

Oracle Multicloud mit Azure

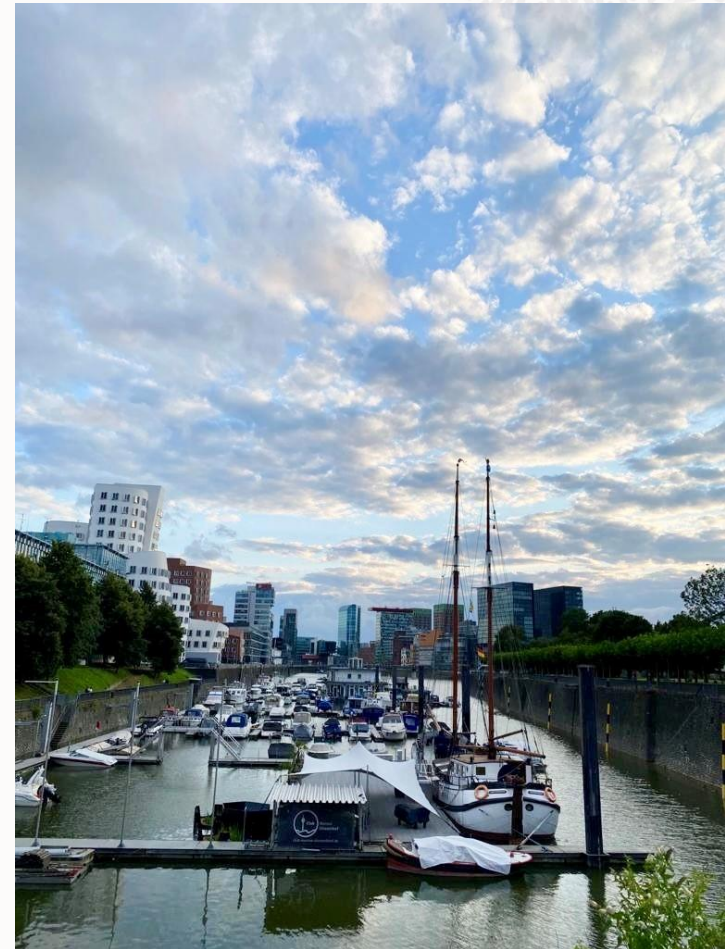
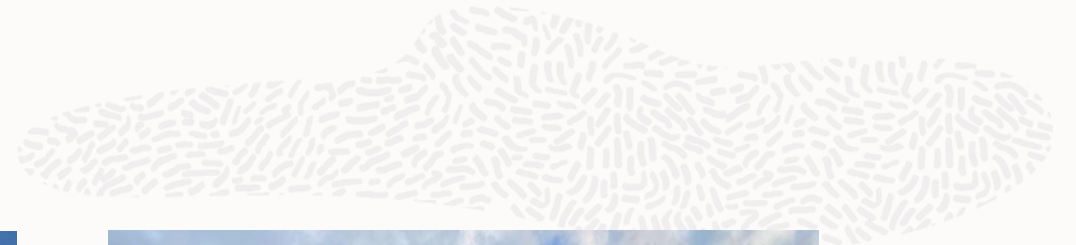
Verschiedene Projekterfahrungen

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

Mehr Informationen
zu den Themen

5

Zusammen fassung

Übersicht der
Ergebnisse

Oracle Multicloud mit Azure

Verschiedene Projekterfahrungen

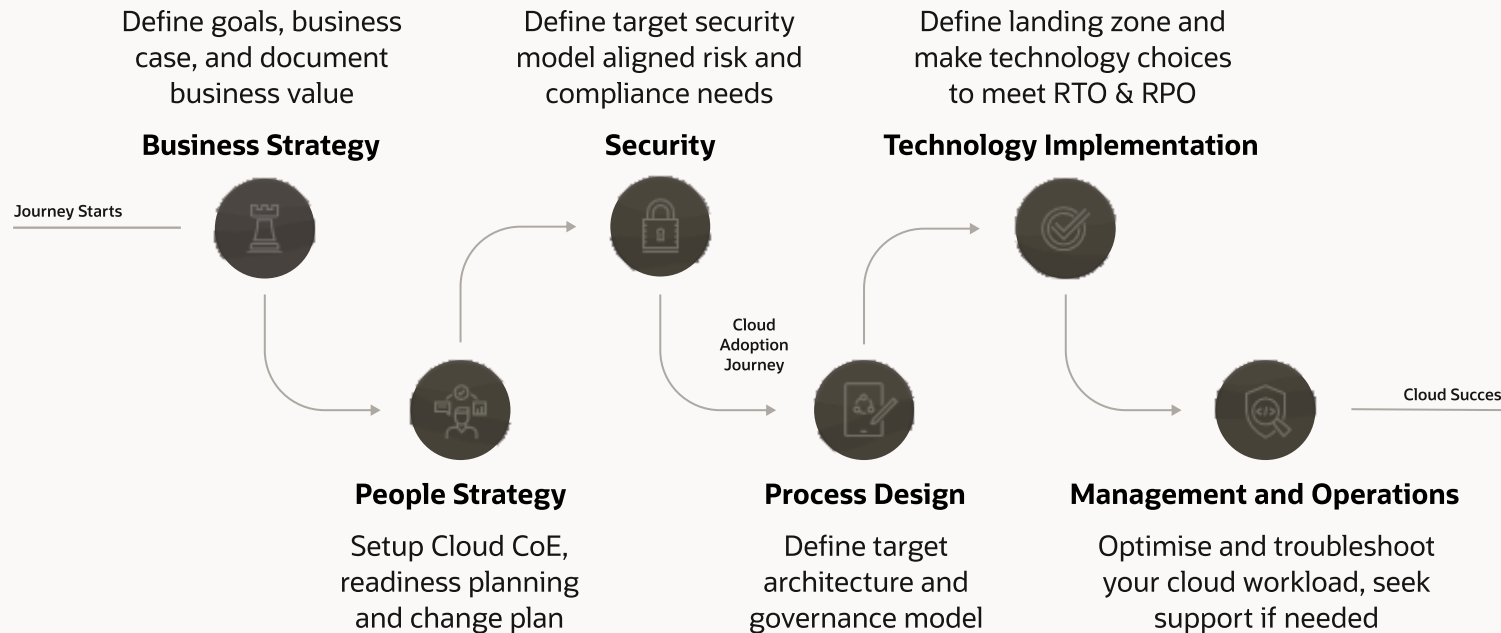
1

Aufbau OCI Landing Zone

Struktur analog zur
Azure Landing Zone
vereinfacht den
Betrieb.

Oracle Cloud Infrastructure Cloud Adoption Framework

OCI Cloud Adoption Framework



OCI Grundlagen

Oracle Cloud Infrastructure Foundations Certification

Certification Title	Duration	Format	Roles
Oracle Cloud Infrastructure Foundations	4h 39m		Cloud Operations...
Become An OCI Architect Professional (2023)	24h 19m	Hands-on...	
Become An OCI Multicloud Architect Associate (2023)	6h 56m	Multiple choice	
Become An OCI Networking Professional (2024)	15h 44m	Multiple choice	



Oracle Cloud Infrastructure for Microsoft Azure professionals

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

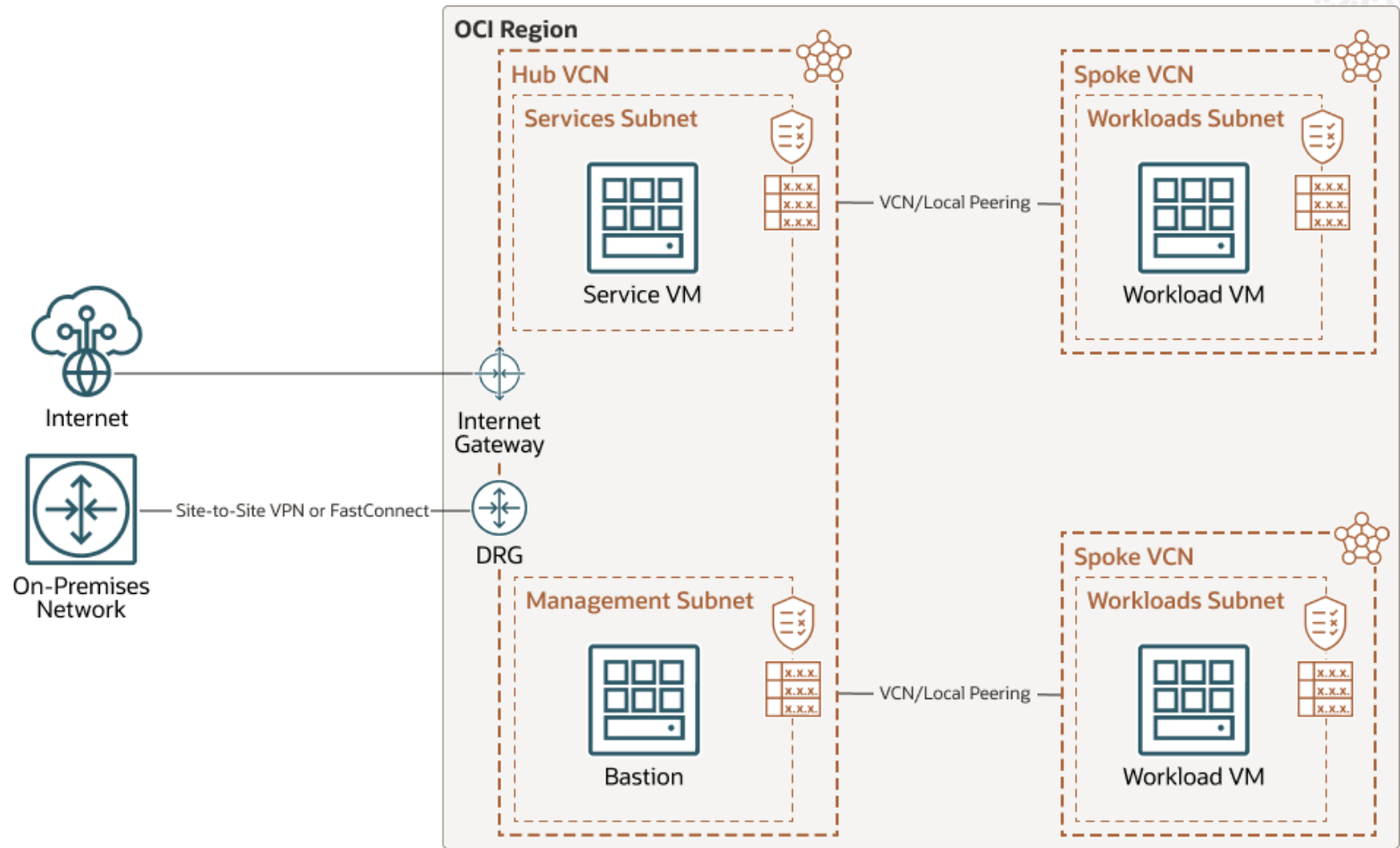
Concept	Microsoft Azure	Oracle Cloud Infrastructure
Cluster of data centers and services	Region	Region
Abstracted data center	Availability Zone	Availability Domain
Hardware Grouping	Fault domains	Fault domains

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

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



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



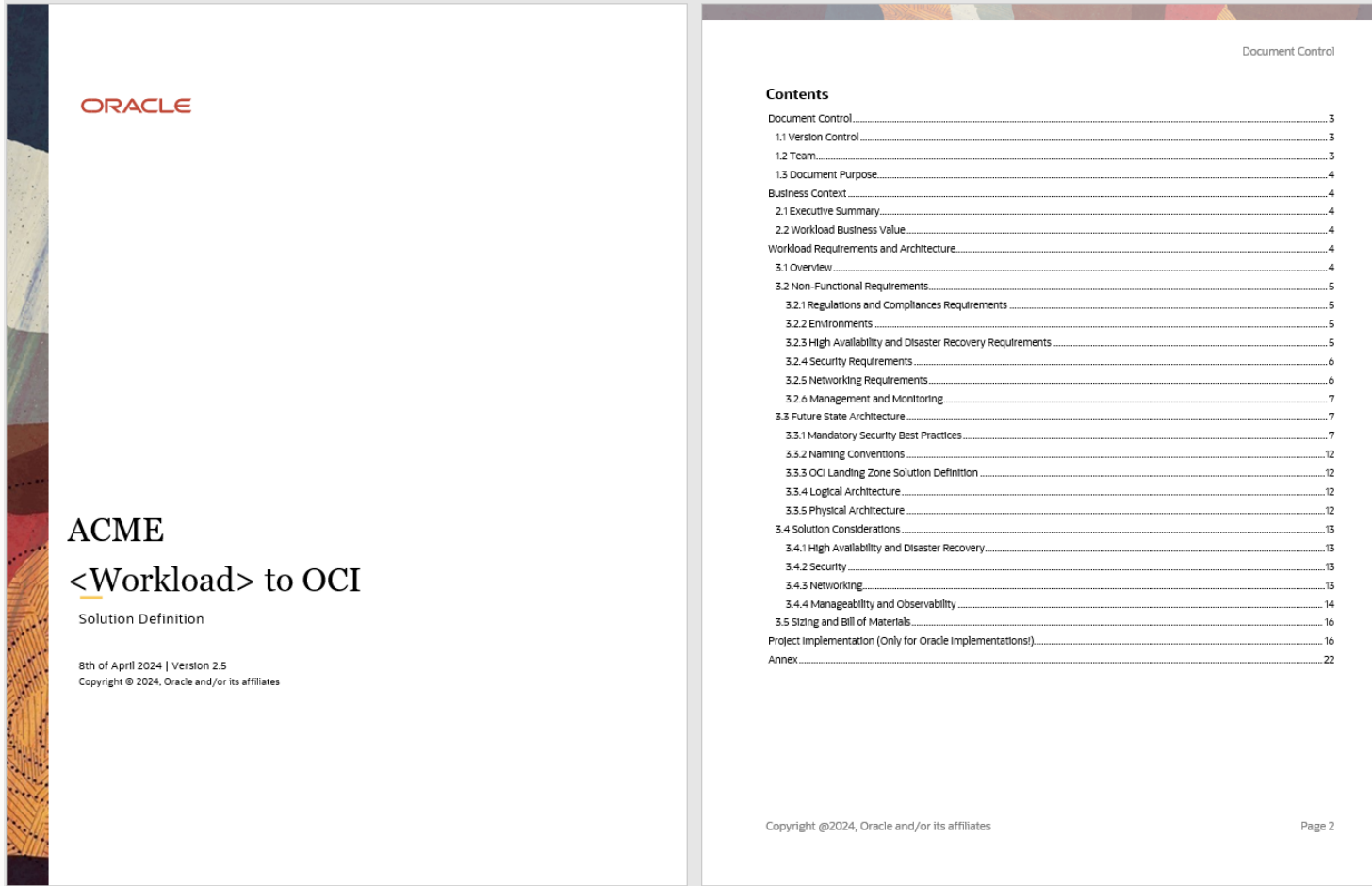
Klassifizierung der zu migrierenden Datenbanken

- 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



- ❖ 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](#)



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.

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



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.

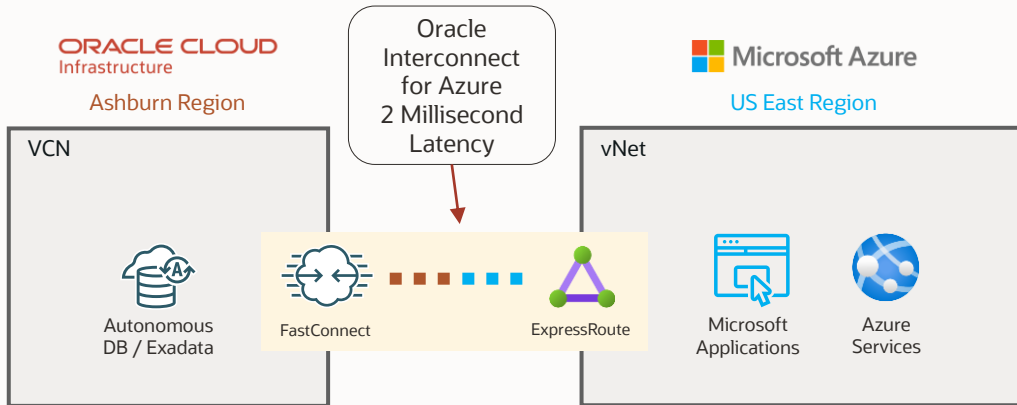
3

Oracle Database @Azure

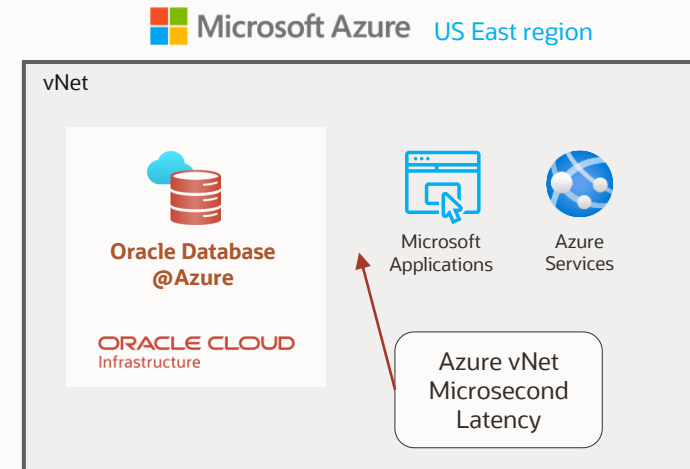
Mission-critical mit
Exadata Cloud
Service und
Fokus auf Latenz.

Oracle Database@Azure optimiert die Latenz weiter

Oracle Database Service for Azure with Oracle for Azure Interconnect



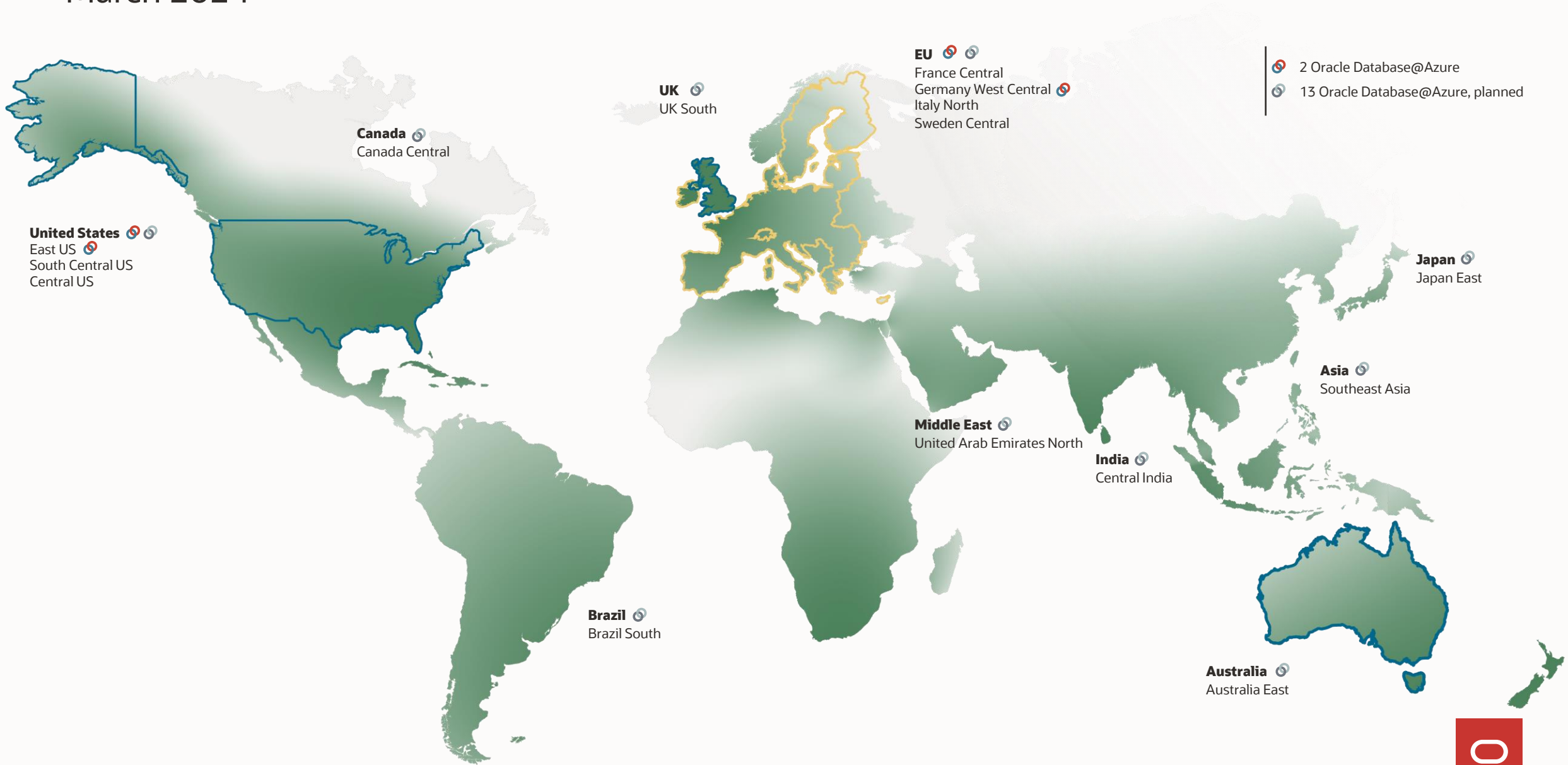
Oracle Database@Azure



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

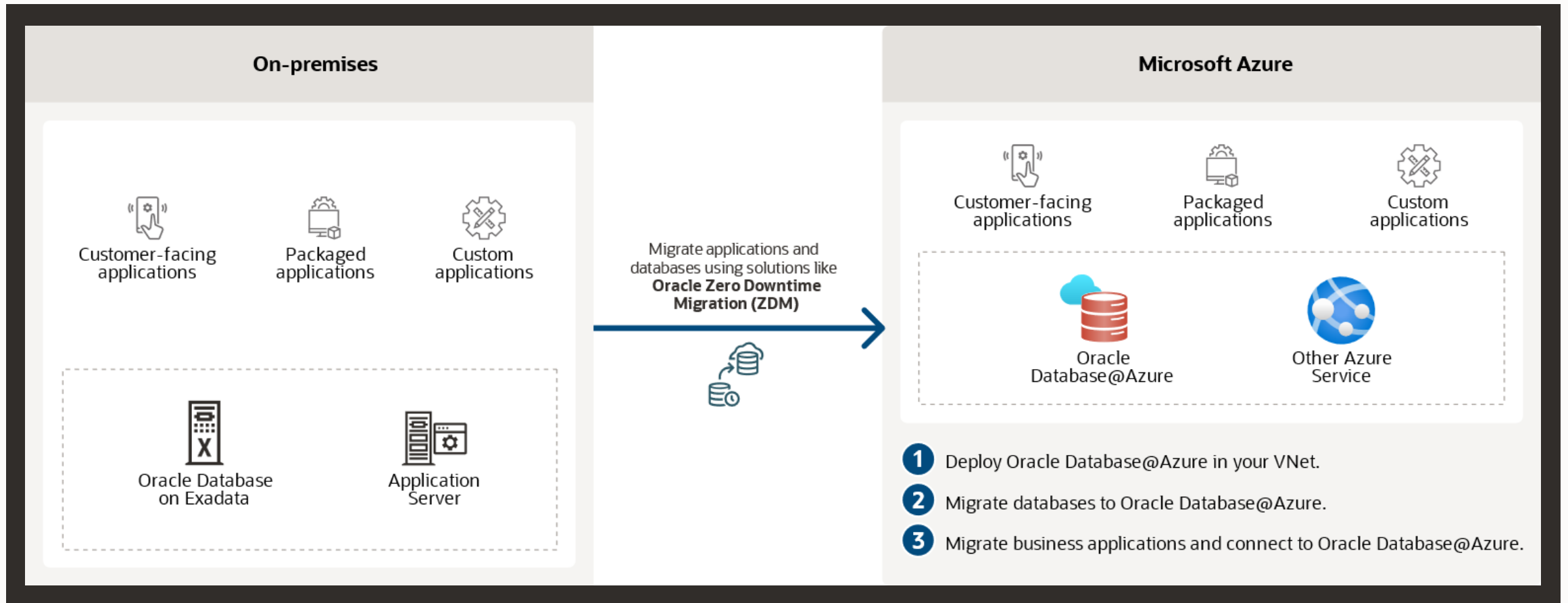
Oracle Database@Azure global footprint

March 2024

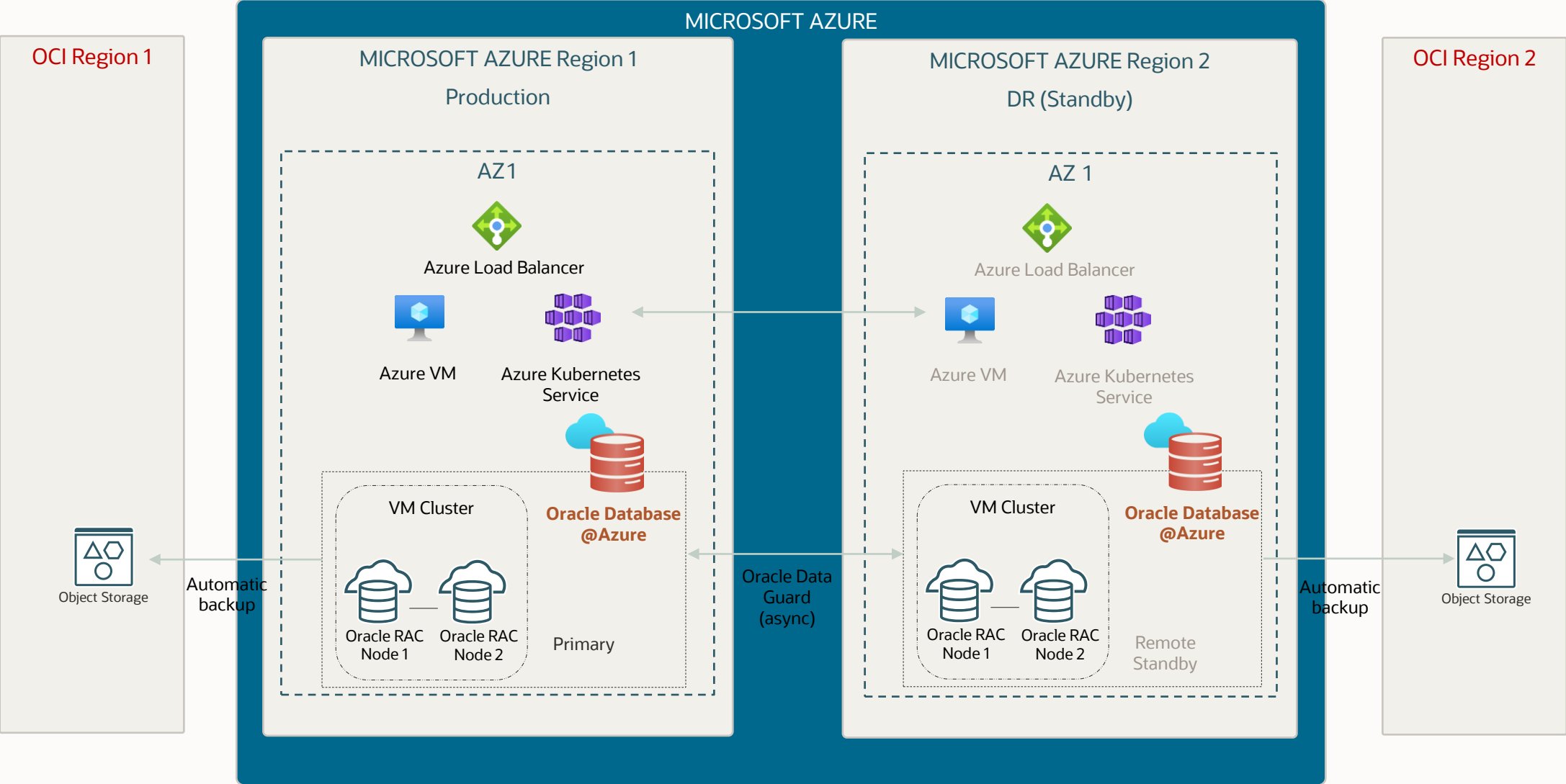


Szenario: Migration von On-premises zu Oracle Database@Azure

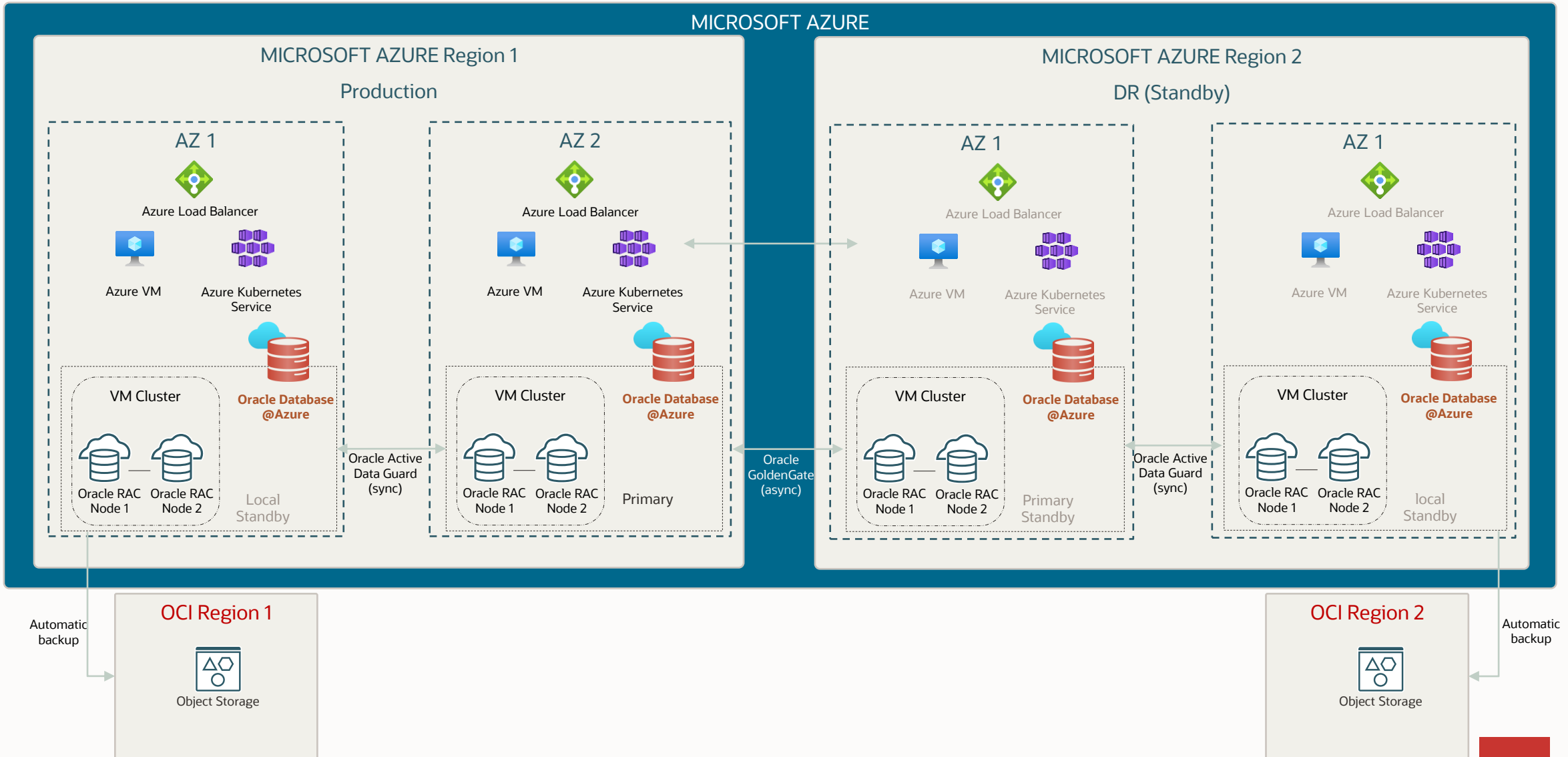
Mission-critical Oracle Database Workloads in Azure zur Verfügung stellen, wie mit Oracle Exadata on-premises oder auf OCI. Kombination von Azure und Oracle Fähigkeiten für einen vereinfachten Betrieb. Migration mit bekannten Lösungen und Strategien.



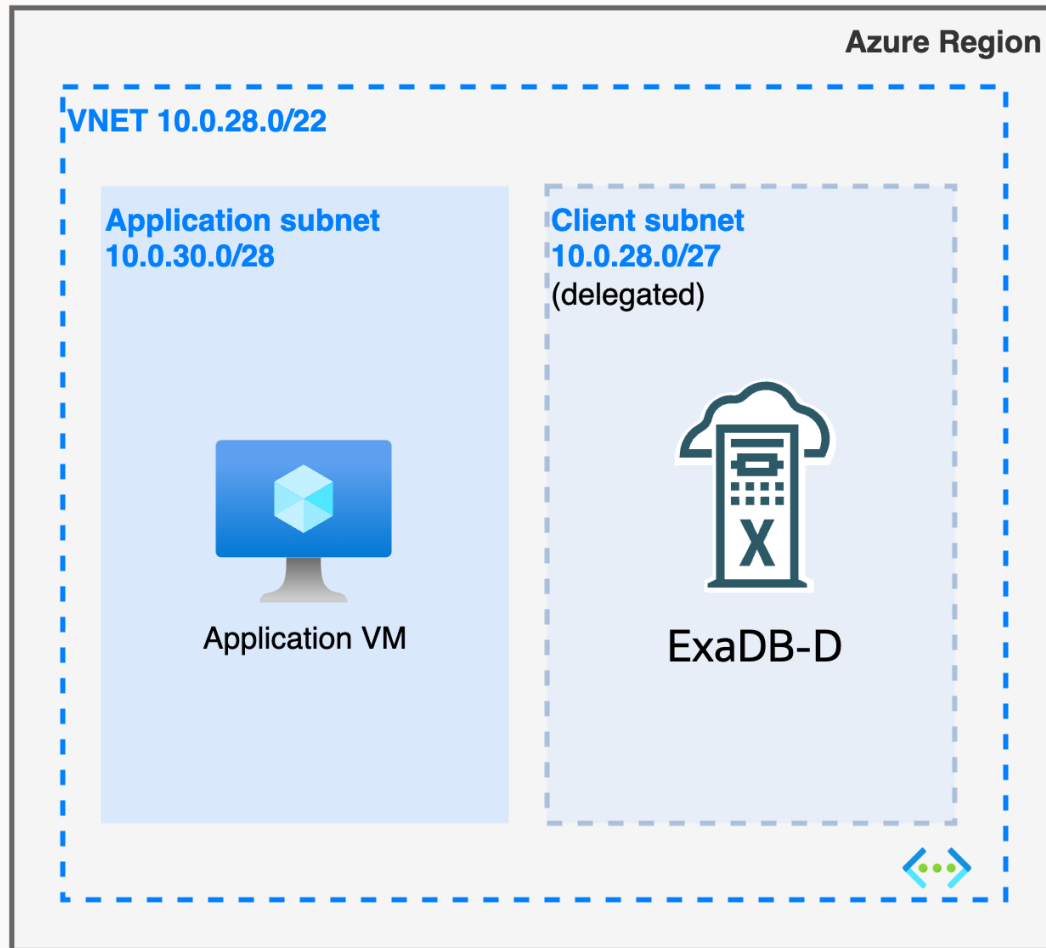
Geschäftskritische Hochverfügbarkeit über 2 Regionen



Geschäftskritische Hochverfügbarkeit über 2 Regionen mit je 2 AZ



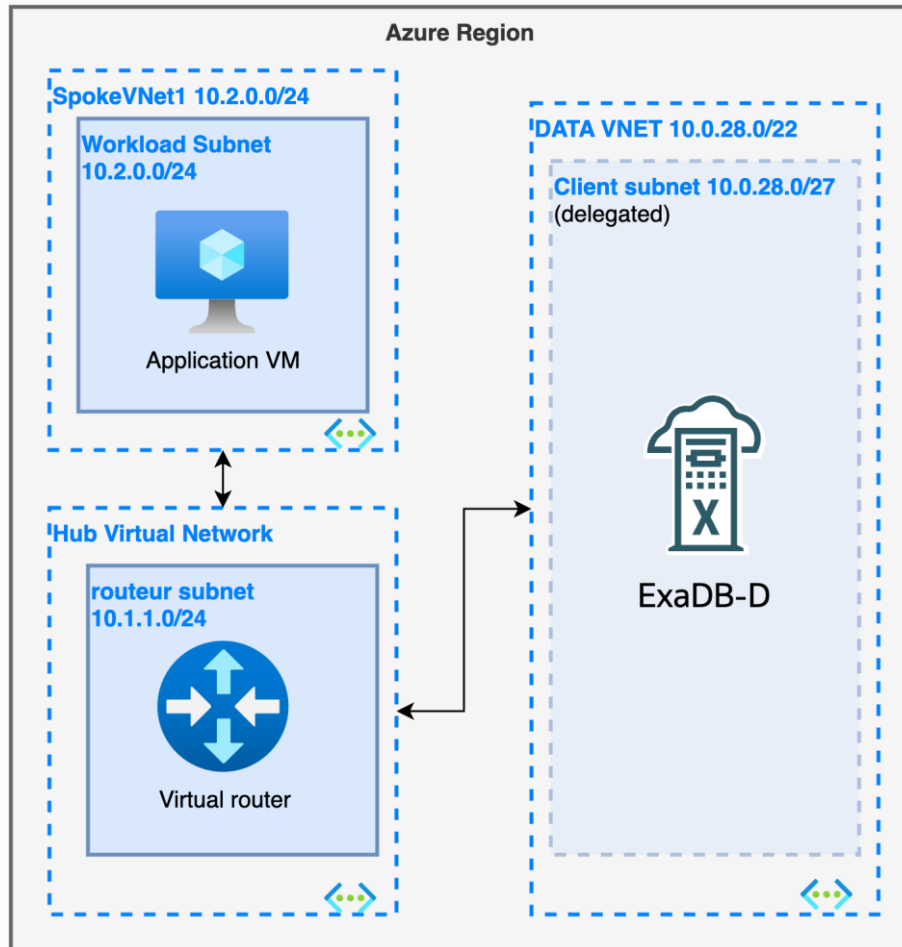
Local VNet topology



- 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



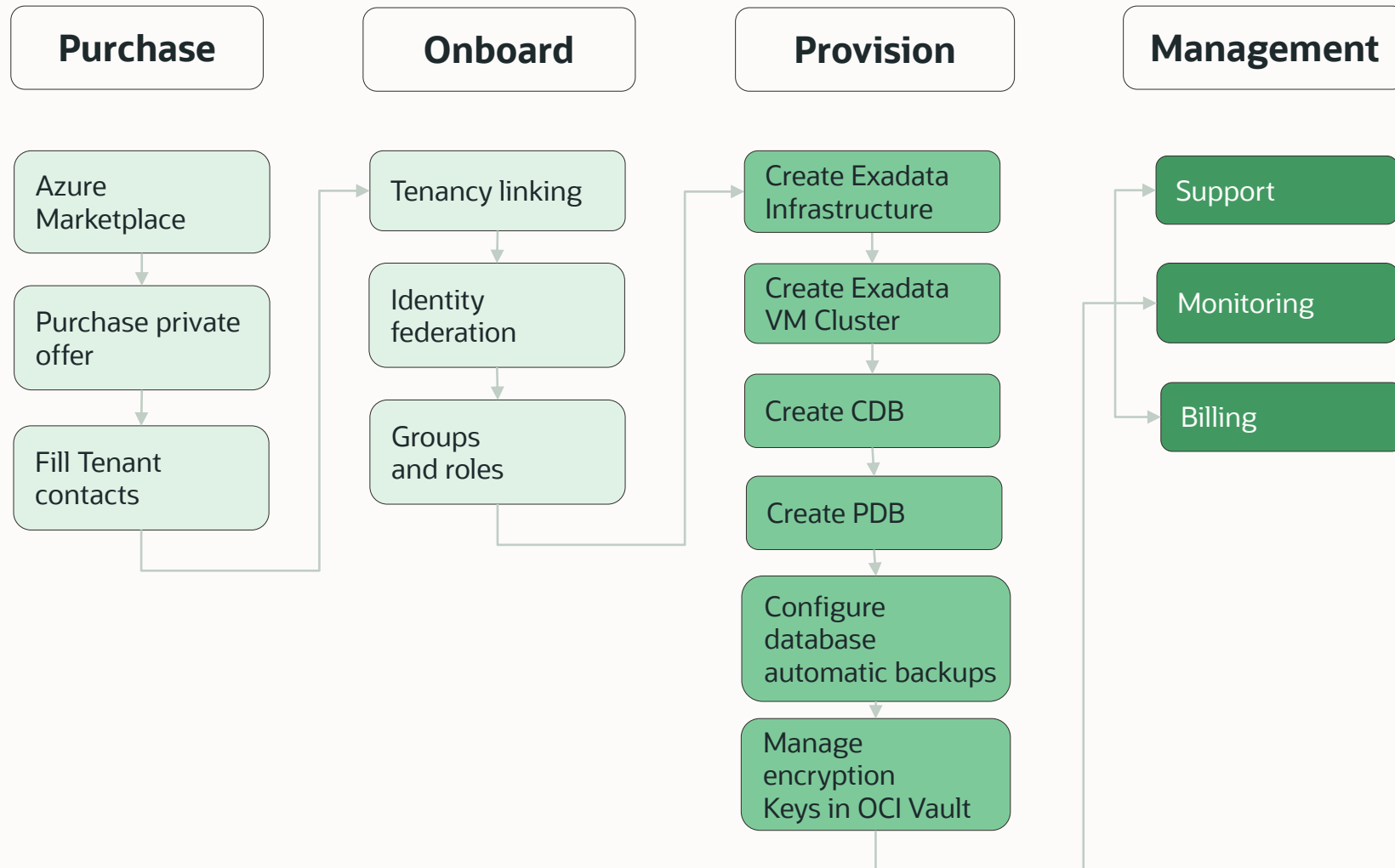
Hub-spoke VNet Peering topology



- 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

The screenshot shows the 'Product Group - Billing Profile | Policies' page in the Azure portal. The left sidebar contains a navigation menu with categories: Overview, Access control (IAM), Cost management (Cost analysis, Budgets), Billing (Invoices, Payment history, Reservation transactions, Azure subscriptions, Invoice sections), and Settings (Billing scopes, Properties, Payment methods, Policies). The main content area shows policy settings for 'Azure Reservations' (Yes/No), 'Azure Marketplace' (Free + Paid/Free/No), 'Azure charges' (Yes/No), and 'Labels' (Yes/No). The 'Azure Marketplace' section is highlighted with a red border, and the 'Free + Paid' option is selected.



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



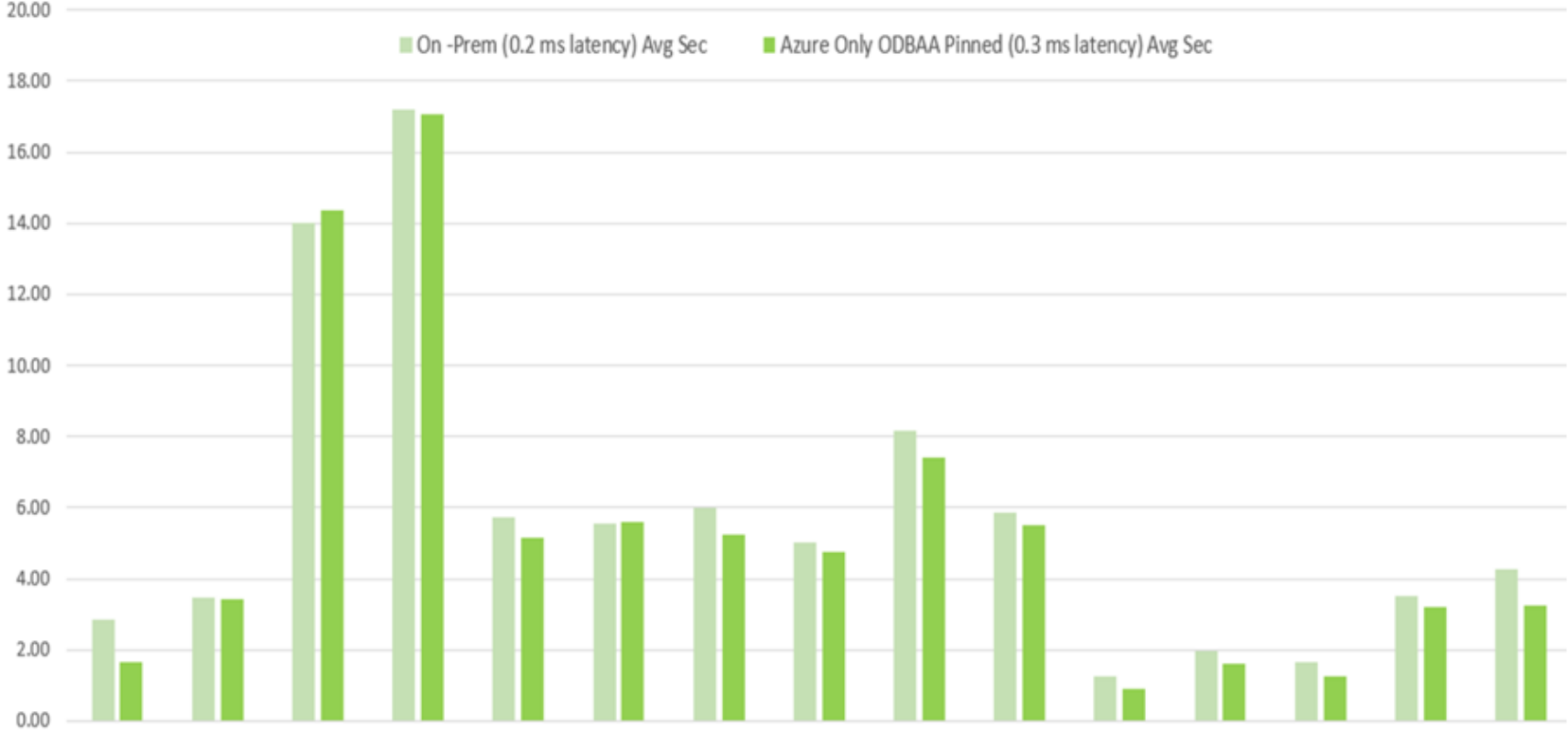
Performance Testing Summary

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
2	Google	Azure VM	Google BMS	Assumed the same as OCI		Eliminated
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) Avg Sec	Azure Only ODBAA Pinned (0.3 ms latency) 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



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.

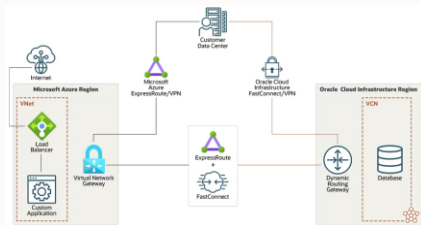
4

Ressourcen

Mehr Informationen
zu den Themen

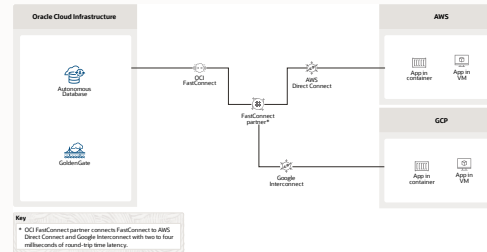
Weitere Multicloud Anwendungsfälle Mit Kundenreferenzen

Oracle Interconnect for Azure with Autonomous Database



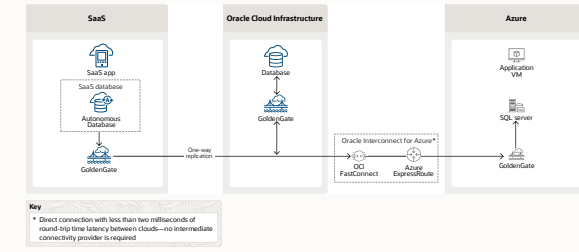
<https://www.oracle.com/cloud/azure/interconnect/>

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



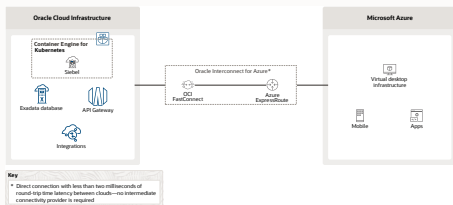
<https://www.oracle.com/cloud/multicloud/#split-stack>

Integrate SaaS applications with applications on different clouds



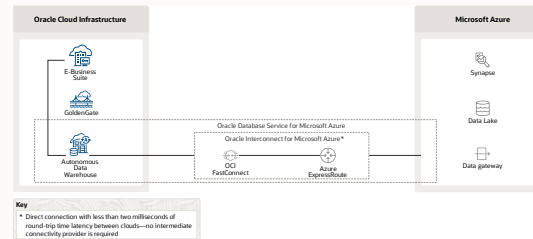
<https://www.oracle.com/cloud/multicloud/#saas-integration>

App to App integration bringing legacy applications to OCI and Azure



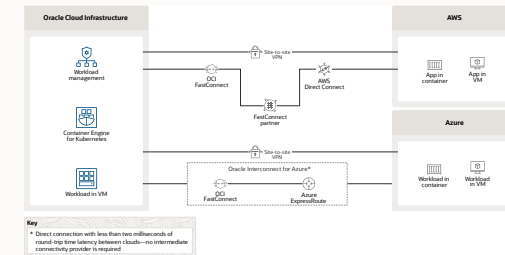
<https://www.oracle.com/cloud/multicloud/#app-to-app>

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)

OCI - Multicloud Office Hours: Oracle Database@Azure (EMEA)
Jan 18, 2024, 10:00 AM Oracle Cloud Infrastructure Events
Event PDF: Description: Multicloud is a cloud computing strategy that uses the best services from more than one cloud provider to deploy a solution. The strateg...

OCI – Multicloud Office Hour: Oracle Database@Azure (EMEA)
Oct 18, 2023, 1:00 PM Oracle Cloud Infrastructure Events
Event PDF: Description: Introducing Oracle Database@Azure, how it works, and the use cases. The office hours will be 10 minutes of presentation and 20 minutes Q...

OCI – Multicloud Office Hours: Migrate to Oracle Database@Azure (EMEA)
Mar 21, 2024, 1:00 PM Oracle Cloud Infrastructure Events
Event PDF: Description: In this session, we will share a few migration pathways. You will learn the proven database migration strategies and services that can h...

OCI – Multicloud Office Hours: Oracle Database@Azure Network Topology (EMEA)
Register for Event Apr 18, 2024, 1:00 PM Oracle Cloud Infrastructure Events
Description: During this office hours session, we will review the network topology and connectivity for the Oracle Database@Azure landing zone accelerator. You ...

UPDATED: OCI - Multicloud Office Hour: Oracle Database@Azure Technical Deep Dive (EMEA)
Nov 16, 2023, 1:00 PM Oracle Cloud Infrastructure Events
Description: Please note the updated event time for this event. We heard you and you want more technical discussions. In this session, we will share the Oracle ...

OCI – Multicloud Office Hours: Oracle Database@Azure High Availability/Disaster Recovery (EMEA)
Dec 21, 2023, 1:00 PM Oracle Cloud Infrastructure Events
Event PDF: Description: Join us for an insightful session following the much-anticipated Oracle Database@Azure December launch announcement at Microsoft Ignite ...

OCI – Multicloud Office Hours: Achieve High Availability and Data Protection with Oracle Database@Azure (EMEA)
Feb 15, 2024, 1:00 PM Oracle Cloud Infrastructure Events
Event PDF: Description: Oracle Database@Azure supports fully automated deployments of Oracle Databases running on Oracle Real Application Clusters (Oracle RAC) ...

Filter Results

Title
Oracle Database@Azure (EMEA)

Author
Select...

Event Date

From mm / dd, 📅

To mm / dd, 📅

Filter



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

HOME › ORACLE CLOUD INFRASTRUCTURE EVENTS › EVENTS


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

When
Apr 18, 1:00 PM - 1:30 PM

Location
[Register for Event](#)

Organizer
Mary Hess-Oracle

Who's Interested

 +15

About the event

Description:

During this office hours session, we will review the network topology and connectivity for the Oracle Database@Azure landing zone accelerator. You will learn the key design considerations and recommendations.

Presented by:

- Ejaz Akram - Multicloud Specialist, Oracle Cloud Infrastructure
- Julien Silverston - Principal Product Manager Multicloud, Oracle Cloud Infrastructure



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.

