

ORACLE CLOUD ADVANCED FULL NOTES

1. OCI Global Infrastructure & Core Architecture

Core Concepts

- Regions
- Availability Domains
- Fault Domains
- Edge Services
- Dedicated Regions

Architecture Principle

Users → DNS → CDN / WAF → Load Balancer → Compute / OKE → Autonomous DB / Database

Best Practices

- Critical workloads ni multiple Fault Domains / ADs lo spread cheyyali
- Region selection lo latency, compliance, DR consider cheyyali
- Single point of failure avoid cheyyali
- Multi-region DR design cheyyali

Remember:

Region = Geographic area

Availability Domain = Isolated data center location

Fault Domain = Failure isolation inside an AD

2. OCI IAM, Identity Domains & Access Management

Core Components

- Users
- Groups
- Dynamic Groups
- Policies
- Compartments
- Identity Domains

Advanced Concepts

- Least Privilege
- Federation
- MFA
- Instance Principals
- Resource Principals
- Conditional Policies
- Cross-Tenancy Access

Access Flow

Principal → Policy → Compartment → Resource

Best Practice

Long-term credentials ಕ್ಕೆ **Instance Principals / Resource Principals** prefer చేಯಾಲಿ.

3. Compartments, Tenancy & Governance

OCI Hierarchy

Tenancy

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Compartments

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Sub-Compartments

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Resources

Core Governance

- IAM Policies
- Tags
- Quotas
- Budgets
- Cost Tracking
- Resource Manager

Advanced Use

- Dev / Test / Prod separation
- Department-wise compartments
- Security boundary creation
- Cost allocation
- Centralized governance

Remember:

Compartment = Logical isolation + access-control boundary

4. OCI Virtual Cloud Network (VCN) – Advanced

Core Components

- VCN
- Public Subnets
- Private Subnets
- Route Tables
- Security Lists
- NSGs
- Internet Gateway
- NAT Gateway
- Service Gateway

Advanced Networking

- Local Peering Gateway
- Dynamic Routing Gateway (DRG)
- Site-to-Site VPN
- FastConnect
- Private Endpoints

Typical Architecture

Internet

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WAF / Load Balancer

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Public Tier

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Private Application Tier

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Private Database Tier

Remember:

NSG = Resource-level security

Security List = Subnet-level security

5. OCI Compute & VM Architecture

Compute Options

- Virtual Machines
- Bare Metal
- Dedicated VM Hosts
- GPU Instances
- Ampere A1 Compute

Core Concepts

- Shapes
- Images
- Boot Volumes
- Block Volumes
- Instance Configurations

Advanced Features

- Flexible Shapes
- Capacity Reservations
- Preemptible Instances
- Autoscaling
- Instance Pools

Architecture

Load Balancer

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Instance Pool

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Compute Instances

6. OCI Load Balancing & Autoscaling

Load Balancing Services

- OCI Load Balancer
- Network Load Balancer

Features

- SSL termination
- Health Checks
- Backend Sets
- Session Persistence
- Path Routing
- Host Routing

Autoscaling Based On

- CPU
- Memory metrics
- Custom metrics
- Scheduled scaling

Architecture

Traffic



Load Balancer



Healthy Backend Instances

Goal:

High Availability + Elasticity + Performance

7. OCI Storage – Object, Block & File

Object Storage Tiers

- Standard
- Infrequent Access
- Archive

Block Storage

Used for:

- VM disks
- Databases
- Transactional applications

File Storage

Used for:

- Shared file systems
- Enterprise applications
- Containers

Advanced Features

- Versioning
- Lifecycle Rules
- Replication
- Encryption
- Immutable Storage

Remember:

Object → Unstructured Data

Block → High-performance disks

File → Shared filesystem

8. Oracle Database Services – Advanced Overview

Core Database Services

- Autonomous Database
- Base Database Service
- Exadata Database Service
- MySQL HeatWave
- NoSQL Database
- Oracle Database@Azure

Autonomous Options

- Autonomous Transaction Processing
- Autonomous Data Warehouse

Selection

Transactional apps → ATP / Base Database

Analytics → ADW

Extreme Oracle DB workloads → Exadata

MySQL analytics → HeatWave

Best Practice

Workload SLA, performance and licensing requirements batti database select cheyyali.

9. Autonomous Database, Exadata & High Availability

Autonomous Database Features

- Automatic patching
- Automatic tuning
- Auto scaling
- Automated backups
- Built-in security

Exadata Features

- High-performance Oracle Database
- Smart Scan
- Scale-out architecture
- High I/O throughput

HA Technologies

- RAC
- Data Guard
- Active Data Guard

- Autonomous Data Guard

Remember:

RAC = Local HA + scale

Data Guard = Disaster recovery

10. Serverless & Event-Driven Architecture

Main Services

- OCI Functions
- API Gateway
- Events
- Streaming
- Queue
- Notifications

Typical Architecture

Client

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API Gateway

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OCI Functions

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Autonomous DB / Object Storage

Advantages

- No server management
- Event-driven
- Automatic scaling
- Pay for execution

Use Cases

- APIs
 - File processing
 - Automation
 - Event handlers
 - Integration workflows
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11. Containers – OKE & Container Registry

Core Services

- Oracle Kubernetes Engine (OKE)
- OCI Container Registry
- Container Instances

Typical Architecture

Users



Load Balancer



OKE Cluster



Microservices



Autonomous DB / Streaming

Advanced Concepts

- Node Pools
- Virtual Nodes
- Autoscaling
- Ingress
- Persistent Storage
- Service Mesh

Selection

Kubernetes workloads → OKE

Simple container execution → Container Instances

12. Monitoring, Logging & Observability

Main Services

- OCI Monitoring
- Logging
- Logging Analytics
- Application Performance Monitoring
- Notifications
- Service Connector Hub

Observability Flow

Application



Metrics + Logs + Traces



OCI Observability

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Alerts → Operations Team

Monitor

- CPU
- Memory
- Disk
- Latency
- Error Rate
- Network Traffic
- Application health

Best Practice

Centralized monitoring + actionable alerts use cheyyali.

13. Security, Encryption & Cloud Protection

Security Services

- Cloud Guard
- Security Zones
- Vault
- WAF
- Bastion
- Data Safe
- Vulnerability Scanning
- Network Firewall

Encryption

At Rest → OCI Vault / Keys

In Transit → TLS

Security Architecture

Internet

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WAF

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Load Balancer

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Private Compute / OKE

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Encrypted Database

Golden Rules

- Least privilege

- Private subnets
 - MFA
 - Secret rotation
 - Centralized logging
 - Continuous threat monitoring
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14. DevOps, CI/CD & Infrastructure as Code

OCI DevOps Services

- Code Repositories
- Build Pipelines
- Deployment Pipelines
- Artifact Registry

Infrastructure as Code

- Terraform
- OCI Resource Manager
- Ansible

Pipeline

Developer Commit

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Build

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Test

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Artifact

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Deploy

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Monitor

Deployment Strategies

- Rolling
- Blue/Green
- Canary
- Automated rollback

Best Practice

Infrastructure + deployments rendu automated ga maintain cheyyali.

15. OCI Advanced Architecture + Pro Tips

Production Architecture

Users



OCI DNS



CDN + WAF



Load Balancer



Compute / OKE



Autonomous DB / Exadata



Object Storage + Backup

Advanced Design Principles

- Design for failure
- Use Fault Domains effectively
- Prefer private networking
- Use managed services
- Automate infrastructure
- Implement HA + DR separately
- Encrypt sensitive workloads
- Centralize monitoring
- Optimize costs continuously
- Test backup and recovery