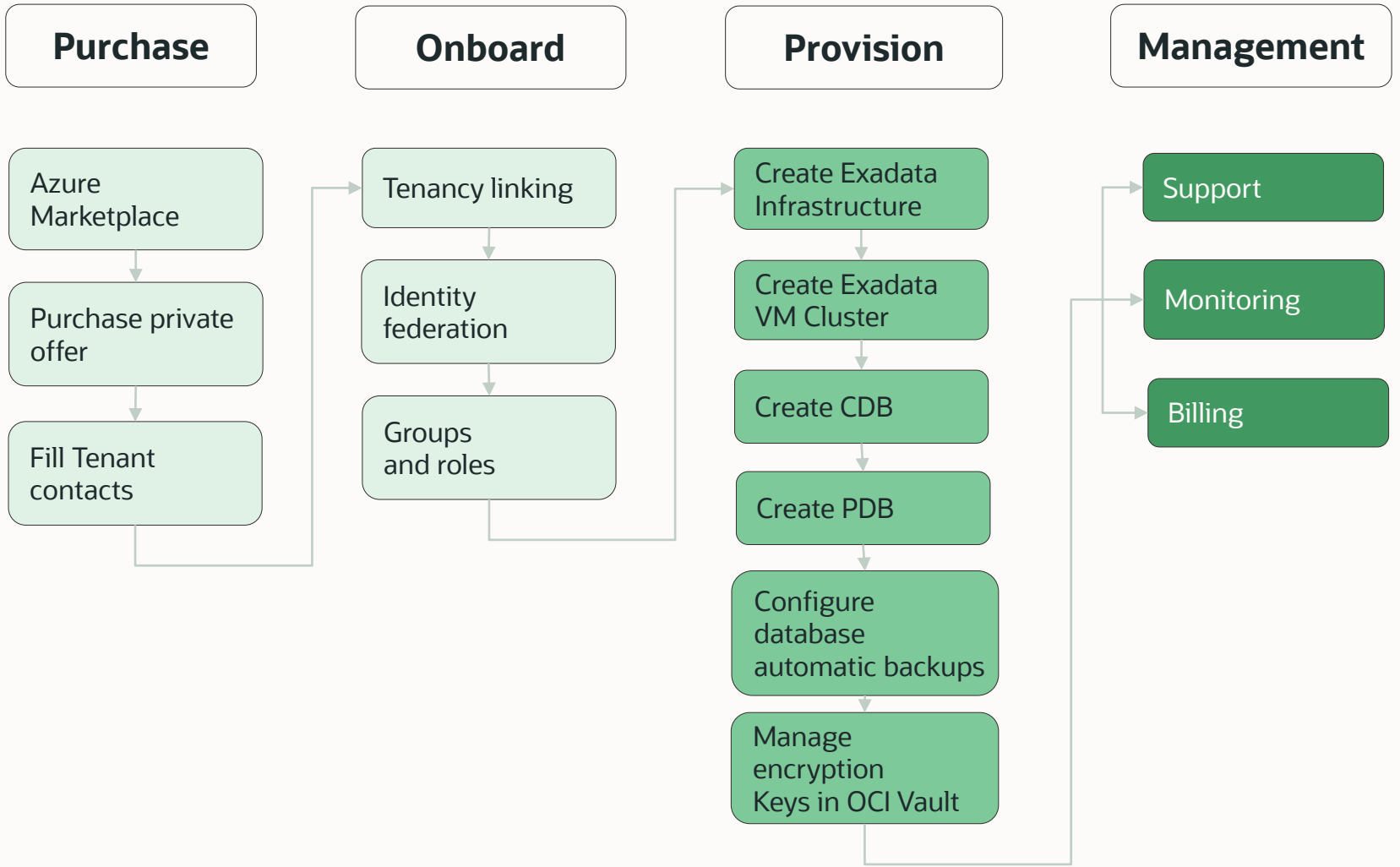
- Simple networking topology connects apps to the database in the same VNet
- App connects to database via Deleted Subnet to client subnet
- Lowest network latency
- No ingress/egress costs

Hub-spoke VNet Peering topology



- The hub VNet is a central point of connectivity between apps and database;
- The spoke VNets peer with the hub.
- VNet Peering incurs ingress and egress costs. For more information, see Virtual Network pricing.
- It's not recommended for latency sensitive apps due to the additional hop.

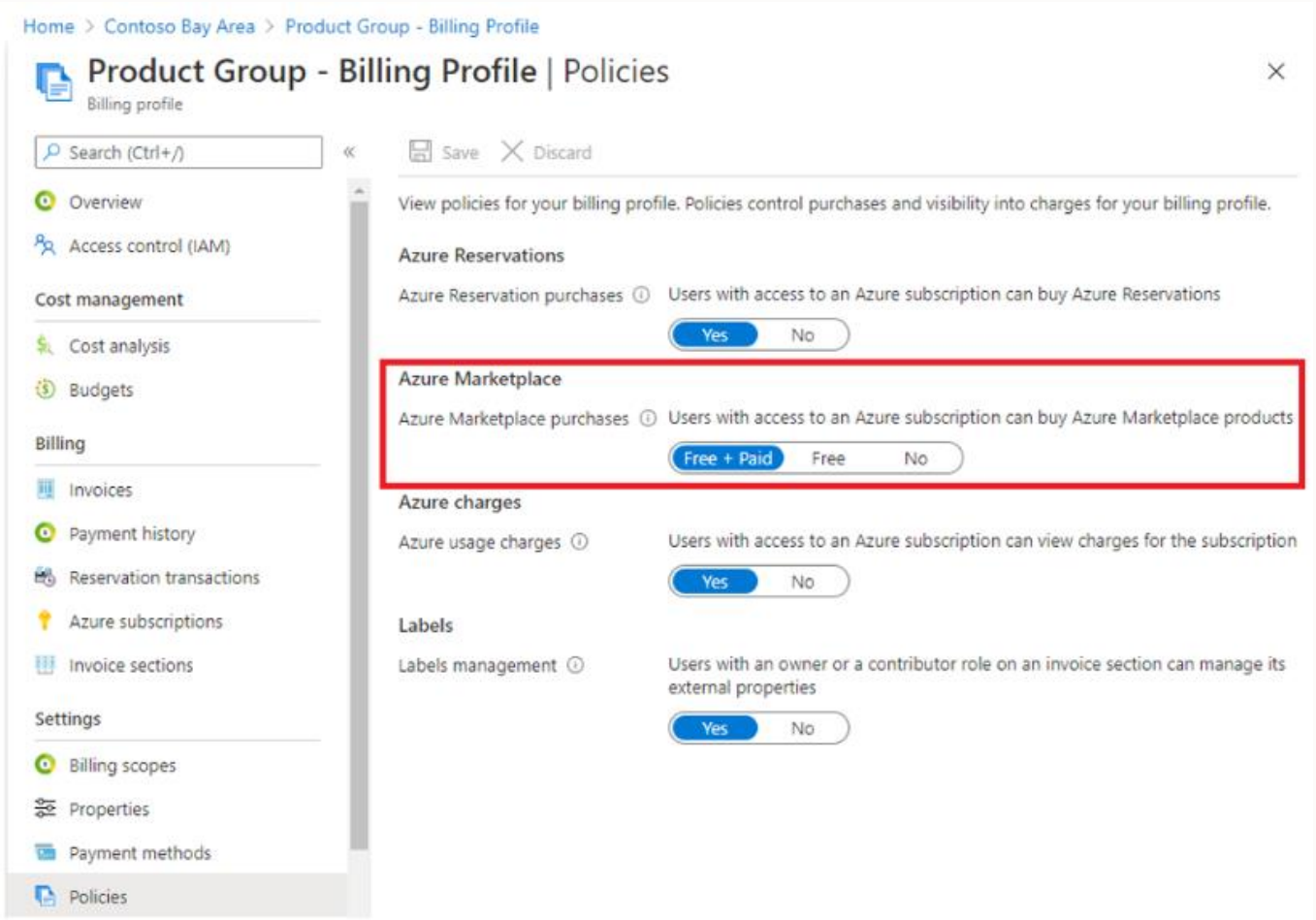
Umsetzung der Oracle Database@Azure



Identity - Azure roles

Azure permissions allowing to accept ”Free + Paid” offers in Azure Marketplace

Agreement type	Permissions to accept offer	Permissions to purchase or subscribe
Microsoft Customer Agreement (MCA)	Billing account owner or contributor	Subscription owner or subscription contributor
Enterprise Agreement (EA)	Enterprise administrator	Subscription owner or subscription contributor



Monitoring & Logs

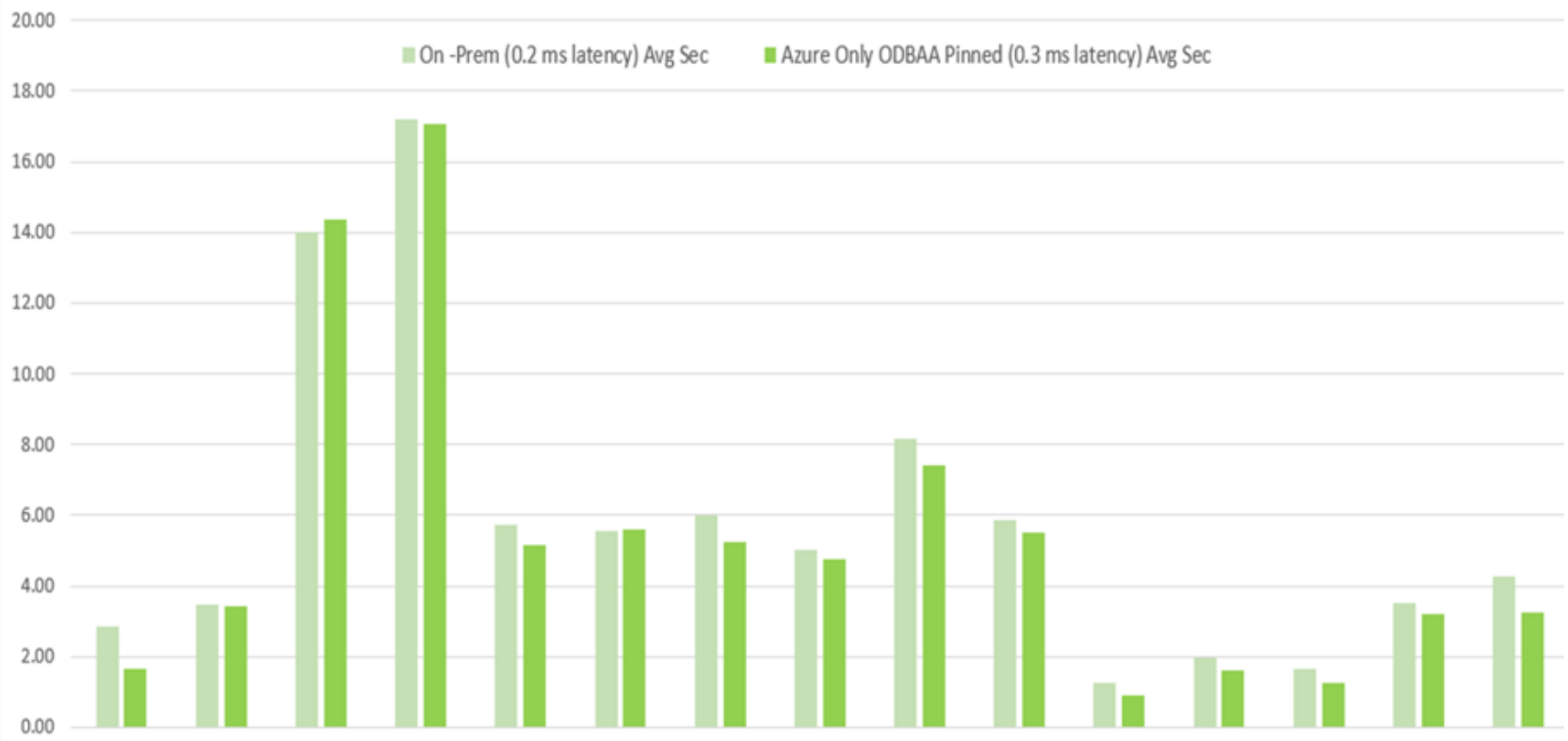
- Embedded in the resource page in Azure
- Single pane of glass
  - VM Cluster (live)
  - Database (early ‘24)
- Fully integrated with Azure Monitor
  - Create charts
  - Correlate metrics to logs
  - Set up alerts

Performance Testing Summary

Oracle Azure InterConnect & Oracle Database@Azure

Cloud Option	Scenarios	App Server	DB Server	Latency (milliseconds)	BY App Performance Compared to On-prem	Comment
0	**On-prem (Base reference)**	On-prem VM	On-Prem ODI	0.2	NA	No firewall between App and DB
1	**Azure-OCI**	Azure VM	OCI Exadata	2.1	-60%	Traffic goes through Azure to OCI/GCP interconnect. Performance degraded by approx. 60% compared to On-prem **Eliminated**
2	**Google**	Azure VM	Google BMS	Assumed the same as OCI		
3a	**Azure Vm App Azure VM DB on Diff Vnet**	Azure VM	Azure VM (Different Virtual Network)	1.4	-20%	Traffic goes through hub VCN and multiple hops. Performance degraded by approx. 20% compared to On-prem. **Eliminated**
3b	**Azure VM App Azure Exa DB on Diff Vnet**	Azure VM	Azure Exadata (Different Virtual Network)	2	-50%	Traffic goes through hub VCN and multiple hops. Accurate performance could not be tested due to absence of routing path to DB. Alternate testing is done using routing through F5 Proxy. **Eliminated**
3c	**Azure VM App Azure Exa DB on Same Vnet**	Azure VM	Azure Exadata (Same Virtual Network)	0.3	10%	No firewall between App and DB. . Performance improved by approx. 10% compared to On-prem. **Good Result**
4	**OCI VM App OCI Exa DB on Same Vnet**	OCI VM	OCI Exadata (Same Virtual Network)	Not tested	Not tested	Decision yet to be taken.

Performance Test Details: Cloud Option 3c - App & Oracle Database@Azure in same Zone and Vnet)



On -Prem (0.2 ms latency)	Azure Only ODBAA Pinned (0.3 ms latency)
Avg Sec	Avg Sec
2.87	1.67
3.48	3.42
14.00	14.35
17.22	17.08
5.73	5.17
5.54	5.60
6.00	5.27
5.04	4.75
8.16	7.40
5.88	5.50
1.25	0.91
1.96	1.60
1.64	1.26
3.52	3.20
4.29	3.24

- **Average 10% faster performance compared to On-Prem**

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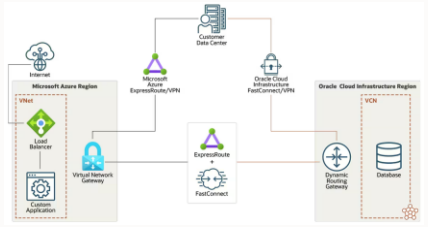
Mehr Informationen zu den Themen

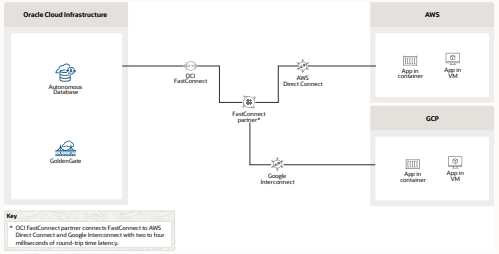
Weitere Multicloud Anwendungsfälle Mit Kundenreferenzen

Oracle Interconnect for Azure with Autonomous Database



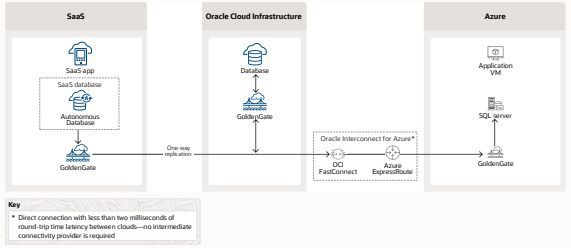
https://www.oracle.com/cloud/azure/interconnect/

Split stack AWS and GCP with Autonomous Database on the backend on OCI.



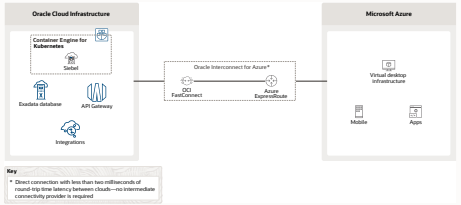
https://www.oracle.com/cloud/multicloud/#split-stack

Integrate SaaS applications with applications on different clouds



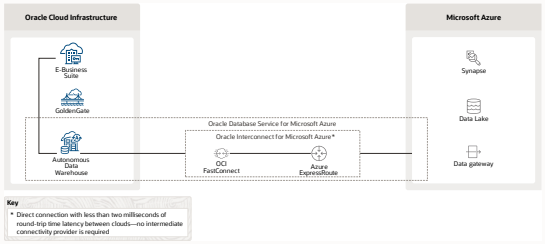
https://www.oracle.com/cloud/multicloud/#saas-integration

App to App integration bringing legacy applications to OCI and Azure



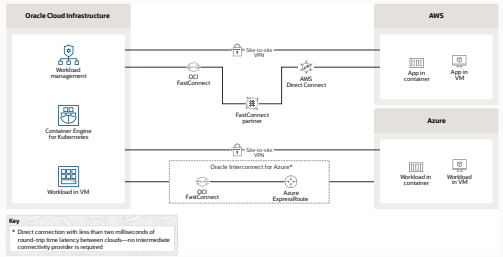
https://www.oracle.com/cloud/multicloud/#app-to-app

Real-time data analysis pipeline to datalake



https://www.oracle.com/cloud/multicloud/#data-analytics-pipeline

Distributed workloads on OCI, AWS, and Azure



https://www.oracle.com/cloud/multicloud/#saas-integration

Cross-Skill to OCI Workshop for Azure/AWS Architects

For a limited time only, Oracle University is pleased to offer you an accelerated learning opportunity to capitalize on your existing cloud architect knowledge and reach OCI Architect skill level in one day of free training.
The purpose of this workshop is to bridge your skills from AWS and/or Azure to OCI.

Cross-Skill to OCI Workshop

Date: April 29, 2024

Start Time: 9:00 a.m. British Summer Time/1:30 p.m. India Standard Time

Duration: 4 hrs

Register Now

Cross-Skill to OCI Workshop

Date: May 7, 2024

Start Time: 9:00 a.m. Pacific Daylight Time/12:00 p.m. Eastern Daylight Time

Duration: 4 hrs

Register Now

Cross-Skill to OCI Workshop

Date: May 16, 2024

Start Time: 9:00 a.m. British Summer Time/1:30 p.m. India Standard Time

Duration: 4 hrs

Register Now

Cross-Skill to OCI Workshop

Date: May 21, 2024

Start Time: 9:00 a.m. Pacific Daylight Time/12:00 p.m. Eastern Daylight Time

Duration: 4 hrs

Register Now

Cross-Skill to OCI Workshop

Date: May 22, 2024

Start Time: 9:00 a.m. Australian Western Standard Time/11:00 a.m. Australian Eastern Standard Time

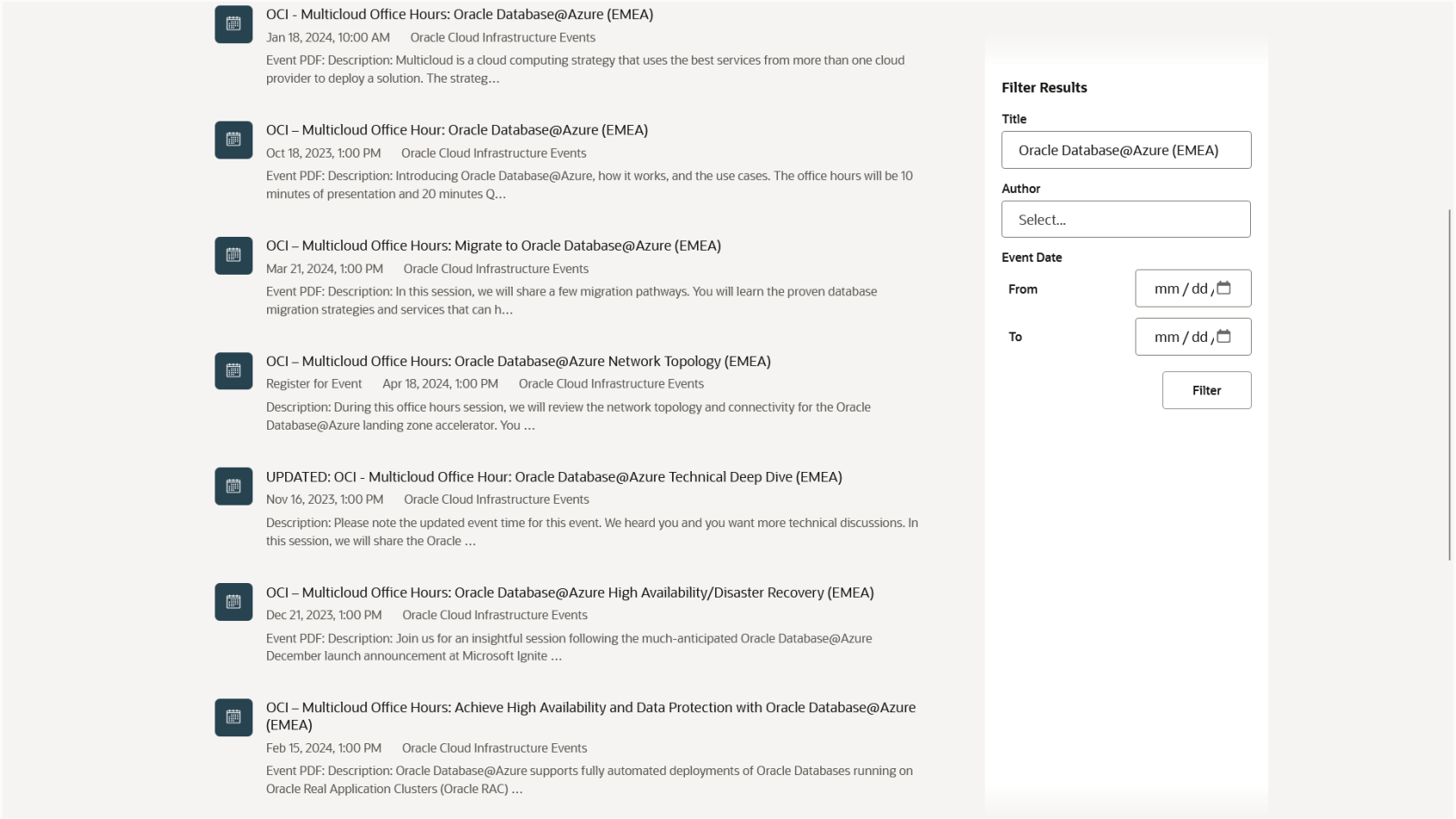
Duration: 4 hrs

Register Now

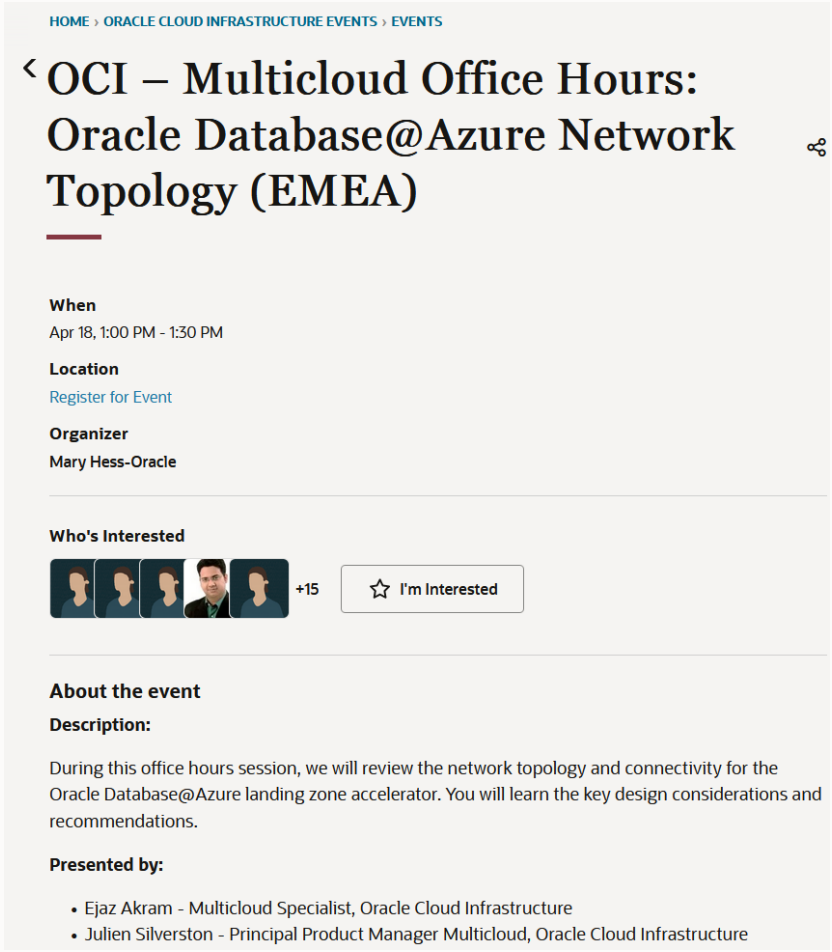
Become an Oracle Database@Azure Specialist

Oracle Database@Azure

Cloud Customer Connect:
OCI – Multicloud Office Hour: Oracle Database@Azure (EMEA)



Morgen: OCI – Multicloud Office Hours: Oracle Database@Azure Network Topology (EMEA)



Weitere Informationen zu Oracle MultiCloud

- Übersicht Oracle MultiCloud, Oracle Database@Azure, Oracle Interconnect for Azure
- Oracle Cloud Infrastructure for Microsoft Azure professionals
- Set up a hub-and-spoke network topology on OCI similar to Azure Setup

Oracle Interconnect for Azure

- Step-by-step guide: Interconnecting Oracle Cloud Infrastructure and Microsoft Azure
- Network latency using OCI-Azure interconnect and best practices

Oracle Database@Azure Documentation

- First Principles: Powering mission critical applications with Oracle Database@Azure

Maximum Availability Architecture:

- Oracle Database@Azure Evaluations by Oracle MAA
- Setup OCI GoldenGate with Microsoft Entra ID for Seamless Integration with Oracle Database@Azure

oracle.com/azure

Erfahrungen mit zwei konkreten Multicloud Szenarien nach Migration von on-premises (weitere möglich)

	InterConnect	Oracle Database@Azure
Szenario	Azure Application to Autonomous Datase	Azure Application to Exadata DB
Region	Amsterdam & Singapore	East US / Ashburn
Hochverfügbarkeit und DR	Active-Active	Active-Passive
Umsetzung, Netzwerkaufbau	Aufbau OCI mit Hub/Spoke, FastConnect	Oracle Database@Azure User Journey, Local VNet Peering
Sicherheit und Benutzerverwaltung	OCI Onboarding analog zu Azure Setup	Azure Entra ID Federation, ODBAA Roles
Betrieb und Automatisierung	Einbindung in Splunk, etc.	Azure Monitoring

Multicloud Strategies are becoming the new normal

MULTICLOUD BENEFITS		
Cost optimization	Data residency	Business agility
Best-in-class product and services	Regulatory compliance	High performance
No vendor lock-in	Disaster recovery	High availability

98%

of enterprises using cloud have multiple clouds

Source: 451 Research custom survey commissioned by Oracle, Q3 2022
S&P – Multicloud in the Mainstream n=1,500 globally

Our mission is to help people see data in new ways, discover insights, unlock endless possibilities.