

Oracle E-Business Suite (EBS) Deployment on Oracle Cloud Infrastructure (OCI)

White Paper | December 2017 | Version 1.0





Table of Contents

Purpose of this Whitepaper	2
Scope & Assumptions	2
Oracle E-Business Suite on Oracle Cloud Infrastructure	3
Deployment choices for E-Business on Oracle Cloud Infrastructure	3
EBS deployment examples.....	5
Single node deployment of E-Business on Oracle Cloud Infrastructure.....	6
Multiple nodes on Oracle Cloud Infrastructure	7
Multiple nodes on Oracle Cloud Infrastructure with DBCS or ExaCS.....	8
Conclusion:	9
Appendix: Key Components of Oracle Cloud Infrastructure (OCI)	10
Oracle Cloud Identifier (OCID).....	10
Cloud Resource	10
On-Premises.....	10
Compute Service	10
Virtual Cloud Network (VCN)	10
Subnet.....	10
Virtual Network Interface Card (VNIC)	11
Dynamic Routing Gateway (DRG).....	11
Internet Gateway (IG).....	11
Security Lists	11
Route Table	11



Purpose of this Whitepaper

Oracle E-Business Suite (EBS) can provide a strategic advantage to your business with the most comprehensive suite of integrated, global business applications that enable organizations to make better decisions, reduce costs, and increase performance. Until now, most EBS users have chosen to run it in their own data centers.

The purpose of this document is to provide an understanding of how EBS can be deployed in the Oracle Cloud Infrastructure (OCI) environment, and enable you to combine the traditional benefits of EBS with the agility, availability, and cost-effectiveness of modern Infrastructure-as-a-Service.

Scope & Assumptions

You should know EBS application fundamental design and architecture and have an understanding of the OCI environment and components.

By following this document, you will gain knowledge of available implementation methods for various EBS configurations, and the OCI EBS architecture for initial development and production deployment. This includes all the necessary compute instances, storage, security, networking and connectivity.

This is an overview document, that is not to be used as a production deployment reference architecture. This paper is provided as a high-level reference guide for deploying Oracle E-Business Suite by either moving an environment from on-premises to the cloud or creating a new development environment on Oracle Cloud Infrastructure. This document outlines some of the best practices, and should not be viewed as Full Reference Guide for E-Business Suite.

There are a number of products and topics that are beyond the scope of this document. While not all topics are listed, Identity Access Management (IAM) and VPN/IPSec are examples of additional components used for typical EBS deployments in OCI which we will not cover in this paper.

Readers of this document should first:

- » Be familiar with the fundamentals of Oracle Cloud Infrastructure
 - » [Getting Started Guide](#)
- » Have a basic understanding of Oracle Cloud Infrastructure Compute
 - » [Oracle Compute Service](#)
- » Have a basic understanding of Oracle Cloud Infrastructure Database
 - » [Database as a Service](#)
- » Have a basic understanding of Oracle Cloud Infrastructure Networking
 - » [Oracle Cloud Networking](#)
 - » [Network Load Balancing](#)
- » Have a basic understanding of Oracle Cloud Infrastructure Storage Services
 - » [Block Storage](#)
 - » [Object Storage](#)
- » Have a basic understanding of Oracle Cloud Infrastructure Identity Access Management (OIAM)
 - » [Identity Access Management](#)
- » Have a basic understanding of VPN IPSec tunnel functionality
 - » [VPN IPSec Tunnels Security](#)

Oracle E-Business Suite on Oracle Cloud Infrastructure

You can think of running Oracle E-Business Suite on Oracle Cloud for Infrastructure as running exactly the same EBS applications that you run on premises in your data center today — the same applications you may have customized — on a combination of Oracle's Infrastructure as a Service (IaaS) and Platform as a Service (PaaS).

EBS application architecture design choices are:

Infrastructure: Oracle Cloud Infrastructure is a set of complementary cloud services that enable you to build and run a wide range of applications and services in a highly-available hosted environment. Oracle Cloud Infrastructure offers high-performance compute capabilities (as physical hardware instances or virtual machines) and storage capacity in a flexible overlay virtual network that is securely accessible from your on-premises network. OCI provides highly scalable, competitively priced compute capacity that you can use to host your EBS application tier and, optionally, your database tier.

Infrastructure + Platform: Oracle Cloud Platform is a comprehensive, standards-based, fully integrated combination of Oracle and open source technologies you can use to build, deploy, migrate, and manage a variety of different application workloads in the cloud at a significantly lower operational cost. The Database Cloud Service (DBCS) or Exadata Cloud Services (ExaCS) part of PaaS can be used to run your database tier, enabling you to provision your chosen database configuration quickly and easily. Java Cloud Service (JCS) can be used for the web and application middle-tier. JCS provides the additional capabilities and benefits of being a PaaS service.

Infrastructure + Platform + Application Management Suite: Oracle Application Management Suite for Oracle E-Business Suite leverages Oracle Enterprise Manager as Oracle's on-premises management platform, providing a single pane of glass for management of Oracle E-Business Suite environments on Oracle Cloud or at customer data centers. Oracle Enterprise Manager provides market-leading automation for monitoring and managing Oracle Cloud environments, Oracle engineered systems, databases, middleware, and Oracle applications.

Later in this paper, we provide some guidelines you can use to navigate these choices.

Deployment choices for E-Business on Oracle Cloud Infrastructure

When you subscribe to Oracle's Infrastructure as a Service (IaaS), you have access to all the compute, storage, and network services associated with it. If necessary, you can also subscribe to the Oracle Database Cloud Service (DBCS) or Exadata Cloud Service (ExaCS) and take advantage of the specific features and capabilities of these offerings. There are several methods of deploying EBS on OCI.

1. Single node, which has all the EBS components installed in a single compute instance and is available from Oracle Marketplace for download.
2. Multiple nodes on Oracle Cloud Infrastructure, which means that the application and the database tiers are being deployed as two distinct sets of compute instances.
3. Multiple nodes on Oracle Cloud Infrastructure, making use of PaaS services for either the application or database tiers. The application tier can take advantage of using either OCI Compute or Java Cloud Service (JCS). JCS provides additional capabilities, such as built-in high availability and session continuance. The database tier can be either Database Cloud Services (DBCS) or Exadata Cloud Services (ExaCS). Both options provide advanced Oracle database options, online core scaling and high availability.

Oracle also offers an automated provisioning capability for EBS called Lift & Shift. The Lift & Shift application can be used to deploy either a Vision (demo) EBS instance or take your on-premises EBS environment and deploy the same matching environment in OCI. Lift & Shift is a common term in the cloud industry. With the L&S capability you have the option to select the architecture layout, single node, multiple node or multiple node with either DBCS or ExaCS. Network architecture definition is configured as well with the addition of VCN, subnets, routing tables, security lists and load balancers. Lift & Shift for Oracle E-Business Suite means to copy (or clone) an on-premises environment to Oracle Cloud. The cloud copy can be used for testing or development, and—when you are ready—as part of a permanent migration of your production environment to the cloud.



E-Business Suite supports the following platforms, storage, networking and versions on the Oracle Cloud Infrastructure:

- Oracle E-Business Suite Release 12.2.3 and higher
- Oracle E-Business Suite Release 12.1.3
- E-Business Database Tier
 - Database versions 11.2.0.4 and 12.1.0.2
 - Enterprise Edition (EE)
 - Database Cloud Service (DBCS)
 - Single node non clustered with High Performance (HP)
 - Real Application Cluster (RAC) with Extreme Performance (EP)
 - Exadata Cloud Service (ExaCS)
 - Exadata Cloud Service (ExaCS) with Extreme Performance (EP)
 - All database versions support both Data Guard (DG) and Active Data Guard(ADG)
- E-Business Application Tier
 - WebLogic releases
 - WLS Standard Edition (SE)
 - WLS Enterprise Edition (EE)
 - WL Suite (WL Suite)
 - WebLogic versions supported in OCI VMs
 - 10.3.6, 11.1.1.7, 12.1.3.0, 12.2.1.2 will support EBS deployments
 - Oracle Java Cloud Service (JCS) on OCI
 - 10.3.6, 11.1.1.7, 12.1.3.0, 12.2.1.2 will support EBS deployments
 - WebLogic High-Availability
 - WebLogic EE or Suite is required
 - WebLogic Multitenancy
 - WebLogic Server Continuous Availability
- Operating systems supported in OCI for EBS:
 - Oracle Linux (6.x, 7.x)
 - Windows Server 2012 R2
 - Other OS's are available via Bring Your Own Image (BYOI)
- Available storage options for EBS on OCI
 - Database storage uses high-performance local or network NVMe block storage
 - Object storage is used as the target for database backups
 - Apple_Top requires the use of shared storage, a separate NFS server is required
- Network architecture with multiple configurations are available in support of the EBS environment
 - Local DNS
 - Supports local DNS service
 - Supports use of Dyn services
 - Static private IP
 - Configure both Application and DB servers with Static IPs
 - LBaaS will have Public IP for external connectivity
 - Load Balancer
 - LBaaS external Public IPs
 - LBaaS supports both Public and Private load balancing
 - Hybrid Story for Connectivity & Migration

- 
- VPN Connectivity
 - VPN IPSec Tunneling
 - MPLS / Fast Connect
 - Security and compliance recommendations
 - The use of Security Lists is recommended for EBS as there are many protocols and ports that are used. When using Lift & Shift, all of the Security Lists (SL) that are created during the process are dependent on your initial network entries. The reason L&S creates multiple SL's is due to the large number of ports and protocols required and these are dependent on which tier/component is attached. This is why during the configuration you create an App Tier SL, DB Tier SL and a Load Balancer SL. The process is repeated for the Routing tables as well.
 - EBS on OCI meets a number of compliance specifications
 - General: SOC1, SOC2, ISO 27001/2
 - Specific: PCI, HIPAA, NIST 800-53
 - EBS on OCI enables a number of available automated management functions like:
 - EBS backup and restore on Oracle Cloud
 - Flexible Cloud Service Cloning
 - Fast Cloning (Compute, DBCS, ExaCS)
 - EBS environment elasticity (managed server, JVM memory, add/delete node)
 - Reshape VM (CPU, Memory and Disk)
 - EBS SOAP/REST Services Enablement
 - Console GUI and API driven environment management
 - DMZ Configuration

EBS deployment examples

The EBS application can be deployed in several configurations, Single node, Multiple node or Multiple node with High Availability and Disaster Recovery. Selecting a deployment architecture is based on a number of factors including but not limited to: performance, user counts, and or operation requirements. Business requirements, such as availability and disaster recovery have to be taken into consideration. Whether this is a single global view of all accounts or supports multiple instances and COAs. Each has a consideration into the design and application of the cloud architecture.

Single node deployment of E-Business on Oracle Cloud Infrastructure

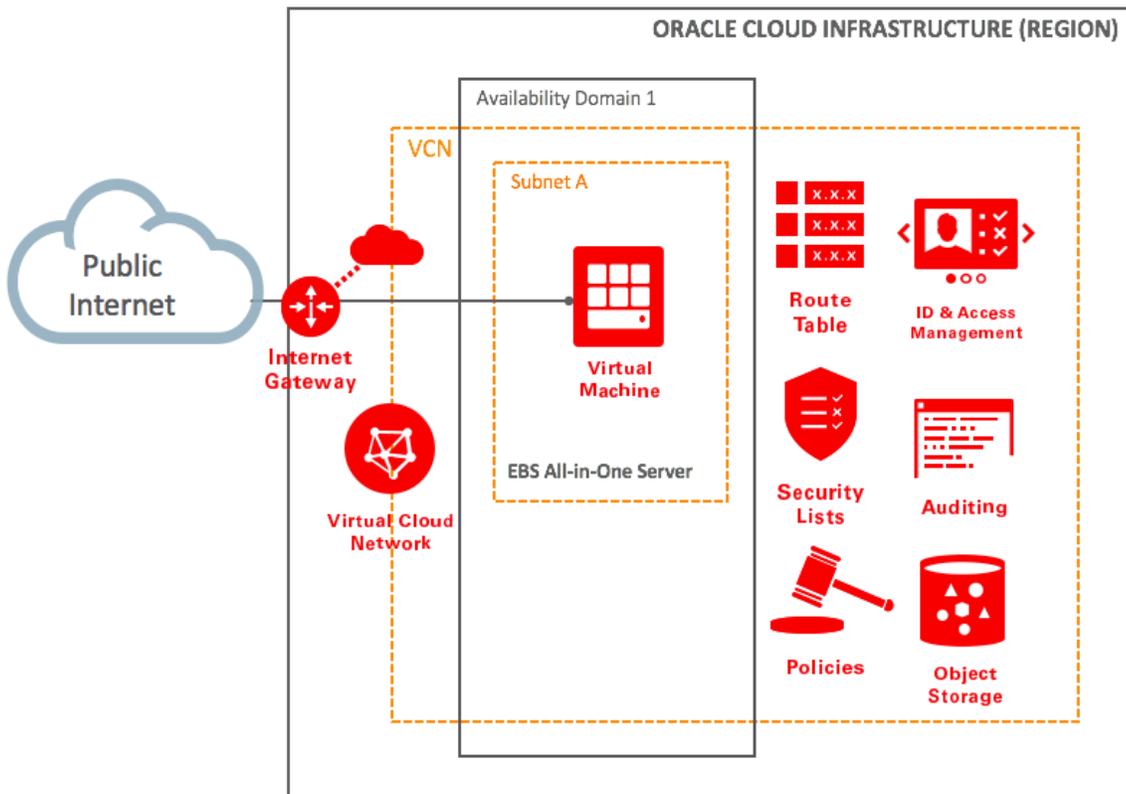
The *single node on IaaS* option consists of an all-in-one Oracle E-Business Suite Release 12.2.5 virtual machine image that includes both the application tier and the database tier. Available on Oracle Cloud Marketplace, this image is updated when required, so you can quickly provision the latest image to explore new features.

This option is ideal if you wish to evaluate and test standard Oracle E-Business Suite functionality, and become familiar with the technology components and other features.

You can use a Vision (demo) installation of Oracle E-Business Suite to evaluate standard functionality, compare it with your own business process flows, and identify any gaps. A Vision installation can also be used as a sandbox environment to try out setups and process flows.

You can configure a fresh installation of Oracle E-Business Suite with functional setups that are specific to your business, enabling you to tailor and test processes tailored to your needs.

Here is an example of a single node EBS Vision test environment installation on OCI.



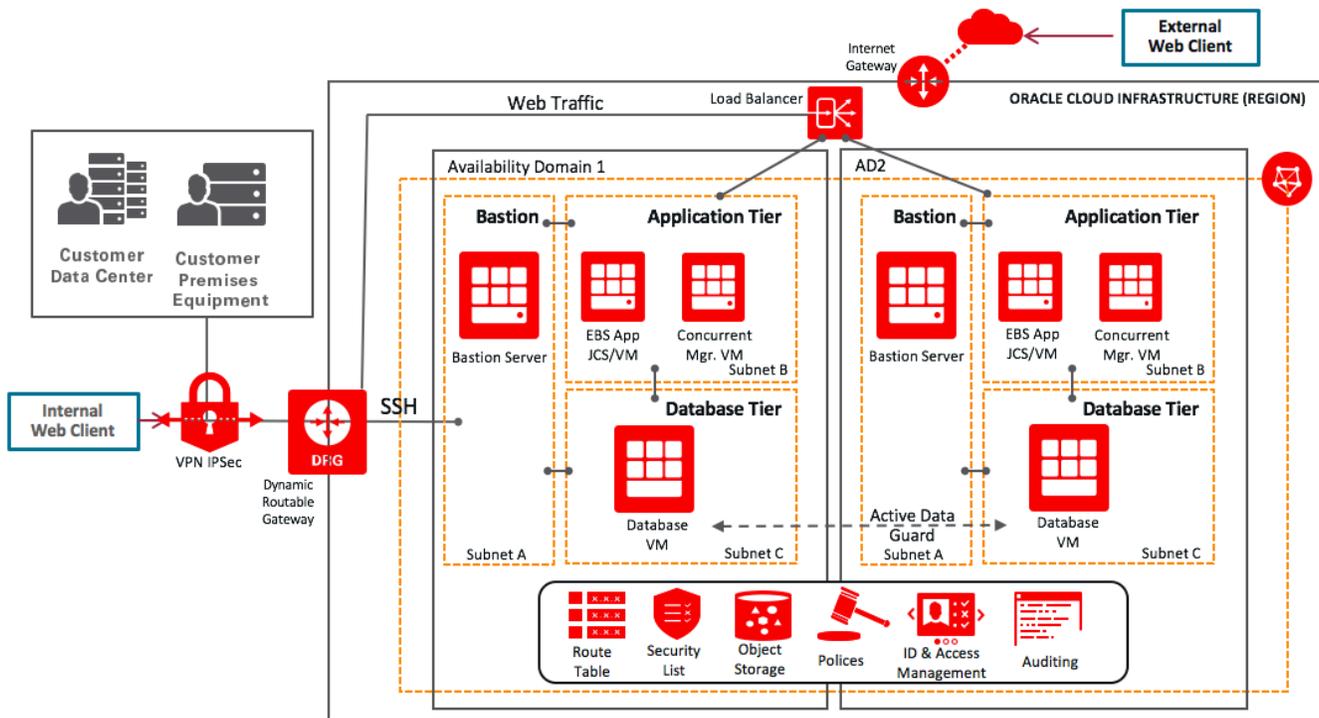
Multiple nodes on Oracle Cloud Infrastructure

The *multiple nodes on IaaS* option allows you to provision one or more application tiers, plus a separate database tier, on the Oracle Cloud Infrastructure Compute. You can scale out the application tier as needed and leverage multiple availability domains for high availability (HA). An automated provisioning tool enables you to create a new installation of Oracle E-Business Suite across Oracle Cloud Infrastructure Compute instances.

The flexibility of this option makes it ideal for supporting production workloads, as well as development, testing and training environments in all types of Oracle E-Business Suite installation:

- Vision (demo) installations of Oracle E-Business Suite 12.2 images from the Oracle Cloud Marketplace.
- Fresh installations of Oracle E-Business Suite 12.2 images from the Oracle Cloud Marketplace.
- Cloning of on-premises Release 12.2 or 12.1.3 instances from on-premises to Oracle Cloud Infrastructure Compute instances.
- Lift & Shift application provides an expedited capacity for migration with reduced risk and shorter a time period for project completion. Release 12.2 or 12.1.3 instances from on-premises to Oracle Cloud Infrastructure Compute instances.

Here is an example of a multi-tier EBS installation on OCI.

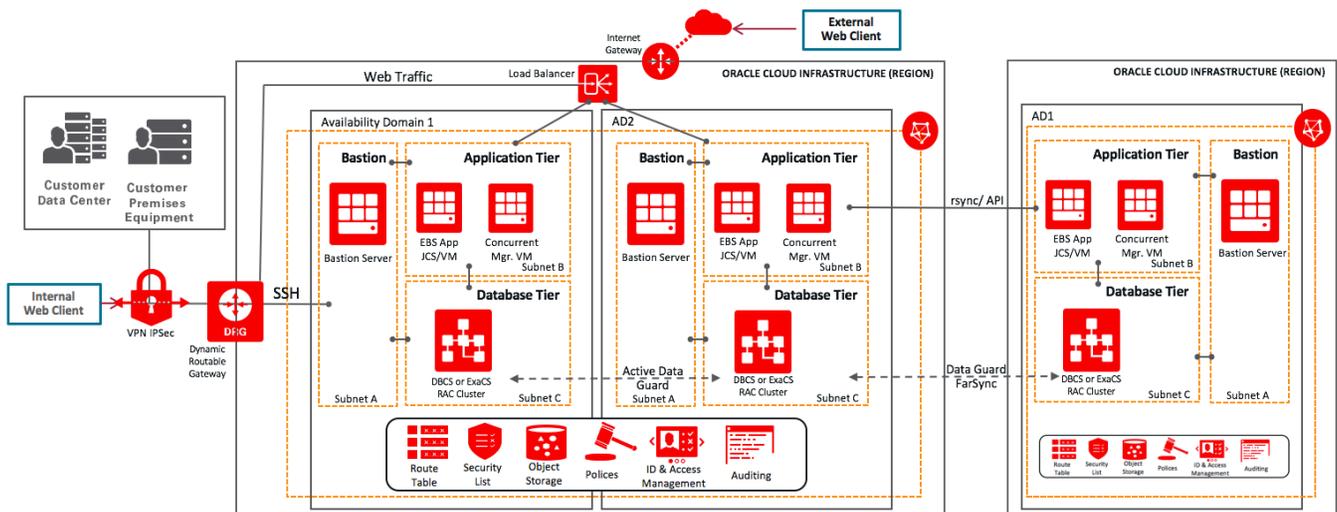


Multiple nodes on Oracle Cloud Infrastructure with DBCS or ExaCS

This option is a variant of the *multiple node* architecture. It is comprised of the same components, but does not deploy the Oracle Database within a compute instance on the Oracle Cloud Infrastructure Compute. Instead, it uses a subscription to Oracle's *Platform as a Service* (PaaS) or Exadata Cloud Service to provide the Oracle E-Business Suite database needed. Additionally, the middle-tier can implement Java Cloud Services (JCS) for the web and application tier servers. As seen in the diagram below, you can also take advantage of OCI, DBCS, or ExaCS for disaster recovery (DR) capabilities in this architecture.

You always have a choice of provisioning these multi-tier instances either from the Oracle Cloud Marketplace (for demo and fresh installs) or from on-premises instances (for cloning of existing Release 12.1.3 or 12.2 instances). The use of the Lift & Shift application provides an expedited capacity for migration with reduced risk and shorter a time period for project completion.

Here is an example of a multi-tier EBS installation on OCI with PaaS services.





Conclusion:

Oracle technology lies at the heart of enterprise IT. Many enterprises rely on Oracle Database and software like Oracle E-Business Suite to power their business. Until recently, it's been hard to move these workloads to the cloud to take advantage of public cloud reliability, elasticity, and cost efficiency.

Oracle has a public cloud Infrastructure-as-a-Service offering – Oracle Cloud Infrastructure – and decades of experience provisioning and running Oracle products. Our hardware choices, staff expertise, and long-honed IT processes are all best-of-breed for managing Oracle workloads, and make Oracle Cloud Infrastructure the best place to host applications like E-Business Suite.

Migrating your existing Oracle applications such as Oracle E-Business Suite to Oracle Cloud Infrastructure helps you:

- Manage solutions and applications – not infrastructure.
- Leverage the public cloud without changing processes and tooling, or retraining staff
- Focus on your core business, not on IT

E-Business Suite on Oracle Cloud Infrastructure is a scalable, reliable, high performance solution. A number of EBS architecture configurations are available to match your current on-premises design. With the EBS Lift & Shift capability, moving from on-premises, operational risk has been reduced with improved success on all migrations. OCI is also very cost-effective for rapid deployment and removal of test and QA environments.

Additional information for EBS on OCI can be found at the following websites:

- [EBS on OCI](#)
- [EBS OCI Library](#)
- [EBS OCI Blog](#)
- [Getting started with EBS on OCI](#)

Appendix: Key Components of Oracle Cloud Infrastructure (OCI)

Oracle Cloud Identifier (OCID)

Oracle Cloud Identifier (OCID) is a unique name assigned to every resource you provision on OCI. This is an auto-generated long string used by Support Engineers to identify your cloud resource when working with any Support Tickets. The customer can't choose a preferred value for OCID and can't modify it for the life of cloud resource. The customer will also use OCIDs when working with REST APIs or SDKs.

Cloud Resource

Cloud resource refers to anything you provision on the cloud platform. In OCI terms, it can be a VCN, Compute, User, Compartment, DBaaS, LBaaS or any other service component on the platform.

On-Premises

On-Premises is a widely-used term in Cloud Technologies and it refers to your traditional data-center environment. It includes any co-location, dedicated floor space, dedicated data-center building or even a desktop running under your desk.

Compute Service

Oracle Cloud Infrastructure Compute lets you provision and manage compute hosts, known as instances. You can launch instances as needed to meet your compute and application requirements. After you launch an instance, you can access it securely from your computer, restart it, attach and detach volumes, and terminate it when you're done with it. Any changes made to the instance's local drives are lost when you terminate it. Any saved changes to volumes attached to the instance are retained.

Oracle Cloud Infrastructure offers both Bare Metal and Virtual Machine instances:

Bare Metal - A bare metal compute instance gives you dedicated physical server access for highest performance and strong isolation.

Virtual Machine - A Virtual Machine (VM) is an independent computing environment that runs on top of physical bare metal hardware. The virtualization makes it possible to run multiple VMs that are isolated from each other. VMs are ideal for running applications that do not require the performance and resources (CPU, memory, network bandwidth, storage) of an entire physical machine.

An Oracle Cloud Infrastructure VM compute instance runs on the same hardware as a Bare Metal instance, leveraging the same cloud-optimized hardware, firmware, software stack, and networking infrastructure.

Virtual Cloud Network (VCN)

Virtual Cloud Network (VCN) also known as Cloud Network is a software-defined network that you set up on OCI. You can think of VCN as an extension of your on-premises network to the cloud, with firewall rules and specific types of communication gateways. A VCN covers a single, contiguous CIDR (range of IP Addresses) block of your choice. VCN is a regional resource, it means it covers all the Availability Domains (ADs) within a region.

Oracle OCI VCN supports a CIDR range of /16 to /30 and you can't change the CIDR of a VCN after it's created. The VCN's CIDR must not overlap with your on-premises network so work with your on-premises Network Administrator to get an available range of IP addresses (CIDR) that can be used with your VCN.

Subnet

A subnet is a subdivision of cloud network (VCN). Subnet is an AD (Availability Domain) specific resource and you must have one subnet per AD in a region. A subnet consists of a contiguous range of IP Addresses that do not overlap with other Subnets within the same VCN. You build a subnet by specifying the CIDR (range of IP Address), Availability Domain (AD) and a user-friendly name for the Subnet. Subnets contain virtual network interface cards (VNIC), which attach to instances. You can designate a subnet as private when you create it, which means VNICs in the subnet can't have public IP address.



A subnet is associated with Security Lists, Route tables and DHCP options to control what traffic is allowed to flow in which direction (DRG or IG for public/private traffic). You can't change Security Lists/Route Table attachment once a subnet is built, however you can change the rules of Security Lists and Route Tables.

Virtual Network Interface Card (VNIC)

A Virtual Network Interface card (VNIC) resides in a Subnet and gets attached to an instance to enable connections to the Subnet's VCN. Each instance has a default primary VNIC that is created during instance launch and can't be removed. You can add Secondary VNICs to an existing instance (in the same AD as the primary AD) if needed.

Dynamic Routing Gateway (DRG)

Dynamic Routing Gateway (DRG) is a virtual router that provides a path for private traffic between OCI cloud network (VCN) and on-premises (data-center) network. DRG is a standalone resource on OCI and is designed to give you full flexibility to attach/detach to different VCN as per the business needs. A DRG is required for both VPN IPSec Tunnels and Fast Connect virtual circuits. A network administrator might think of the DRG as the VPN headend on their OCI Services.

Internet Gateway (IG)

Internet Gateway (IG) is an optional virtual router that you can add to an VCN for internet connectivity. It provides internet access to your VCN and is controlled by the Route Tables and Security List configuration on the Subnet Level. In addition to IG, you must have the following to access the internet from the compute instance:

- a) Routing rule in Route Table that points to the IG
- b) Appropriate port open in the Security List, e.g. Port 80/443 must be opened for Web Server Traffic.

NOTE: Having an Internet Gateway alone DOES NOT expose your subnet to the internet unless you satisfy both conditions above.

Security Lists

Security Lists are a virtual firewall for your VCN on OCI infrastructure. Each security list consists of ingress and egress rules that specify the destination (CIDR) and type of traffic (Protocol and port) allowed in and out of instances within a subnet. A Security List is attached to a subnet and you can change the traffic type/destination dynamically. For example, a rule in Security Lists with source CIDR 10.100.200.0/24 with destination port 22 of TCP protocol will allow all ingress traffic from IP addresses (10.100.200.0/24) on to OCI instances on port 22 for ssh connection.

Route Table

Route Tables are virtual route tables where you configure private and public traffic using DRG or IG. The route table rules provide mapping for the traffic from subnets via gateways to a destination outside VCN, e. g., private traffic flows using DRG and public traffic flows using IG. You can build multiple route tables within a VCN or use the default route table.

A route table must be assigned to a subnet within a VCN, so a default route table is used when you create a subnet without specifying a route table. You can have one dedicated route table per subnet to keep it easy for subnet management. You can't change a subnet to use another route table once a subnet is created, however, you can change the route table rules at any time.

EBS Deployment on Oracle Cloud Infrastructure (OCI)

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. This document is provided *for* information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0116

EBS Deployment on Oracle Cloud Infrastructure
December 2017

Author: David Foster (dave.c.foster@oracle.com) Principal Solutions Architect

Oracle Corporation, World Headquarters	Worldwide Inquiries
500 Oracle Parkway	Phone: +1.650.506.7000
Redwood Shores, CA 94065, USA	Fax: +1.650.506.7200



| Oracle is committed to developing practices and products that help protect the environment