

The background features several abstract, organic shapes. On the left, a large, textured, brownish-grey shape resembles a cloud or a stylized wave. To its right, there are smaller, more fluid shapes in teal and red, also with a textured, brush-stroke-like appearance. Scattered throughout the background are small, horizontal orange and yellow dashes and lines, some of which are grouped together in the upper right and lower right areas.

ORACLE

OCI Load Balancing Service (LBaaS)

Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

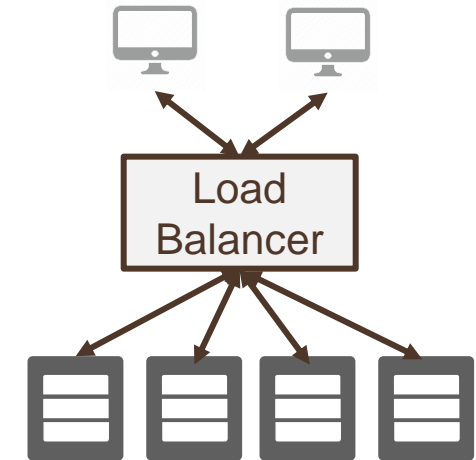
Basic Concepts

A load balancer sits between the clients and the backends performs tasks such as:

- **Service Discovery:** What backends are available in the system? How should the load balancer talk to them?
- **Health Check:** What backends are currently healthy and available to accept requests?
- **Algorithm:** What algorithm should be used to balance individual requests across the healthy backends?

Load Balancer benefits

- **Fault tolerance and HA:** using health check + LB algorithms, a LB can effectively route around a bad or overloaded backend
- **Scale:** LB maximizes throughput, minimizes response time, and avoids overload of any single resource
- **Naming abstraction:** name resolution can be delegated to the LB



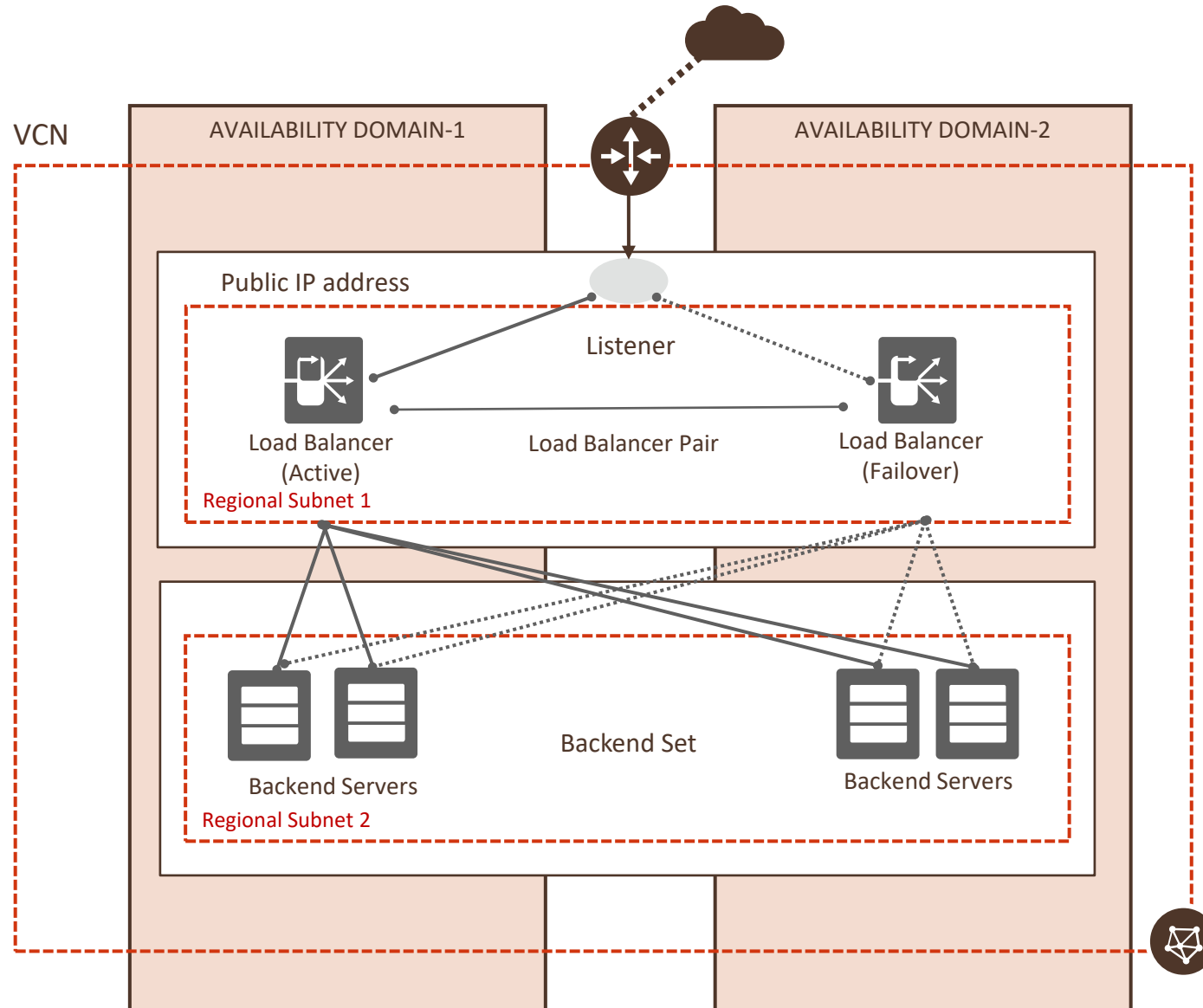
OCI Load Balancing Service

- Load Balancer as-a-service, provides scale and HA
- Public and Private Load Balancer options
- Supported Protocols – TCP, HTTP/1.0, HTTP/1.1, HTTP/2, WebSocket
- Supports ***frontend SSL backend SSL point-to-point SSL***
- Supports advanced features such as session persistence and policy routing
- Flexible Load Balancing
- Flexible Network Load Balancer
- Key differentiators
 - Private or Public Load Balancer (with Public IP address)
 - Dynamic bandwidth and/or 100 Mbps, 400 Mbps, 8 Gbps size
 - Flexible shaping, OCI Load Balancer automatically adjust bandwidth

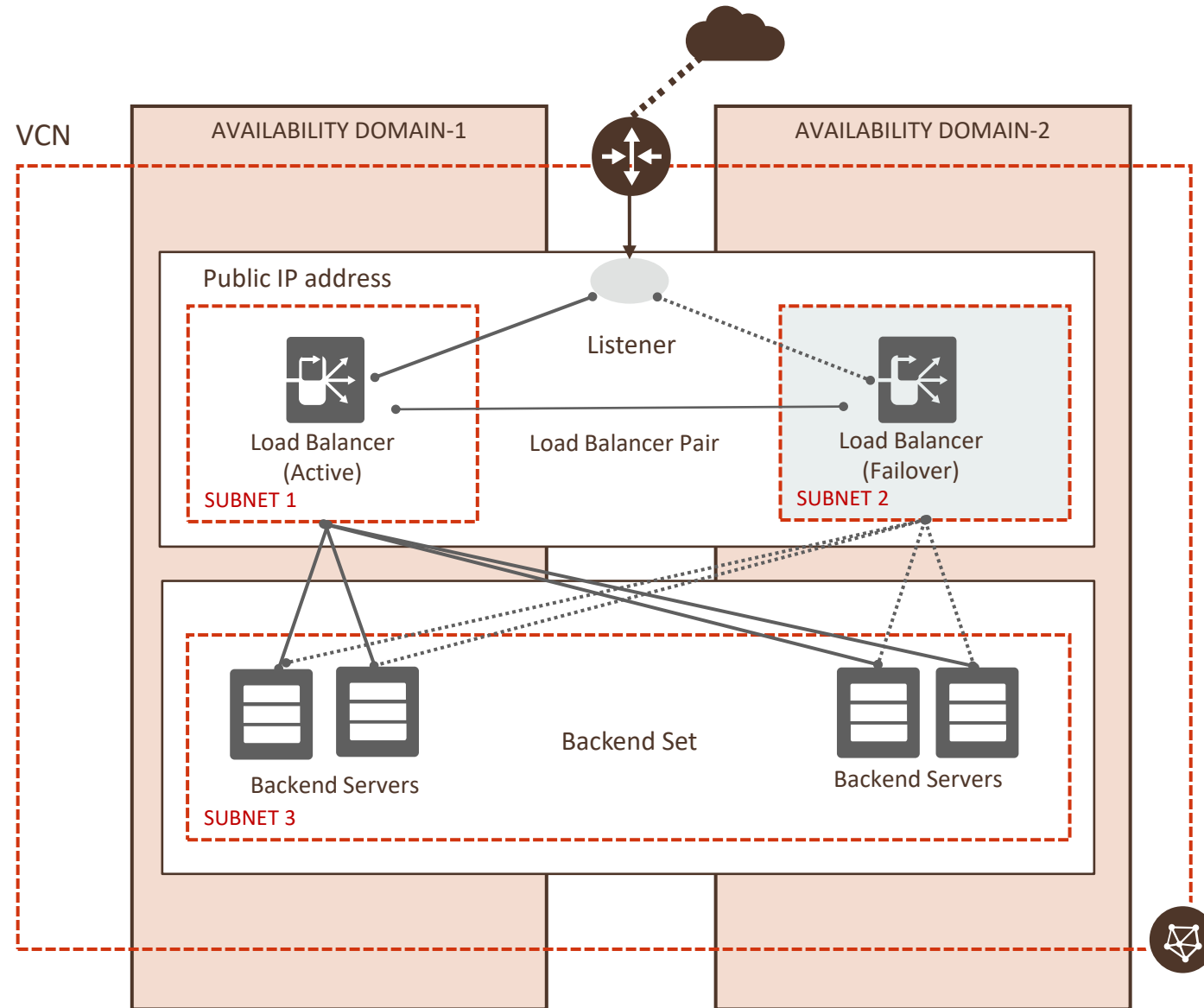
Public Load Balancer

- Accepts traffic from the internet using a public IP address that serves as the entry point for incoming traffic
- Public Load Balancer is a **regional service**
- If your region includes multiple availability domains, a public load balancer requires either a **regional subnet (recommended)** or **two availability domain-specific (AD-specific) subnets**, each in a separate availability domain.
- Load Balancing service creates a primary load balancer and a standby load balancer, each in a different availability domain
- Supports AD failover in the event of an AD outage in an Oracle Cloud Infrastructure multi-AD region
- Floating Public IP is attached to the primary load balancer, and in the event of an AD outage Floating Public IP is attached to the standby load balancer
- Service treats the two load balancers as equally you cannot denote one as "primary"

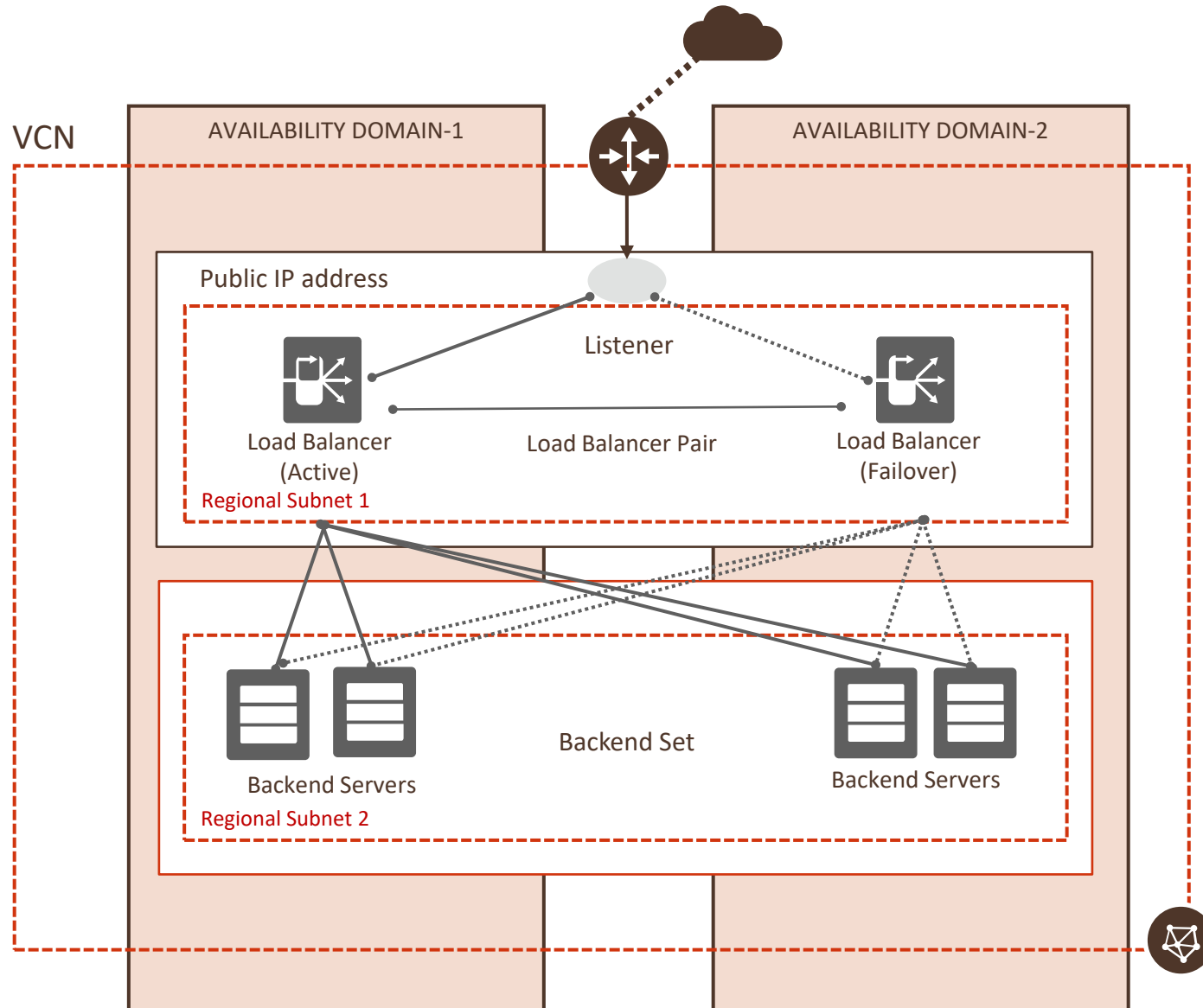
Public Load Balancer (Regional Subnets - recommended)



Public Load Balancer (AD Specific Subnets)



Concepts - Public Load Balancer



- **Load Balancing Policy** – tells the load balancer how to distribute incoming traffic to the backend servers
 - round-robin
 - IP hash
 - least connection
- **Backend Server** – application server responsible for generating content in reply to the incoming TCP or HTTP traffic
- **Health Checks** – a test to confirm the availability of backend servers; supports
 - TCP-level
 - UDP-level
 - HTTP-level health checks
- **Backend Set** – logical entity defined by a list of backend servers, a load balancing policy, and a health check policy
- **Listener** – entity that checks for incoming traffic on the load balancer's IP address

Private Load Balancer

- Assigned a private IP address from the subnet hosting the load balancer
- The load balancer can be regional or AD-specific, depending on the scope of the host subnet; highly-available within an AD with AD specific subnets or Highly available with regional subnets
- The primary and standby load balancer each require a private IP address from that subnet
- The load balancer is accessible only from within the VCN that contains the associated subnet, or as further restricted by your security list rules

Dynamic Change of LB Shapes

OCI Standard Load Balancer

OCI launched Dynamic Change of Shapes, where customers can switch between shape options on their LB instance at runtime

Customer can switch between bandwidth shapes without having to create a new LB as a workaround

10 Mbps 100 Mbps 400 Mbps 8,000 Mbps shapes

The screenshot displays the Oracle Cloud Infrastructure console interface. The main page shows the details of a Load Balancer named 'lb_w3' in the 'Germany Central (Frankfurt)' region. The load balancer is currently in an 'ACTIVE' state. The 'Load Balancer Information' section lists the following details:

- OCID:** ...oyarra
- Created:** Wed, Jun 16, 2021, 11:03:03 UTC
- Shape:** Flexible
- Min Bandwidth:** 10 Mbps
- Max Bandwidth:** 100 Mbps
- IP Address:** 129.159.206.174 (Public)
- Virtual Cloud Network:** w3
- Subnet:** lb_sub
- Network Security Groups:** None
- Type:** Load Balancer

The 'Update Shape' dialog is open, showing the current shape configuration and the option to update it. The dialog includes a warning message: 'All existing connections to this load balancer will be reset during the update process and may take up to a minute, leading to potential connection loss. Learn more about changing shapes.' The dialog also features a 'Save Changes' button and a 'Cancel' button.

Overall Health: OK

Backend Services: 0 Critical, 0 Warning, 0 Incomplete, 0 Pending, 1 OK

Terms of Use and Privacy | Preference sui cookie

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Flexible Load Balancer

OCI Standard Load Balancer

Customer just defines the minimum and maximum bandwidth

- Minimum bandwidth provides instant readiness for load
- Maximum bandwidth allows control of maximum cost
- Customer pays a minimal base cost for the load balancer and then pays a simple single rate for the larger of the reserved bandwidth or the maximum bandwidth actually used each minute

Oracle Cloud Infrastructure | Sign in | Load Balancers | Oracle Cloud Infrastructure | console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers

ORACLE Cloud Search for resources, services, and documentation Germany Central (Frankfurt) Help

Create Load Balancer

- 1 Add Details
- 2 Choose Backends
- 3 Configure Listener

Oracle will generate an IP address for you.

Bandwidth

Shapes
Pick the type and size of bandwidth shape for your load balancer. [Learn more about load balancer shapes.](#)

☒ **Flexible Shapes**
Create a flexible shape size within the minimum and maximum size range you specify.

☐ **Dynamic Shapes**
Choose from one of the available predefined shape sizes.

Choose the minimum bandwidth ⓘ

10 Mbps 10 Mbps 8000 Mbps

Choose the maximum bandwidth *Optional* ⓘ

3962 Mbps 10 Mbps 8000 Mbps

The maximum service limit is currently 4880 Mbps. For more bandwidth, request a service limit increase from the service limits page in the console.

☐ Enable IPv6 Address Assignment

[Next](#) [Cancel](#)

[Terms of Use and Privacy](#) [Preferenze sui cookie](#)

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Load Balancing Policies

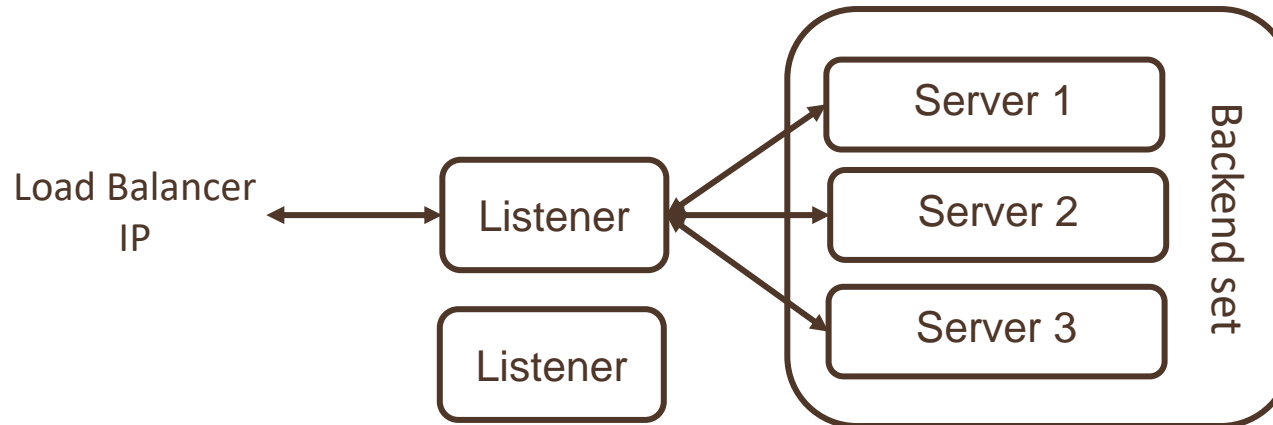
OCI Standard Load Balancer

- **Round Robin:** default policy, distributes incoming traffic sequentially to each server in a backend set. After each server has received a connection, the load balancer repeats the list in the same order.
- **IP Hash:** uses an incoming request's source IP address as a hashing key to route non-sticky traffic to the same backend server
- **Least Connection:** routes incoming non-sticky request traffic to the backend server with the fewest active connections
- Load balancer policy decisions apply differently to TCP load balancer, cookie-based session persistent HTTP requests (sticky requests), and non-sticky HTTP requests
 - A TCP load balancer considers policy and weight criteria
 - An HTTP load balancer w/ cookie-based session persistence forwards requests using cookie's session info
 - For non-sticky HTTP requests, the load balancer applies policy and weight criteria

Health Check

OCI Standard Load Balancer

- Health check is a test to confirm the availability of backend servers. Health Check is activated for
 - Backends
 - Backend set
 - Overall Load Balancer
- A load balancer IP can have up to 16 listeners (port numbers). Each listener has a backend set that can have 1 to N backend servers



- Health API provides a 4-state health status (ok, warning, critical, unknown)
- Health status is updated every three minutes

Health Check

OCI Standard Load Balancer

Load Balancers | Oracle Cloud Int

https://console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers/ocid1.loadbalancer.oc1.eu-frankfurt-1.aaaaaaaakiqg4yeegemttswjtd3fkmv7kb73ka5w4trxid5b4...

Are you a Developer using the OCI SDK? If so, please fill out our survey to help us make the OCI SDK better for you. [Take the survey](#)

ORACLE Cloud

Search for resources, services, and documentation

Germany Central (Frankfurt)

Networking » Load Balancers » Load Balancer Details

LB

ACTIVE

lb_w3

Update Shape

Move Resource

Add Tags

Terminate

Load Balancer Information

Tags

Load Balancer Information

OCID: ...oyarra

Show

Copy

Created: Wed, Jun 16, 2021, 11:03:03 UTC

Shape: Flexible

Min Bandwidth: 10 Mbps

Max Bandwidth: 100 Mbps

IP Address: 129.159.206.174 (Public)

Virtual Cloud Network: w3

Subnet: lb_sub

Network Security Groups: None

Edit

Type: Load Balancer

Traffic between this load balancer and its backend servers is subject to the governing security lists and network security groups.

Overall Health

OK

Backend Sets Health

0

Critical

0

Warning

0

Incomplete

0

Pending

1

OK

Terms of Use and Privacy

Cookie Preferences

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Request Routing

- Each HTTP request is evaluated against the rules.
- The rules are run in the order that is defined in the policy.
- Each rule has at least one condition and a backend set.
- If the HTTP request condition matches a rule, the request is forwarded to the backend set defined for the rule. The other rules in the policy are skipped and the request is not evaluated against them

Load Balancers | Oracle Cloud

console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers/ocid1.loadbalancer.oc1.eu-frankfurt-1.aaaaaaakigg4yeeemttswjtd3fkmv7kb73ka5wt4nsid5b4efshzoyarra/routing-policies/w3route

ORACLE Cloud

Germany Central (Frankfurt)

Search for resources, services, and documentation

Networking » Load Balancers » Load Balancer Details » Routing Policies » Routing Policy Details

RP

W3route

Edit Delete

Routing Policy Information

Load Balancer: lb_w3

Resources

Routing Policy Rules (2)

Routing Policy Rules

Order	Name	Conditions	Backend Set
1	rule1	1	bs_lb_2021-0616-1256
2	rule2	1	bs_lb_2021-0616-1256

Showing 2 items < 1 of 1 >

OCI Standard Load Balancer

Load Balancers | Oracle Cloud

console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers/ocid1.loadbalancer.oc1.eu-frankfurt-1.aaaaaaakigg4yeeemttswjtd3fkmv7kb73ka5wt4nsid5b4efshzoyarra/routing-policies

ORACLE Cloud

Germany Central (Frankfurt)

Search for resources, services, and documentation

Create Routing Policy

1 Configure Rules

2 Set Order

Name

rule_w3

Conditions

When the following conditions are met...

If All Match

Condition Type

Path

Operator

Is

URL String

/w3/app

+ Another Condition

Action

Then perform the following action:

Route to Backend Set

Select a backendset where the traffic will be routed for the conditions

Backend Set

Next

Cancel

Load Balancers | Oracle Cloud

console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers/ocid1.loadbalancer.oc1.eu-frankfurt-1.aaaaaaakigg4yeeemttswjtd3fkmv7kb73ka5wt4nsid5b4efshzoyarra/routing-policies

ORACLE Cloud

Germany Central (Frankfurt)

Search for resources, services, and documentation

Create Routing Policy

1 Configure Rules

2 Set Order

Order	Name	Conditions	Backend Set	Change Order
1	rule1	1	bs_lb_2021-0616-1256	Reorder
2	rule2	1	bs_lb_2021-0616-1256	Reorder

Showing 2 items < 1 of 1 >

Previous

Create Routing Policy

Cancel

Terms of Use and Privacy

Preference sui cookie

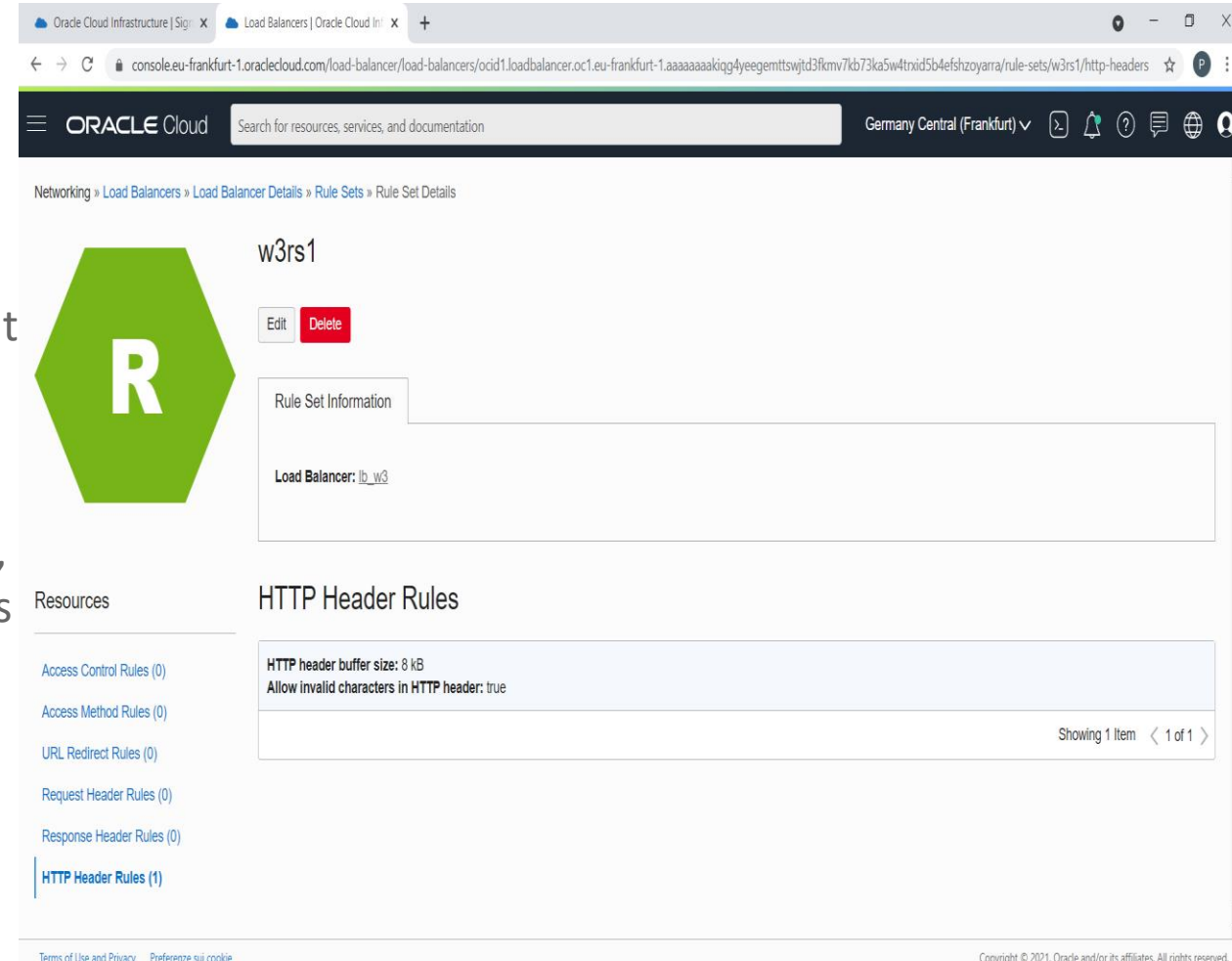
Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Rule Set

OCI Standard Load Balancer

A rule set is a named set of rules associated with a load balancer and applied to one or more listeners on that load balancer

- Access control rules restrict access to application resources based on the source of the request.
- Access method rules specify the permitted HTTP methods.
- URL redirect rules route incoming HTTP requests to a different destination URL.
- Request and response header rules, which add, alter, or remove HTTP request or response headers.
- HTTP header rules, which specify the size of the HTTP header, enlarge header and whether period and underscore characters are permitted within the headers.



The screenshot displays the Oracle Cloud console interface for a Rule Set. The breadcrumb navigation shows the path: Networking » Load Balancers » Load Balancer Details » Rule Sets » Rule Set Details. The main content area features a green hexagonal icon with a white 'R' on the left. To its right, the Rule Set name 'w3rs1' is displayed, along with 'Edit' and 'Delete' buttons. Below this, a 'Rule Set Information' section shows the 'Load Balancer' as 'lb_w3'. A 'Resources' sidebar on the left lists various rule categories: Access Control Rules (0), Access Method Rules (0), URL Redirect Rules (0), Request Header Rules (0), Response Header Rules (0), and HTTP Header Rules (1). The 'HTTP Header Rules' section is expanded, showing a table with one rule: 'HTTP header buffer size: 8 kB' and 'Allow invalid characters in HTTP header: true'. The bottom of the console shows 'Showing 1 Item' and navigation arrows.



SSL Handling

OCI Standard Load Balancer

Terminate SSL at the load balancer. This configuration is *frontend SSL*. Your load balancer can accept encrypted traffic from a client. No encryption of traffic exists between the load balancer and the backend servers.

Implement SSL between the load balancer and your backend servers. This configuration is *backend SSL*. Your load balancer does not accept encrypted traffic from client servers. Traffic between the load balancer and the backend servers is encrypted.

Implement point-to-point SSL. Your load balancer can accept SSL encrypted traffic from clients and encrypts traffic to the backend servers.

To use SSL with your load balancer, you must add one or more certificate bundles to your system.

Oracle Cloud Infrastructure accepts x.509 type certificates in PEM format only.

The screenshot displays the Oracle Cloud console interface. The top navigation bar includes the Oracle Cloud logo, a search bar, and the region 'Germany Central (Frankfurt)'. The left sidebar shows a 'Resources' menu with options like Metrics, Logs, Backend Sets, Routing Policies, Rule Sets, Listeners (1), Cipher Suites, Certificates, Hostnames, Path Route Sets, and Work Requests. The main content area is titled 'Create Listener' and contains the following fields and instructions:

- Name:** A text input field containing 'w3https'.
- Protocol:** A dropdown menu set to 'HTTPS'.
- Port:** A text input field containing '443'.
- Use SSL:** A checkbox that is checked.
- Backend Set:** A dropdown menu set to 'bs_lb_2021-0616-1256'.
- Idle Timeout In Seconds:** An optional text input field.
- Routing Policy:** An optional dropdown menu.

Below the fields, there are instructions: 'To allow your load balancer to accept ingress traffic, specify the protocol and port for your public IP address.' and 'There are no certificates for this load balancer. Add a certificate.' and 'There are no hostnames for this load balancer. Create a hostname.' and 'There are no path route sets for this load balancer. Create a path route set.' At the bottom, there are 'Create Listener' and 'Cancel' buttons.

Session Persistence

Session persistence is a feature that can be configured and enabled on the level of a backend set. For each backend set, two parameters are set to control it:

- **Cookie name:** the name of a cookie, or a match-all pattern, that will be set in the response from the backend server to request session persistence, application or lb generated
- **Fallback:** a boolean value that controls how OCI LB handles session persisted requests in case the original backing server isn't available
false: the load balancer fails the request and returns an HTTP 502 code

OCI Standard Load Balancer

The screenshot shows the 'Create Load Balancer' page in the OCI console, specifically the 'Session Persistence' tab. The page is part of the 'Load Balancers | Oracle Cloud' section. The breadcrumb trail indicates the path: 'Load Balancers | Oracle Cloud | Create Load Balancer'. The page has a sidebar with 'ORACLE Cloud' and a search bar. The main content area shows the 'Create Load Balancer' form with tabs for 'Backend Set Name', 'Security List', 'Session Persistence', and 'SSL Policy'. The 'Session Persistence' tab is active, showing options to enable or disable session persistence. The 'Enable load balancer cookie persistence' option is selected. Below this, there is a 'Cookie Name' field with a placeholder 'Optional' and a note 'If blank, the default cookie name is X-Oracle-6MC-LBS-Route'. There is also a 'Fallback' checkbox labeled 'Disable Fallback' with a note 'Disable fallback to other servers when the original server is unavailable'. At the bottom, there is a 'Domain Name' field with a placeholder 'Optional' and a note 'Specify the domain in which the cookie is valid'. The page has a 'Previous' button, a 'Next' button, and a 'Cancel' button. The footer contains 'Terms of Use and Privacy', 'Cookie Preferences', and a copyright notice 'Copyright © 2021, Oracle and/or its affiliates. All rights reserved.'

Load Balancers | Oracle Cloud | Create Load Balancer

Are you a Developer using the OCI SDK? If so, please fill out our survey to help us make the OCI SDK better for you. [Take the survey](#)

ORACLE Cloud Search for resources, services, and documentation Germany Central (Frankfurt) Help

Create Load Balancer

[Add Details](#) [Hide Advanced Options](#)

2 Choose Backends [Configure Listener](#)

Backend Set Name Security List **Session Persistence** SSL Policy

To enable cookie-based session persistence, specify whether the cookie is generated by your application server or by the load balancer. Learn more about [session persistence](#).

☐ Disable Session Persistence

☐ Enable application cookie persistence

☒ Enable load balancer cookie persistence

Cookie Name *Optional*

If blank, the default cookie name is X-Oracle-6MC-LBS-Route.

☐ Disable Fallback
Disable fallback to other servers when the original server is unavailable.

Domain Name *Optional*

Specify the domain in which the cookie is valid.

Path: Optional

[Terms of Use and Privacy](#) [Cookie Preferences](#) Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Logging

OCI Standard Load Balancer

Load Balancers | Oracle Cloud Inf

+

← → ↺

console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers/ocid1.loadbalancer.oc1.eu-frankfurt-1.aaaaaaaakiqg4yeegemttswjtd3fkmv7kb73ka5w4trxid5b4efshzoyarra/load-balancer-logs

☆ P

ORACLE Cloud

Search for resources, services, and documentation

Germany Central (Frankfurt)

Shape: Flexible

Min Bandwidth: 10 Mbps

Max Bandwidth: 100 Mbps

IP Address: 129.159.206.174 (Public)

Virtual Cloud Network: [w3](#)

Subnet: [lb_sub](#)

Network Security Groups: *None* [Edit](#)

Type: Load Balancer

Traffic between this load balancer and its backend servers is subject to the governing security lists and network security groups.

[Learn more about load balancers and security lists.](#)

Backend Sets Health

0

Critical

0

Warning

0

Incomplete

0

Pending

1

OK

Resources

Metrics

Logs

Backend Sets (1)

Routing Policies (1)

Rule Sets (0)

Listeners (1)

Logs

Category	Status	Log Name	Log Group	Enable Log
Access Logs	<div>● Active</div>	lb_w3_access	Default_Group	<div><div></div>Enabled</div>
Error Logs	<div>● Active</div>	lb_w3_error	Default_Group	<div><div></div>Enabled</div>

Showing 2 Items

Terms of Use and Privacy

Preferenze sui cookie

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

https://docs.oracle.com/en-us/iaas/Content/Balance/Reference/troubleshooting_load_balancer.htm



General Metrics for LB

OCI Standard Load Balancer

Load Balancers | Oracle Cloud Inf

+

console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers/ocid1.loadbalancer.oc1.eu-frankfurt-1.aaaaaaaakiqg4yeegemttswjtd3fkmv7kb73ka5w4trxid5b4efshzoyarra/metrics

ORACLE Cloud

Search for resources, services, and documentation

Germany Central (Frankfurt)

>

🔔

?

💬

🌐

👤

Virtual Cloud Network: [w3](#)

Subnet: [lb_sub](#)

Network Security Groups: [None](#) [Edit](#)

Type: Load Balancer

Traffic between this load balancer and its backend servers is subject to the governing security lists and network security groups.

[Learn more about load balancers and security lists.](#)

0 Pending

1 OK

Resources

Metrics

Logs

Backend Sets (1)

Routing Policies (1)

Rule Sets (0)

Listeners (1)

Cipher Suites (5)

Certificates (0)

Hostnames (0)

11 Metrics

Start time

End time

Quick Selects

Jun 18, 2021 9:54:02 AM

Jun 18, 2021 10:54:02 AM

Last hour

Reset charts

Inbound Requests

Interval: 1 minute

Statistic: Mean

Count

0

1

09:55

10:00

10:05

10:10

10:15

10:20

10:25

10:30

10:35

10:40

10:45

10:50

Options

View Query in Metrics Explorer

Copy Chart URL

Copy Query (MQL)

Create an Alarm on this Query

Table View

Active Connections

Interval: 1 minute

Statistic: Mean

0

1

09:55

10:00

10:05

10:10

10:15

10:20

10:25

10:30

10:35

10:40

10:45

10:50

Options

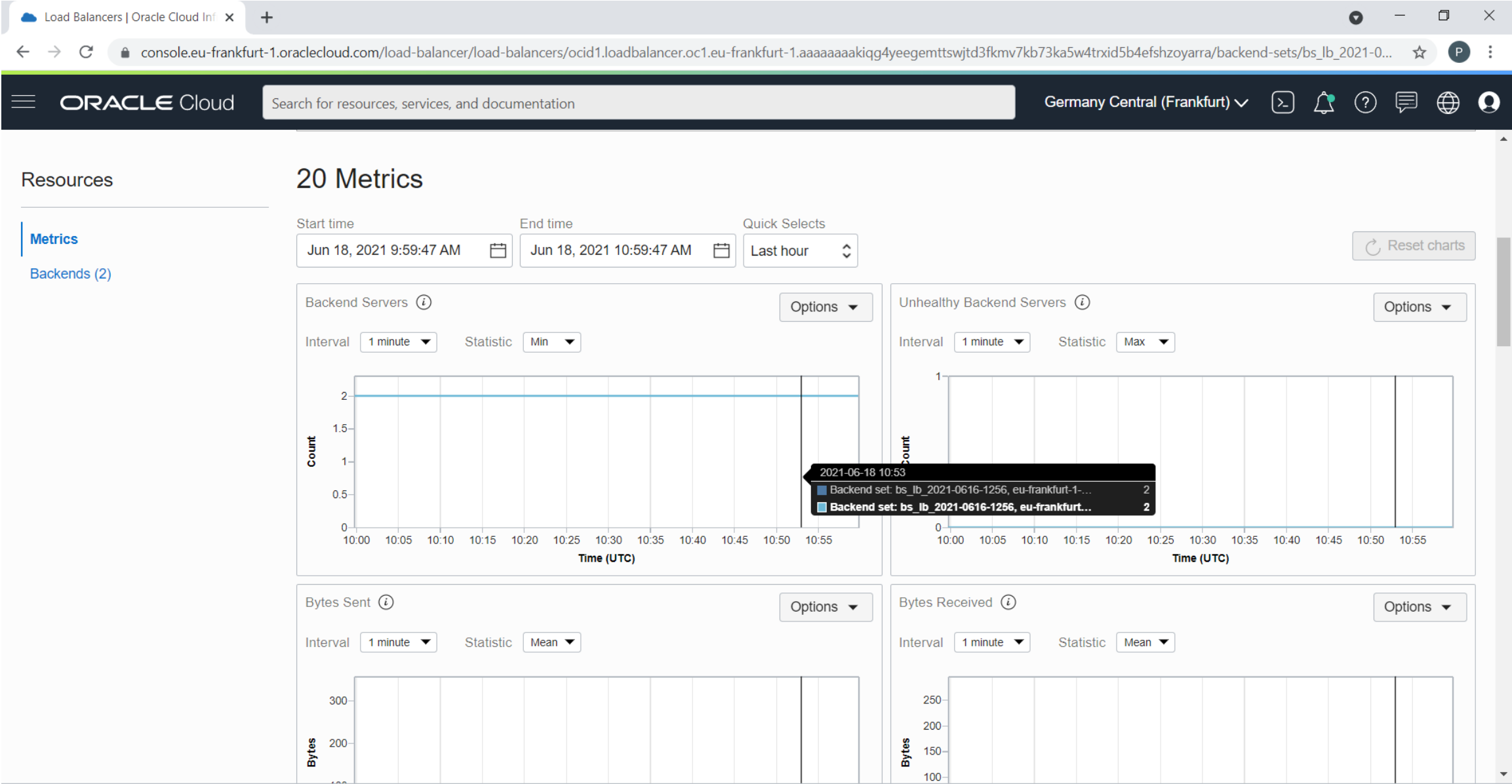
Terms of Use and Privacy

Preference sui cookie

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Metrics for Backend Set

OCI Standard Load Balancer



Network Load Balancer

OCI Network Load Balancer

The Network Load Balancer load balance layer 3 and layer 4 (TCP/UDP/ICMP) workloads

It's designed to handle volatile traffic patterns and millions of flows, offering high throughput while maintaining ultra-low latency.

Ideal load balancing solution for latency-sensitive workloads includes real-time streaming, VoIP, Internet of Things, and trading platforms

The Network Load Balancer is optimized for long-running connections in the order of days or months, which makes it best suited for your database or WebSocket type applications

The Network Load Balancer operates at the connection level and balances incoming client connections to healthy backend with session affinity for udp/tcp a given flow is always forwarded to the same backend for the lifetime of the connection

OCI Flexible Network Load Balancer can be public or private

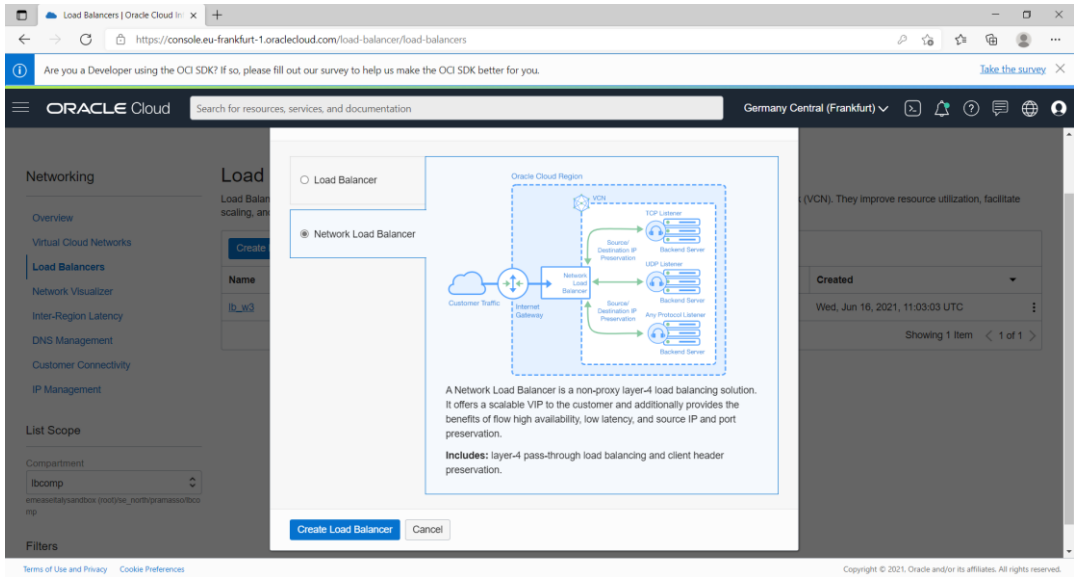
Provides the benefits of flow high availability, source and destination IP addresses, and port preservation



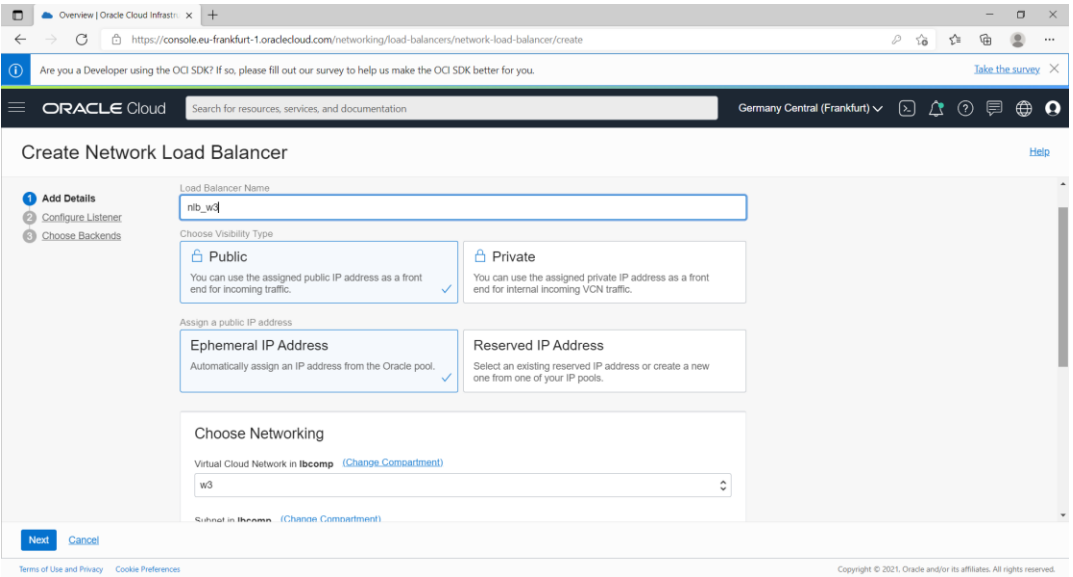
Network Load Balancer Creation Steps

OCI Network Load Balancer

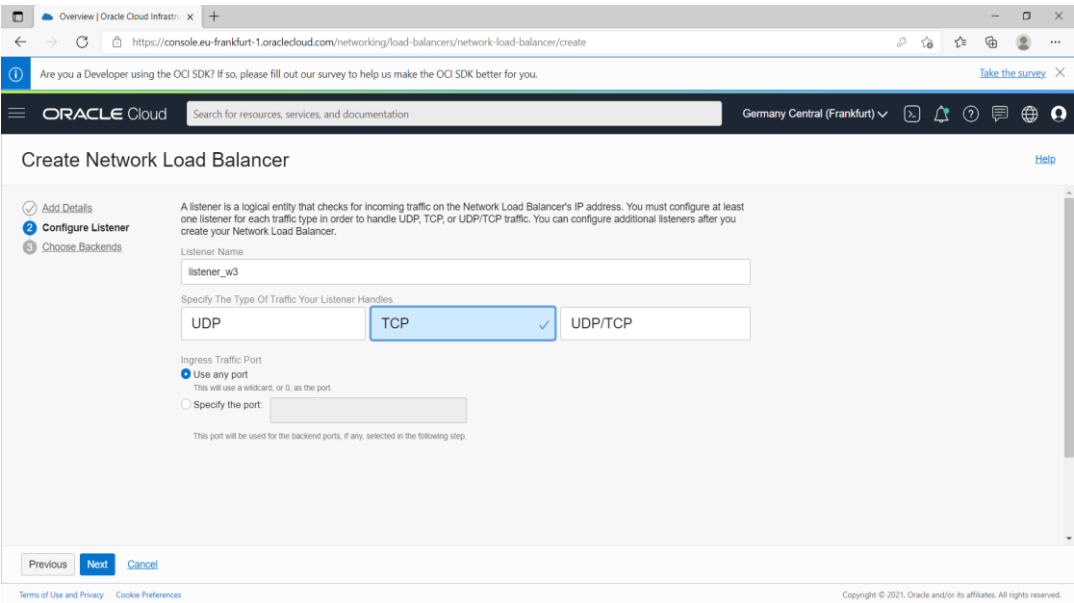
n
l
b



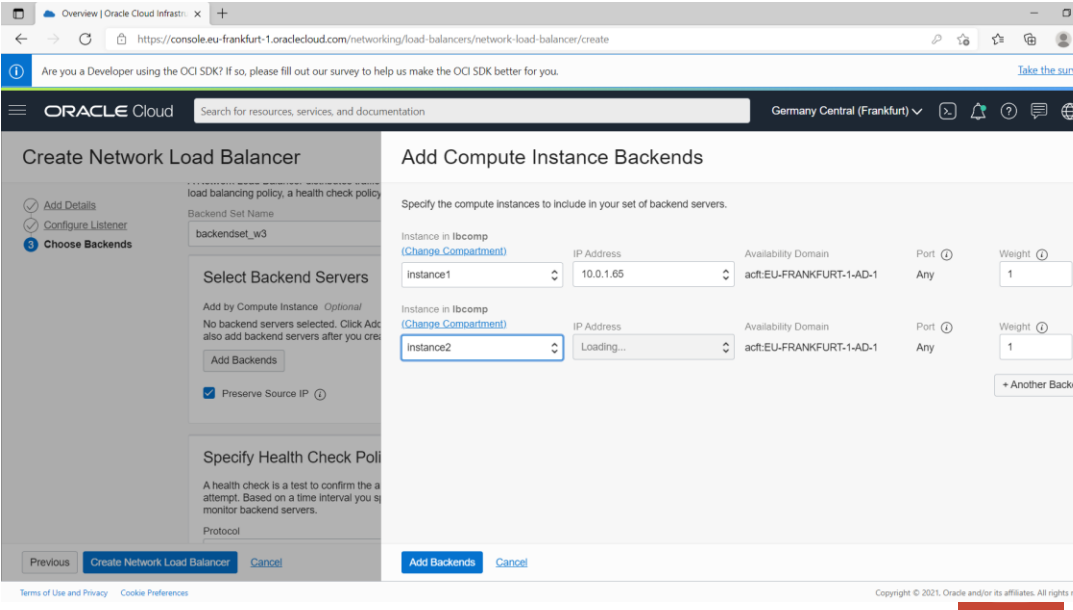
L
i
s
t
e
n
e
r



P
o
r
t
d
e
f
.



b
a
c
k
e
n
d
s



Network Load Balancer (cont.)

OCI Network Load Balancer

- **Protocol:** Required. Select one of the following options:
 - UDP
 - TCP
 - UDP/TCP

Overview | Oracle Cloud Infrastru x

console.eu-frankfurt-1.oraclecloud.com/networking/load-balancers/network-load-balancer/ocid1.networkloadbalancer.oc1.eu-frankfurt-1.amaaaaaa7gvtugaaq6rtr76yabqp wz464mdv2k34l6tb2ex2ckotnl4a6...

ORACLE Cloud

Search for resources, services, and documentation

Germany Central (Frankfurt) v

ACTIVE

Load Balancer Information

OCID: ...4a6x4q Show Copy

Created: Thu, Jun 17, 2021, 07:48:06 UTC

IP Address: 130.61.31.127 (Public)

Subnet: lb_sub

Network Security Groups: None Edit

Type: Network Load Balancer

Overall Health

OK

Backend Set

0 Critical

0 Warning

0 Unknown

1 OK

Traffic between this NLB and the backend set is governed by the governing security list.

Learn more about Network Load Balancers

Resources

Metrics

Backend Sets (1)

Listeners (1)

Work Requests (4)

Listeners

Create Listener

Name	Protocol	Port
listener_w3	TCP	Any

Edit Listener

Help

To allow your Network Load Balancer to accept ingress traffic, specify the protocol and port for your public IP address.

Protocol

TCP

UDP

TCP

UDP/TCP

This port will be used for the backend ports, if any, selected in the following step.

Backend Set

backendset_w3

Save Changes Cancel

Terms of Use and Privacy

Preference sui cookie

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Network Load Balancer (cont.)

- 5-Tuple Hash:** Routes incoming traffic based on 5-Tuple (source IP and port, destination IP and port, protocol) Hash. This is the default network load balancer policy.
- 3-Tuple Hash:** Routes incoming traffic based on 3-Tuple (source IP, destination IP, protocol) Hash.
- 2-Tuple Hash:** Routes incoming traffic based on 2-Tuple (source IP Destination, destination IP) Hash.

The 5-Tuple Hash policy provides session affinity within a given TCP or UDP session, where packets in the same session are directed to the same backend server behind the flexible network load balancer. Use a 3-Tuple or 2-Tuple network load balancing policy to provide session affinity beyond the lifetime of a given session

OCI Network Load Balancer

The screenshot displays the Oracle Cloud Infrastructure console for a Network Load Balancer. The top navigation bar shows the Oracle Cloud logo, a search bar, and the region 'Germany Central (Frankfurt)'. The main content area is titled 'Backend Set Information' and shows the following details:

- Created:** Thu, Jun 17, 2021, 07:48:06 UTC
- Policy:** Five Tuple Hash
- Network Load Balancer:** [nlb_w3](#)
- Source Header (IP, Port) Preservation:** Enabled

The 'Overall Health' section shows a green checkmark and 'OK'. The 'Backends Health' section shows a summary of health status:

Health Status	Count
Critical	0
Warning	0
Unknown	0
OK	2

Below this, a note states: 'Traffic between this Network Load Balancer and its backend servers is subject to the governing security lists and network security groups. Learn more about [Network Load Balancers](#) and [security lists](#).'

The 'Resources' section on the left includes 'Metrics' and 'Backends (2)'. The 'Backends' table lists the following instances:

Name	IP Address	Availability Domain	Port	Weight	Drain	Offline	Health
instance1	10.0.1.65	ad:EU-FRANKFURT-1-AD-1	Any	1	False	False	OK
instance2	10.0.1.214	ad:EU-FRANKFURT-1-AD-1	Any	1	False	False	OK

At the bottom of the console, there are links for 'Terms of Use and Privacy' and 'Preference sui cookie', and a copyright notice: 'Copyright © 2021, Oracle and/or its affiliates. All rights reserved.'

Network Load Balancer (cont.)

OCI Network Load Balancer

Check **Preserve Source IP** to preserve the original source and destination header (IP addresses and ports) of each incoming packet all the way to the backend server

Overview | Oracle Cloud Infrastru x

console.eu-frankfurt-1.oraclecloud.com/networking/load-balancers/network-load-balancer/ocid1.networkloadbalancer.oc1.eu-frankfurt-1.amaaaaaa7gvtugaaq6tr76yabqp wz464mdv2k34l6tb2ex2ckotnl4a6...

ORACLE Cloud

Search for resources, services, and documentation

Germany Central (Frankfurt) v

ACTIVE

Load Balancer Info

OCID: ...4a6x4q Show Copy

Created: Thu, Jun 17, 2021, 07:

IP Address: 130.61.31.127 (Put

Subnet: lb_sub

Network Security Groups: Non

Type: Network Load Balancer

Resources

Metrics

Backend Sets (1)

Listeners (1)

Work Requests (1)

Backend Sets

Create Backend Set

Name

backendset_w3

Edit Backend Set

Specify a set of policies that define how the Network Load Balancer routes ingress traffic to your backend servers.

Updating the backend set temporarily interrupts traffic and may drop active connections.

Specify a Load Balancing Policy

5-Tuple Hash

This policy distributes incoming traffic based on 5-Tuple (source IP and port, destination IP and port, protocol) Hash.

3-Tuple Hash

If enabled, the Network Load Balancer will preserve the source IP of the packet when it is forwarded to backends. Backends will see the original Source IP.

2-Tuple Hash

This policy routes incoming traffic to the same backend server based on 2-Tuple (Source/Destination) Hash.

Source Header (IP, Port) Preservation (Backend Set)

☒ Preserve Source IP

Save Changes Cancel

Terms of Use and Privacy

Preference sui cookie

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Network Load Balancer (cont.)

OCI Network Load Balancer

Weighting affects the proportion of requests directed to each server. For example, a server weighted as 3 receives three times the number of connections as a server weighted as 1

Overview | Oracle Cloud Infrastru x +

console.eu-frankfurt-1.oraclecloud.com/networking/load-balancers/network-load-balancer/ocid1.networkloadbalancer.oc1.eu-frankfurt-1.amaaaaa7gvtugaaq6rtr76yabqp wz464mdv2k34l6tb2ex2ckotnl4a6...

ORACLE Cloud

Search for resources, services, and documentation

Germany Central (Frankfurt) v

ACTIVE

Backend Set Information

Created: Thu, Jun 17, 2021, 07:48:06 UTC

Policy: Five Tuple Hash

Network Load Balancer: [nlb_w3](#)

Source Header (IP, Port) Preservation: Enabled

OK

Backends H

0 Critical

0 Warning

0 Unknown

2 OK

Traffic between this N governing security lis

Learn more about Ne

Resources

Metrics

Backends (2)

Backends

Add Backends

Edit

Delete

	Name	IP Address	Availability Domain	Port
<input type="checkbox"/>	instance2	10.0.1.214	acft:EU-FRANKFURT-1-AD-1	Any
<input type="checkbox"/>	instance1	10.0.1.65	acft:EU-FRANKFURT-1-AD-1	Any

0 Selected

Edit Backend

Help

Specify new traffic management settings for the backend server.

Weight

1

Drain

☐ True

☒ False

Offline

☐ True

☒ False

Backup

☐ True

☒ False

Save Changes

Cancel

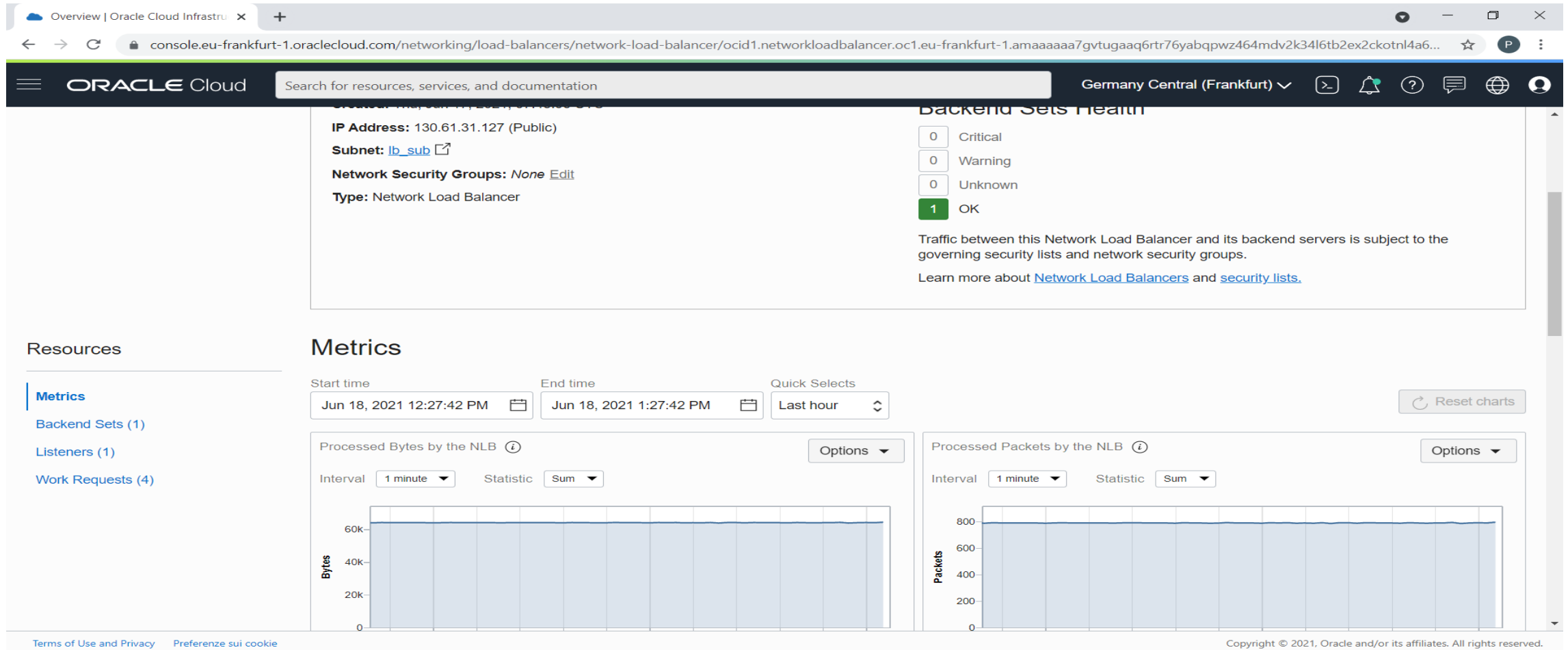
Terms of Use and Privacy

Preferenze sui cookie

Copyright © 2021, Oracle and/or its affiliates. All rights reserved.

Network Load Balancer (cont.)

OCI Network Load Balancer



<https://docs.oracle.com/en-us/iaas/Content/NetworkLoadBalancer/WorkRequests/metrics.htm>

https://docs.oracle.com/en-us/iaas/Content/Network/Concepts/vcn_flow_logs.htm#vcn_flow_logs

Both LB and NLB Summary

Load Balancers | Oracle Cloud Infrastructure

https://console.eu-frankfurt-1.oraclecloud.com/load-balancer/load-balancers

Are you a Developer using the OCI SDK? If so, please fill out our survey to help us make the OCI SDK better for you. [Take the survey](#)

ORACLE Cloud

Search for resources, services, and documentation

Germany Central (Frankfurt)

Networking

Overview

Virtual Cloud Networks

Load Balancers

Network Visualizer

Inter-Region Latency

DNS Management

Customer Connectivity

IP Management

List Scope

Compartment

lbcomp

emeaseitaisandbox (root)/se_north/pramasso/lbcomp

Filters

Terms of Use and Privacy

Cookie Preferences

Load Balancers in lbcomp Compartment

Load Balancers provide automated traffic distribution from one entry point to multiple servers reachable from your virtual cloud network (VCN). They improve resource utilization, facilitate scaling, and help ensure high availability.

Create Load Balancer

Name	Type	State	IP Address	Shape	Overall Health	Created
nlb_w3 Always Free	Network Load Balancer	Active	130.61.31.127 (Public)	—	OK	Thu, Jun 17, 2021, 07:48:06 UTC
lb_w3	Load Balancer	Active	129.159.206.174 (Public)	Flexible	OK	Wed, Jun 16, 2021, 11:03:03 UTC

Showing 2 Items < 1 of 1 >

Oracle Cloud Infrastructure **Load Balancing service** provides automated traffic distribution from one entry point to multiple servers reachable from your virtual cloud network (VCN) to load balance transport Layer 4 and Layer 7 (TCP and HTTP) traffic

Oracle Cloud Infrastructure Flexible **Network Load Balancing service** (Network Load Balancer) provides automated traffic distribution from one entry point to multiple backend servers in your virtual cloud network (VCN). It operates at the connection level and load balances incoming client connections to healthy backend servers based on Layer 3/Layer 4 (IP protocol) data.



Q/A

Thank you

