ORACLE

ACME-Corporation WLS Applications

Workload Architecture Document
STARTER PACK

28 June 2023 | Version 1.2

CONTENTS

DOCUMENT CONTROL

1.1 Version Control

Version	Authors	Date	Comments
1.0	The Author	4th Feb 2022	Startup Pack Template
1.1	The Author	8th Mar 2022	Review with Mr Reviewer
1.2	The Author	21th Mar 2023	Converted to new Pandoc Format

1.2 Team

Name	eMail	Role	Company
The Author	the.author@oracle.com	3rd Party Apps Specialist	Oracle
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1.3 Abbreviations and Acronyms

Term	Meaning
Dev	Development
IaaS	Infrastructure as a Service
OCI	Oracle Cloud Infrastructure
PaaS	Platform as as Service
Prod	Production
SaaS	Software as a Service

1.4 Document Purpose

This document provides a high-level solution definition for the Oracle solution and aims at describing the current state, to-be state as well as a potential 'Oracle Lift' project scope and timeline. The Lift parts will described as a physical implementable solution. The intended purpose is to provide all parties involved a clear and well-defined insight into the scope of work and intention of the project as it will be done as part of the Oracle Lift service.

The document may refer to a 'Workload', which summarizes the full technical solution for a customer (You) during a single engagement. The Workload is described in chapter Workload Requirements and Architecture. In some cases Oracle offers a free implementation service called 'Oracle Lift', which has its own dedicated scope and is typically a subset of the initial Workload. The Lift project, architecture and implementation details are documented in chapter Oracle Lift Project and Architecture and in chapter Oracle Lift Implementation.

BUSINESS CONTEXT

2.1 Executive Summary

ACME-Corporation is a transport company based in France which execute land and maritime transportation services.
The company is developing internally an application to manage tickets, travellers and collect IOT data from Bus.
The application is actually on test in on-prem systems and should go production on December 2022.
This document will design the solution to lift the application to Oracle Cloud Infrastructure (OCI).

2.2 Workload Business Value

The Lift Project objective is to move to OCI a set of applications currently running on multiple WebLogic domains. Those applications will be consolidated on one domain for each environment (Production and Test). The main benefit is that migration of this workload on OCI can be done in a fast, efficient and scalable manner. Moreover, using the capabilities that OCI can offer it will potentially mean that the customer can use the existing infrastructure to migrate or develop future enhancements for this existing workload or any other workloads they consider suitable. Besides these aspects it is important to mention that the customer will levearege a modern and flexible architecture at a lower cost then on-prem solution.

WORKLOAD REQUIREMENTS AND ARCHITECTURE

3.1 Overview

Applications in scope initially discussed are:

- Application 1 - Short description
- Application 2 - Short description
- Application 3 - Short description

The applications are deployed on the WLS domains and they use the same Oracle Database as application data.

3.2 Functional Requirements

The functional requirements for the applications to be migrated are as follows:

Application 1: The application is .... (description here)

Application 2: A portal page allows users to login and a page is offered with links to other services.

Application 3: Custom API for websites to interact with customer's ERP, exposed to public internet access.

3.3 Non Functional Requirements

3.3.1 Environments

Required environments to be implemented are:

Name	Size of Prod	Location	MAA	Scope
Production		Dubai	Gold/no HA	In scope
Production DR	100%	Frankfurt	Bronze	In scope
Test	100%	Dubai	Bronze	In scope

3.3.2 Resilience and Recovery

3.3.2.1 High Availability

No requirements in term of High availability have been expressed for DB and Weblogic. Customer has already agreed on the target services. We can take default SLA uptime for OCI:

Service Name	KPI	Unit	Value
DB	Availability	percent	99.9
Compute	Availability	percent	99.9
Load Balancer	Availability	percent	99.99

3.3.2.2 Disaster Recovery

DR must be available for production environment.

Service Name	KPI	Unit	Value
Web Application	RTO	hours	4
Web Application	RPO	minutes	10

3.3.2.3 Backup and Restore

No requirements in term of Backup and Restore have been expressed

3.3.3 Management and Monitoring

Tool	Task	Target	Location	New	Notes
Enterprise Manager	Manage and monitor	DB and Weblogic	OCI (Migration)	Yes	

Enterprise Manager on OCI will be used but it is out of scope of this lift project.

3.3.4 Performance

Performance requirements have not been specified for this environment.

3.3.5 Capacity

System	Capacity	KPI	Unit	Value	Notes
DB server	DB size	MaxVol	GB	150	

3.3.6 Security

3.3.6.1 Identity and Access Management

Actually a Single Sign On system is not used by the applications. Authentication and authorization are application-based.

3.3.6.2 Data Security

No requirements expressed.

3.4 Constraints, Challenges and other Requirements

3.4.1 Required Services

The domain need to have access to a shared file system.

3.4.2 Integrations

The workload is part of a larger landscape to be moved on OCI. The services must be implemented in the respect of general standards and networks. The integrations with other websites and the ERP database must be granted by proper security rules and routing tables.

3.5 Current State Architecture

Design representation of the current state architecture.

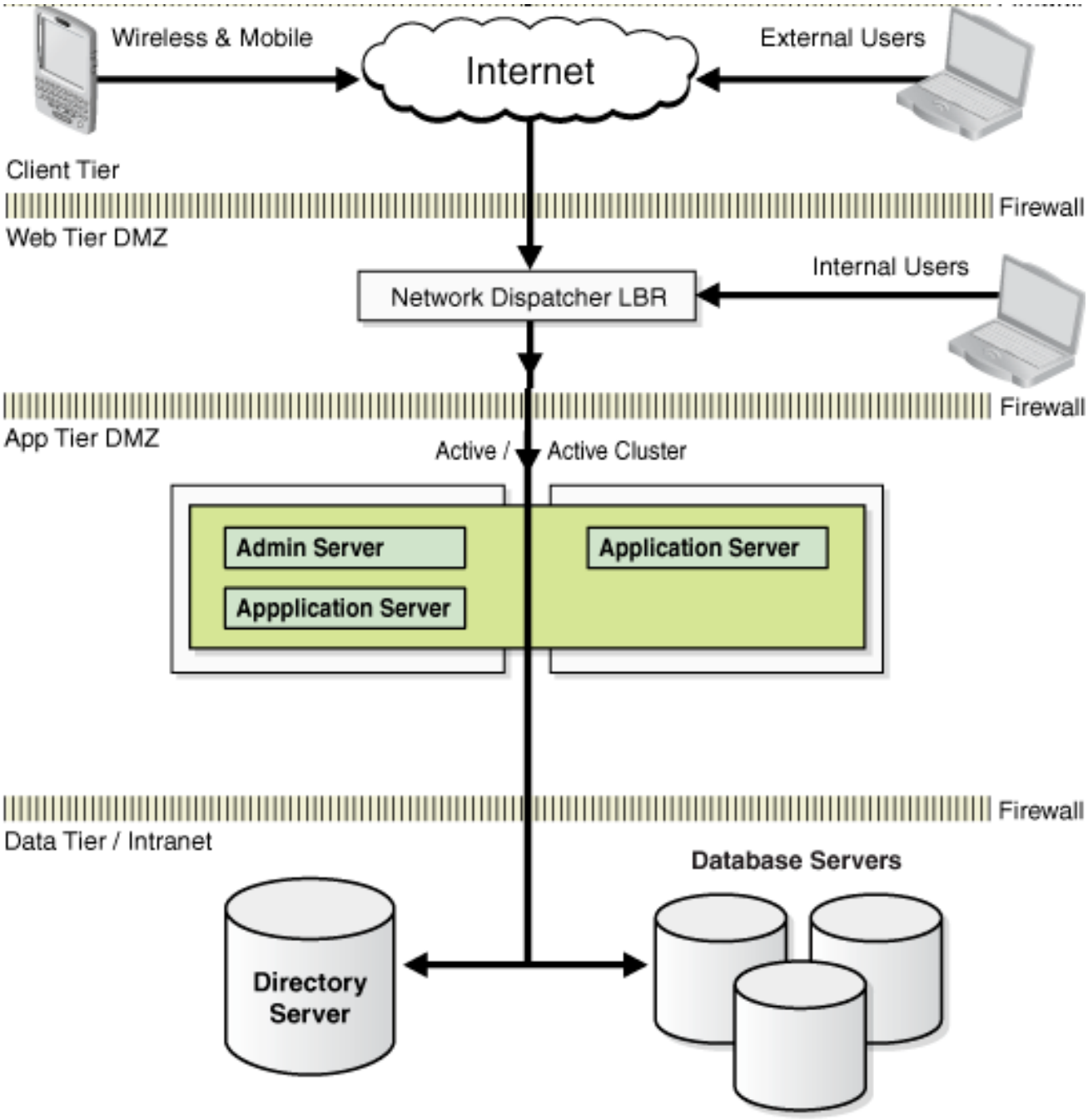

Figure 1: Current State

In the current configuration the components are:

- F5 Load Balancer
- 2-nodes Weblogic 12.2 Domain (Admin Server on the first node)
- Backend database release 19c

3.5.1 ACME Domain Information

WebLogic ACME Domain collected details:

Domain Name	ACME DOMAIN PROD	ACME DOMAIN TEST
Environment	Production	Test
WLS version	12.2.1.3	12.2.1.3
Hosts	2	2
OS Release	Oracle Linux 6.9	Redhat Linux 6.4
Dedicated host for Admin?	n	y
# of managed servers	4	2
# of clusters	0	0
# of applications to deploy	5	2
# of datasources	1	1
connected db versions	11.2.0.4	11.2.0.4
LDAP integrations / version	no	No
Single Sign On Integrations	no	no
Coherence configuration required	no	no
# of jms queue	0	0
# of files stores	0	0
Channels used?	no	no
AdminServer uses SSL?	y	y
Managed servers use SSL?	n	n
Load Balancer required	y	n
Level of Service/criticality	99.95 % SLA	99.95 % SLA
Disaster recovery required	y	y
Shared Storage requirements (SAN, NAS..)	y	y
Access from public internet	n	n
Connected (dependent) systems	1	1
Custom library deployed?	n	n
Customization of logs (paths or format)	n	n

3.5.2 Database Information

Question	answer
DB Name	ACMEPRD (REPO DB For ACME_DOMAIN WebLogic)
DB Version [e.g 11.2.0.4 / 8.1.7.4]	11.2.0.4.0
Database Edition	Enterprise Edition
If 12c mention CDB or Non-CDB	N/A
Env Type	Prod
DB Size (In GB)	150
Criticality (5-: Highly Critical; 1-> Low Criticality)	5
Downtime window [Select from drop-down list]	Only on Weekend and Public Holidays.
Source DB Characterset	AL32UTF8
Characterset Conversion to AL32UTF8 Required ? [Y/N]	N

Question	answer
RAC [Y/N]	N
Operating System with version & Release (	Oracle Linux Server release 6.7
Target Database Edition & Version	Latest Certified Version
Target Platform & OS	Latest Certified Version
Source Application Name	Dearler Online Portal (war file deployment)
Redo Generation Rate per day(MB)	1024
Partitioning Implemented? [Y/N]	N
Compression & Encryption Implemented? [Y/N]	N
Data Protection Implemented? [Y/N]	N
DR [Y/N]	N

3.6 Future State Architecture

Solution components for Production:

- Load Balancer Service with Web Application Firewall option: is the access point for external calls.
- File System Service (FSS) can expose as NFS a storage.
- DR for DBCS is implemented by Dataguard Configuration on Frankfurt Region
- DR for Weblogic Computes is implemented by rsync (Linux utility) on Frankfurt Region
- The FSS must be in sync between the two regions.
- In case of failover, the standby database will be activated and DNS resolution can be used to switch to Frankfurt systems.

Notice: Abu Dhabi region will be soon available for a lower latency DR solution and can be considered for the DR, granting a lower latency between the primary and secondary region as well as between secondary and the on-prem network.

3.6.1 Logical Architecture

The target architecture is described in the following picture that shows the main components and interconnections.

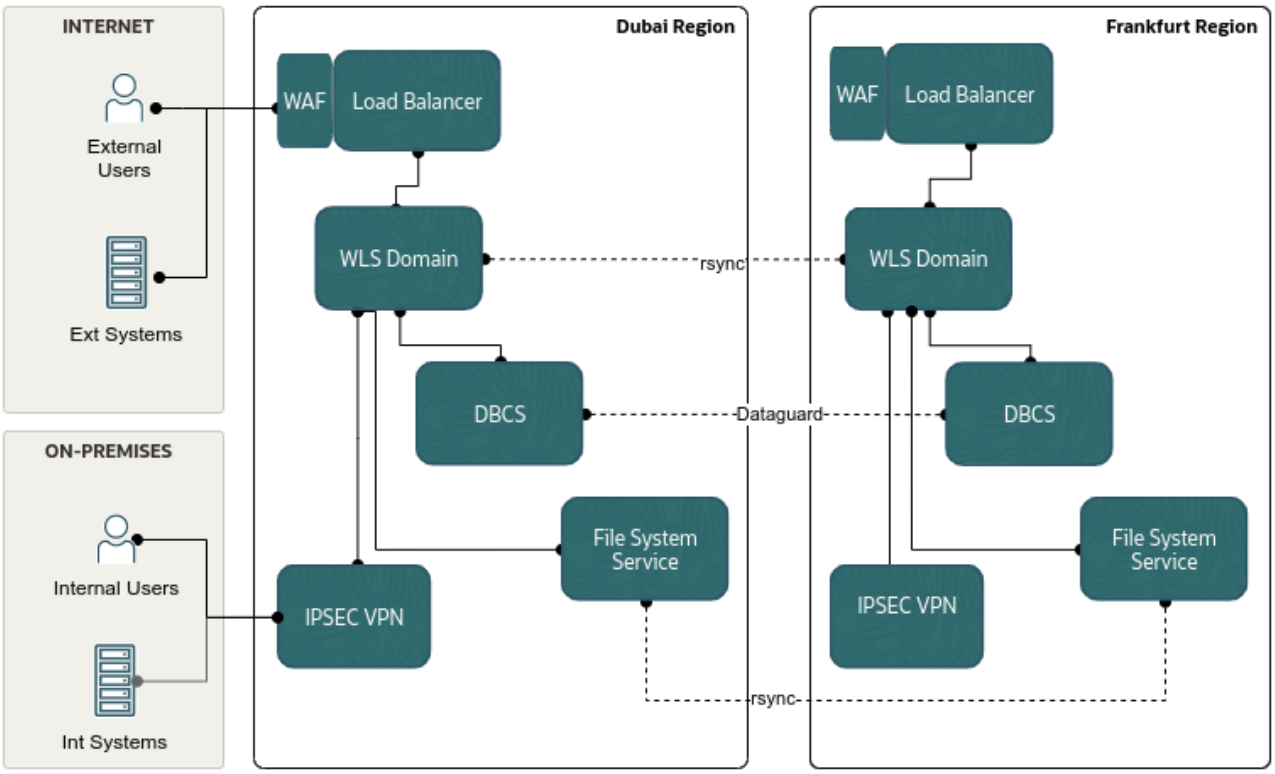

Figure 2: Future State logical view

3.6.2 Physical Architecture for Production

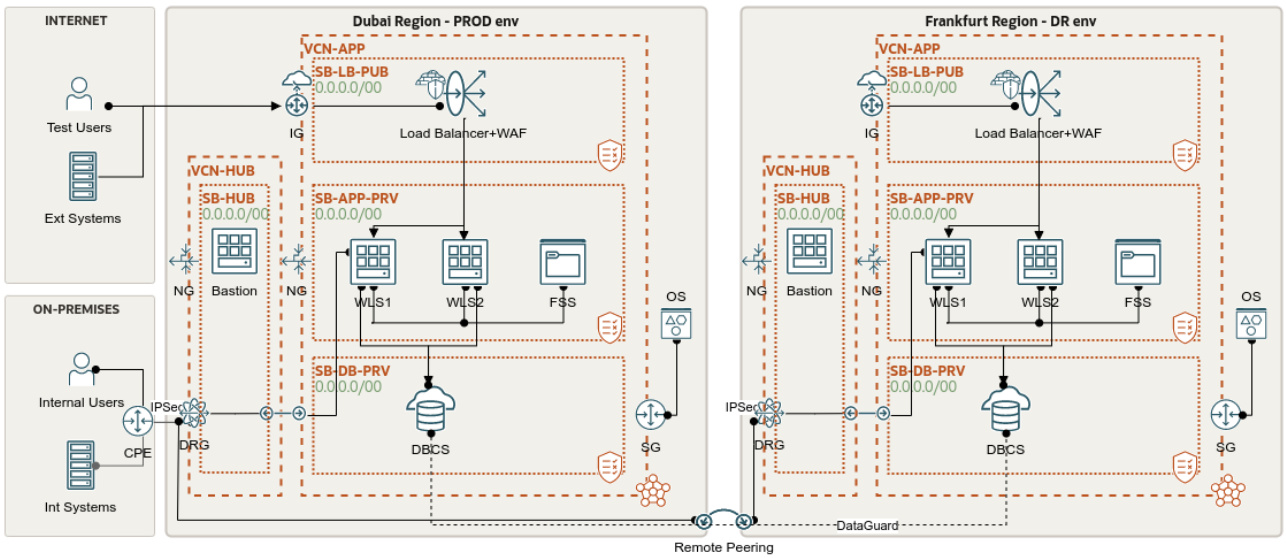

Figure 3: Future State physical view

3.6.3 Physical Architecture for Test

In this case the environment with reference to production environment:

- has same topology of production
- has different sizing of resources
- there is no DR

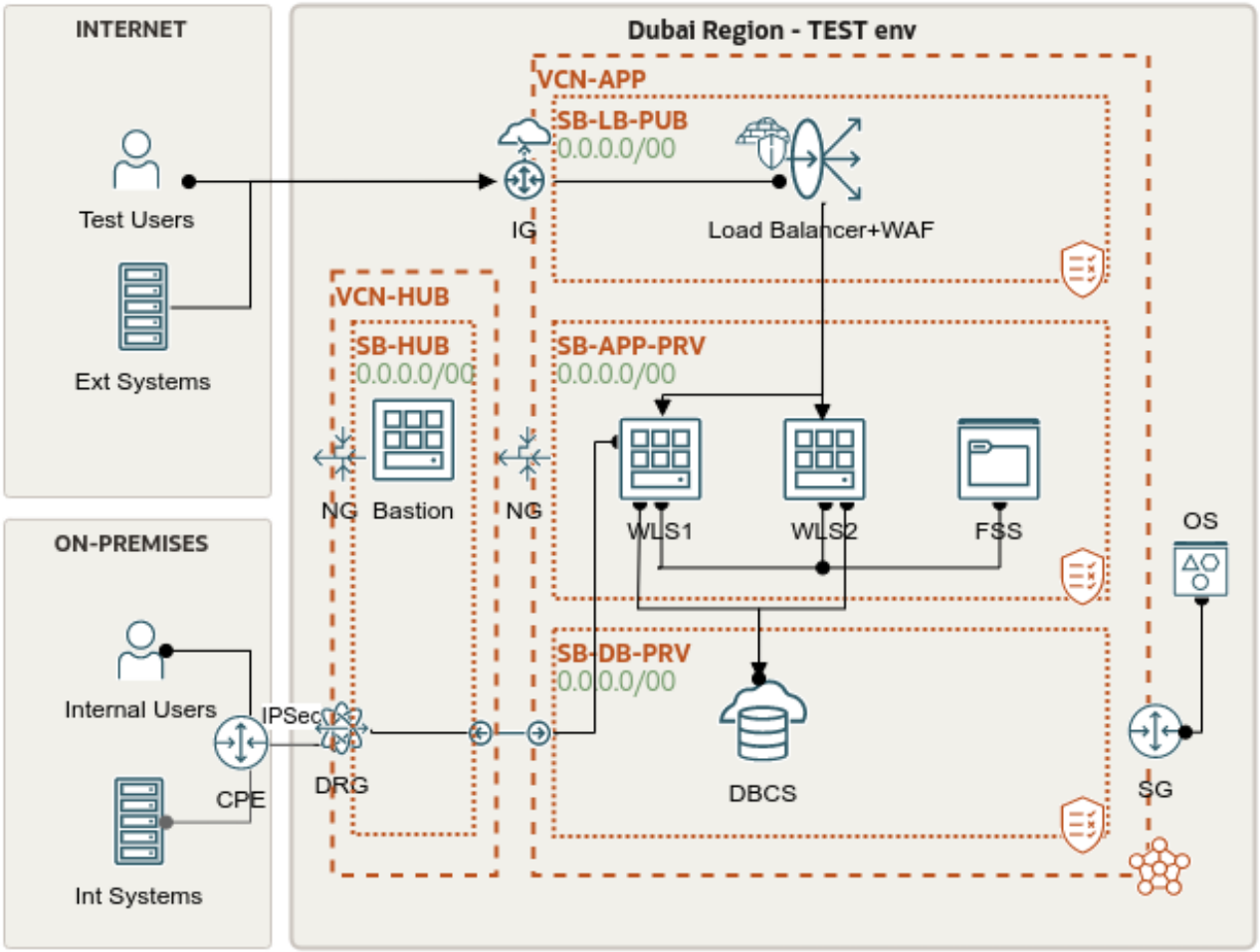

Figure 4: Future State physical view

3.6.4 OCI Services explanation

With reference to the physical diagrams, the OCI Services used are the following:

Virtual Cloud Network (VCN): A VCN is a software-defined network that you set up in the Oracle Cloud Infrastructure data centers in a particular region. VCNs are segmented into subnets in which elements are registered. Both subnets and VCNs are protected via the mechanisms of Route Table, Security List and Network Security Groups.

Subnets: A subnet is a segment of a VCN and any online OCI resource is associated with a specific subnet. A subnet reserves a subset (less significant bits) of the IP addresses allocated to the VCN (following the CIDR notation), can be specific to an Availability Domain or to a region (regional subnet), can be private or public (accessible by Internet) and is secured with the Security List and Routing Table components.

Internet gateway (IG): To provide the public subnet direct access to public endpoints on the internet. Connections can

be initiated from the subnet or from the internet. The resources in the public subnet must have public IP addresses.

Service gateway (SG): To provide the private subnet with private access to supported Oracle services within the region. Connections can be initiated only from the subnet.

NAT gateway (NG): To provide the private subnet with private access to public endpoints on the internet. Connections can be initiated only from the subnet.

Dynamic Routing Gateway (DRG): A DRG acts as a virtual router, providing a path for traffic between your on-premises networks and VCNs, and can also be used to route traffic between VCNs.

Remote Peering: is the process of connecting two VCNs in different regions (but the same tenancy). The peering allows the VCNs' resources to communicate using private IP addresses without routing the traffic over the internet or through your on-premises network. Without peering, a given VCN would need an internet gateway and public IP addresses for the instances that need to communicate with another VCN in a different region.

Object Storage (OG): it is an internet-scale, high-performance storage platform that offers reliable and cost-efficient data durability. The Object Storage service can store an unlimited amount of unstructured data of any content type, including analytic data and rich content, like images and videos.

File Storage Service (FSS): it provides a durable, scalable, secure, enterprise-grade network file system. You can connect to a File Storage service file system from any bare metal, virtual machine, or container instance in your Virtual Cloud Network (VCN).

Load Balancer Service: a load balancer improves resource utilization, facilitates scaling, and helps ensure high availability. The Oracle Cloud Infrastructure Load Balancing service provides automated traffic distribution from one entry point to multiple servers reachable from the VCN. In OCI this is a managed service. It offers a load balancer with your choice of a public or private IP address, and provisioned bandwidth. More info here

Web Application Firewall (WAF): is a regional-based and edge enforcement service that is attached to an enforcement point, such as a load balancer or a web application domain name. WAF protects applications from malicious and unwanted internet traffic. WAF can protect any internet facing endpoint, providing consistent rule enforcement across a customer's applications.

Compute Service (FLEX shapes): let users customize the number of OCPUs and the amount of memory allocated to an instance. When users create a VM instance using a flexible shape, they select the number of OCPUs and the amount of memory that is needed for the workloads that run on the instance. The network bandwidth and number of VNICs scale proportionately with the number of OCPUs. This flexibility lets users build VMs that match the workload, enabling them to optimize performance and minimize cost.

Oracle Database Cloud Service: this service offers autonomous and co-managed Oracle Database cloud solutions. Autonomous databases are preconfigured, fully-managed environments that are suitable for either transaction processing or for data warehouse workloads. Co-managed solutions are bare metal, virtual machine, and Exadata DB systems that users can customize with the resources and settings that meet their needs. Oracle Cloud Infrastructure offers single-node DB systems on either bare metal or virtual machines, and 2-node RAC DB systems on virtual machines. Oracle Database instances can be Standard Edition, Enterprise Edition, Enterprise Edition - High Performance and Enterprise Edition - Extreme Performance. Versions available are 11.2, 12.1, 12.2, 18c, 19c and 21c at the time of writing of this document.

3.7 Architecture Decisions

- **Networks**: A VCN is dedicated to each environment with isolation between test and production systems. Subnets are used to separate functional components (DB, Weblogic, front end balancer) and to impose security rules in communication.
- **Intercommunication**: IPsec VPN tunnels are used to connect on-prem networks to OCI Dubai and Frankfurt as well. Hub & Spoke configuration is configured: all traffic between OCI and Services is transiting through a Hub VCN (for both Test and Production VCNs). Remotepeering gateway is used to interconnect the two regions. Only public access to OCI is through the Internet Gateway that allows communication with the public load Balancer.
- **Disaster Recovery**: Dataguard Standby Database is configured for DR of DBCS instance. Application Servers are kept in sync with rsync linux utility and sync of domain directory is required; sync of Oracle Home can be triggered manually only when a patching o particular configuration happen. Rsync is used to synchronize shared FSS as

well.

- **Marketplace Weblogic**: By installing WebLogic Domain (BYOL or License Included) from Oracle Marketplace automation, a full multinode WLS domain can be installed and configured including a Load Balancer and a File System Service. This choice is preferred when no customization are necessary in terms of directories and naming.

3.7.1 Architecture Best Practices

The Production solution reflects Oracle Best Practices for Disaster Recovery for example described here . Usually the best practice is to leverage on multiple Availability Domains (AD) thata are separated data centers located within a region. In our case Dubai region currently offers only one AD. In this case only Fault Domains (FD) can be used: a FD is a grouping of hardware and infrastructure within an availability domain. The proposed solution is not leveraging on Fault Domains because all components are single node (DB and Weblogic). For eventual future evolution, to follow best practices, we could extend Weblogic Clusters on multiple servers located on different FD and use 2-nodes DBCS (RAC).

3.8 Roadmap

The proposed roadmap includes, after an agreement between Oracle and ACME, the collaboration of Oracle Lift team to implement the OCI infrastructure with all the designed services. The customer will be involved in the application deployment and in the functional test of primary and secondary (standby) systems.

3.9 Sizing and Bill of Materials

3.9.1 Sizing Production

Component	Sizing	Comments
Database Cloud Service - Enterprise Edition	VM.Standard2.4 4 OCPUs / 60 GB RAM / 500 GB Storage	
OCI - Compute - Virtual Machine	VM.Standard2.4 4 OCPUs / 60 GB RAM / 150 GB Storage	DMZ Domain
OCI - Compute - Virtual Machine	VM.Standard2.4 4 OCPUs / 60 GB RAM / 250 GB Storage	Int Domain
OCI - Load Balancer	1x 400 Mbps	Public Load Balancers.
OCI - File Storage Service	1 TBs	Shared File System.
OCI - Object Storage	2048 GBs	Backups.

3.9.2 Sizing DR

Component	Sizing	Comments
Database Cloud Service - Enterprise Edition	VM.Standard2.4 4 OCPUs / 60 GB RAM / 500 GB Storage	
OCI - Compute - Virtual Machine	VM.Standard2.4 4 OCPUs / 60 GB RAM / 150 GB Storage	DMZ Domain
OCI - Compute - Virtual Machine	VM.Standard2.4 4 OCPUs / 60 GB RAM / 250 GB Storage	Int Domain
OCI - Load Balancer	1x 400 Mbps	Public Load Balancers.
OCI - File Storage Service	1 TBs	Shared File System.
OCI - Object Storage	2048 GBs	Backups.

3.9.3 Sizing Test

Component	Sizing	Comments
Database Cloud Service - Enterprise Edition	VM.Standard2.4 4 OCPUs / 60 GB RAM / 500 GB Storage	
OCI - Compute - Virtual Machine	VM.Standard2.4 4 OCPUs / 60 GB RAM / 150 GB Storage	DMZ Domain
OCI - Compute - Virtual Machine	VM.Standard2.4 4 OCPUs / 60 GB RAM / 250 GB Storage	Int Domain
OCI - Load Balancer	1x 100 Mbps	Public Load Balancers.
OCI - File Storage Service	1 TBs	Shared File System.
OCI - Object Storage	2048 GBs	Backups.

Notice: the size is base on assumptions and can be reduced depending on the real requirements, not known at the moment of writing this document. The File System Service size does not need to be associated to a specific sizing when implemented: the cost is proportional to the storage allocated. The VM shapes can be reviewed with the customer to a lower size.

3.9.4 Bill of Materials

Environment	Part #	Item	Metric Annual Flex	Quantity
Production	B88514	Compute - Virtual Machine Standard - X7	OCPU Per Hour	12
Production	B91961	Storage - Block Volume - Storage	100 x Gigabyte Storage Capacity Per Month	10
Production	B91628	Object Storage - Storage	Gigabyte Storage Capacity Per Month	2048
Production	B90329	Networking - Web Application Firewall - Requests	1,000,000 Incoming Requests month	TBD
Production	B90330	Networking - Web Application Firewall - Good Traffic	Gigabyte of Good Traffic month	TBD
Production	B93030	Networking - Load Balancing - Load Balancer Base	Load Balancer Hour	1
Production	B93031	Networking - Load Balancing - Load Balancer Bandwidth	Mbps Per Hour	900
DR	B88514	Compute - Virtual Machine Standard - X7	OCPU Per Hour	12
DR	B91961	Storage - Block Volume - Storage	100 x Gigabyte Storage Capacity Per Month	10
DR	B91628	Object Storage - Storage	Gigabyte Storage Capacity Per Month	2048
DR	B90329	Networking - Web Application Firewall - Requests	1,000,000 Incoming Requests month	TBD

Environment	Part #	Item	Metric Annual Flex	Quantity
DR	B90330	Networking - Web Application Firewall - Good Traffic	Gigabyte of Good Traffic month	TBD
DR	B93030	Networking - Load Balancing - Load Balancer Base	Load Balancer Hour	1
DR	B93031	Networking - Load Balancing - Load Balancer Bandwidth	Mbps Per Hour	900
Test	B88514	Compute - Virtual Machine Standard - X7	OCPU Per Hour	12
Test	B91961	Storage - Block Volume - Storage	100 x Gigabyte Storage Capacity Per Month	10
Test	B91628	Object Storage - Storage	Gigabyte Storage Capacity Per Month	2048
Test	B90329	Networking - Web Application Firewall - Requests	1,000,000 Incoming Requests month	TBD
Test	B90330	Networking - Web Application Firewall - Good Traffic	Gigabyte of Good Traffic month	TBD
Test	B93030	Networking - Load Balancing - Load Balancer Base	Load Balancer Hour	1
Test	B93031	Networking - Load Balancing - Load Balancer Bandwidth	Mbps Per Hour	900

See previous chapter considerations for real sizing.

ORACLE LIFT PROJECT AND ARCHITECTURE

4.1 Solution Scope

4.1.1 Disclaimer

As part of the Oracle Lift Project, any scope needs to be agreed upon by both the customer and Oracle. A scope can change but must be confirmed again by both parties. Oracle can reject scope changes for any reason and may only design and implement a previously agreed scope. A change of scope can change any agreed times or deadlines and needs to be technically feasible.

All items not explicitly stated to be within the scope of the Lift project will be considered out of scope. Oracle recommends the use of professional services to implement extensions or customizations beyond the original scope, as well as to operate the solution, with an Oracle-certified partner.

4.1.2 Overview

The Lift project will implement the full workload scope as descripted in the previous chapter Workload Requirements and Architecture.

4.1.3 Business Value

The Lift project offers a fast and free service to the customer. A fast implementation will result into realizing the business values quicker as described in chapter Business Context.

4.1.4 Success Criteria

- Provision scoped infrastructure resources
- Migration of the data tier
- Implement DR environment
- Increase the security posture, by deploying the following security solutions:
  - Web Application firewall
  - Data Safe
  - Cloud Guard

4.2 Workplan

4.2.1 Deliverables

- Workload Architecture Document.
- Technical Migration Document.
- Terraform Scripts.

4.2.2 Included Activities

This Oracle Lift proposal is based on the following scope of services:

- OCI Foundation setup, VCN, Subnet, Compartment, Security & IAM rules.
  - 1x Site to Site IP-Sec VPN for Dubai Region
  - 1x Site to Site IP-Sec VPN for Frankfurt Region
  - 2x VCN with 1 x (DRG, IG, NAT, SG) and 4x subnet on Dubai Region
  - 2x VCN with 1 x (DRG, IG, NAT, SG) and 4x subnet on Frankfurt Region
  - 2x VCN with 1 x (DRG, NAT, SG) and 4x subnet on Dubai Region (for Test)
- Provisioning and configuration:
  - 6x Compute VMs, OL 8 (see *Future State Architecture* section) (6x Weblogic MPIs - 12.2.1.4)
  - 3x Oracle Database Cloud Service Enterprise Edition (19.12.0) instances.
  - Migration of DB (for both TEST and PROD) using downtime based data pump export/import method."
  - Perform DR(Physical Standby) Configuration for Production Environment.
  - 3x File Storage Service with 1x mount endpoint to be attached to selected VMs
  - 2x WAF, Configuration of WAF to protect public endpoints stated by the customer
  - 2x OCI Load Balancer Dynamic 400 Mbps., Creation and configuration of public load balancers with WAF option
  - 1x OCI Load Balancer Dynamic 100 Mbps. (test env)

4.2.3 Recommended Activities

All items not explicitly stated to be within the scope of the Lift project will be considered out of scope. Oracle recommend the use of professional services to implement extensions or customizations beyond the original scope, or to operate the solution with any of Oracle certified partners. Oracle also recommends to use the clustered environment for Production for High availability.

These are some examples of other recommended activities:

- Any on-premise activity such as encryption/patching/backups required for migration.
- AD integration/federation/SSO.
- Application Migration.
- Production cutover and DR switchover/failover/fallback.
- Database compression / consolidation and Database Character set conversion.

- Any integration with other products than in scope
- Functional testing, all functional testing is to be conducted by the customer and/or third party involved.
- Application upgrade of any Oracle or other vendor / open Source application or component.
- Troubleshooting of existing open issues, including performance of Application.
- Backup and Recovery strategy implementation.
- Load Testing, Performance benchmarking, testing & tuning of any component in the solution.
- 24*7 Support coverage.
- Target Hardware sizing, architecture and design changes.
- Third Party Firewall implementation, Security tools, monitoring tools implementation.
- Third Party Backup tool implementation.
- Post Migration “Managed service” support
- Server Hardening, Audit certification implementation.
- Any Vulnerability Assessment and Penetration Testing.
- Trainings on deployed products and Cloud Services.
- SSL certificate management and configuration.

4.2.4 Timeline

#	Lift Services Activities	Responsibility	Week 1	Week 2	Week 3	Week 4
1	Project Initiation	Oracle/ ACME				
2	Discovery & Analysis	Oracle				
3	OCI Foundation (Non-Prod Compartment, VCN, Subnet) & Bastion Service	Oracle				
4	IP Sec VPN	Oracle/ ACME				
5	Private DNS setup for WAF	Oracle				
	Test Env					
6	Provision of DBCS	Oracle				
7	Export Source Database extract (TEST, **PROD-Trial Run**) & Copy to OCI Storage	ACME				
8	Import Source database Extract to DBCS	Oracle				
9	Validate Import	Oracle				
14	Provisioning of Weblogic MPI for INT Domain	Oracle				
15	Provisioning of Weblogic MPI for DMZ Domain	Oracle				
17	Provisioning Private Load Balancer	Oracle				
	PROD Env					
6	Provision of DBCS	Oracle				
7	Export Source Database extract (TEST, **PROD-Trial Run**) & Copy to OCI Storage	ACME				
8	Import Source database Extract to DBCS	Oracle				
9	Validate Import	Oracle				
10	Export Source Database extract (**PROD-Final Run**) & Copy to OCI Storage	ACME				
11	Import Source database Extract to DBCS	Oracle				
9	Validate Import	Oracle				
22	Provisioning of Weblogic MPI for INT Domain	Oracle				
23	Provisioning of Weblogic MPI for DMZ Domain	Oracle				
25	Provisioning Public Load Balancer	Oracle				
	DR Env					
6	Provision of DBCS	Oracle				
12	Configure Dataguard for PROD DB in another Dataguard.	Oracle				
13	Validate DG Replication.	Oracle				
18	Provisioning of Weblogic MPI for INT Domain	Oracle				
19	Provisioning of Weblogic MPI for DMZ Domain	Oracle				
21	Provisioning Public Load Balancer	Oracle				
26	Application Configure & Connectivity Testing/Go-Live	ACME				
27	Support during Application Configure & Connectivity Testing/Go-Live	Oracle				
28	Secure Implemetation (Cloud Guard and Datasafe)	Oracle				
29	Documentation and Handover	Oracle				
30	Project Management	Oracle/ ACME				
31	**Technical delivery effort**					
32	**Contigency**					
33	**Total including delivery & Contigency**					

Figure 5: Timeline

4.2.5 Implementation RACI

Matrix responsibilities between Oracle and customer including customer obligations and prerequisites:

SN	Activity Details	Oracle	Customer
1	Project kick-off	RA	C

SN	Activity Details	Oracle	Customer
2	OCI access	I	RA
3	OCI Foundation Setup	RA	C
4	Provision Load Balancers/WAF	RA	C
4	Provision Compute VM	RA	C
5	Provision DBCS Environments	RA	C
6	Source database extracts and upload to Cloud	C	RA
7	Import & Migrate Database to OCI (trial and final run)	RA	C
8	Setup & Configure DR/Standby for PROD.	RA	C
9	Deploy applications	I	RA
10	Application & Functional Validation	I	RA
11	Production Go-Live	I	RA
12	Project Management	R	A

R- Responsible, I- Informed, A- Accountable, C- Consulted

4.2.6 Assumptions

Assumptions made related to the Oracle Cloud Lift Services project:

- It is assumed that all required contractual agreements between Oracle and the Customer are in place to ensure an uninterrupted execution of the project.
- It is assumed that all work will be done remotely and within either central European time or India standard time normal office working hours.
- It is assumed that upgrades are excluded from the scope of work and no production systems / production cutover is part of the scope of work undertaken by the Oracle LIFT Service
- It is assumed that all required Oracle cloud technical resources are available for use during the duration of the project and that engineers involved have been granted the appropriate access to those technical resources by the customer prior to the start of the project.
- It is assumed that all required customer resources, and if applicable third-party resources, are available during the duration of the project to work in an open and collaborative manner to realize the project goals in an uninterrupted fashion.
- It is assumed that all required customer resources, and if applicable third-party resources, are aware of all technical and none-technical details of the as-is and to-be components, there intend and technical working as far as is needed for the execution of the project.
- It is assumed that all required documentation, system details and access needed for the execution of the project can be given / granted to parties involved when and where deemed needed for the success of the project.
- It is assumed that the customer will have adequate licenses for all the products that may/will be used during the project and that appropriate support contracts for those products are in place where the customer will take the responsibility of managing any potential service request towards a support organization to seek resolution of a problem.
- It is assumed the customer will provide the appropriate level of information and guidance on rules and regulations which can directly and/or indirectly influence the project or the resulting deliverables. This includes, however not limited to, customer specific naming conventions, security implementation requirements, internal SLA requirements as well as details for legal and regulatory compliancy. It will be the responsibility of the customer to ensure that the solution will adhere to this.
- It is assumed that the under the customers responsibility the customer will ensure and validate that the solution will be placed under the proper controls for ensuring business continuity, system availability, recoverability, security control and monitoring and management as part of a post project task.
- It is assumed that the customer will take responsibility on testing all functional and non-functional parts of the solution within the provided timeline and ensure a proper test report will be shared with the full team (including customer, Oracle and if applicable third party).

- It is assumed that any requirement, deliverable or expectation which is not clearly defined as in-scope of the project will not be handled as part of the project and is placed under the responsibility of the customer to be handled outside of the project.
- It Is recommended to use Fast Connect as connectivity for Data transfer for Higher sizes(> 200gb). In case IPSec is used ACME to ensure minimum of 150 MBps bandwidth is available.
- All Databases considered to be migrated are assumed to be less than 1024 GB.
- ACME is responsible to certify the compatibility of their applications/database components used on the target platform & DB versions.
- Sufficient storage to be provided for export / import at Source/On-Premises.
- Customer to perform source extract and upload to cloud storage.
- Enough service limit for VM shape in customer tenancy is available for VM provisioning.
- Details and Naming convention for VM and Database will be provided by Customer.
- Admin/admin equivalent level access required at source during migration activity.
- Provided Storage are considered while estimating and if any change in Server storage sizing then effort will be vary.
- Any item which is/are not covered in Lift services activity will be out of scope.

4.2.7 Obligations

- ACME will have purchased the appropriate Universal Credits for the services required for the project.
- The Oracle Lift team will have admin access to the customers tenancy for implementation.
- ACME will ensure the appropriate product training has been obtained to maintain and support the implementation
- ACME will be available for the Testing phase, which will be completed within the agreed testing window.
- ACME will provide project management for the project and will manage any third party suppliers or vendors.

4.3 Physical Future State Architecture for Production

Implementation of physical Future State Architecture (production)

4.4 Physical Future State Architecture for Test

Implementation of physical Future State Architecture (test)

ORACLE LIFT IMPLEMENTATION

5.1 Approach

This section describes the implementation requirements and approach at the high level.

- Database setup:
  - Data Migration from source on-premises database (see *Database Information* and *Specific Technical Requirements* sections for further details):
    - Execution of *expdp* in source database (Data Pump based migration).
    - Upload dump files to File Storage Service.
    - Execute import to target the provisioned Database Cloud instance.
  - Configuration of backups to Object Storage for on-demand backups.
  - Set up Data Guard standby in secondary Availability Domain once data is imported for Production environment only.

5.2 Generic Definitions

- **Availability Domain (AD)**: Availability domains are standalone, independent data centers within a region. The physical resources in each availability domain are isolated from the resources in the other availability domains, which provides fault tolerance. Availability domains don't share infrastructure such as power or cooling, or the internal availability domain network. So, a failure at one availability domain is unlikely to affect the other availability

domains in the region. A region can have 3 availability domains and in regions that have multiple availability domains, you can distribute the resources in each region across the availability domains, for high availability.

- **Fault Domain (FD)**: A fault domain is a grouping of hardware and infrastructure within an availability domain. Each availability domain has three fault domains with independent power and hardware. When you distribute resources across multiple fault domains, your applications can tolerate physical server failure, system maintenance, and power failures inside a fault domain.
- **Service Level Agreements (SLAs)**: Oracle is the only cloud vendor that offers end-to-end SLAs covering Availability, Performance and Manageability of services. This information is publicly available at with the respective commitments at a Service level granularity. The Architecture design on OCI leverages the provided SLAs in order to properly design a solution that meets business criteria for QoS. More details on OCI SLAs here
- **High Availability**: Means to operate workload in multiple hardware (nodes) at the same time in order to survive any downtime due to node failure (of hw or sw). As a principle the architecture needs to be designed without SPOF (single point of failure) for ALL workloads. In Oracle we address that overall with Clustering strategy and we extend that to Active-Active operation to combine with horizontal Scalability. For OCI Architectures this is addressed that with Fault Domains and Availability Domains at the IaaS level and platform technologies for the levels above IaaS. Below are the cases for Database and Weblogic technologies:
- **Disaster Recovery**: Means to maintain a replica of the workload in "warm" state in order to failover in case a disaster happens in primary datacenter (e.g. earthquake). As principle the architecture needs to be designed so that ALL workloads are DR-ed. In Oracle we address that with session state replication or configuration/metadata replication for non-DB workloads and with Data Guard for Database workloads. In OCI Architecture addresses that with Availability Domains and Regions at IaaS level. Especially for the case of Database, we address that with the unique feature of **Data Guard**.

5.3 Deployment Build

5.3.1 Compartments

Compartment Name	Type	Main Compartment	Remark
ACMEDXBOCI	Dubai Tenancy Root Compartment	root	Root Compartment Created while creating the DXB Tenancy
ACMEOCI	Frankfurt Tenancy Root Compartment	root	Root Compartment Created while creating the Frankfurt Tenancy
NETWORK-COMPARTMENT	Sub Compartment	ACMEDXBOCI	DXB tenancy: For all Network Resources VCN, Subnet, Load Balancers Bastion Host etc
ACME-NETWORK	Sub Compartment	ACMEOCI	Frankfurt Tenancy: For all Network Resources VCN, Subnet, Load Balancers Bastion Host etc
ACME-WLS-PRD-CMP	Sub Compartment	PROD-COMPARTMENT	For WLS Prod Workloads
ACME-WLS-TST-CMP	Sub Compartment	NONPROD-COMPARTMENT	For WLS Test Workloads
ACME-WLS-DR-CMP	Sub Compartment	ACMEOCI	For WLS DR Workloads in the Frankfurt Tenancy

5.3.2 Policies

Name	Statements	Region	Compartment	Description	Tags
ACME_network_admin_policy	Allow group ACME_network_admin to manage virtual-network-family in compartment ACME-NETWORK	All		Policy for Network_Admins	
	Allow group ACME_epm_admin,ACM ACME_epmdr_admin,AC ACME_wlsdr_admin to use virtual-networkfamily in compartment ACME-NETWORK				
	Allow group ACME_network_admin,ACME_epm_admin,ACME_epmprd_admin,ACME_epmtst_admin, ACME_epmdr_admin,ACME_wls_admin,ACME_wlsprd_admin,ACME_wlstst_admin, ACME_wlsdr_admin to inspect compartments in tenancy				
ACME_wls_admin	Allow group ACME_wls_admin to manage all-resources in compartment ACMEepmcmp				
ACME_wlsprd_admin	Allow group ACME_wlsprd_admin to manage instance-family in compartment ACME-WLS-PRD-CMP				
	Allow group ACME_wlsprd_admin to manage virtual-network-family in compartment ACME-WLS-PRD-CMP				
	Allow group ACME_wlsprd_admin to manage database-family in compartment ACME-WLS-PRD-CMP				
	Allow group ACME_wlsprd_admin to manage object-family in compartment ACME-WLS-PRD-CMP				

Name	Statements	Region	CompartmentDescription	Tags
	Allow group ACME_wlsprd_admin to manage volume-family in compartment ACME-WLS-PRD-CMP			
	Allow group ACME_wlsprd_admin to manage load-balancers in compartment ACME-WLS-PRD-CMP			
	Allow group ACME_wlsprd_admin to read compartments in compartment ACME-WLS-PRD-CMP			
	Allow group ACME_wlsprd_admin to manage file-family in compartment ACME-WLS-PRD-CMP			
	Allow group ACME_wlsprd_admin to read all-resources in tenancy			
ACME_wlstst_admin	Allow group ACME_wlstst_admin to manage instance-family in compartment ACME-WLS-TST-CMP			
	Allow group ACME_wlstst_admin to manage virtual-network-family in compartment ACME-WLS-TST-CMP			
	Allow group ACME_wlstst_admin to manage database-family in compartment ACME-WLS-TST-CMP			
	Allow group ACME_wlstst_admin to manage object-family in compartment ACME-WLS-TST-CMP			

Name	Statements	Region	CompartmentDescription	Tags
	Allow group ACME_wlstst_admin to manage volume-family in compartment ACME-WLS-TST-CMP			
	Allow group ACME_wlstst_admin to manage load-balancers in compartment ACME-WLS-TST-CMP			
	Allow group ACME_wlstst_admin to read compartments in compartment ACME-WLS-TST-CMP			
	Allow group ACME_wlstst_admin to manage file-family in compartment ACME-WLS-TST-CMP			
	Allow group ACME_wlstst_admin to read all-resources in tenancy			
ACME_wlsdr_admin	Allow group ACME_wlsdr_admin to manage instance-family in compartment ACME-WLS-DR-CMP			
	Allow group ACME_wlsdr_admin to manage virtual-network-family in compartment ACME-WLS-DR-CMP			
	Allow group ACME_wlsdr_admin to manage database-family in compartment ACME-WLS-DR-CMP			
	Allow group ACME_wlsdr_admin to manage object-family in compartment ACME-WLS-DR-CMP			

Name	Statements	Region	CompartmentDescription	Tags
	Allow group ACME_wlsdr_admin to manage volume-family in compartment ACME-WLS-DR-CMP			
	Allow group ACME_wlsdr_admin to manage load-balancers in compartment ACME-WLS-DR-CMP			
	Allow group ACME_wlsdr_admin to read compartments in compartment ACME-WLS-DR-CMP			
	Allow group ACME_wlsdr_admin to manage file-family in compartment ACME-WLS-DR-CMP			
	Allow group ACME_wlsdr_admin to read all-resources in tenancy			

5.3.3 Groups

Name	Matching Rule	Region	Authentication	Description	Tags
ACME_network_admin		All	IAM	Users that have admin access to network administration	
ACME_wls_admin		All	IAM	Users that have admin access to WLS administration	
ACME_wlsprd_admin		All	IAM	Users that have admin access to WLS Prod administration	
ACME_wlstst_admin		All	IAM	Users that have admin access to WLS Test administration	
ACME_wlsdr_admin		All	IAM	Users that have admin access to WLS DR administration	

5.3.4 Virtual Cloud Networks

Virtual Cloud Network (VCN): A VCN is a software-defined network that you set up in the Oracle Cloud Infrastructure data centers in a particular region. VCNs are segmented into subnets in which elements are registered. Both subnets and VCNs are protected via the mechanisms of Route Table, Security List and Network Security Groups.

Compart.	VCN Name	CIDR Block	DNS Label	IGW	DRG	NGW	SGW	Region	Tags
NETWORK-COMPARTMENT	VCN-ACME-DXB-NONERP	172.25.48.0/21	ACMENONERPPRD	ACME-NONERP-IGW		NGW-DRNONERP	SGW-NONERP	Dubai	-
NETWORK-COMPARTMEN	VCN-ACME-DXB-TEST	172.25.56.0/21	ACMENONERPTST	ACME-TST-IGW		NGW-TEST	SGW-TEST	Dubai	-
ACME-NETWORK	VCN-ACME-DR-FRA-NONERP	172.23.48.0/21	ACMEDRNONERP	ACME-DR-IGW		NGW-DRNONERP	SGW-DRNONERP	Frankfurt	-

5.3.5 Subnets

Subnets: A subnet is a segment of a VCN and any online OCI resource is associated with a specific subnet. A subnet reserves a subset (less significant bits) of the IP addresses allocated to the VCN (following the CIDR notation), can be specific to an Availability Domain or to a region (regional subnet), can be private or public (accessible by Internet) and is secured with the Security List and Routing Table components.

Compartment	VCN Name	Subnet Name	CIDR Block	Subnet Span	Type	Security List Name	Route Table Name	Region	Tags
NETWORK-COMPARTMENT	VCN-ACME-DXB-NONERP	SB-NONERP-LB-PRV	172.25.49.0/24	regional	private	SL-NONERP-LB-PRV	RT-NONERP-LB-PRV	Dubai	
NETWORK-COMPARTMENT	VCN-ACME-DXB-NONERP	SB-NONERP-AP-PRV	172.25.50.0/24	regional	private	SL-NONERP-APP-PRV	RT-NONERP-APP-PRV	Dubai	
NETWORK-COMPARTMENT	VCN-ACME-DXB-NONERP	SB-NONERP-DB-PRV	172.25.51.0/24	regional	private	SL-NONERP-DB-PRV	RT-NONERP-DB-PRV	Dubai	
NETWORK-COMPARTMENT	VCN-ACME-DXB-TEST	SB-TST-LB-PRV	172.25.57.0/24	regional	private	SL-TST-LB-PRV	RT-TST-LB-PRV	Dubai	
NETWORK-COMPARTMENT	VCN-ACME-DXB-TEST	SB-TST-AP-PRV	172.25.58.0/24	regional	private	SL-TST-APP-PRV	RT-TST-APP-PRV	Dubai	
NETWORK-COMPARTMENT	VCN-ACME-DXB-TEST	SB-TST-DB-PRV	172.25.59.0/24	regional	private	SL-TST-DB-PRV	RT-TST-DB-PRV	Dubai	
ACME-NETWORK	VCN-ACME-DR-FRA-NONERP	SB-DRNONERP-LB-PRV	172.23.49.0/24	regional	private	SL-DRNONERP-LB-PRV	RT-DRNONERP-LB-PRV	Frankfurt	
ACME-NETWORK	VCN-ACME-DR-FRA-NONERP	SB-DRNONERP-AP-PRV	172.23.50.0/24	regional	private	SL-DRNONERP-APP-PRV	RT-DRNONERP-APP-PRV	Frankfurt	
ACME-NETWORK	VCN-ACME-DR-FRA-NONERP	SB-DRNONERP-DB-PRV	172.23.51.0/24	regional	private	SL-DRNONERP-DB-PRV	RT-DRNONERP-DB-PRV	Frankfurt	

5.3.6 Dynamic Routing Gateways Attachment

Name	VCN	Compartment	IPSEC/Virtual Circuit	Region	Tags
ACME-DRG	VCN-ACME-DXB-HUB	NETWORK-COMPARTMENT	ivc-dubai	Dubai	

5.3.7 Route Tables

Name	Table Compart.	Destination CIDR	Target Type	Target Compart.	Target	Region	Description	Tags	VCN Name
RT-NONERP-LB-PRV	NETWORK-COMPARTMENT	X.X.X.X/24	DRG	Network	ACME-DRG	Dubai	On-premises traffic		VCN-ACME-DXB-NONERP
RT-NONERP-APP-PRV	NETWORK-COMPARTMEN	X.X.X.X/24	DRG	Network	ACME-DRG	Dubai	On-premises traffic		VCN-ACME-DXB-NONERP
RT-NONERP-APP-PRV	NETWORK-COMPARTMENT	0.0.0.0/0	NAT	Network	NGW-NONERP	Dubai	Internet traffic		VCN-ACME-DXB-NONERP
RT-NONERP-DB-PRV	NETWORK-COMPARTMEN	X.X.X.X/24	DRG	Network	ACME-DRG	Dubai	On-premises traffic		VCN-ACME-DXB-NONERP
RT-NONERP-DB-PRV	NETWORK-COMPARTMENT	0.0.0.0/0	NAT	Network	NGW-NONERP	Dubai	Internet traffic		VCN-ACME-DXB-NONERP
RT-NONERP-DB-PRV	NETWORK-COMPARTMEN	all fra services in Oracle services network	SGW	Network	SGW-NONERP	Dubai	OCI Services traffic (Object Storage)		VCN-ACME-DXB-NONERP
RT-TST-LB-PRV	NETWORK-COMPARTMENT	X.X.X.X/24	DRG	Network	ACME-DRG	Dubai	On-premises traffic		VCN-ACME-DXB-TEST
RT-TST-APP-PRV	NETWORK-COMPARTMEN	X.X.X.X/24	DRG	Network	ACME-DRG	Dubai	On-premises traffic		VCN-ACME-DXB-TEST
RT-TST-APP-PRV	NETWORK-COMPARTMENT	0.0.0.0/0	NAT	Network	NGW-TST	Dubai	Internet traffic		VCN-ACME-DXB-TEST
RT-TST-DB-PRV	NETWORK-COMPARTMEN	X.X.X.X/24	DRG	Network	ACME-DRG	Dubai	On-premises traffic		VCN-ACME-DXB-TEST
RT-TST-DB-PRV	NETWORK-COMPARTMENT	0.0.0.0/0	NAT	Network	NGW-TST	Dubai	Internet traffic		VCN-ACME-DXB-TEST
RT-TST-DB-PRV	NETWORK-COMPARTMEN	all fra services in Oracle services network	SGW	Network	SGW-TST	Dubai	OCI Services traffic (Object Storage)		VCN-ACME-DXB-TEST
RT-DRNONERP-LB-PRV	ACME-NETWORK	X.X.X.X/24	DRG	Network	ACME-DRG	Frankfurt	On-premises traffic		VCN-ACME-DR-FRA-NONERP

Name	Table Compart.	Destination CIDR	Target Type	Target Compart.	Target	Region	Description	Tags	VCN Name
RT-DRNONERP-APP-PRV	ACME-NETWORK	X.X.X.X/24	DRG	Network	ACME-DRG	Frankfurt	On-premises traffic		VCN-ACME-DR-FRA-NONERP
RT-DRNONERP-APP-PRV	ACME-NETWORK	0.0.0.0/0	NAT	Network	NGW-DRNONERP	Frankfurt	Internet traffic		VCN-ACME-DR-FRA-NONERP
RT-DRNONERP-DB-PRV	ACME-NETWORK	X.X.X.X/24	DRG	Network	ACME-DRG	Frankfurt	On-premises traffic		VCN-ACME-DR-FRA-NONERP
RT-DRNONERP-DB-PRV	ACME-NETWORK	0.0.0.0/0	NAT	Network	NGW-DRNONERP	Frankfurt	Internet traffic		VCN-ACME-DR-FRA-NONERP
RT-DRNONERP-DB-PRV	ACME-NETWORK	all fra services in Oracle services network	SGW	Network	SGW-DRNONERP	Frankfurt	OCI Services traffic (Object Storage)		VCN-ACME-DR-FRA-NONERP

5.3.8 Security Lists (Egress)

Name	Comp.	Egress Type	Destination	Protocol	Source Port	Dest. Port	VCN Name	Region	Description	tags
SL-NONERP-LB-PRV	NETWORK-COMPARTMENT	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-NONERP	Dubai	General egress rule	
SL-NONERP-APP-PRV	NETWORK-COMPARTMENT	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-NONERP	Dubai	General egress rule	
SL-NONERP-DB-PRV	NETWORK-COMPARTMENT	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-NONERP	Dubai	General egress rule	
SL-TST-LB-PRV	NETWORK-COMPARTMENT	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-TEST	Dubai	General egress rule	
SL-TST-APP-PRV	NETWORK-COMPARTMENT	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-TEST	Dubai	General egress rule	
SL-TST-DB-PRV	NETWORK-COMPARTMENT	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-TEST	Dubai	General egress rule	
SL-DRNONERP-LB-PRV	ACME-NETWORK	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-DRNONERP	Frankfurt	General egress rule	
SL-DRNONERP-APP-PRV	ACME-NETWORK	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-DRNONE	Frankfurt	General egress rule	
SL-DRNONERP-DB-PRV	ACME-NETWORK	Stateful/ CIDR	0.0.0.0/0	all	all	all	VCN-ACME-DXB-DRNONERP	Frankfurt	General egress rule	

5.3.9 Security Lists (Ingress)

Name	Comp.	Ingress Type	Source	Protocol	Source Port	Dest. Port	VCN Name	Region	Description Tags
SL-NONERP-LB-PRV	NETWORK-COMPARTMENT	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-NONERP	Dubai	ingress from DRG traffic
SL-NONERP-APP-PRV	NETWORK-COMPARTME	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-NONEI	Dubai	ingress from DRG traffic
SL-NONERP-DB-PRV	NETWORK-COMPARTMENT	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-NONERP	Dubai	ingress from DRG traffic
SL-TST-LB-PRV	NETWORK-COMPARTME	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-TEST	Dubai	ingress from DRG traffic
SL-TST-APP-PRV	NETWORK-COMPARTMENT	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-TEST	Dubai	ingress from DRG traffic
SL-TST-DB-PRV	NETWORK-COMPARTME	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-TEST	Dubai	ingress from DRG traffic
SL-DRNONERP-LB-PRV	ACME-NETWORK	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-DRNONERP	Frankfurt	ingress from DRG traffic
SL-DRNONERI APP-PRV	ACME-NETWORK	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-DRNOI	Frankfurt	ingress from DRG traffic
SL-DRNONERP-DB-PRV	ACME-NETWORK	Stateful/CIDR	X.X.X.X/24	TCP	all	all	VCN-ACME-DXB-DRNONERP	Frankfurt	ingress from DRG traffic

5.3.10 Compute Instances

Compute Service: Oracle Cloud Infrastructure Compute lets you provision and manage compute hosts, known as instances . You can create instances as needed to meet your compute and application requirements. After you create 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.

Compute for ACME DBSystem can be built on Hardened custome images, obtained from Oracle provided images with additional hardening, or the final compute server can be hardened at the end of installation.

Compartment	Availability Domain	Name	Fault Domain	Subnet	OS Image	Shape	boot disk size	Backup Policy	Region	NSG	Tags
ACME-WLS-PRD-CMP	AD1	ACMEDOPDMZPRD1	FD1	SB-NONERP-APP-PRV	OL 8	VM.Standard2.4 / 4 OCPUs / 60 GB RAM	150 GB	Gold	Dubai	-	
ACME-WLS-PRD-CMP	AD1	ACMEDOPINTPRD1	FD2	SB-NONERP-APP-PRV	OL 8	VM.Standard2.4 / 4 OCPUs / 60 GB RAM	250 GB	Gold	Dubai	-	
ACME-WLS-TST-CMP	AD1	ACMEDOPDMZTST1	FD1	SB-NONERP-APP-PRV	OL 8	VM.Standard2.4 / 4 OCPUs / 60 GB RAM	150 GB	Gold	Dubai	-	
ACME-WLS-TST-CMP	AD1	ACMEDOPINTTST1	FD2	SB-TST-APP-PRV	OL 8	VM.Standard2.4 / 4 OCPUs / 60 GB RAM	250 GB	Gold	Dubai	-	
ACME-WLS-DR-CMP	AD1	ACMEDOPDMZDR1	FD1	SB-DR-APP-PRV	OL 8	VM.Standard2.4 / 4 OCPUs / 60 GB RAM	150 GB	Gold	Frankfurt-		
ACME-WLS-DR-CMP	AD1	ACMEDOPINTDR1	FD2	SB-DR-APP-PRV	OL 8	VM.Standard2.4 / 4 OCPUs / 60 GB RAM	250 GB	Gold	Frankfu	-	

5.3.11 File Storage

Compartment	Availability Domain	Mount Target Name	Mount Target Subnet	FSS Name	Path	IP Whitelist	Region	Compute mount	Tags
ACME-WLS-PRD-CMP	AD1	dopmntprd	SB-NONERP-APP-PRV	dopfss	/dopfs	0.0.0.0/24	Dubai	ACMEDOPDMZPRD1, ACMEDOPINT-PRD1	
ACME-WLS-TST-CMP	AD1	dopmnttst	SB-TST-APP-PRV	dopfss	/dopfs	0.0.0.0/24 TBD	Dubai	ACMEDOPDMZ1 ACME-DOPINTTST1	
ACME-WLS-DR-CMP	AD1	dopmntdr	SB-DR-APP-PRV	dopfss	/dopfs	0.0.0.0/24 TBD	Frankfurt	ACMEDOPDMZDR1, ACME-DOPINTDR1	

(mount points and white lists to be reviewed)

5.3.12 Load Balancers

Load Balancer Service: a load balancer improves resource utilization, facilitates scaling, and helps ensure high availability. The Oracle Cloud Infrastructure Load Balancing service provides automated traffic distribution from one entry point to multiple servers reachable from the VCN. In OCI this is a managed service. It offers a load balancer with your choice of a public or private IP address, and provisioned bandwidth. More info here

Web Application Firewall Service (WAF): this is a cloud-based, Payment Card Industry (PCI) compliant, global security service that protects applications from malicious and unwanted internet traffic. WAF can protect any internet facing endpoint, providing consistent rule enforcement across a customer's applications. WAF provides users with the ability to create and manage rules for internet threats including Cross-Site Scripting (XSS), SQL Injection and other OWASP-defined vulnerabilities. Unwanted bots can be mitigated while tactically allowed desirable bots to enter. Access rules can limit based on geography or the signature of the request. The global Security Operations Center (SOC) will continually monitor the internet threat landscape acting as an extension of your IT infrastructure. WAF is an option inside the Load Balancer Configuration

Compart.	LB Name	Shape	Subnet	Visibility	Hostnames	NSG	Region	Tags
ACME-WLS-PRD-CMP	lbdopprd	400Mbps	SB-NONERP-LB-PRV	Public	TBD	-	Dubai	
ACME-WLS-TST-CMP	lbdoptst	100Mbps	SB-TST-LB-PRV	Public	TBD	-	Dubai	
ACME-WLS-DR-CMP	lbdopdr	400Mbps	SB-NONERP-APP-PRV	Public	TBD	-	Frankfurt	

5.3.12.1 Backend Sets

LB Name	Backend Set Name	Backend Server:Port	Backend Policy	SSL	Region	Tags	HC Proto-col	HC Port
lbdopprd	lb-dop-bset	ACMEDOPDMZPRD1:80	Round Robin	Yes	Dubai		HTTP	80
lbdoptst	lb-dop-bset	ACMEDOPDMZTST1:8	Round Robin	Yes	Dubai		HTTP	80
lbdopdr	lb-dop-bset	ACMEDOPDMZDR1:80	Round Robin	Yes	Frankfurt		HTTP	80

5.3.12.2 Listeners

LB Name	Backend Set Name	Hostname	SSL	Listener Name	Protocol	Port	Region
lbdopprd	lb-dop-bset	https://dop.arg.ae	Yes	Lsn1_dop	HTTPS	443	Dubai
lbdoptst	lb-dop-bset	https://doptst	Yes	Lsn1_dop	HTTPS	443	Dubai
lbdopdr	lb-dop-bset	https://dop.arg.ae	Yes	Lsn1_dop	HTTPS	443	Frankfurt

5.3.13 Databases

Oracle Database Cloud Service: this service offers autonomous and co-managed Oracle Database cloud solutions. Autonomous databases are preconfigured, fully-managed environments that are suitable for either transaction processing or for data warehouse workloads. Co-managed solutions are bare metal, virtual machine, and Exadata DB systems that users can customize with the resources and settings that meet their needs. Oracle Cloud Infrastructure offers single-node DB systems on either bare metal or virtual machines, and 2-node RAC DB systems on virtual machines. Oracle Database instances can be Standard Edition, Enterprise Edition, Enterprise Edition - High Performance and Enterprise Edition - Extreme Performance. Versions available are 11.2, 12.1, 12.2, 18c, 19c and 21c at the time of writing of this document.

5.3.13.1 DBSystem Info

Region	Compartment	Display Name	Shape	Total Node count	DB Software Edition	DB Size GB	Tags
Dubai	ACME-WLS-PRD-CMP	ACMEdbcslytprd1	VM.Standard2.4	1	19c EE	512	
Dubai	ACME-WLS-TST-CMP	ACMEdbcslytt	VM.Standard2	1	19c EE	512	
Frankfurt	ACME-WLS-DR-CMP	ACMEdbcslytdr1	VM.Standard2.4	1	19c EE	512	

5.3.13.2 DBSystem Network

Display Name	Hostname Prefix	Subnet Name	Availability Domain	License Type	Time Zone
ACMEdbcslytprd1	ACMEdbcslytprd1	SB-NONERP-DB-PRV	AD1	BYOL	Asia-Dubai
ACMEdbcslyttst	ACMEdbcslyttst1	SB-TST-DB-PRV	AD1	BYOL	Asia-Dubai
ACMEdbcslytdr1	ACMEdbcslytdr1	SB-DR-DB-PRV	AD1	BYOL	Asia-Dubai

5.3.13.3 Database

Display Name	PDB Name	Workload Type	Database Name	Database Version	Character Set
ACMEdbcslytprd1	pdb1	OLTP/DSS	lytdb	19	AL32UTF8
ACMEdbcslyttst1	pdb1	OLTP/DSS	lytdb	19	AL32UTF8
ACMEdbcslytdr1	pdb1	OLTP/DSS	lytdb	19	AL32UTF8

5.3.14 DR Configurations

5.3.14.1 DB

Dataguard configuration must be configured as:

- ACMEdbcslytprd1: primary database
- ACMEdbcslytdr1: standby database - dataguard Configuration

5.3.14.2 Compute

Oracle Home and Domain Directory must be in sync (rsync scripts, excluding log directories). DR servers (on Frankfurt) should resolve primary site hostnames on themselves so that starting Weblogic does not need any configuration change.

5.3.14.3 File System Service

The required shared filesystem must be synced by rsync script because there is no native replication feature on this service.