ORACLE
Cloud Infrastructure

Monitoring

Level 100

ORACLE

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

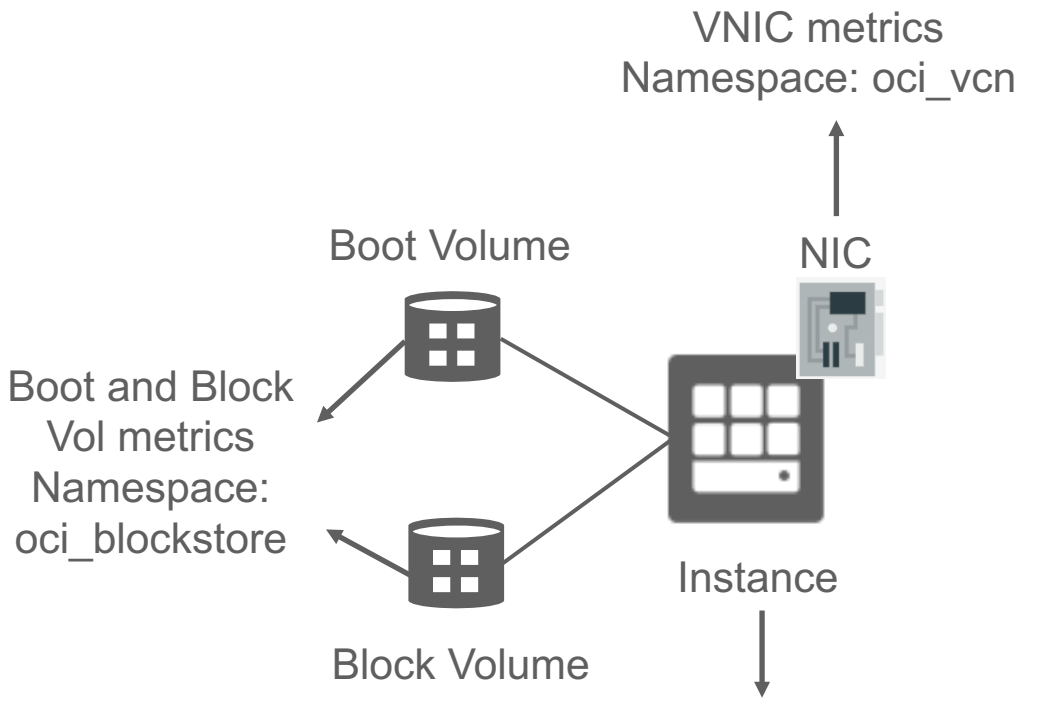
OCI Monitoring Service

- 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

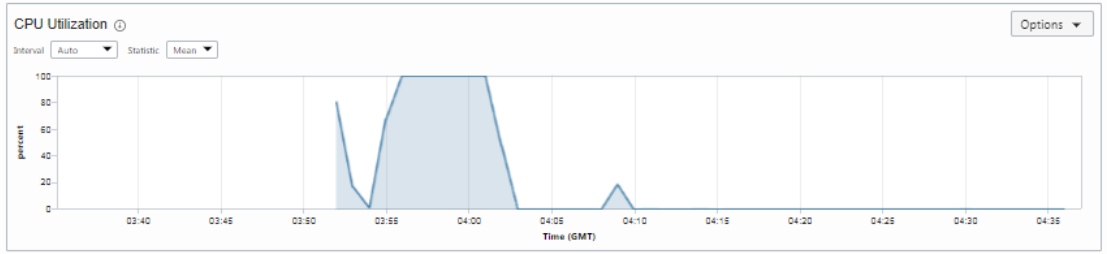
Other namespaces include oci_lbaas, oci_objectstorage, oci_notification

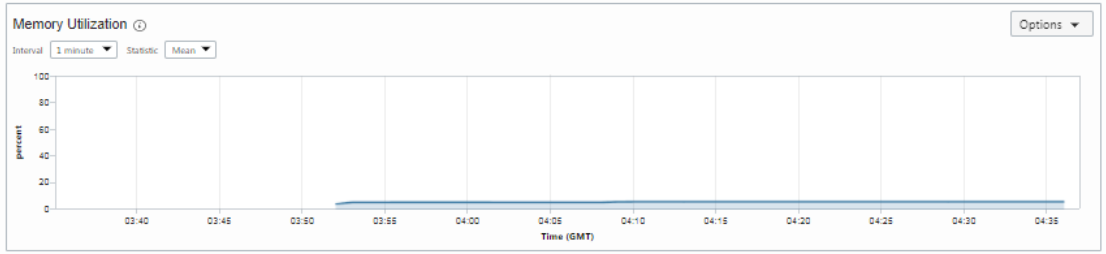
Resources

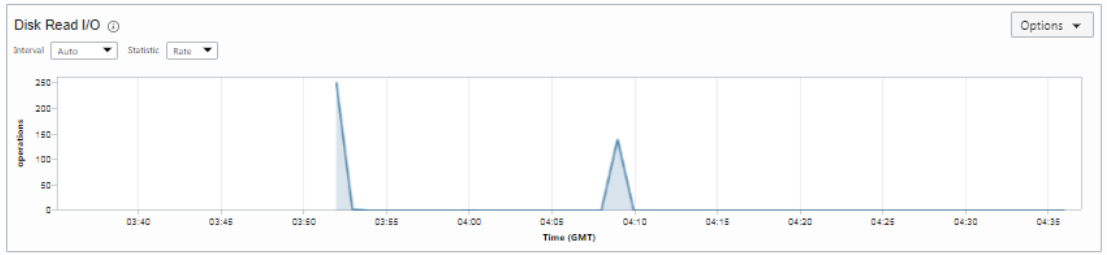
- Metrics
- Attached Block Volumes (0)
- Attached VNICs (1)
- Boot Volume (1)
- Console Connections (0)

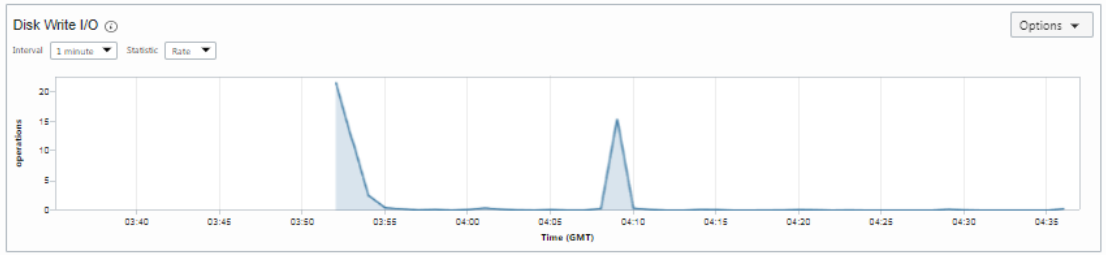
8 Metrics

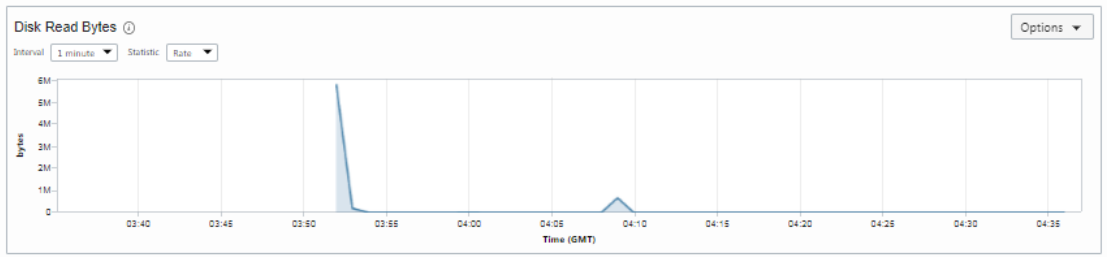
START TIME 2019-02-06 03:35 END TIME 2019-02-06 04:37 Reset charts

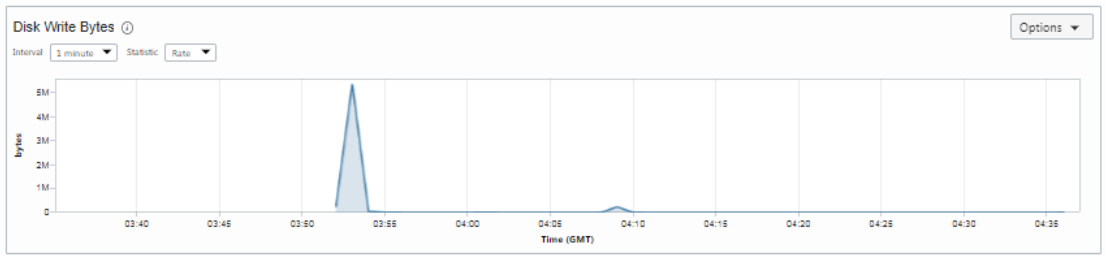


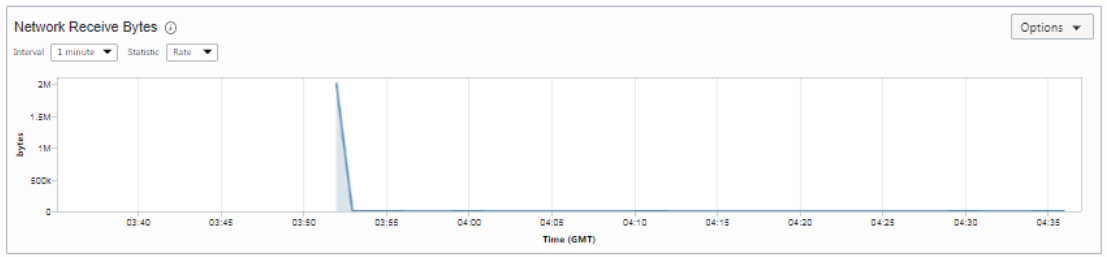


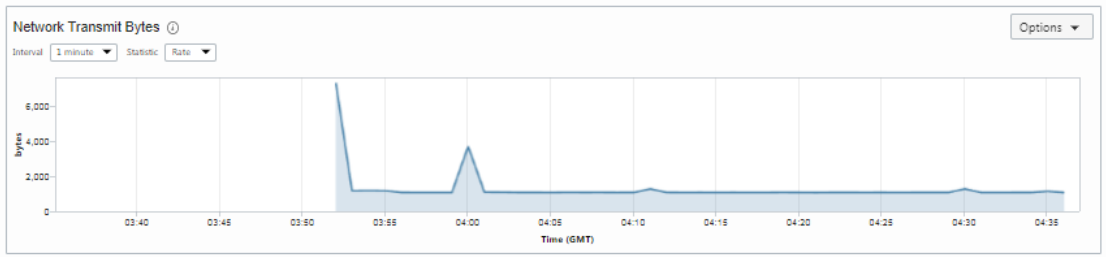












Metric Queries

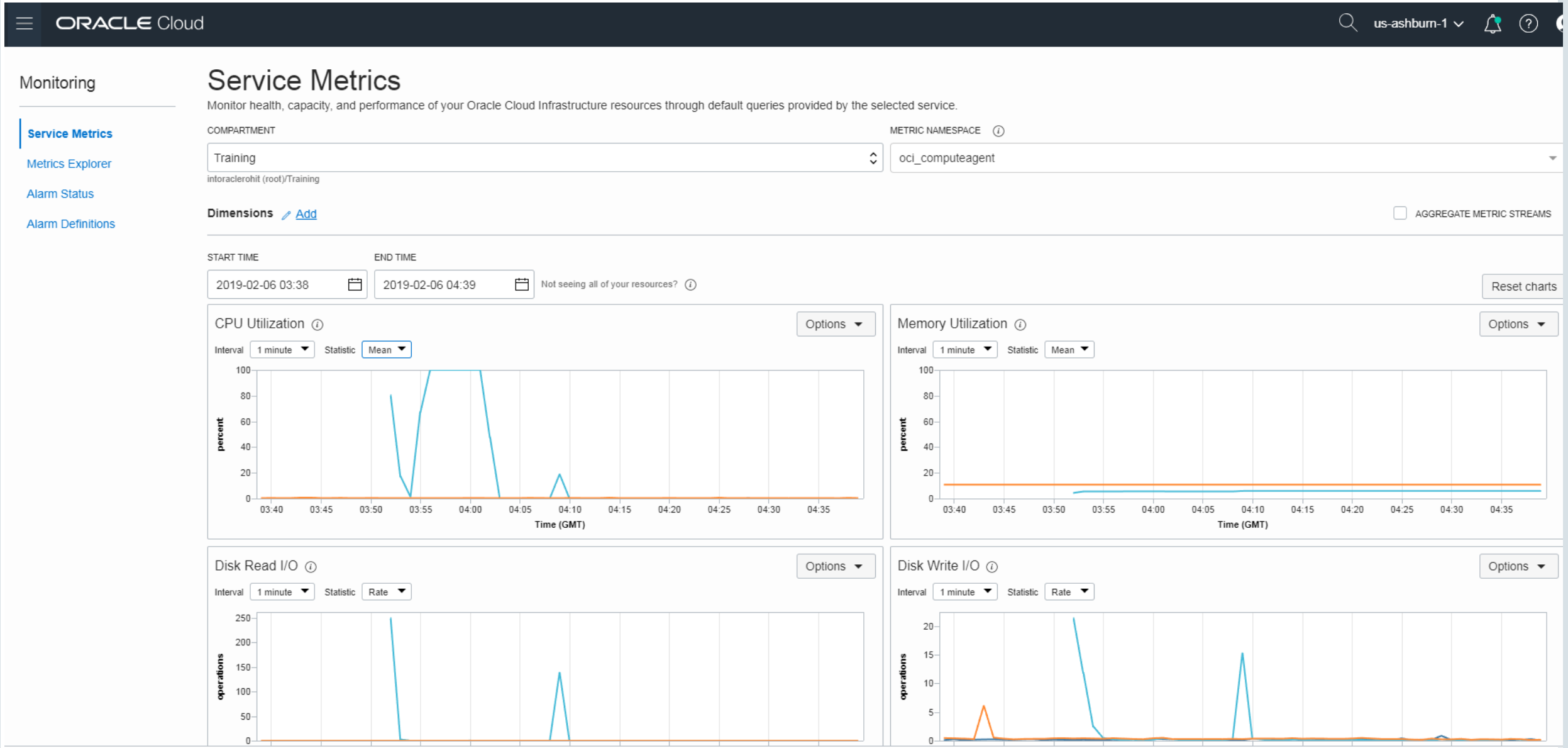
- Monitoring Query Language (MQL) expression can be used to evaluate returning aggregated data. The query must specify a metric, statistic, and interval
- Syntax: metric[interval]{dimensionname=dimensionvalue}.groupingfunction.statistic
  - Interval: frequency at which data points are aggregated. E.g. 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, IopsRead[1m]{compartmentId="ocid1.compartment.oc1.phx..exampleuniqueID"}.grouping().max()

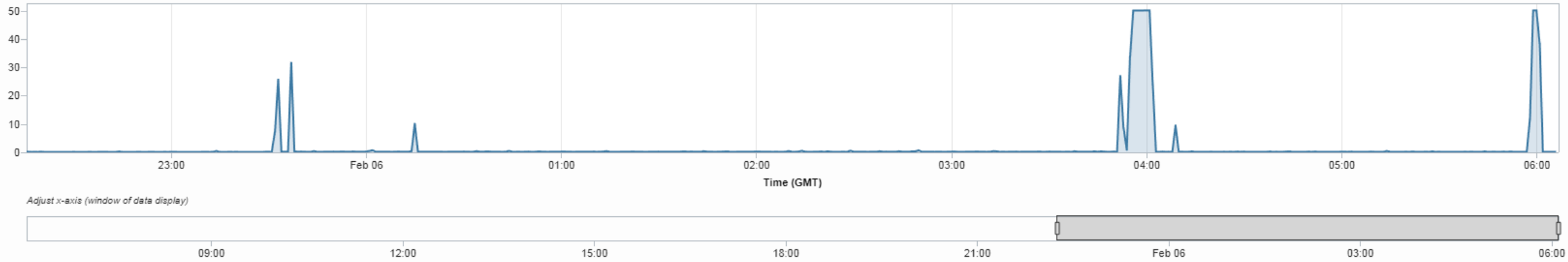
Alarms

- 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





Close Query Editor

Query 1

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

Add Query

Query 1

ADVANCED MODE

COMPARTMENT: Training

intoraclerohit (root)/Training

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.

COMPARTMENT

Training

intoraclerohit (root)/Training

METRIC NAMESPACE

oci_computeagent

METRIC NAME

CpuUtilization

INTERVAL

1m

STATISTIC

Mean

Metric dimensions (optional)

DIMENSION NAME

availabilityDomain

DIMENSION VALUE

dKYS:US-ASHBURN-AD-1

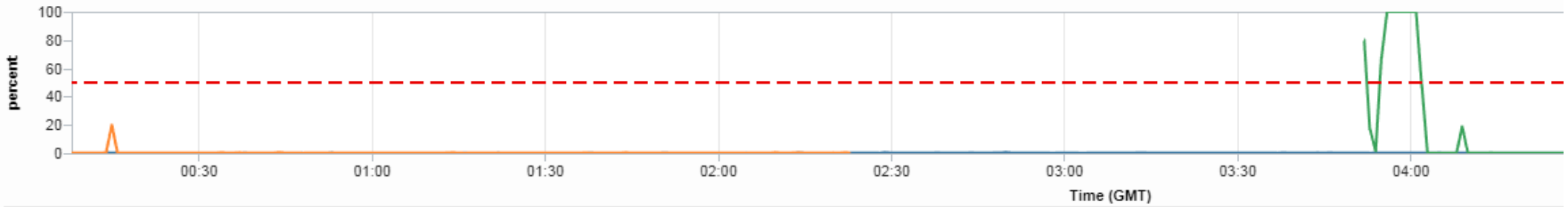
AGGREGATE METRIC STREAMS

Trigger rule

The condition for putting the alarm in the firing state.

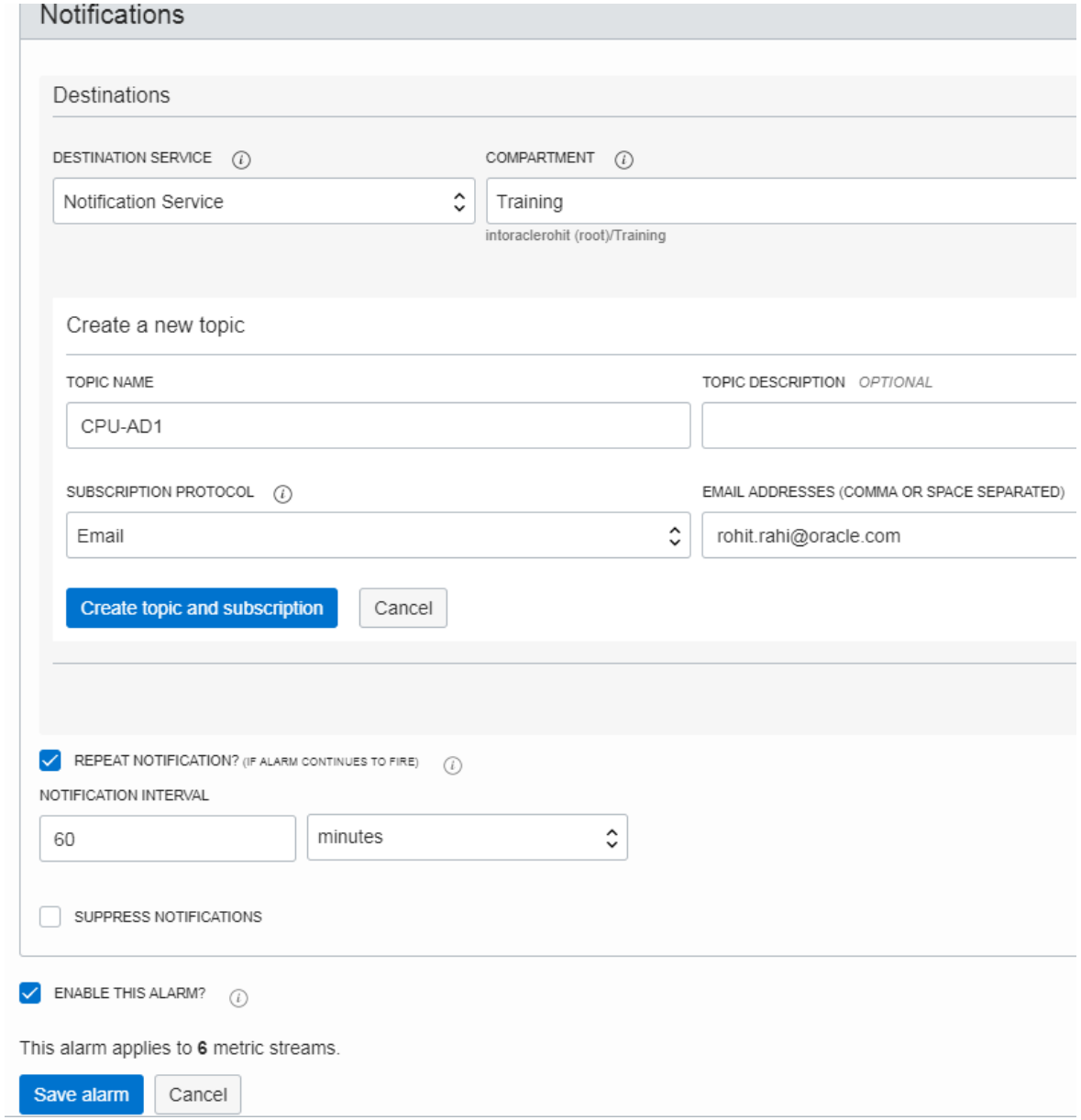
OPERATOR	VALUE	TRIGGER DELAY MINUTES
greater than	50	1

CPU Utilization



Query 1 (6 metric streams)

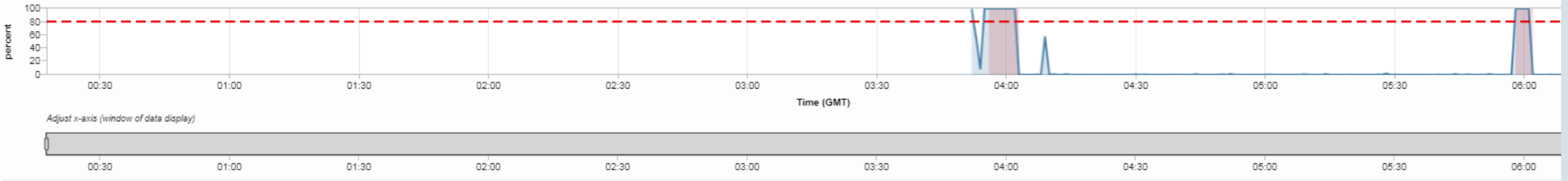
CpuUtilization[1m]{availabilityDomain = "dKYS:US-ASHBURN-AD-1"}.mean()



SUMMARY	Alarm fires when the **max()** of this metric is **greater than** the threshold value of **80**, with a trigger delay of **a minute**.				
ALARM SEVERITY	Critical				
EVALUATION	**Compartment:**	Training-sub1	**Notifications:**	1 destination (details)	
	Namespace:	oci_computeagent	**Repeat notification:**	Repeats every 5 minutes	
	Metric:	CPUUtilization	**Suppression:**	Not suppressed	
	Statistic:	max()	**Last updated:**	2019-02-06 04:10 GMT	
	Interval:	1m			
	Aggregation:	None			
	Dimensions:	**resourceId:**ocid1.instance.oc1.iad.abuwcljtbdsllkixnbabtcc65lvpnvdcdmtva6ijesqwks4gvbjafcy7hc6a			
TAGS	No tags applied				

Alarm history

START TIME 2019-02-06 00:17 END TIME 2019-02-06 06:17



▸ **Query 1** (1 metric stream)

CPUUtilization[1m]{resourceId = "ocid1.instance.oc1.iad.abuwcljtbdsllkixnbabtcc65lvpnvdcdmtva6ijesqwks4gvbjafcy7hc6a"}.max()

Transition time	Transition state
2019-02-06 06:02 GMT	Ok
2019-02-06 05:58 GMT	Firing
2019-02-06 04:03 GMT	Ok
2019-02-06 03:56 GMT	Firing

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

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