

Copyright © 2024, Oracle and/or its affiliates.

Disclaimer

This document contains proprietary information and is protected by copyright and other intellectual property laws. The document may not be modified or altered in any way. Except where your use constitutes "fair use" under copyright law, you may not use, share, download, upload, copy, print, display, perform, reproduce, publish, license, post, transmit, or distribute this document in whole or in part without the express authorization of Oracle.

The information contained in this document is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

Restricted Rights Notice

If this documentation is delivered to the United States Government or anyone using the documentation on behalf of the United States Government, the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software" or "commercial computer software documentation" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

Trademark Notice

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

Intel and Intel Inside 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, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

Third-Party Content, Products, and Services Disclaimer

This documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

1028062024

Table of Contents

14 15 16 18 19 20 21 22
16 18 19 20 21
20 21 22
20 21 22
20 21 22
21 22
23
24
26
27
28
29
30
31
32
34
35
36
38
39
40

Queue Management Operations	41
Message Operations	44
Publish Messages	45
PutMessages – Code Example	46
Consume Messages	47
GetMessages – Code Example	48
Update Message	49
UpdateMessage – Code Example	50
Delete Message	51
DeleteMessage – Code Example	53
OCI Queue Guarantees	54
Service Limits	55
OCI Queue Use Cases	56
Application Decoupling	57
Parallel Processing	
Reliable Message Processing	
Prevent Loss of Messages	64
Strategies for Handling Dead Letter Queue Messages	65
Which Messaging Solution?	66
Messaging Service Options	
Messaging for Microservices Developers	68
Single or Multiple Consumers Per Message	
Cost	
Comparison Considerations	71
Maximum Message Size and Volume	72
Message Volume	
Message Size	
Message Retention	
Guaranteed Ordering Oracle Cloud Infrastructure Developer Professional (2024): Hands-on Workshop 4	

Guaranteed Ordering -Queue	77
Guaranteed Ordering -Streaming	79
Input and Output Support Protocols	8o
Queue vs Streaming	81
Demo: OCI Queue	
Exploring OCI Queue	83
Deploy a microservice into Kubernetes to process messages from OCI Queue	84
Module 7: Serverless Events	
Fundamental Concepts	
Overview	87
Using Events vs. Explicit Polling	91
OCI Events Service Concepts	92
An Example of OCI Events Service in Action	93
Summary	94
Event Messages and Event Types	
What is an Event?	
What does an Event look like?	97
Services That Produce Events	0.0
OCI Service Event Types	99
Summary	
Rule Actions	101
Rule Action Destinations	102
Streaming Service	
Streaming Service: Creating a Stream	104
Rule Action Type: Streaming	
Oracle Functions	
Oracle Functions:Creating a Function	
Rule Action Type: Functions	108

Notifications Service	109
Notifications Service:Creating a Topic	110
Rule Action Type: Notifications	
Summary	112
Actions Demo	113
Working with Rules	
What are Rules?	
Typical Rule Design Workflow	116
Creating Rules	117
Configuring Rules in the OCI Console	118
Rule Design Considerations	119
Rule Metrics	121
Summary	122
Rules Demo	123
Events Use Cases	
Example High-Level Use Cases	
Automating Log Security Analysis	
Event-Driven Infrastructure-as-Code	
Automating Corporate Security Policy Checks	129
Triggering an OIC Integration via OCI Events	130
Integrating Oracle Cloud Guard with External Systems	131
OCI Events with ERP Cloud, APEX and ORDS	
Event-Driven Design Patterns	135
Module 8: API Management	136
Introduction to API Management	137
Agenda	
Introduction to API Management	
What is an API?	140

Elements of an API	142
What is an API Gateway?	145
Oracle Cloud Infrastructure API Gateway	
Networking and Security Policies	148
Networking	149
Policies	150
Demo	
Creating an API	152
Prototyping an API	
Create and Prototype an API	155
Demo	156
Validating API Requests	157
Path Routing	158
Path Parameters	159
Wildcards	
Demo	
Authorizing Requests	
Generic OAuth Flow	164
JWT Validation in API Gateway	
Demo	166
Using Context Variables	
Context	
Transforming API Requests and Responses	169
Transforming Requests	
Transforming Responses	
Transforming API Requests and Responses Transforming Requests Transforming Responses Demo	172
Dynamic Authentication	173
Overview of API authorization	
Dynamic Authentication	
D	4-6
Demo Oracle Cloud Infrastructure Developer Professional (2024): Hands-on	Workshop /

Dynamic Routing	177
Dynamic Authentication	178
Demo	179
Monitoring APIs	180
Monitoring	181
Demo	182
Module 9: Testing & Securing Cloud Native Applications	183
Cloud Native Testing Overview	184
Cloud Native Testing	185
Measures for Cloud Native Application	186
Cloud Native Testing Strategies	187
Strategies for Testing Cloud Native Applications	188
Testing for Unknown Unknowns in Cloud Native	
OCI Vault: Introduction	191
OCI Vault	192
Vaults	193
Keys	194
Master and Data Encryption Keys	195
Master Encryption Keys: Protection Modes	197
Wrapping Keys	
Rotating Keys	
OCI Vault: Integration with OCI Services	
OCI Services Integration with Vault	
Encryption Using Oracle-Managed Keys	
Encryption Using Customer-Managed Keys	203
Example: OCI Object Storage Integration with Vault	204
OCI Vault: Secrets	205
What are Secrets? Oracle Cloud Infrastructure Developer Professional (2024): Hands-on Workshop 8	206

Secrets	207
Secret Rules	209
Using Secrets	210
Image Security Enhancing Container Image Security using Signing and Securing	214
Enhancing Container Image Security using Signing and Scanning	215
Container Image Signing	217
Use Image Digests Instead of Tags	223
Container Image Scanning	224
Viewing Scan Results	_
OKE: Container Image Security	226
Container images must have the following characteristics:	227
Security First	228
Container images must have the following characteristics:	229
Unaltered Integrity	
Container images must have the following characteristics:	
Trusted Sources	232
Demo: Scanning Container Image for Vulnerabilities	233
Demo: Sign and Verify Container Image for Security	235
Enforcing the Use of Signed Images from OCIR	
Enforcing the Use of Signed Images from OCIR	.
IAM Policies for Enforcing the Use of Signed Images from OCIR	
Demo: Enforcing the Use of Signed Images from OCIR	
Function Container Permissions	
Understanding Limited Permissions Granted to Function Containers	
OCI Certificates Integration	
Using OCI Certificates with API Gateway	
Custom Trust Store	249
Customizing Trust Stores for TLS Certificate Verification Oracle Cloud Infrastructure Developer Professional (2024): Hands-on Workshop 9	250

Customizing the Trust Store	251
Mutual TLS (mTLS) Support	252
mTLSAuthentication	252
Adding mTLSSupport to API Deployments	254
Adding mTLS Support to API Deployments	
Module 10: Monitoring & Troubleshooting Cloud Native Applications	
Overview	257
Key Services	258
Module Lessons and Demos	259
Monitoring	268
Monitoring Service	269
Metrics	270
Alarms	271
Logging Service	272
OCI Logging Service	273
Log Groups	274
Logging Concepts	275
Types of Logs	276
Searching Logs	277
Viewing Audit Log Events	278
IAM Policies Required	279
Service Flow	280
Demo: Functions Metrics & Logs	281
Metrics & Logs for Oracle Functions	282
Demo: API Gateway Metrics & Logs	283
Metrics & Logs for API Gateway	284
Demo: OKE Cluster Metrics & Logs	285
Metrics & Logs for OKE Oracle Cloud Infrastructure Developer Professional (2024): Hands-on Workshop 10	286
Oracie Cioud Infrastructure Developer Professional (2024): Hands-on Workshop 10	

Application Log Management	287
Application Log Management	288
Application Performance Monitoring	289
Application Performance	290
Features	291
Demo: Oracle Functions Tracing	295
Tracing Oracle Functions With The ApplicationPerformance Monitoring (APM) Service	
Demo: Microservice Application Distributed Tracing	297
OCI Application Performance Monitoring Service (APM)	298
Distributed Tracing with APM Demo	301
Demo: Debugging Container Applications in OKE	302
Debugging OKE Cluster Applications with Rookout	303
Module 11: OCI Service Mesh	304
OCI Service Mesh Overview	305
Scenario	306
What is OCI Service Mesh	314
How Service Mesh Works	315
Features and Benefits of OCI Service Mesh	316
Features of OCI Service Mesh	317
Benefits of OCI Service Mesh	318
What Organizations can Benefit from OCI Service Mesh?	319
Service Mesh Architecture and Concepts	320
Service Mesh Overview	321
Service Mesh Architecture	322
Service Mesh Hierarchy	324
OCI Service Mesh resources – Service Mesh	325
OCI Service Mesh Resources – Ingress Gateway	327
OCI Service Mesh Resources – Ingress Gateway Route Table Oracle Cloud Infrastructure Developer Professional (2024): Hands-on Workshop 11	329

OCI Service Mesh Resources – Ingress Gateway Route Table (IGRT)	330
OCI Service Mesh Resources – Virtual Service	
OCI Service Mesh Resources – Virtual Deployment	333
OCI Service Mesh Resources – Virtual Service Route Table	
OCI Service Mesh Resources – Virtual Service Deployment Binding	339
OCI Service Mesh Resources – Ingress Gateway Deployment	
OCI Service Mesh Resources – Access Policy	
Developing Cloud Native Applications using OCI Service Mesh	
Service Mesh Access Policies	
Identity and Access Management (IAM) Policies	348
IAM Policies – Service Mesh	349
IAM Policies – Mesh Virtual Services	350
IAM Policies – Mesh Virtual Services Route Tables	351
IAM Policies – Mesh Virtual Deployments	352
IAM Policies – Mesh Ingress Gateways	353
IAM Policies – Mesh Ingress Gateway Route Tables	354
IAM Policies – Mesh Access Policies	355
IAM Policies – Mesh Work Requests	356
Policy Examples	357
Dynamic Group Rules	358
Policies for the BookStore Application	359
Using OCI Service Mesh to Deploy Cloud Native Application	360
Demo: Setup and Configure OCI Service Mesh to the Application Deployed on OKE	361
Bookinfo Application- Service Mesh Architecture	
Using OCI Service Mesh to Deploy Cloud Native Application	363