

# Monitoring

Level 100

# 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.

# Objectives

After completing this lesson, you should be able to:

- Describe the OCI Monitoring Service
- Understand Metrics, Alarms, monitoring query language
- Create a query in the Metrics Explorer and trigger an alarm

# OCI Monitoring Service

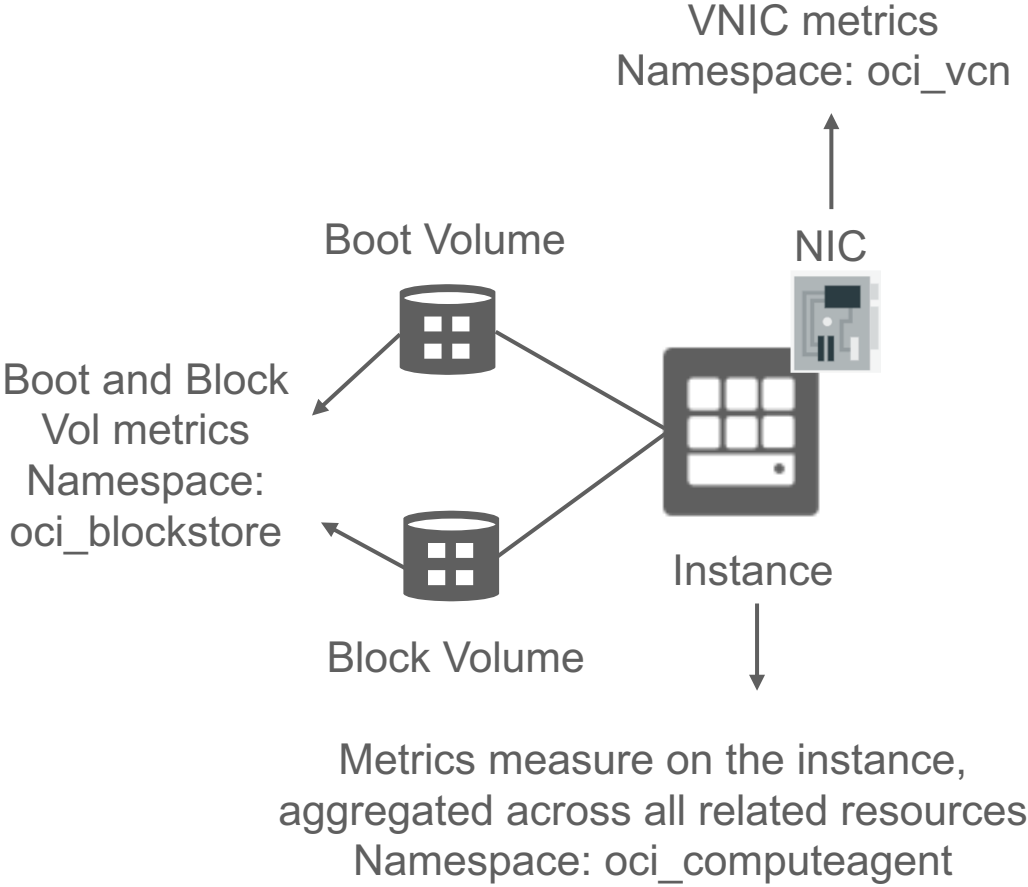
- OCI Monitoring service enables you to monitor your cloud resources
- Currently, supports Metrics and Alarms features
- Current supported services include compute, VCN, Load Balancer, Block and Object storage
- Metrics feature relays metric data about the health, capacity, and performance of your cloud resources
  - Offers a standard set of pre-defined metrics for most common OCI resources
  - Includes advanced Monitoring Query Language (MQL) for deeper insights
  - Supports custom metrics (customer can bring their own metrics)
- Alarms feature to notify you when metrics meet alarm-specified triggers
  - Notifications sent via the OCI Notification service for Email and PagerDuty
- OCI Monitoring service is available via the OCI Console, API, SDK, and Terraform



# Metrics

- Metric: a measurement related to health, capacity, or performance of a given resource. E.g. CpuUtilization metric measures usage of a compute instance
- Metric -> Namespace + Dimension + Metadata
  - Namespace: an indicator of the resource, service, or application that emits the metric. E.g. the CpuUtilization metric lists the metric namespace oci\_computeagent as its source
  - Dimension: a qualifier to filter or group metric data. E.g. dimension name-value pair for filtering by AD: availabilityDomain = "VeBZ:PHX-AD-1"
  - Metadata: A reference provided in a metric definition. E.g. unit (bytes), for oci\_computeagent metricDiskBytesRead (provides additional information for a metric)
- Metric Stream: An individual set of aggregated data for a metric. A stream can be either specific to a single resource or aggregated across all resources in the compartment

# Compute Metrics



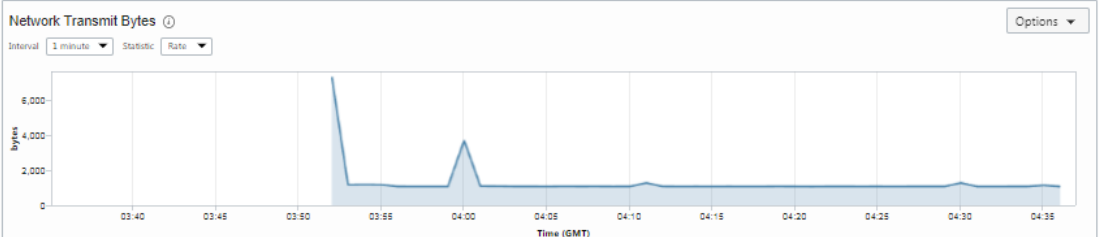
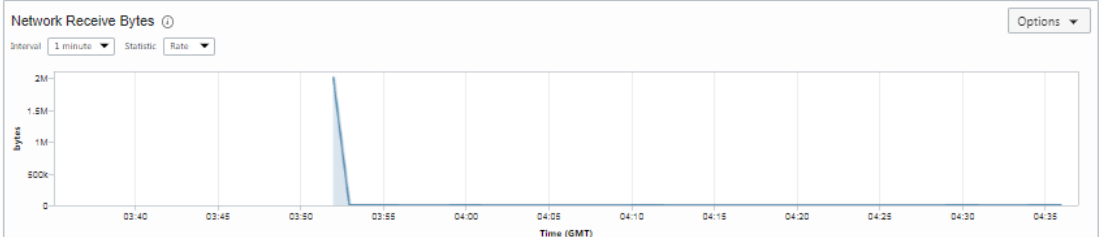
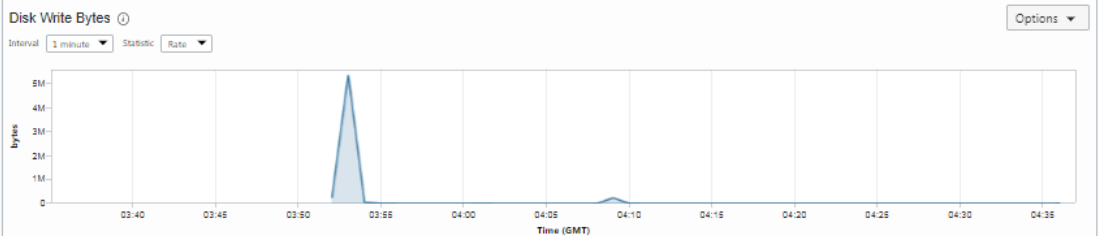
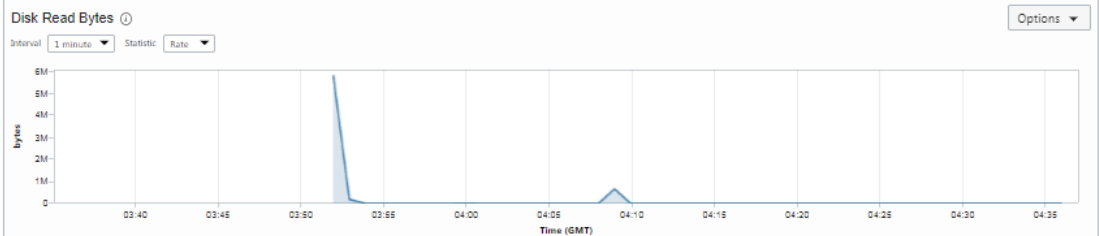
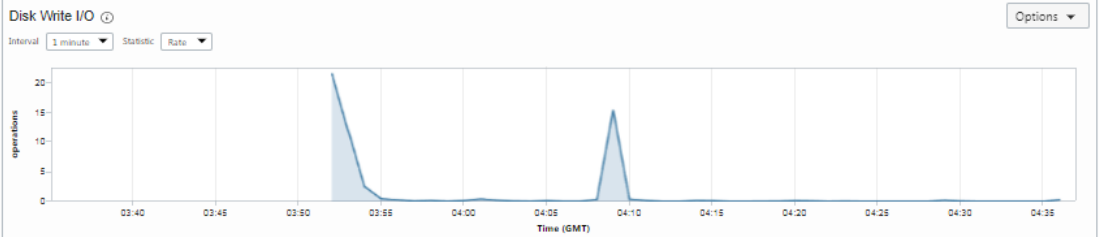
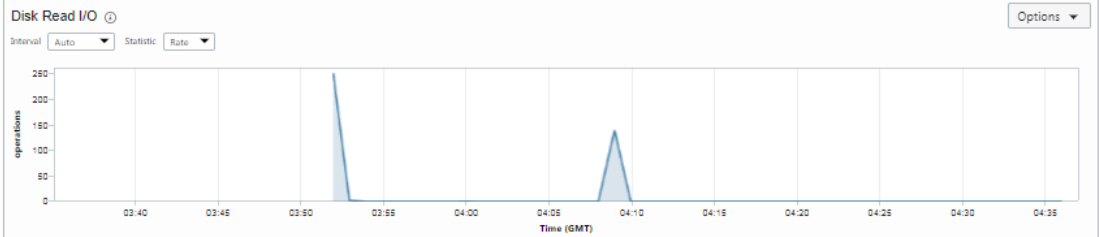
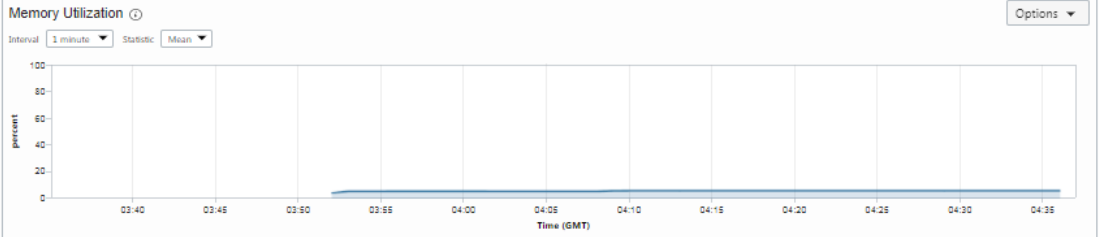
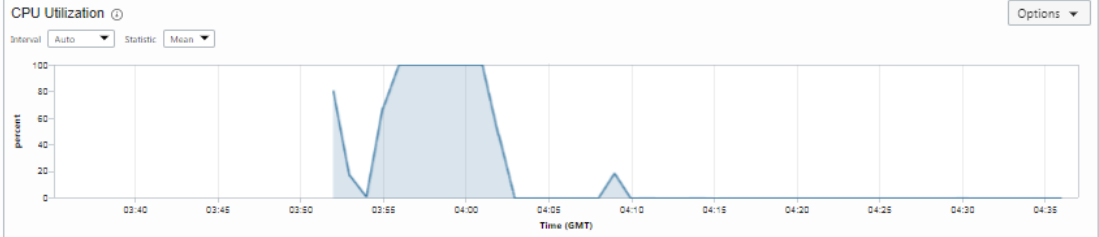
Metric Namespace*	Resource OCID	Where measured
oci_computeagent	Instance OCID	On the instance. Metrics in this namespace are aggregated across all the related resources on the instance. E.g., DiskBytesRead is aggregated across all the instance's attached storage volumes, and NetworkBytesIn is aggregated across all the instance's attached VNICs
oci_blockstore	Boot/Block OCID	By the Block Volume service. The metrics are for an individual boot/block volume
oci_vcn	VNIC OCID	By the Networking service. The metrics are for an individual VNIC

Other namespaces include oci\_lbaas, oci\_objectstorage, oci\_notification

# 8 Metrics

START TIME  
2019-02-06 03:35

END TIME  
2019-02-06 04:37



# Metric Queries

- Monitoring Query Language (MQL) expression can be used to evaluate returning aggregated data. The query must specify a metric, statistic, and interval
- Syntax: `metric[interval]{dimensionname=dimensionvalue}.groupingfunction.statistic`
  - Interval: frequency at which data points are aggregated. E.g. 5 min
  - Statistic: available functions include count, max, mean, rate, min, sum, and percentile
- Examples
  - Max CPU utilization at 1 min intervals, `CpuUtilization[1m].max()`
  - Maximum CPU Utilization at a one-minute interval, filtered to a single resource, `CpuUtilization[1m]{resourceId="ocid1.instance.oc1.phx.exampleuniqueID"}.max()`
  - All read IOPS at a one-minute interval, filtered to a compartment, aggregated for the maximum, `lopsRead[1m]{compartmentId="ocid1.compartment.oc1.phx..exampleuniqueID"}.grouping().max()`

# Alarms

- The Alarms feature of the Monitoring service publishes alarm messages to configured destinations managed by the OCI Notification service
- Monitoring Query Language (MQL) expression can be used to evaluate for the alarm. An alarm query must specify a metric, statistic, interval, and a trigger rule (threshold or absence)
- Alarm states
  - Firing
  - Reset - The alarm is not detecting the metric firing; the metric is no longer being emitted
  - Suspended

# Use case

- Service Metrics: same metrics as the resource specific ones, but for all the resources in a compartment. Allows for filtering with Dimensions
- Metric Explorer: Dive into detail on a specific metric and show multiple resource metrics together. Also includes a powerful Metric Query Language (MQL) interface for complex queries
- Alarm Definition: create an alarm based on a metric and create a notification via OCI Notifications Service (email and PagerDuty)
- Alarms Status: review the status of the configured firing alarms
- Both Monitoring pages plus the Resource specific charts allow the customer to create Alarms directly, prepopulating the query

## Monitoring

### Service Metrics

Metrics Explorer

Alarm Status

Alarm Definitions

# Service Metrics

Monitor health, capacity, and performance of your Oracle Cloud Infrastructure resources through default queries provided by the selected service.

COMPARTMENT

Training

intoraclohit (root)/Training

METRIC NAMESPACE ⓘ

oci\_computeagent

Dimensions [Add](#)

☐ AGGREGATE METRIC STREAMS

START TIME

END TIME

2019-02-06 03:38

2019-02-06 04:39

Not seeing all of your resources? ⓘ

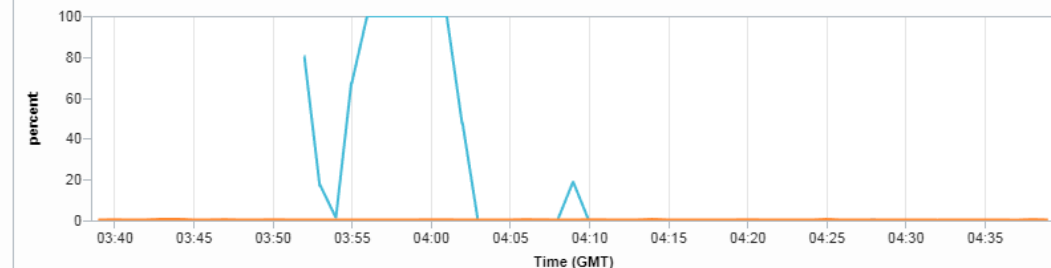
Reset charts

## CPU Utilization ⓘ

Options ▾

Interval 1 minute

Statistic Mean

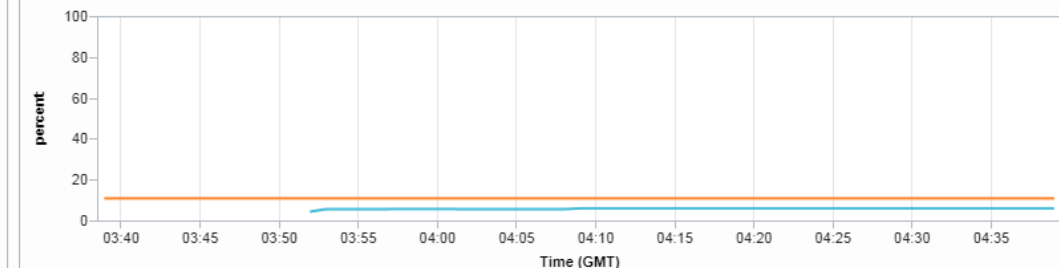


## Memory Utilization ⓘ

Options ▾

Interval 1 minute

Statistic Mean

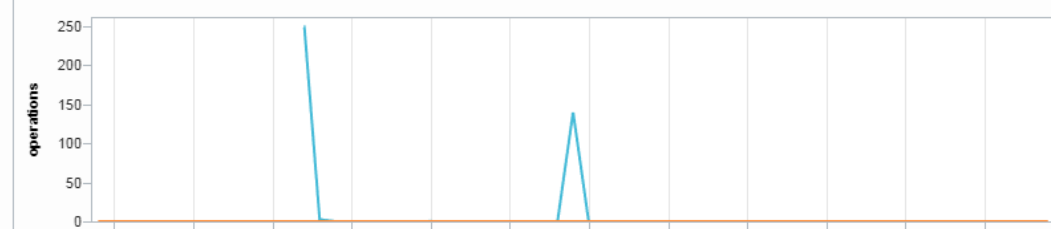


## Disk Read I/O ⓘ

Options ▾

Interval 1 minute

Statistic Rate

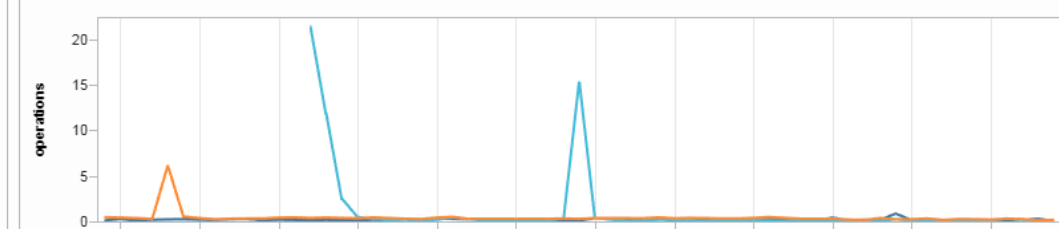


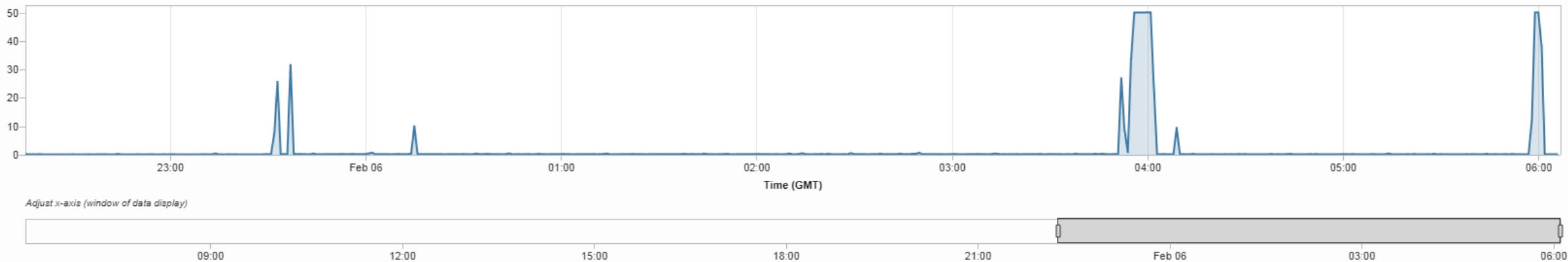
## Disk Write I/O ⓘ

Options ▾

Interval 1 minute

Statistic Rate





Close Query Editor

### Query 1



CpuUtilization[1m]{availabilityDomain = "dKYS:US-ASHBURN-AD-1"}.group...

Add Query

### Query 1

☐ ADVANCED MODE

COMPARTMENT

Training

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METRIC NAMESPACE ⓘ

oci\_computeagent

METRIC NAME ⓘ

CpuUtilization

INTERVAL ⓘ

1m

STATISTIC ⓘ

Mean

#### Metric dimensions (optional)

DIMENSION NAME ⓘ

availabilityDomain

DIMENSION VALUE ⓘ

dKYS:US-ASHBURN-AD-1

☒ AGGREGATE METRIC STREAMS

+ Additional dimension

Update Chart

Create Alarm



## Define alarm

ALARM NAME

CPU-AD1

ALARM SEVERITY ⓘ

Critical

ALARM BODY *OPTIONAL* ⓘ

Enter notification content. Example: High CPU usage alert. Follow runbook instructions for resolution.

Limited to 1000 characters (0/1000)

### Tags (optional)

Tagging is a metadata system that allows you to organize and track alarms within your tenancy.

TAG NAMESPACE

None (apply a freeform tag)

TAG KEY

VALUE

### Metric description

The metric to evaluate for the alarm.

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METRIC NAMESPACE ⓘ

oci\_computeagent

METRIC NAME ⓘ

CpuUtilization

INTERVAL ⓘ

1m

STATISTIC ⓘ

Mean

## Metric dimensions (optional)

DIMENSION NAME ⓘ

availabilityDomain

DIMENSION VALUE ⓘ

dKYS:US-ASHBURN-AD-1

☐ AGGREGATE METRIC STREAMS

## Trigger rule

The condition for putting the alarm in the firing state.

OPERATOR ⓘ

greater than

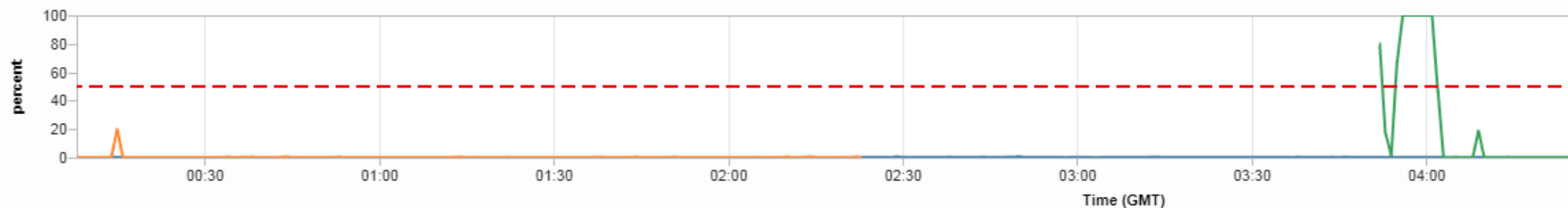
VALUE ⓘ

50

TRIGGER DELAY MINUTES ⓘ

1

## CPU Utilization



### Query 1 (6 metric streams)

CpuUtilization[1m]{availabilityDomain = "dKYS:US-ASHBURN-AD-1"}.mean()

## Notifications

### Destinations

DESTINATION SERVICE ⓘ

Notification Service

COMPARTMENT ⓘ

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### Create a new topic

TOPIC NAME

CPU-AD1

TOPIC DESCRIPTION OPTIONAL

SUBSCRIPTION PROTOCOL ⓘ

Email

EMAIL ADDRESSES (COMMA OR SPACE SEPARATED)

rohit.rahi@oracle.com

Create topic and subscription

Cancel

☒ REPEAT NOTIFICATION? (IF ALARM CONTINUES TO FIRE) ⓘ

NOTIFICATION INTERVAL

60

minutes

☐ SUPPRESS NOTIFICATIONS

☒ ENABLE THIS ALARM? ⓘ

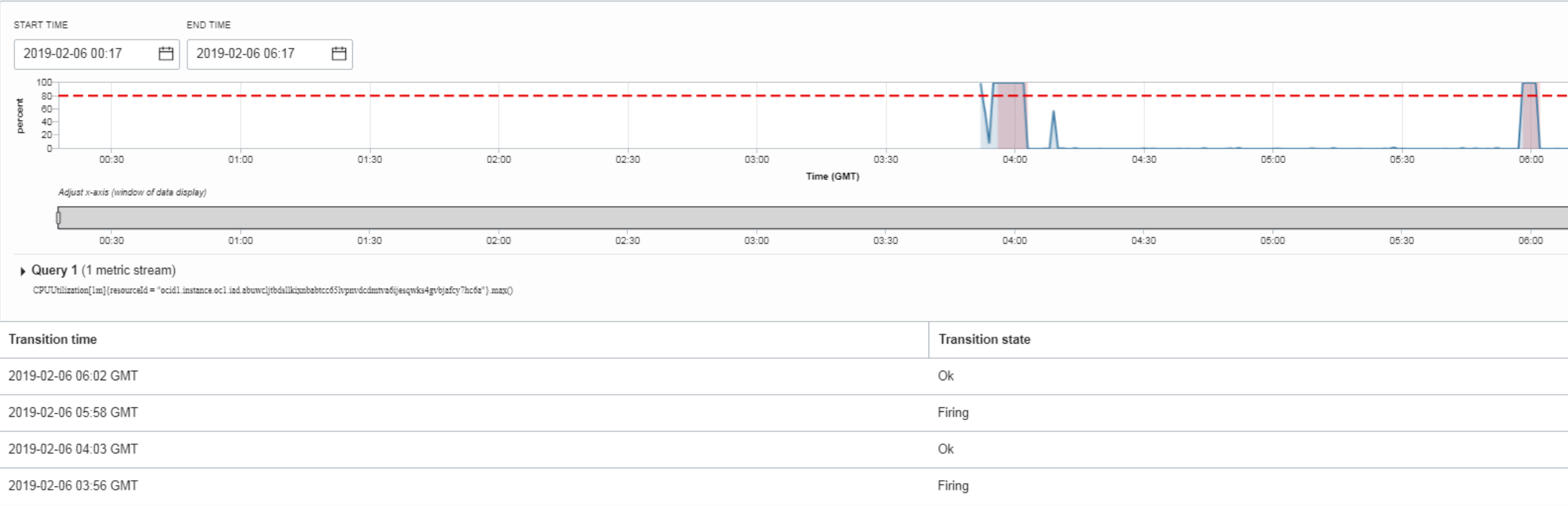
This alarm applies to 6 metric streams.

Save alarm

Cancel

SUMMARY	Alarm fires when the <b>max()</b> of this metric is <b>greater than</b> the threshold value of <b>80</b> , with a trigger delay of <b>a minute</b> .			
ALARM SEVERITY	❖ Critical			
EVALUATION	Compartment: Namespace: Metric: Statistic: Interval: Aggregation: Dimensions:	Training-sub1 oci_computeagent CPUUtilization max() 1m None resourceId:ocid1.instance.oc1.iad.abuwcljtbdsllkixnbabtcc65lvpnvdcmtva6ijesqws4gvbjafcy7hc6a	Notifications: Repeat notification: Suppression: Last updated:	<a href="#">1 destination (details)</a> Repeats every 5 minutes Not suppressed 2019-02-06 04:10 GMT
TAGS	No tags applied			

Alarm history



# Monitoring Demo

# Design Considerations

- OCI Monitoring service doesn't support OCI DB Systems and ATP/ADW
- OCI Monitoring service doesn't support FastConnect/VPN to report on availability, connectivity and performance between customer data centers and VCNs
- OCI compute instances need to have a public IP in order to emit metrics

# Pricing

- OCI Monitoring Ingestion:
  - Price \$0.0025 per 1 million data points ingested, first 500 Million data points ingested per month free
- OCI Monitoring Retrieval:
  - Price \$0.0015 per 1 million data points analyzed, first 1 Billion data points analyzed per month free



[cloud.oracle.com/iaas](https://cloud.oracle.com/iaas)

[cloud.oracle.com/tryit](https://cloud.oracle.com/tryit)