TechKnowledge
Enablement
& DEVs

OCI Foundations 2023

Network &
Compute Services

Alexandre Fagundes
alexandre.af.fagundes@oracle.com
Cloud Architect, Oracle Latin America

2023 OCI Foundations Associate

→ Become an OCI Foundations Associate 2023

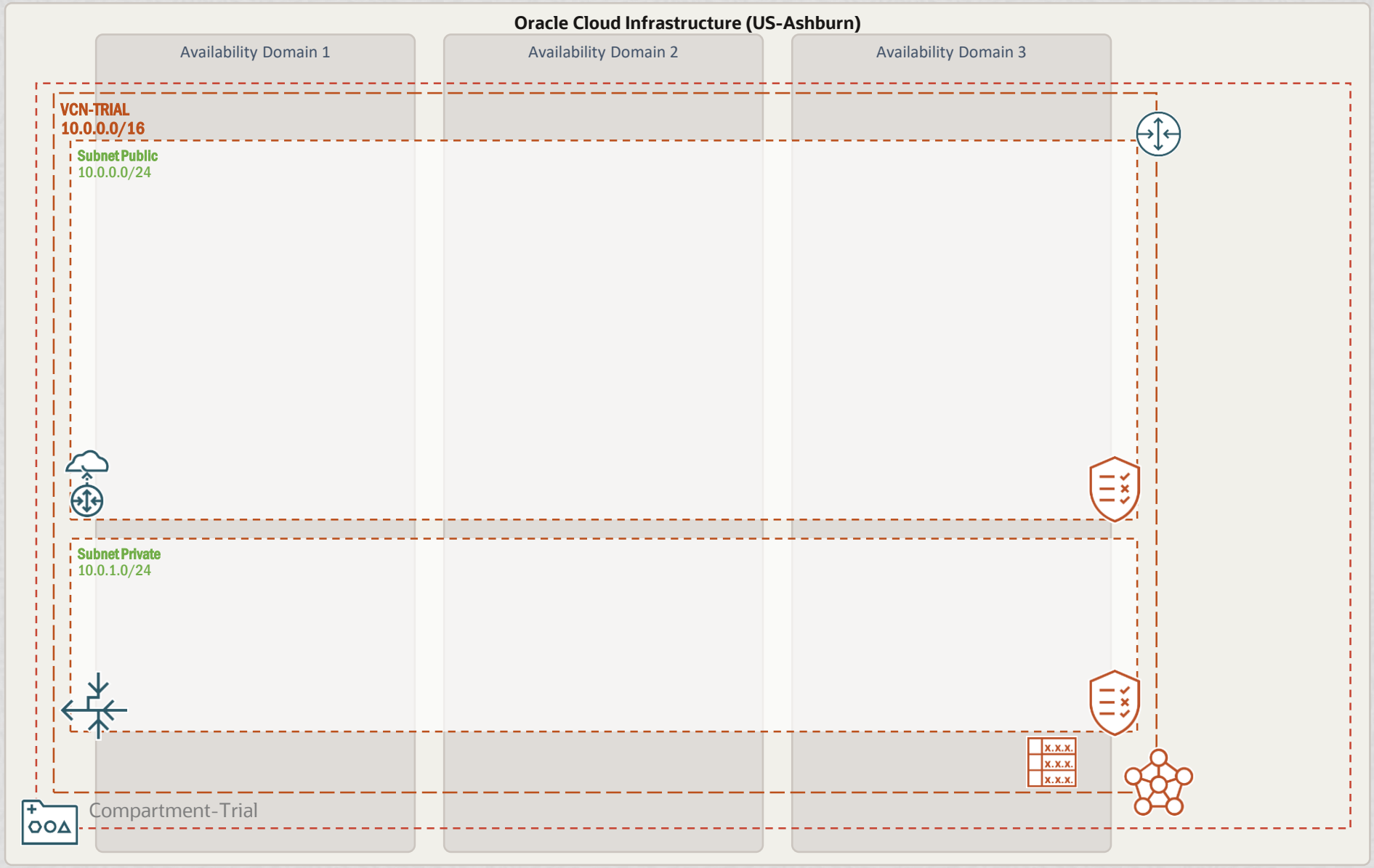
ORACLE
Cloud Infrastructure

Networking

Virtual Cloud Networks

ORACLE
Cloud Infrastructure

Architecture example:

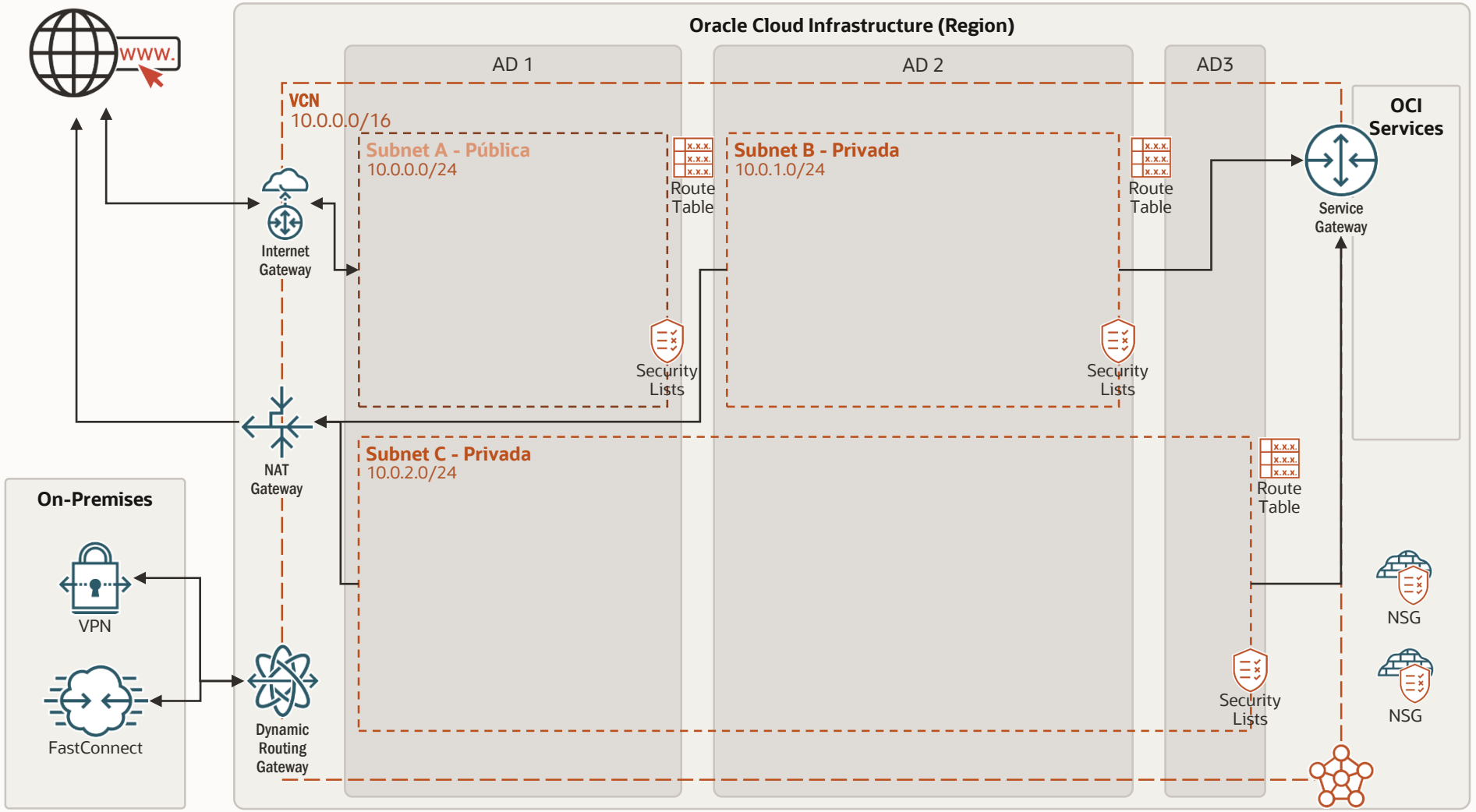


Resources:

- Compartment
- VCN
- Subnets
- Security Rules
- Route Table
- Internet Gateway

Virtual Cloud Network (VCN)

Network as a Service



VCN is a configurable **virtual private network in an OCI region**

A VCN can have:

- Subnets (public and private)
- Route Tables
- Gateways (IG, NAT, DRG, SG)
- Security Lists
- Network Security Groups (NSG)

Important topics

- Supports IPv4 and IPv6 prefixes
- Recommended to use Private IP address ranges listed in **RFC 1918**: (10.0.0.0/8, 172.16/12, and 192.168/16)

Virtual Cloud Network (VCN)

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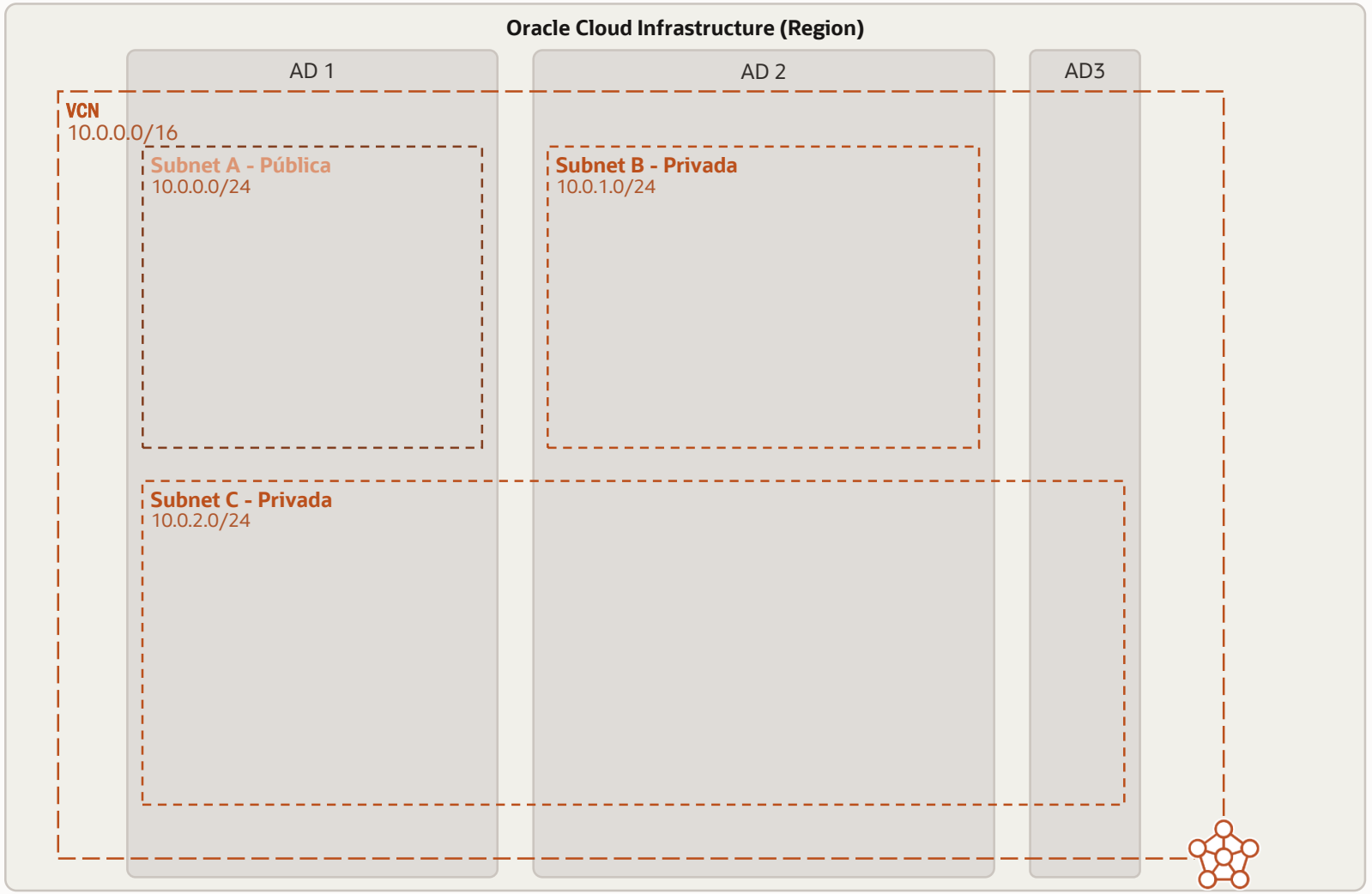
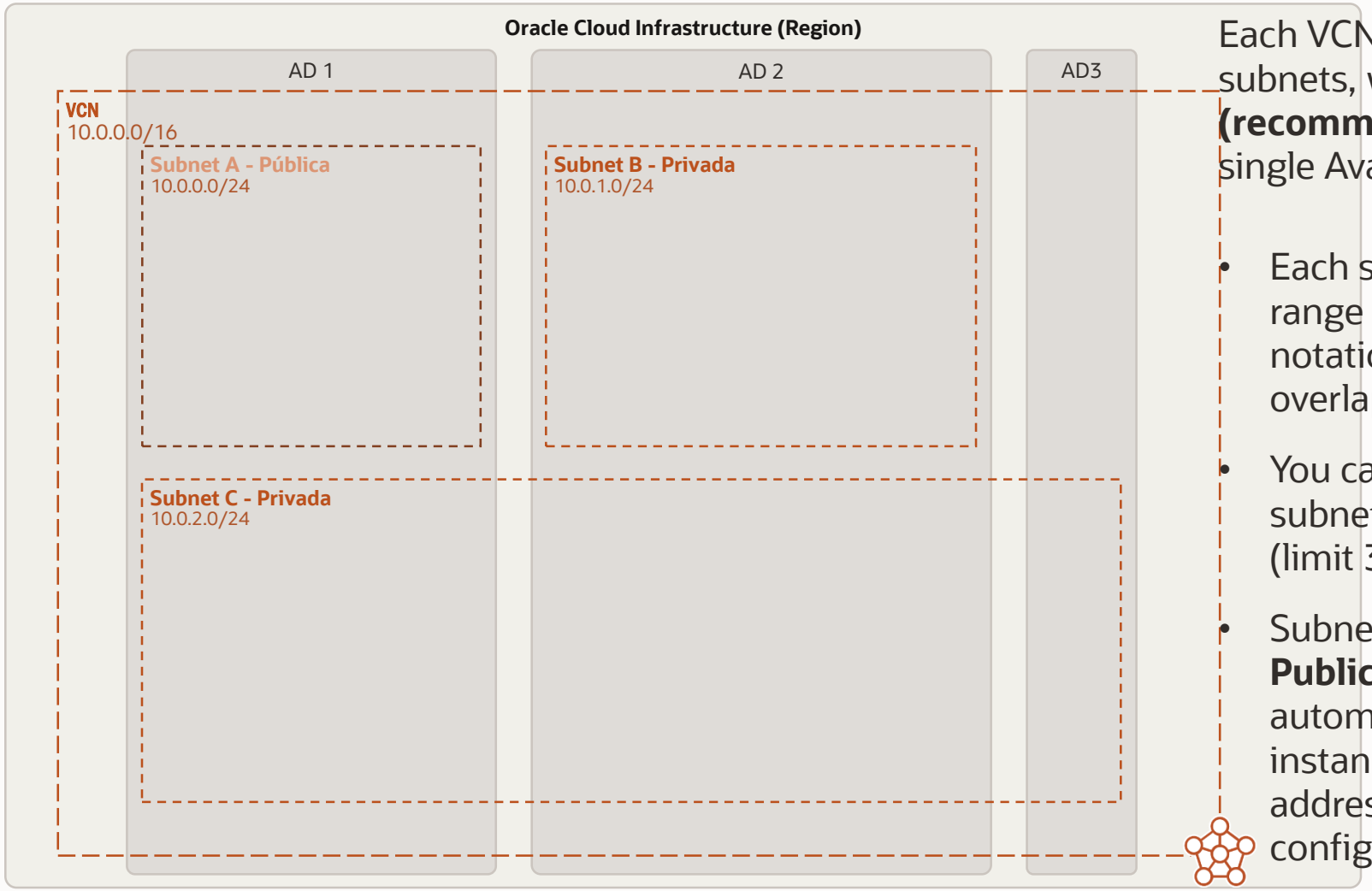


A VCN can have:

- Subnets (public and private)

Subnet

Network as a Service

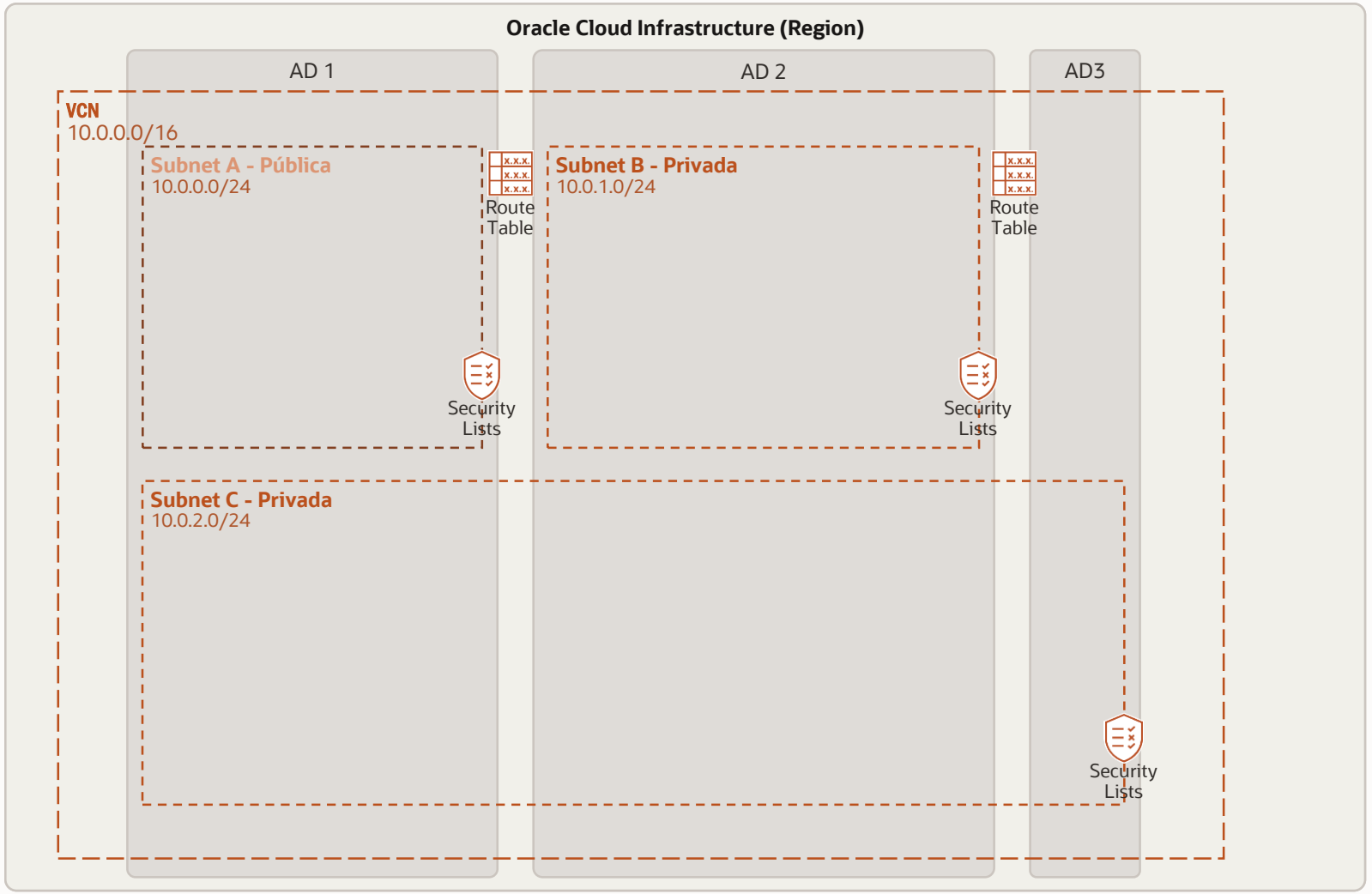


Each VCN network is subdivided into subnets, which can be **Regional (recommended)** or contained within a single Availability Domain (AD)

- Each subnet has a contiguous range of IPs, described in CIDR notation. Subnet IP ranges cannot overlap
- You can have more than one subnet in an AD for a given VCN (limit 300 subnets/AD)
- Subnets can be designated as **Public** or **Private** When automatically provisioned, the instance receives its internal IP address and the subnet's network configuration

Virtual Cloud Network (VCN)

Network as a Service



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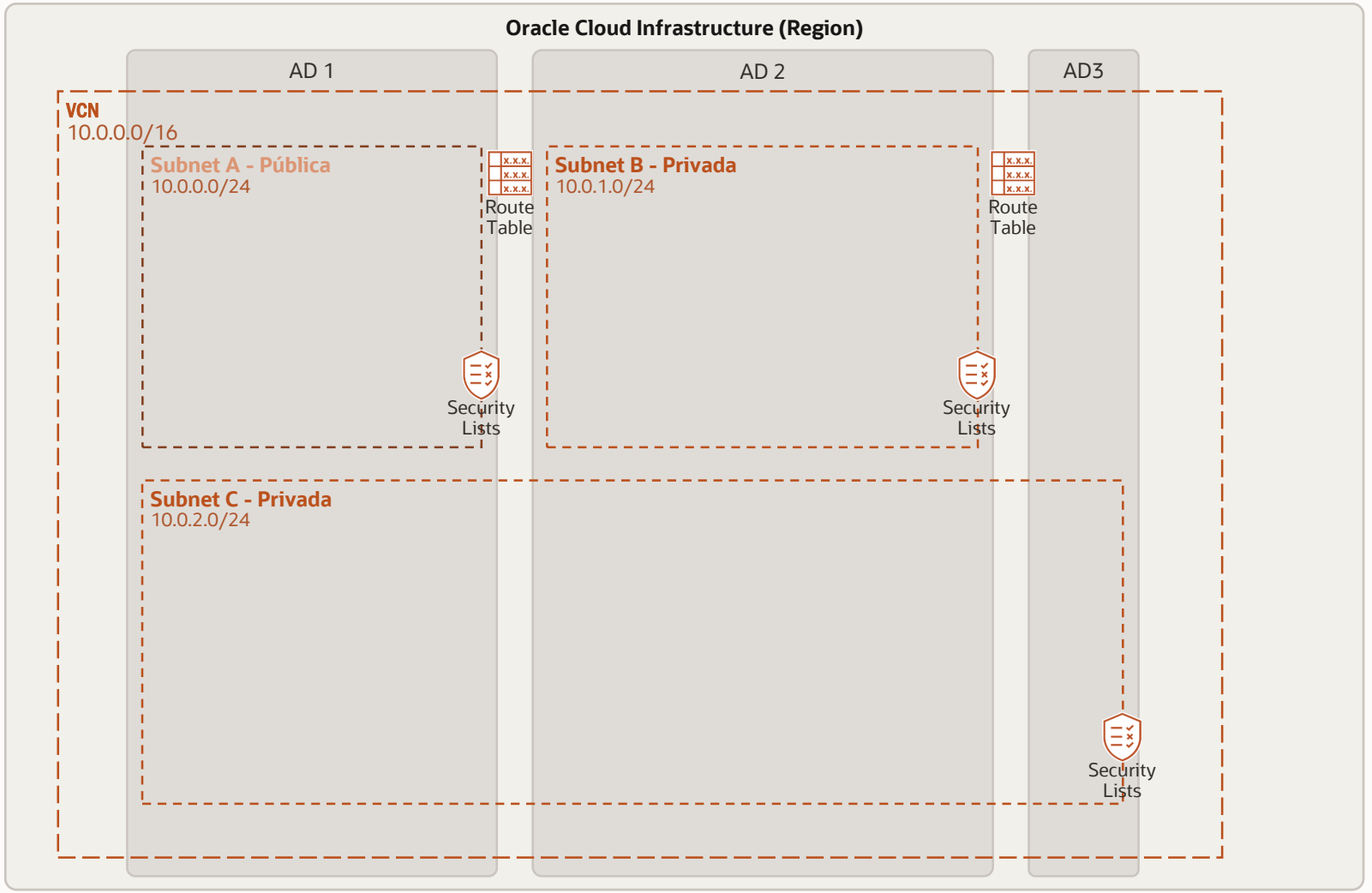
Network as a Service



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Virtual Cloud Network (VCN)

Network as a Service

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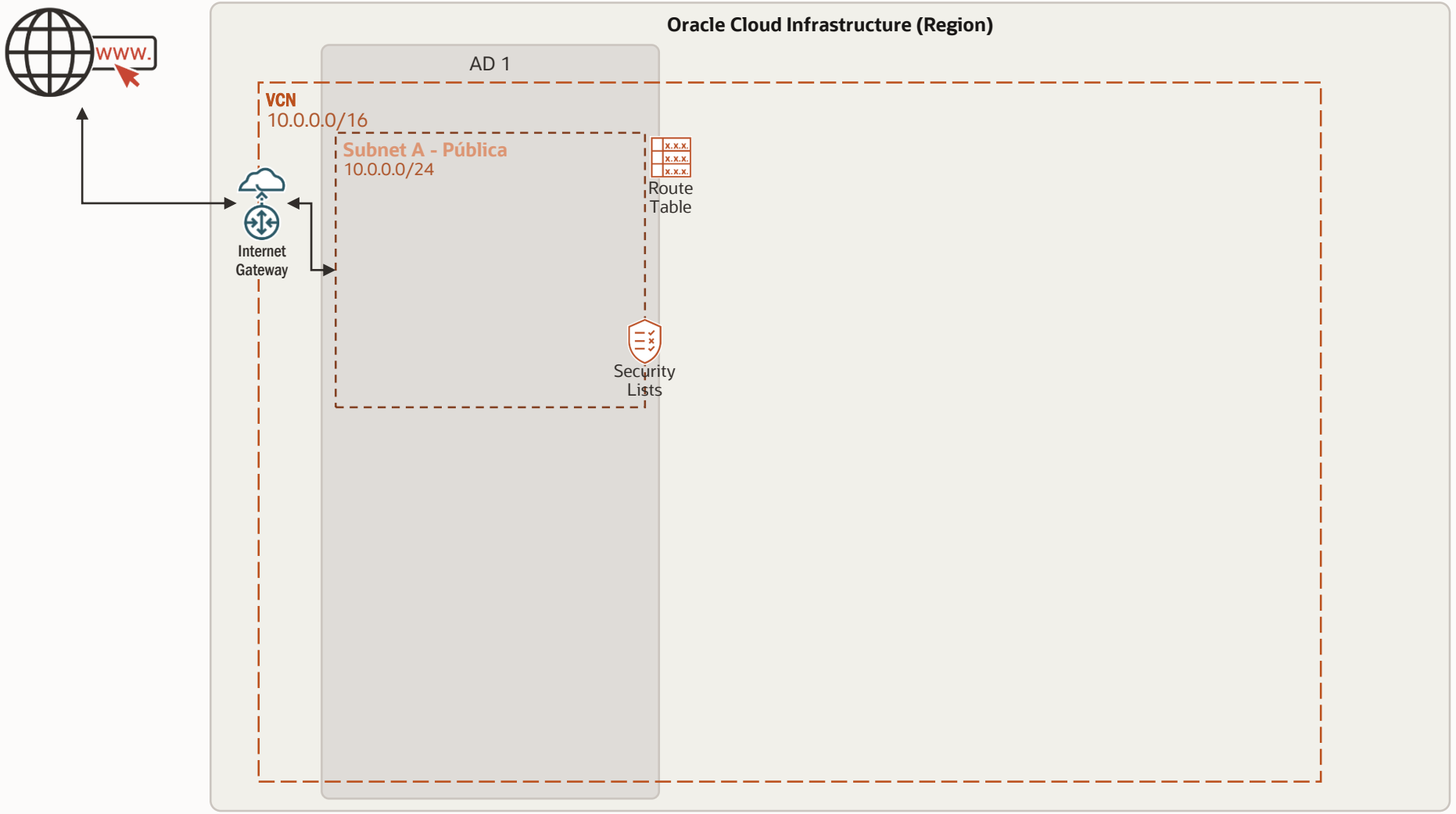


VCN is a configurable **virtual private network in an OCI region**

A VCN can have:

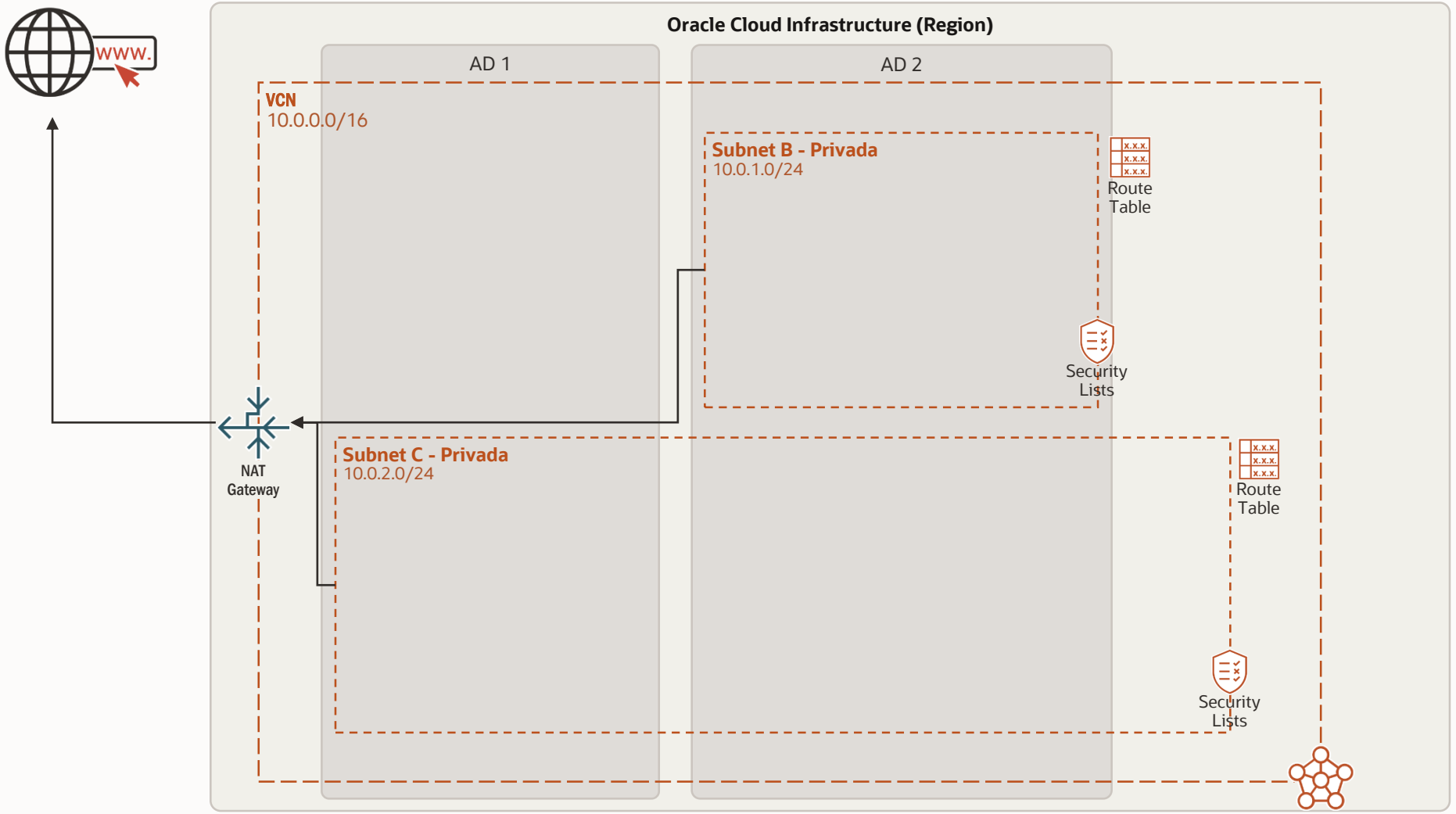
- Gateways (IG, NAT, DRG, SG)

Internet Gateway

- Ativa a conectividade com a internet
- Faz a conexão com uma subnet pública
- Bidirecional: suporta conexões iniciadas na VCN e conexões iniciadas na internet.

Virtual Cloud Network (VCN)

Network as a Service



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A VCN can have:

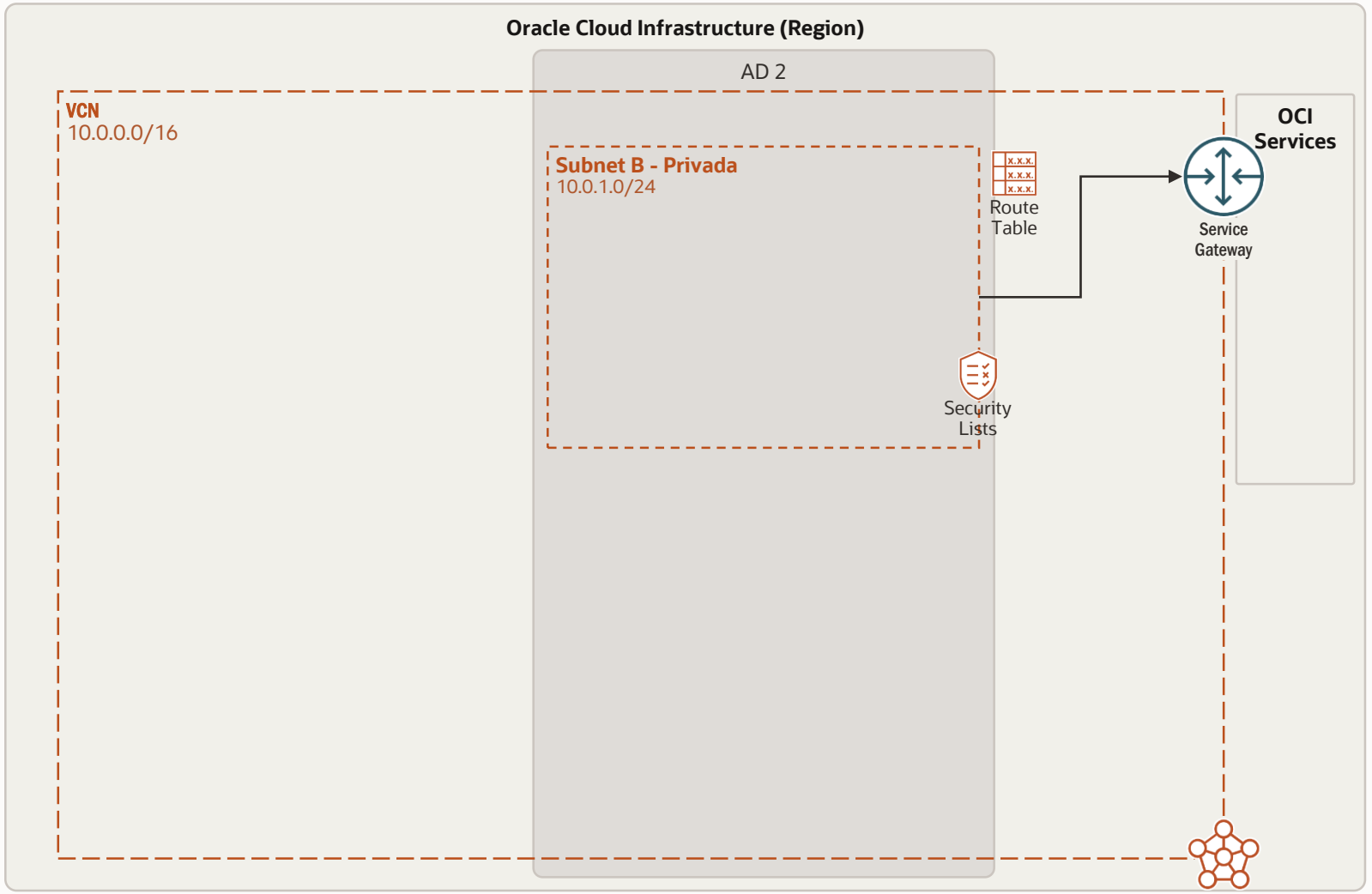
- Gateways (IG, NAT, DRG, SG)

NAT Gateway

- Permite que instâncias em uma sub-rede privada tenham acesso à internet.
- Unidirecional: as instâncias podem iniciar conexões com a internet e podem receber respostas, mas não podem receber conexões de entrada iniciadas na internet.

Virtual Cloud Network (VCN)

Network as a Service



VCN is a configurable **virtual private network in an OCI region**

A VCN can have:

- Gateways (IG, NAT, DRG, SG)

Service Gateway

- Acessa os serviços da Oracle sem passar pelo tráfego da internet
- Conecta com subnet pública e privada
- Regional

Virtual Cloud Network (VCN)

Network as a Service

VCN is a configurable **virtual private network in an OCI region**

A VCN can have:

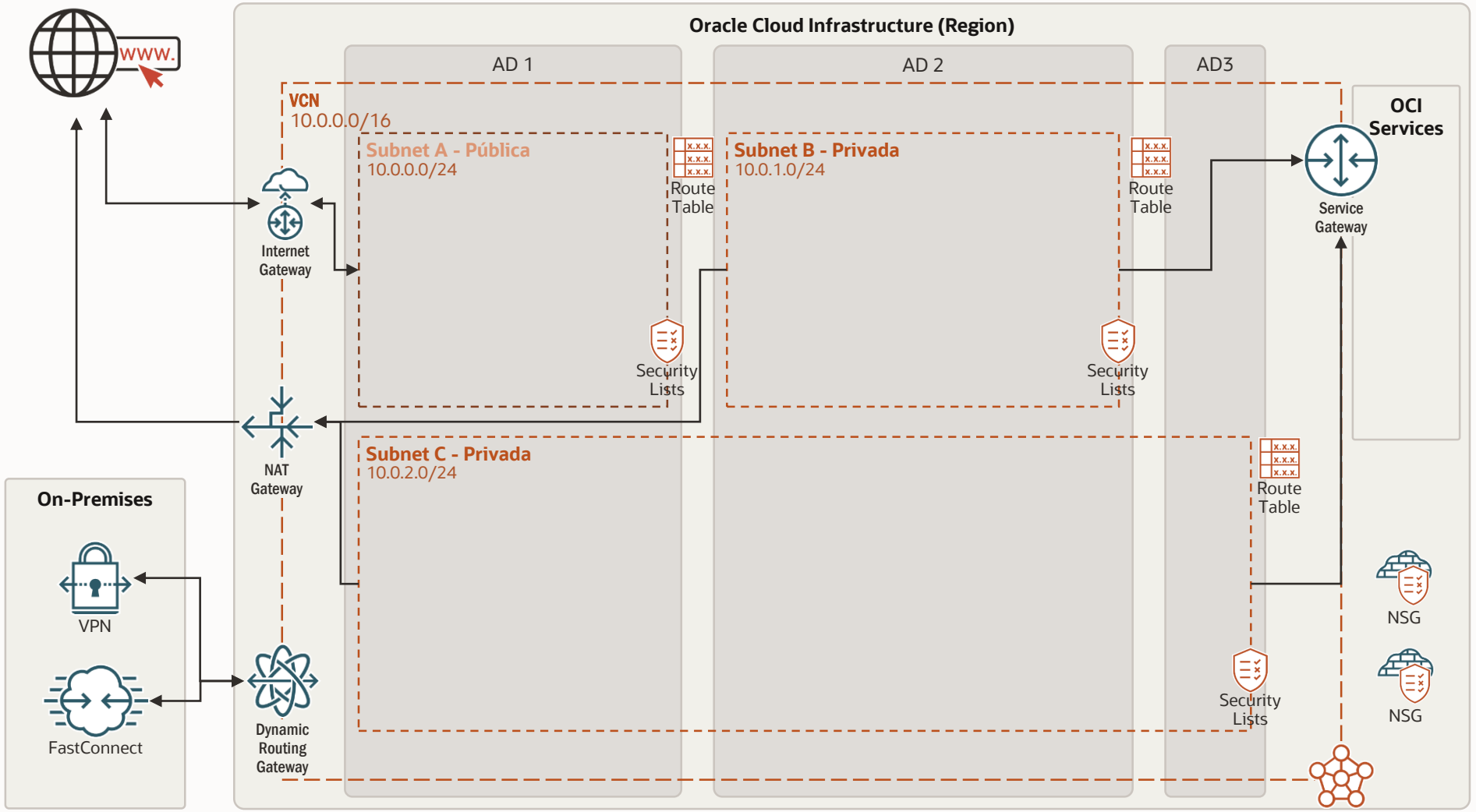
- Gateways (IG, NAT, DRG, SG)

Dynamic Routing Gateway

- Roteador Virtual
- Fornece um caminho para o tráfego entre suas redes on-premises e as VCNs ou o tráfego entre as próprias VCNs

Virtual Cloud Network (VCN)

Network as a Service



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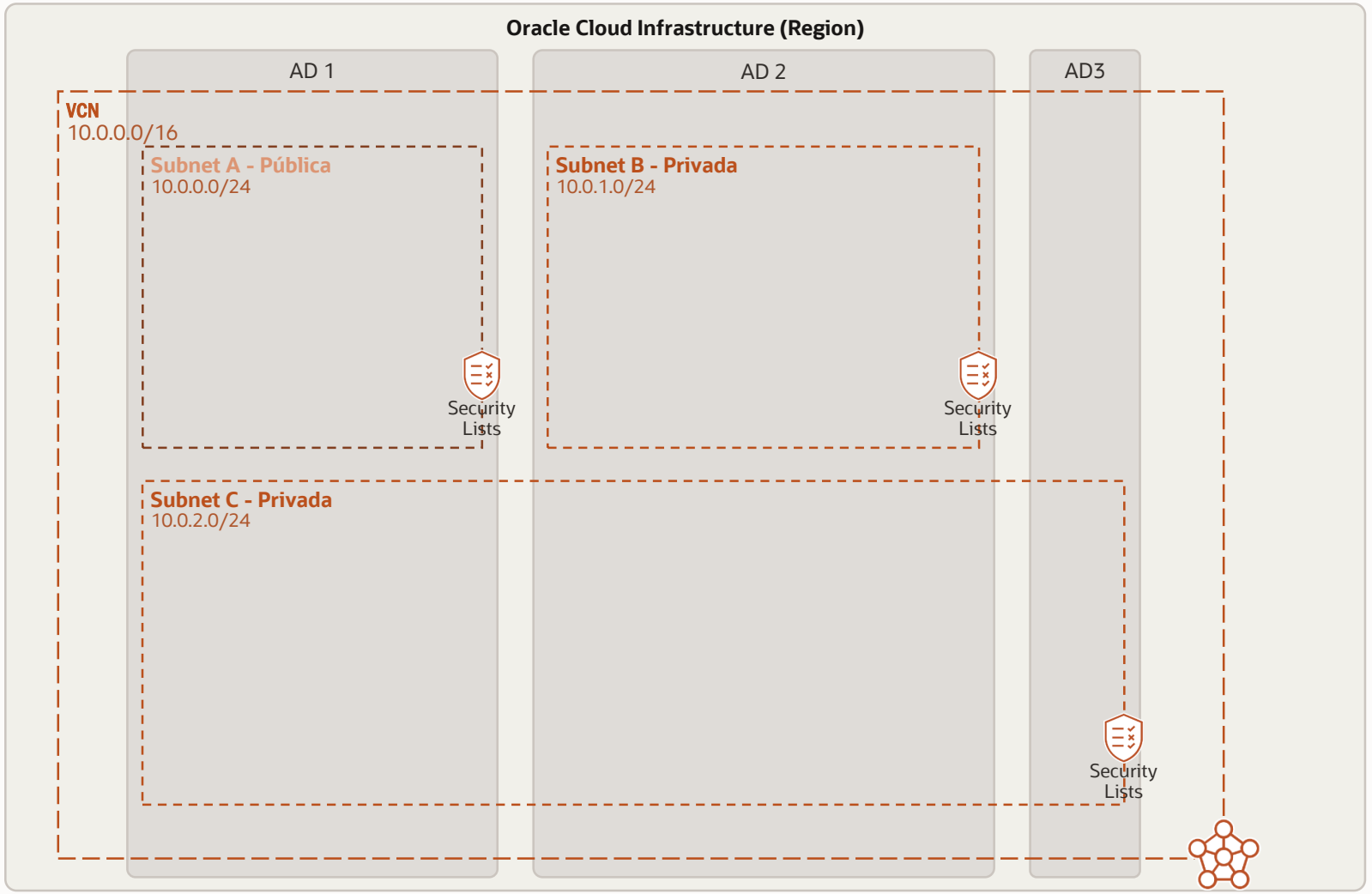


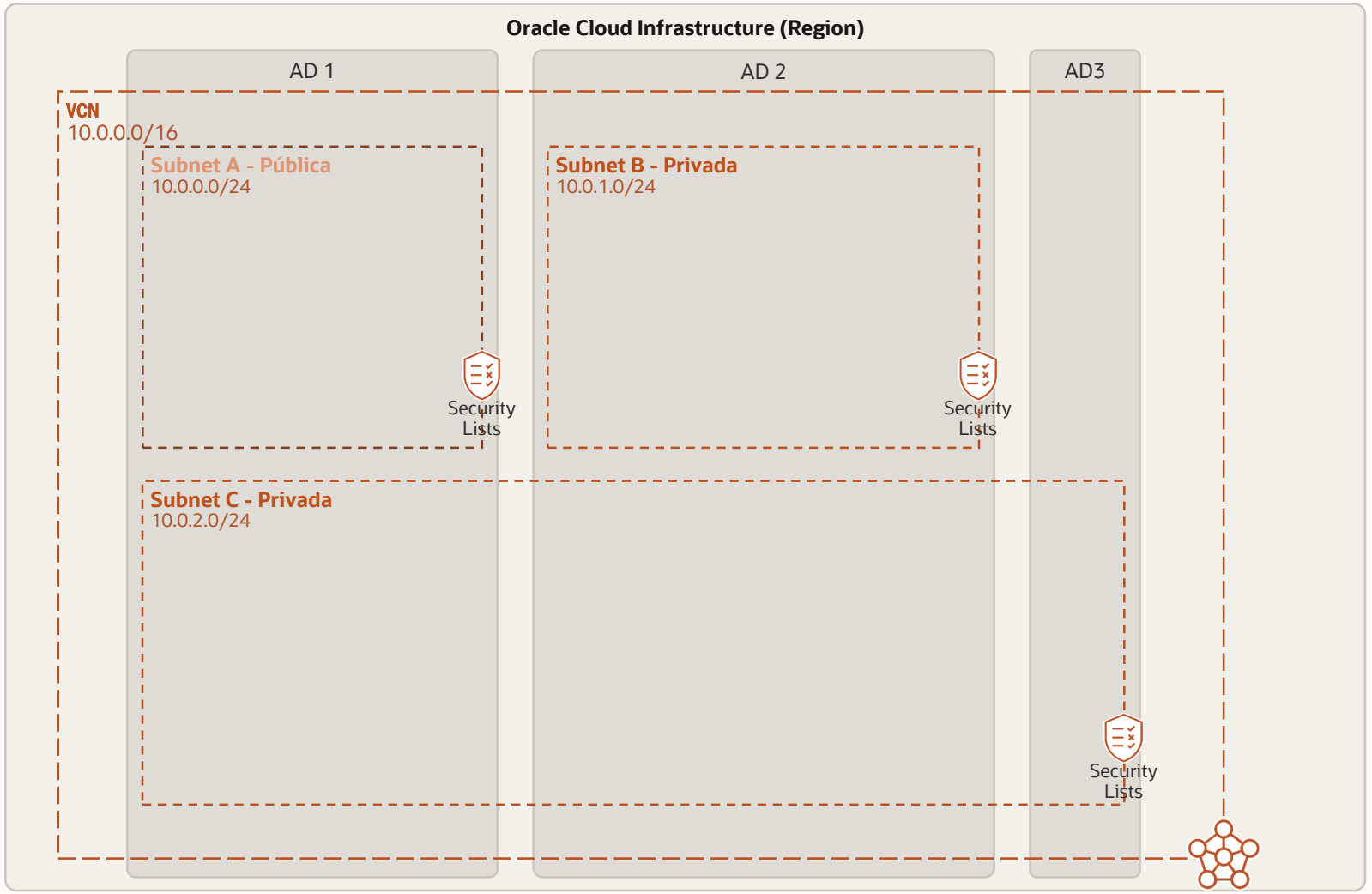
VCN is a configurable **virtual private network in an OCI region**

A VCN can have:

- Security Lists

Security List (SL)

Network as a Service



VCN is a configurable **virtual private network in an OCI region**

A VCN can have:

- Security Lists

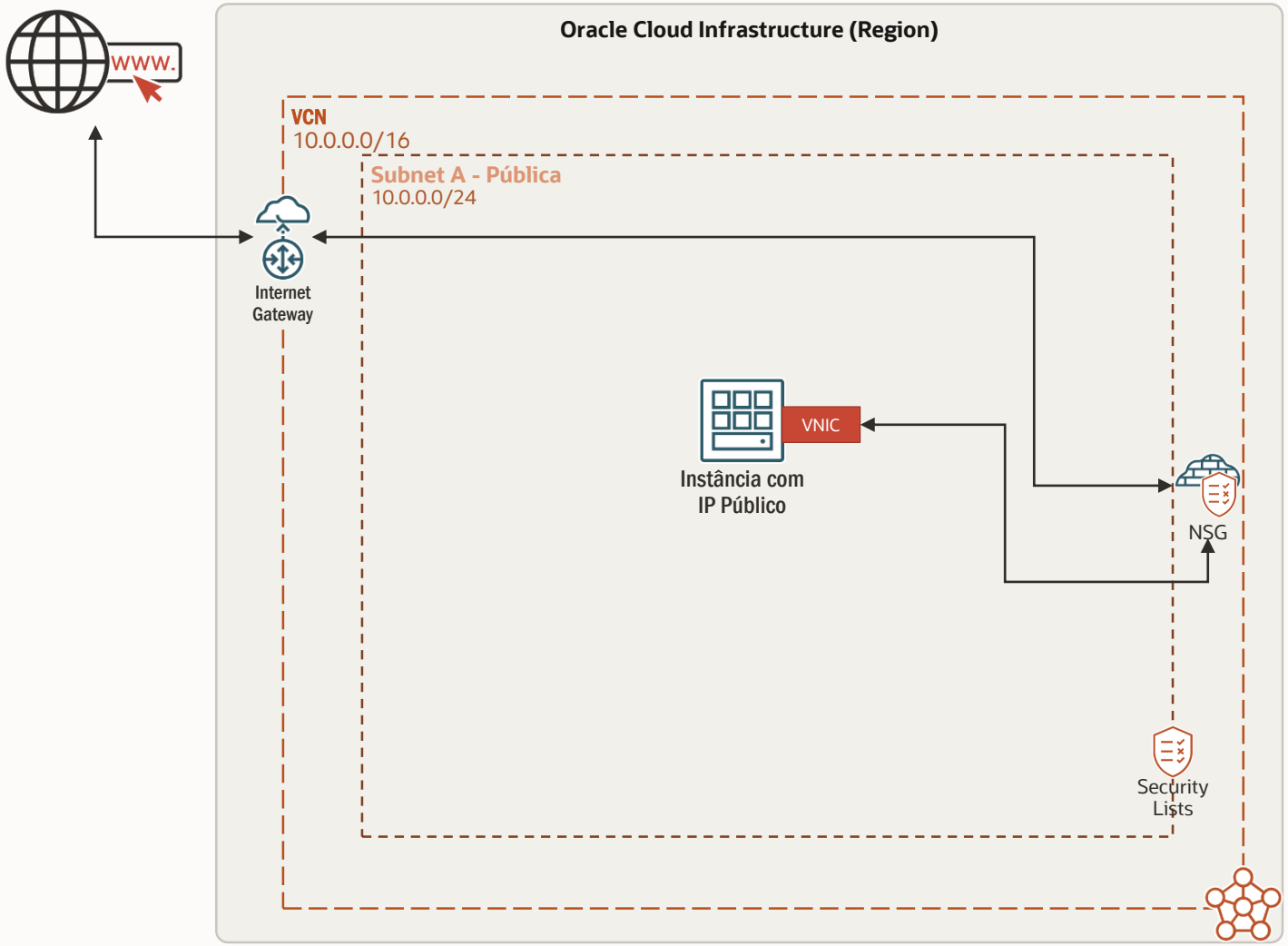
A common set of **firewall rules associated with a subnet** and **applied to all instances launched within the subnet**

Security lists provide **ingress and egress rules** that specify the types of traffic allowed in and out of instances

You can choose whether a given rule is **Stateful** or **Stateless**

Network Security Group (NSG)

Firewall rules for specific resources on a Subnet



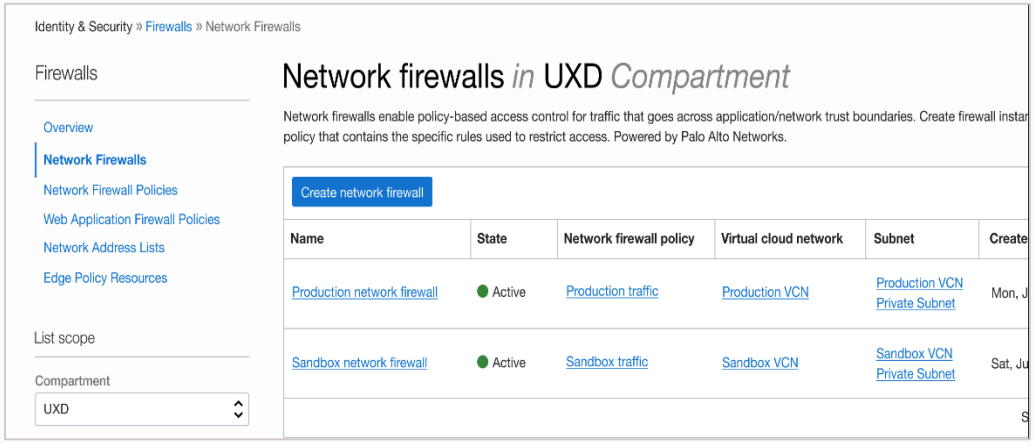
O serviço Networking oferece **dois recursos de firewall** virtual para controlar o tráfego no nível do pacote:

- **Listas de segurança:** O tipo original de firewall virtual oferecido pelo serviço de rede.
- **Grupos de segurança de rede:** Os grupos de segurança
de rede têm suporte apenas para recursos/serviços específicos.
- Ambos os firewalls usam **Listas de Segurança (*security rules*).**

OCI Network Firewall

Use network firewall and its advanced features together with other OCI security services to create a layered network security solution

OCI Network Firewall is a cloud-native managed firewall service that is built using industry leading **Palo Alto Networks** next-generation firewall technology. It provides advanced threat protection capabilities including custom URL filtering, intrusion prevention and detection (IDS/IPS), and TLS inspection to help prevent malicious traffic and malware propagation.



Customer benefits

- **Cloud-Native Firewall** - Scalable native service that eliminates the need to manage additional third-party security infrastructure.
- **Deep Integration with OCI** - Natively integrated with OCI platform including logging and metrics services.
- **Layered Defense** - Easily apply deeper security controls and segmentation for encrypted and non-encrypted traffic to customer workloads on OCI.
- **Advanced Threat Protection** – Industry leading threat protection to help monitor and block malware, spyware and vulnerability exploits.
- **Meet Compliance Goals** – Helps meet compliance requirements and stringent security needs of regulated environments.

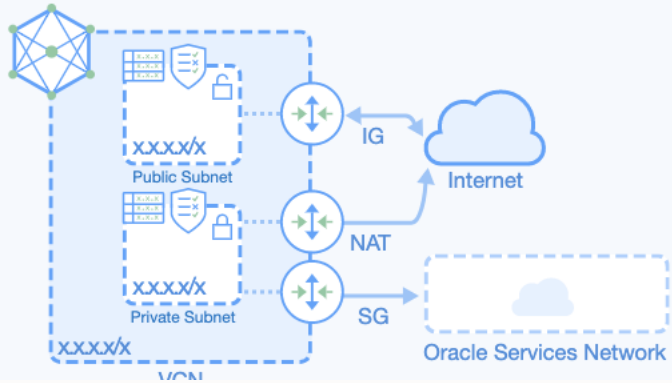
Oracle Cloud Network Wizard Setup

Fast provisioning of a complete Network environment

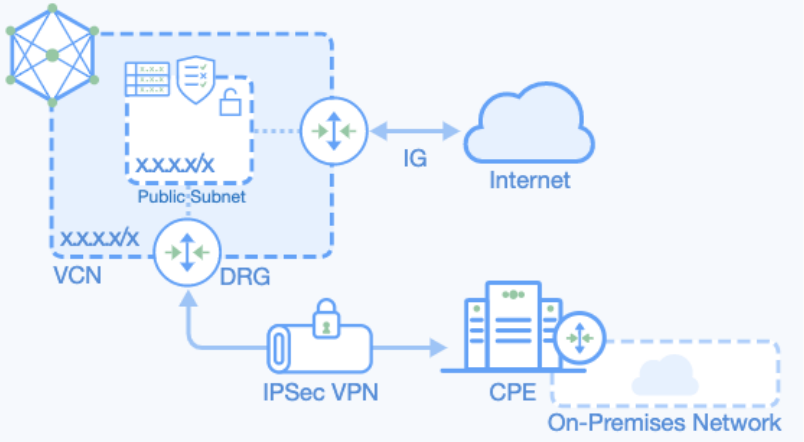
To correctly setup a network layer of any Cloud provider, the user must have a clear understanding of how to configure it's gateway's, setup firewall rules, create subnets, and so on …

OCI takes one step ahead in this process. The Networking creation process is now completely wizard based.

VCN With Internet Connectivity



VCN With VPN and Internet Connectivity

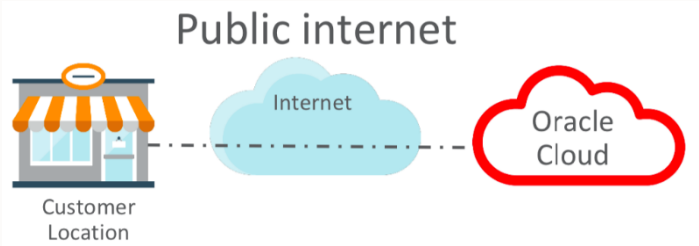


You can now run the entire network setup, with internet connection, public and private subnets, required gateways and security rules in less than 3 minutes.

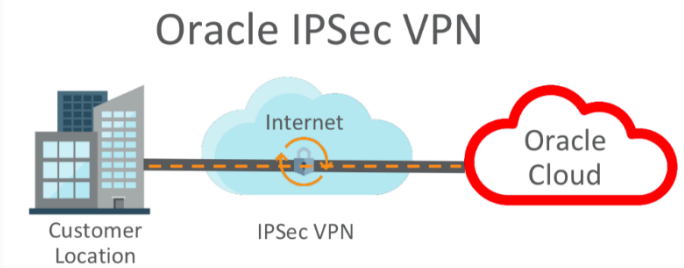
The process may also cover the VPN connection

https://docs.cloud.oracle.com/iaas/Content/Network/Concepts/overview.htm

Connectivity options



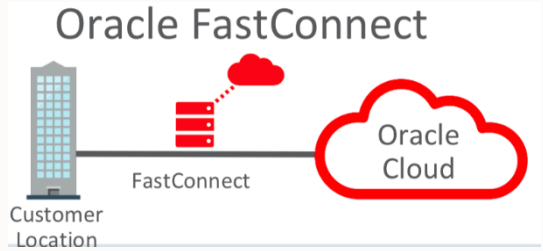
- Reserved IPs
- Ephemeral IPs
- Internet Data out Pricing (first 10TB free)



- IPsec authentication and encryption

Two main options

- OCI managed VPN Service (free)
- Software VPN (running on OCI Compute)



- Private Connection
- Separate from the internet
- Consistent network experience
- Port speeds of 1 Gbps, 10 Gbps, 100 Gbps
- **SLA**
- Oracle charges only for port hours consumed and not data transfer

https://cloud.oracle.com/fastconnect/faq#billing

Network Command Center

Visualize, Monitor, Troubleshoot

Network Command Center

Visualize. Monitor. Troubleshoot.

Network Command Center offers a unified experience for your virtual network monitoring needs.

Network Command Center services

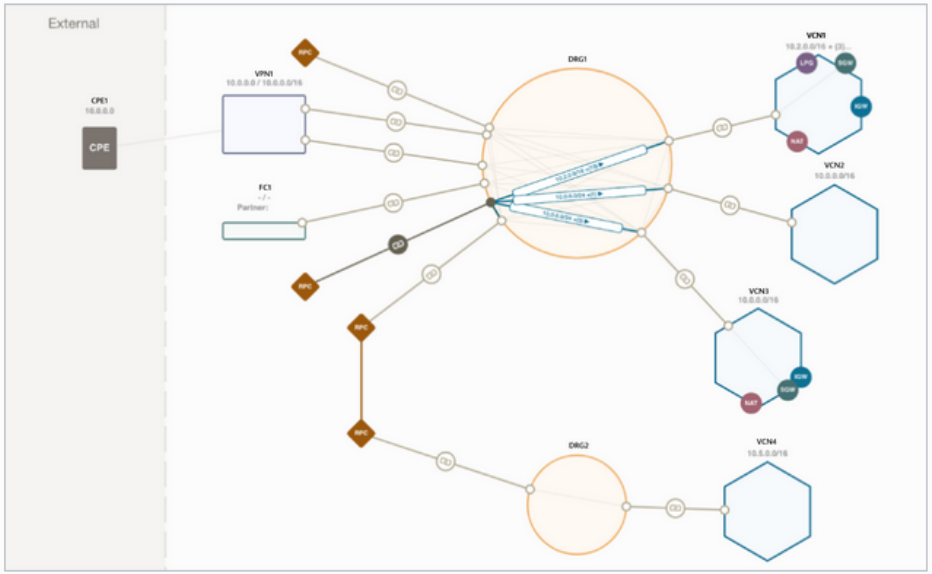
Collapse

- Visualize your networks
- Check your connectivity
- Monitor network traffic
- See Inter-Region Latency

Use the topology view to understand relationships between resources

Network Visualizer provides an interactive and intuitive visualization of your virtual network topology, showing resource interconnections and dependencies.

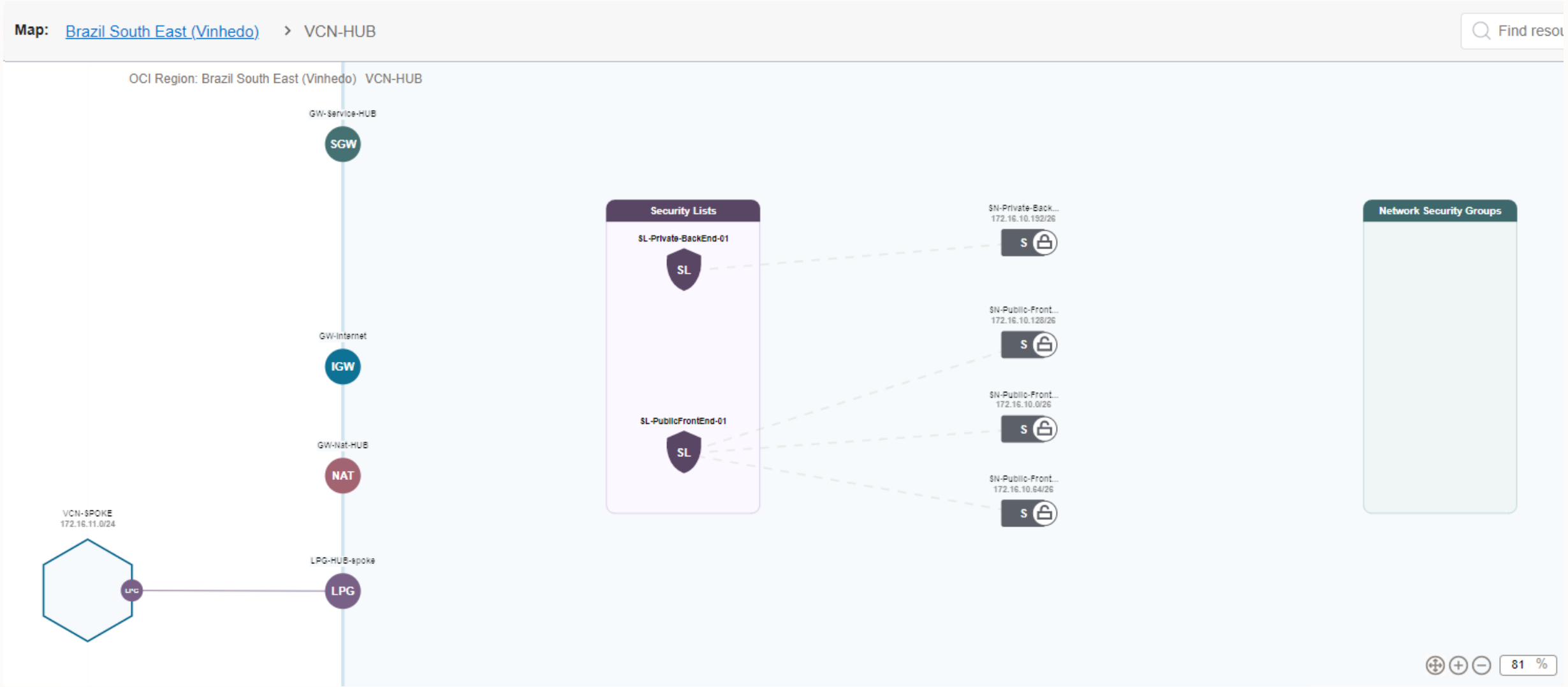
Launch Network Visualizer



Learn more about Network Visualizer

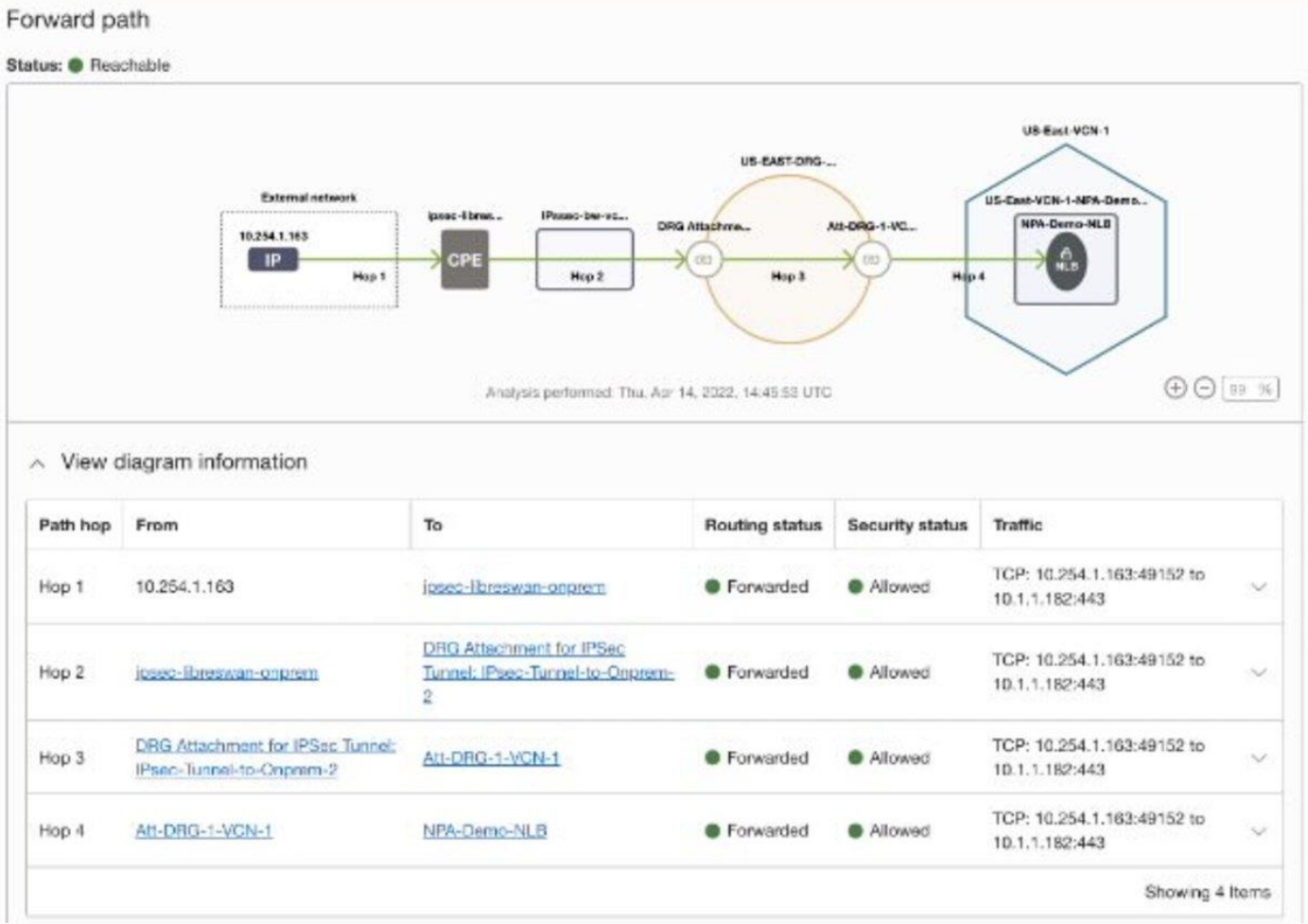
Network Visualizer

Interactive and intuitive visualization of your virtual network topology



Network Path Analyzer

Identify virtual network configuration issues by analyzing the configured connectivity



The following source and destination scenarios are supported:

- OCI to OCI
- OCI to on-premises
- On-premises to OCI
- Internet to OCI
- OCI to internet

Do you Want to Know More on Networking ?

Public Documentation

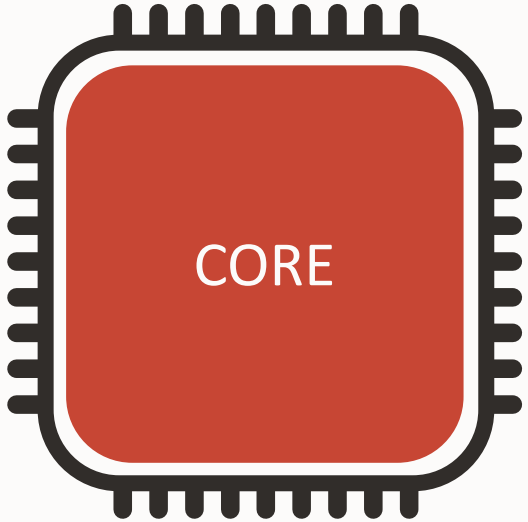
https://docs.cloud.oracle.com/iaas/Content/Network/Concepts/overview.htm
https://docs.cloud.oracle.com/iaas/Content/Network/Tasks/managingVCNs.htm
https://docs.cloud.oracle.com/iaas/Content/Network/Tasks/managingIGs.htm
https://docs.cloud.oracle.com/iaas/Content/Network/Concepts/securitylists.htm
https://docs.cloud.oracle.com/iaas/Content/Network/Tasks/managingIPsec.htm
https://docs.cloud.oracle.com/iaas/Content/Network/Tasks/managingDRGs.htm
https://docs.cloud.oracle.com/iaas/Content/Network/Concepts/fastconnect.htm
https://cloud.oracle.com/fastconnect/faq#billing

ORACLE
Cloud Infrastructure

Compute

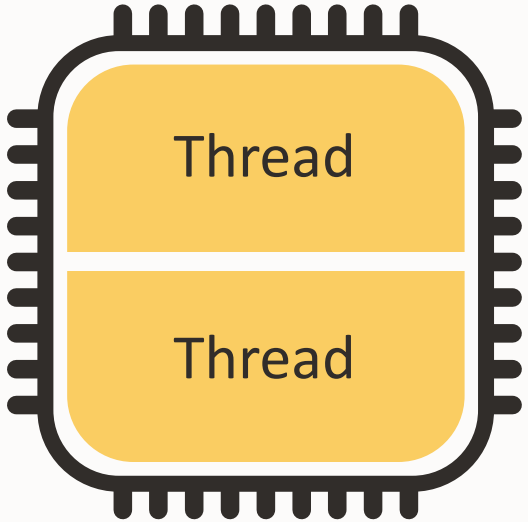
Compute Cores

OCPU vs vCPU



1 Core = 1 **OCPU**

1 OCPU ≅ 2 vCPUs



1 Thread = 1 **vCPU**

An **Oracle Compute Unit (OCPU)** is the processing unit that Oracle uses to build your service. The larger the compute size, the greater the processing power.

Compute Instances

Bare Metal and Virtual Machine

Bare Metal (BM)

Direct Hardware Access – customers get the full Bare Metal server

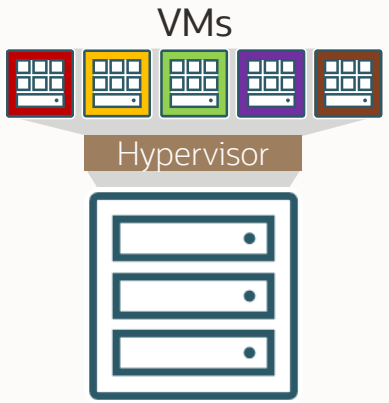
(single-tenant model)

Bare Metal

Virtual Machine (VM)

A hypervisor to virtualize the underlying Bare Metal server into smaller VMs

(multi-tenant model)

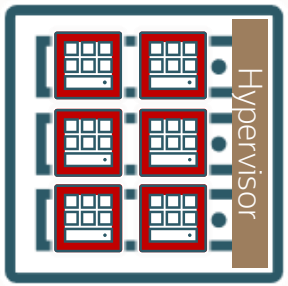


Bare Metal

Dedicated VM Hosts (DVH)

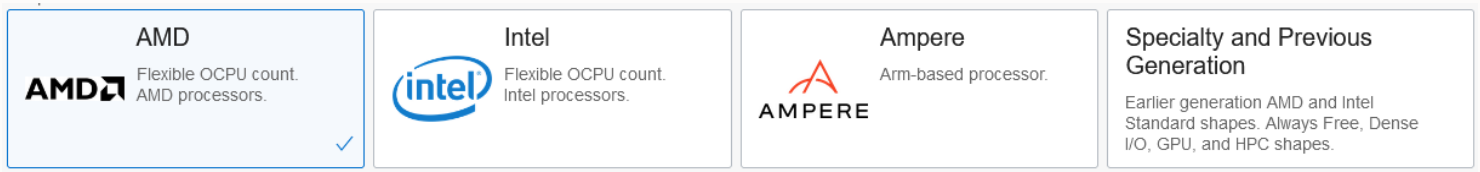
Run your VMs instances on dedicated servers that are a single tenant and not shared with other customers

(single-tenant model)



Bare Metal

vmware vSphere | KVM | Microsoft Hyper-V | ORACLE VM



Bare Metal

Shapes

Bare Metal (BM)

Direct Hardware Access – customers get the full Bare Metal server

(single-tenant model)

Bare Metal

vmware vSphere | KVM | Microsoft Hyper-V | ORACLE VM

SHAPE			
Standard	intel **Standard3** Intel Xeon Platinum 8358 X9 Ice Lake - 3.0 GHz - 3.7 GHz	AMD **Standard.E4** AMD 7J13 EPYC- 2.55 GHz - 3.5 GHz	AMPERE **Standard.A1** Ampere Altra Q80-30 A1 Arm-based- 3.0 GHz
DenseIO	intel **51 TB NVMe SSD storage** Intel Xeon Platinum 8167M X7 - 2.0 GHz - 2.4 GHz	AMD **54.4 TB NVMe SSD storage** AMD 7J13 EPYC- 2.55 GHz - 3.5 GHz	
HPC and Optimized	intel XEON GOLD inside **Intel Xeon Gold 6354** X9 Ice Lake 3.0 GHz - 3.6 GHz **3.84 TB NVMe SSD storage** **Cluster RDMA Network** 1.5µs latency, 100GB/s network		
GPU	NVIDIA **NVIDIA Tesla V100 8x16 GB** **GPU Memory - 128 GB** Intel Xeon Platinum 8167M X7 - 2.0 GHz - 2.4 GHz	NVIDIA **NVIDIA A100 8x40 GB** **GPU Memory - 320 GB** AMD 7542 EPYC 2.9 GHz - 3.4 GHz	

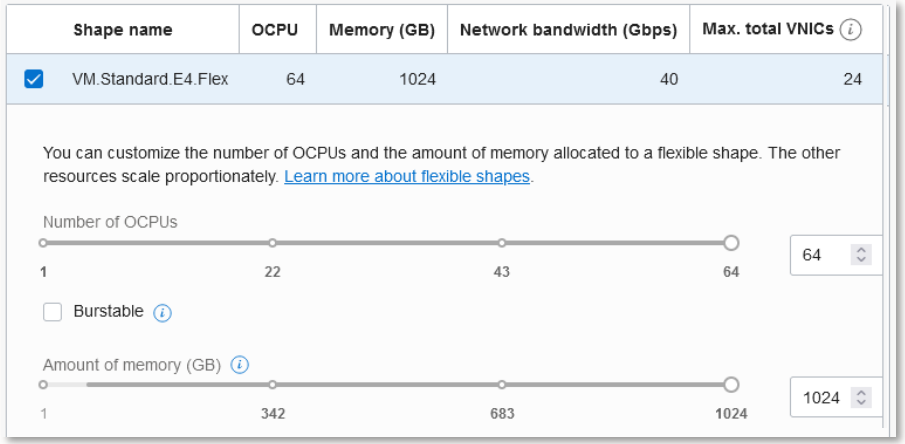
https://docs.oracle.com/en-us/iaas/Content/Compute/References/computeshapes.htm

Virtual Machine

Shapes

Flex Virtual Machine Shapes

Flexibility to choose the exact number of Cores (OCPUs) and Memory



SHAPE	
Standard (shape flex)	**Standard3** Intel Xeon Platinum 8358 X9 Ice Lake - 3.0 GHz - 3.7 GHz **Standard.E4** AMD 7J13 EPYC- 2.55 GHz - 3.5 GHz **Standard.A1** Ampere Altra Q80-30 A1 Arm-based- 3.0 GHz
DenseIO	AMD 7J13 EPYC- 2.55 GHz - 3.5 GHz **Shapes:** • 6.8 TB NVMe SSD storage • 13.6 TB NVMe SSD storage • 27.2 TB NVMe SSD storage
HPC (shape flex)	**Optimized3** **Intel Xeon Gold 6354** X9 Ice Lake 3.0 GHz - 3.6 GHz 1-18 OCPUs 1-256 GB RAM
GPU	**NVIDIA Tesla V100 16 GB** Intel Xeon Platinum 8167M X7 - 2.0 GHz - 2.4 GHz **Shapes:** • 16 GB GPU Memory • 32 GB GPU Memory • 64 GB GPU Memory

https://docs.oracle.com/en-us/iaas/Content/Compute/References/computeshapes.htm

Container Engine for Kubernetes (OKE)

Managed Kubernetes Infrastructure

Cloud Native

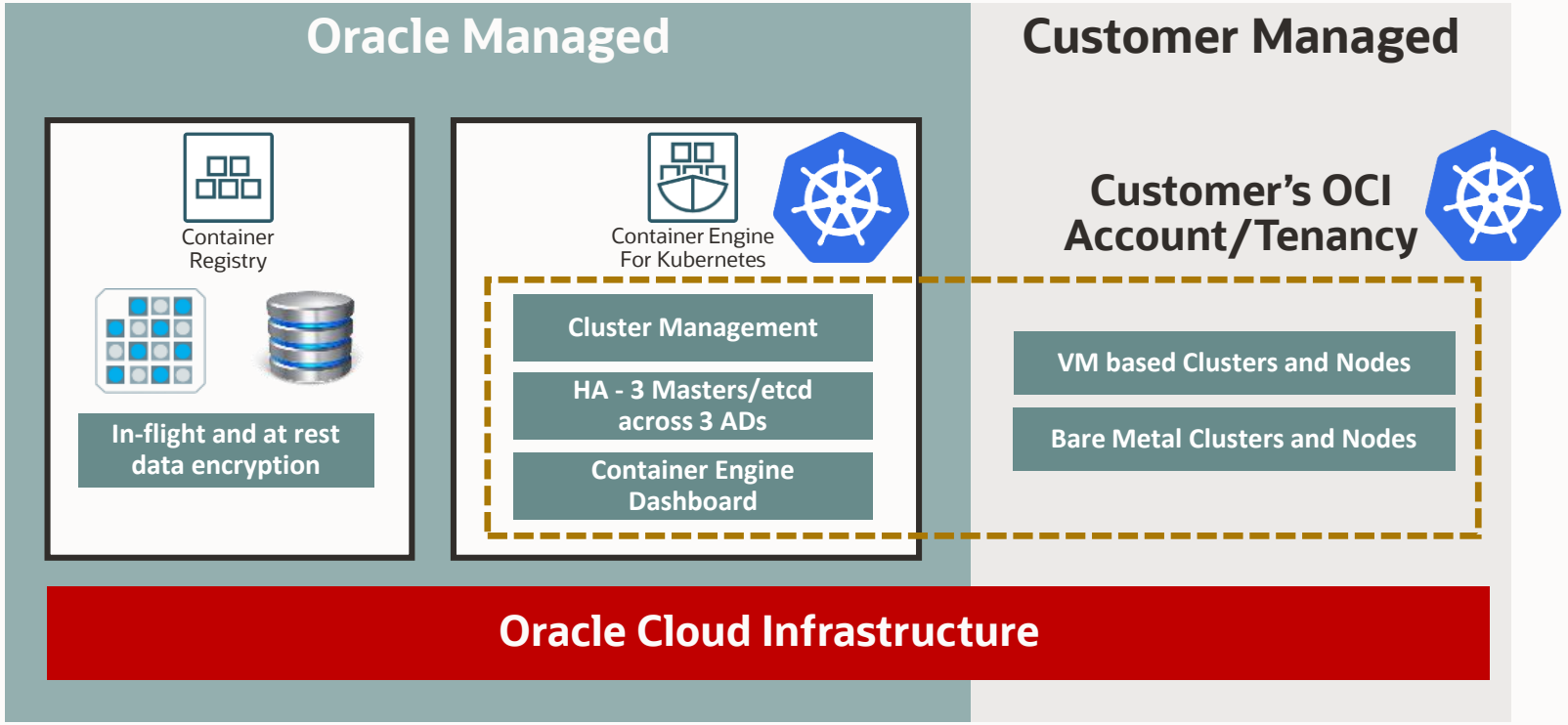
- Docker padrão e Kubernetes
- Integração com Registry
- Integrado com rede e armazenamento em nuvem virtual

Friendly User

- Fluxo de trabalho simplificado
- API REST completa
- Complementos de cluster integrados
- Padrões abertos

Enterprise Ready

- Operações de cluster simplificadas
- Desempenho completo em Bare Metal e IaaS altamente disponível
- Controles de acesso baseados em equipe
- Clusters Autônomos



Oracle Images

A template of a virtual hard drive that determines the operating system and other software for an instance. Images can be **Oracle-provided**, Custom, or **BYOI ****
Oracle provides several pre-built images for Oracle Linux, Microsoft Windows, Ubuntu and CentOS
Prebuild Windows images with SQL Server **ready for use**.

OCI Platform Images
Image
Oracle Autonomous Linux
Oracle Linux
Oracle Linux Cloud Developer
Ubuntu
CentOS
Windows Server 2012 R2
Windows Server 2016
Windows Server 2019

*Windows Server Platform Image uses Windows licence as a Service

Bring Your Own Image (BYOI)	
Vendor	**Images**
RHEL	4.5, 5.9, 5.11, 6.9, 7.4
CentOS	4.0, 4.8, 5.11, 6.9, 7.x
Oracle Linux	4.5, 4.8, 5.11, 6.2, 6.5, 6.9, 7.4
Ubuntu	12.04, 14.04, 16.04
Windows Server	2012 and 2016 Std, Enterprise, Datacenter

You can create a maximum of 25 custom images per region per root compartment

Do you Want to Know More on Compute Instances ?

Public Documentation

https://docs.cloud.oracle.com/iaas/Content/Compute/Concepts/computeoverview.htm
https://docs.cloud.oracle.com/iaas/Content/Monitoring/Concepts/monitoringoverview.htm
https://blogs.oracle.com/cloud-infrastructure/announcing-a-certified-vmware-solution-on-oracle-cloud

ORACLE
Cloud Infrastructure

Any doubts?
Pls let me know!

Alexandre Fagundes
alexandre.af.fagundes@oracle.com
Cloud Architect
Oracle Latin America


ORACLE