



Oracle Cloud Infrastructure Data Source for Grafana

Mickey Boxell – Oracle Cloud Native Labs

#OracleCloudNative
cloudnative.oracle.com



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Who am I?



Mickey Boxell

Cloud Advocate, etc.

Oracle Cloud Native Labs

Share best practices and build original solutions and content for cloud developers with a key focus on cloud native/container native, open source, and DevOps

<http://cloudnative.oracle.com/>

Oracle Cloud



- Public cloud with enterprise grade governance and security
- Virtual Machine and Bare Metal infrastructure - same set of APIs used for both
- Managed Kubernetes: Container Engine for Kubernetes (OKE)
- Image Registry: Oracle Cloud Infrastructure Registry (OCIR)
- Non-oversubscribed network, low latency, high throughput, predictable network and CPU performance

Why Grafana?



- Oracle Cloud Monitoring offers valuable telemetry data from a number of resources
- Our users have enough dashboards to keep track of already
- Grafana offers a centralized dashboard to view metrics from countless different sources

Compute » Instances » Instance Details



RUNNING

grafana_webinar

Start Stop Reboot Move Resource Apply Tag(s) Actions

Instance Information Tags

Instance Information

Availability Domain: PKGK:US-ASHBURN-AD-1

Fault Domain: FAULT-DOMAIN-2

Region: iad

Shape: VM.Standard2.1

Virtual Cloud Network: [terraform-example](#)

Maintenance Reboot: -

Image: [Oracle-Linux-7.6-2019.07.15-0](#)

OCID: ...2idreq [Show](#) [Copy](#)

Launched: Mon, 29 Jul 2019 15:22:18 GMT

Compartment: oracle-cloudnative (root)/mickey

Launch Mode: NATIVE

Primary VNIC Information

Private IP Address: 10.0.0.8

Public IP Address: 129.213.43.215

Network Security Groups: None [Edit](#)

Internal FQDN: grafana-webinar... [Show](#) [Copy](#)

Subnet: [Public Subnet PKGK:US-ASHBURN-AD-1](#)

This instance's traffic is controlled by its firewall rules in addition to the associated [Subnet's](#) security lists and the VNIC's network security groups.

Launch Options

Resources

Metrics

Attached Block Volumes (0)

Attached VNICS (1)

Boot Volume (1)

Console Connections (0)

Work Requests (1)

8 Metrics

START TIME

2019-07-29 18:26

END TIME

2019-07-29 19:26

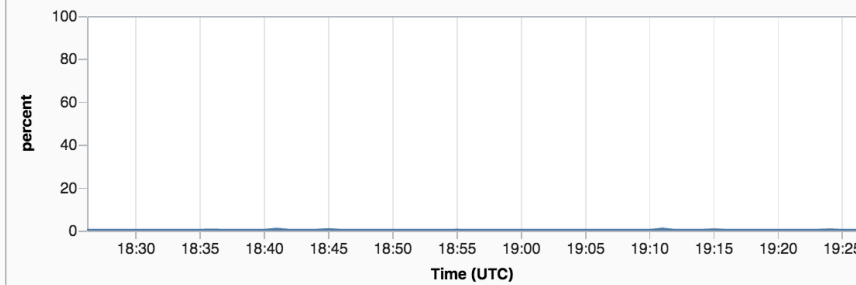
Reset charts

CPU Utilization

Options

Interval 1 minute

Statistic Mean

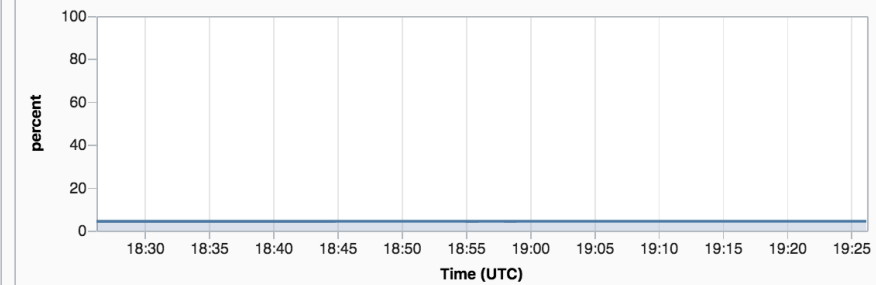


Memory Utilization

Options

Interval 1 minute

Statistic Mean

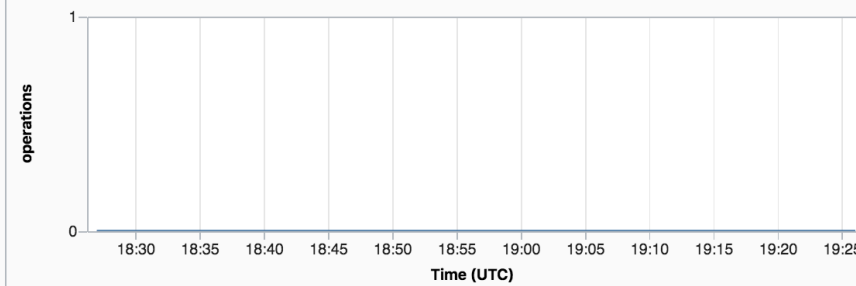


Disk Read I/O

Options

Interval 1 minute

Statistic Rate

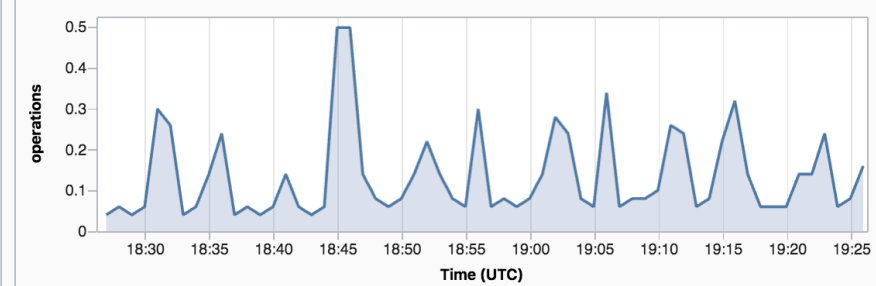


Disk Write I/O

Options

Interval 1 minute

Statistic Rate



Grafana and Oracle: Installation Options



- Use the `grafana-cli` tool to install the Oracle Cloud plugin from the command line: `grafana-cli plugins install oci-datasource`
- Install from the binary (pre-Grafana 6.0.0)
- Update your Grafana pod in Kubernetes with:
 - name: `GF_INSTALL_PLUGINS`
value: `oci-datasource`

Grafana and Oracle: Authentication Options



- Local Installation: Oracle Cloud CLI (API key pair)
- Oracle Cloud Installation: Dynamic Group/Instance Principals

Identity » Dynamic Groups » Dynamic Group Details



grafana_vm

Apply Tag(s) Delete

Group Information Tags

OCID: ...d246ya [Show](#) [Copy](#)

Created: Mon, 29 Jul 2019 15:58:07 GMT

Description: grafana vm dynamic group

Resources

Matching Rules (1)

Matching Rules

Displaying 1 Matching Rules

Edit All Matching Rules

Instances that meet the criteria defined by any of these rules will be included in the group

ANY {instance.compartment.id = 'ocid1.compartment.oc1..aaaaaaaatjuwhxwkspkxhumqke4o73b2bs5jtibjkv5ozjw5rcarvk2sm5da'}



Identity » Policies » Policy Details



grafana_webinar

Update Version Date Delete Apply Tag(s)

Policy Information Tags

OCID: ...gc5vhq [Show](#) [Copy](#)

Version Date: Keep Policy current

Compartment: oracle-cloudnative

Description: policy

Created: Mon, 29 Jul 2019 16:34:52 GMT

Resources

Statements (2)

Statements

Displaying 2 Statements

Add Policy Statement

allow dynamicgroup grafana_vm to read metrics in tenancy



allow dynamicgroup grafana_vm to read compartments in tenancy



Features



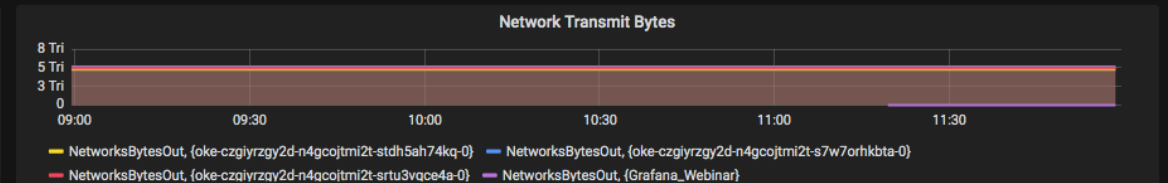
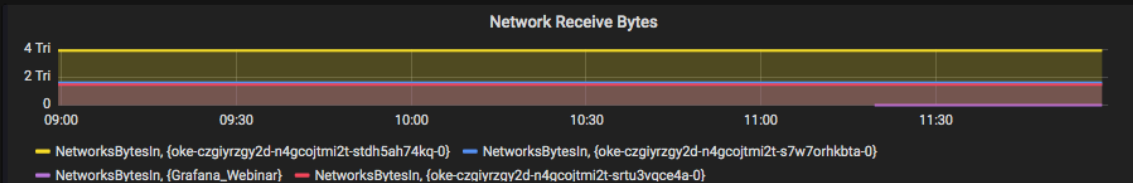
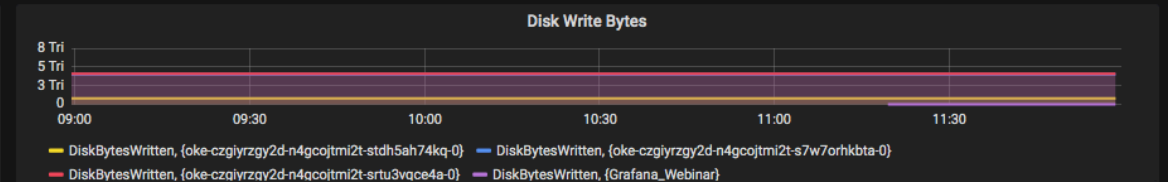
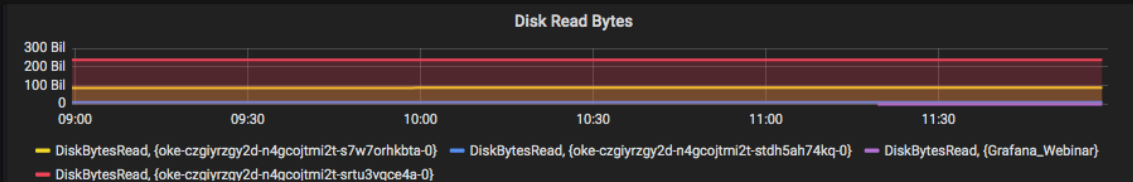
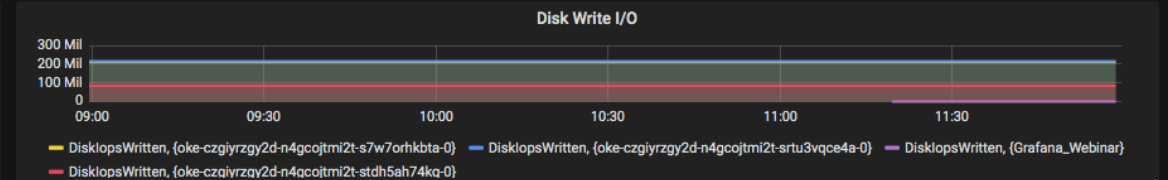
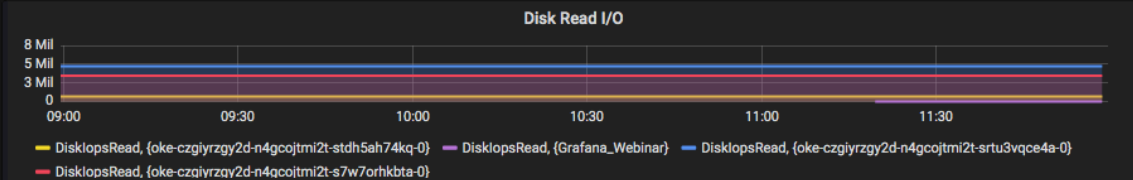
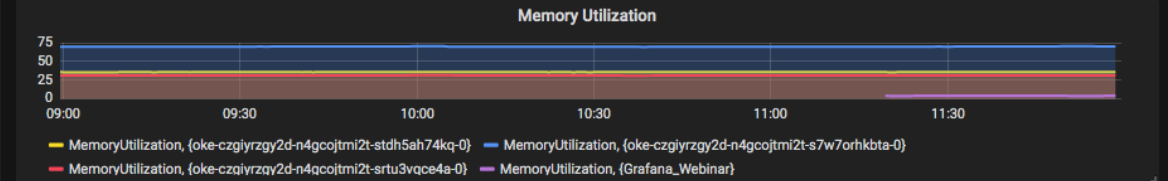
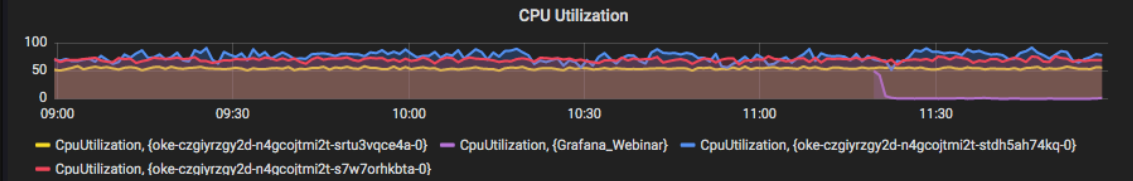
- Query Editor
- Dimensions
- Templating
- Custom Metrics Namespaces



Oracle Compute Agent Service Metrics -

📊 ⭐ 🔄 📄 ⚙️ 🗨️ ⌚ Last 3 hours Refresh every 5s 🔍 ↺

region PHX compartment kube-1 namespace oci_computeagent metric CpuUtilization



Query Editor

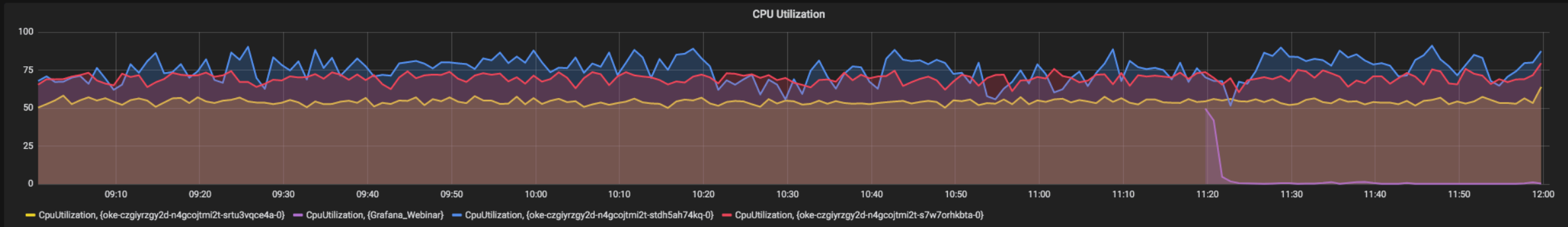


- Simplifies the querying process with pre-built lists of variables
- Choose **Region** (IAD, PHX, etc.), **Compartment**, **Namespace** (computeAgent, blockStore, etc), **Resolution**, **Metric** (CpuUtilization, etc.), **Aggregation** (mean(), min(), etc.) , and **Window**

Oracle Compute Agent Service Metrics

Last 3 hours Refresh every 5s

region PHX compartment kube-1 namespace oci_computeagent metric CpuUtilization



Queries to Oracle Cloud Infrastructure

Add Query Query Inspector ?

A

Region	\$region	Compartment	\$compartment	Namespace	\$namespace	Resolution	1m
Metric	\$metric	Aggregation	mean()	Window	1m		
Dimensions	availabilityDomain	=	select tag value	+			

Relative time 1h Time shift 1h

Example Metrics



Compute Agent:

- CpuUtilization
- DiskBytesRead
- DiskBytesWritten
- DiskIopsRead
- DiskIopsWritten
- MemoryUtilization
- NetworksBytesIn
- NetworksBytesOut

Example Metrics



Metric	Metric Display Name	Unit	Description
CpuUtilization	CPU Utilization	percent	Activity level from CPU. Expressed as a percentage of total time.
DiskBytesRead	Disk Read Bytes	bytes	Read throughput. Expressed as bytes read per interval.
DiskBytesWritten	Disk Write Bytes	bytes	Write throughput. Expressed as bytes written per interval.
DiskIopsRead	Disk Read I/O	operations	Activity level from I/O reads. Expressed as reads per interval.
DiskIopsWritten	Disk Write I/O	operations	Activity level from I/O writes. Expressed as writes per interval.
MemoryUtilization	Memory Utilization	percent	Space currently in use. Measured by pages. Expressed as a percentage of used pages.
NetworksBytesIn	Network Receive Bytes	bytes	Network receipt throughput. Expressed as bytes received.
NetworksBytesOut	Network Transmit Bytes	bytes	Network transmission throughput. Expressed as bytes transmitted.

Dimensions



- Add specificity to graphs by means of dimensions
- Dimensions provide an additional filter for queries
- For example: choosing **AvailabilityDomain** as your tag value for a **ComputeAgent** query will provide you with the option to graph only compute resources from a particular availability domain (e.g. **PHX-AD-1**)

Example Dimensions



Compute Agent:

- FaultDomain
- ResourceId
- ImageId
- AvailabilityDomain
- Shape
- Region
- InstancePoolId
- ResourceDisplayName

Example Dimensions

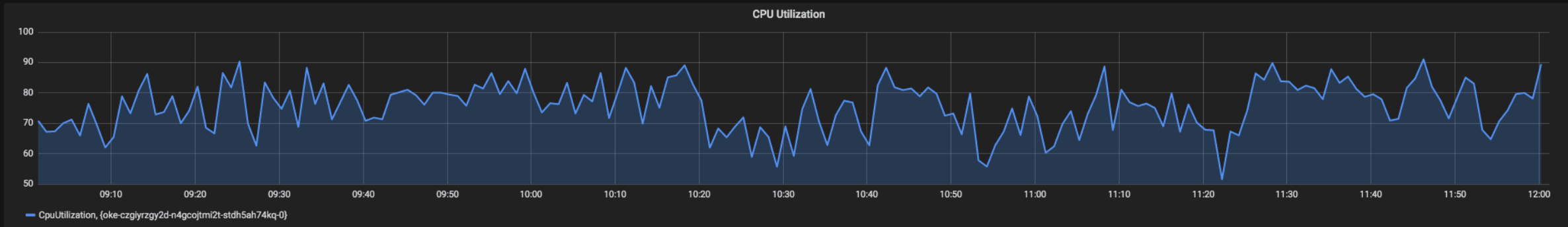


- **AVAILABILITYDOMAIN**: The availability domain where the instance resides
- **FAULTDOMAIN**: The fault domain where the instance resides
- **IMAGEID**: The OCID of the image for the instance
- **INSTANCEPOOLID**: The instance pool the instance belongs to
- **REGION**: The region where the instance resides
- **RESOURCEDISPLAYNAME**: The human-readable name of the instance
- **RESOURCEID**: The OCID of the instance
- **SHAPE**: The shape of the instance

Oracle Compute Agent Service Metrics

Last 3 hours Refresh every 5s

region PHX compartment kube-1 namespace oci_computeagent metric CpuUtilization



Queries to

Oracle Cloud Infrastructure

Add Query Query Inspector ?

A

Region	\$region	Compartment	\$compartment	Namespace	\$namespace	Resolution	1m
Metric	\$metric	Aggregation	mean()	Window	1m		
Dimensions	availabilityDomain	=	PKGK:PHX-AD-1	+			

Relative time 1h Time shift 1h

Templating

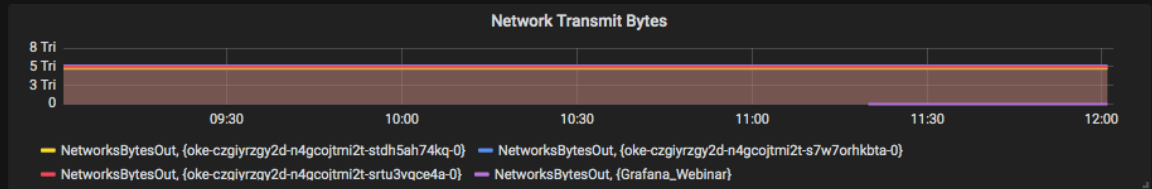
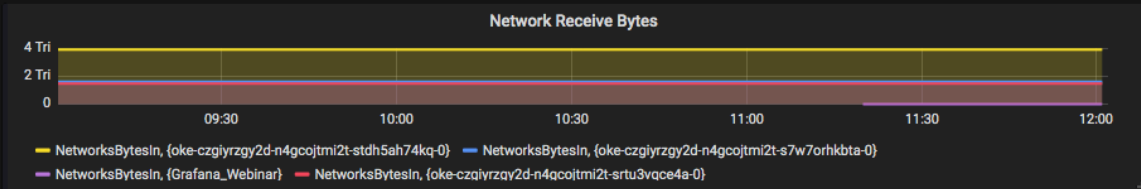
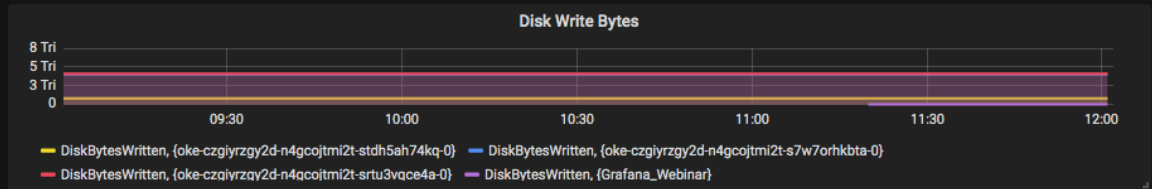
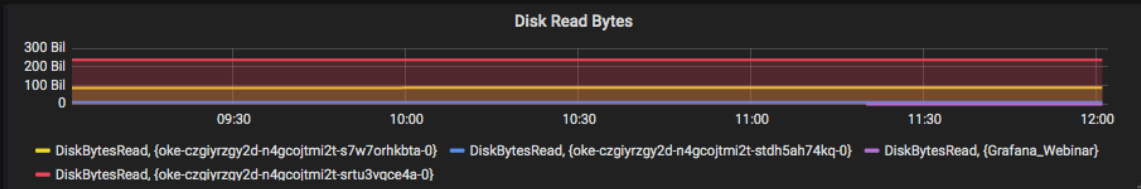
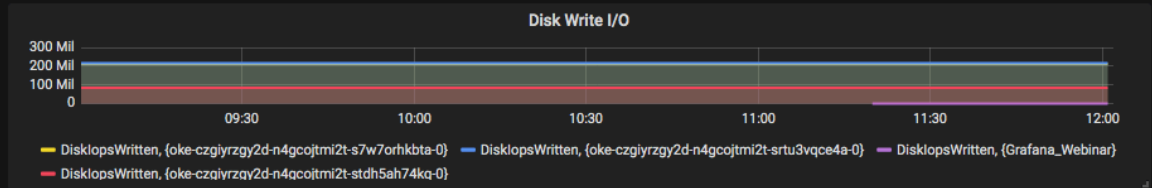
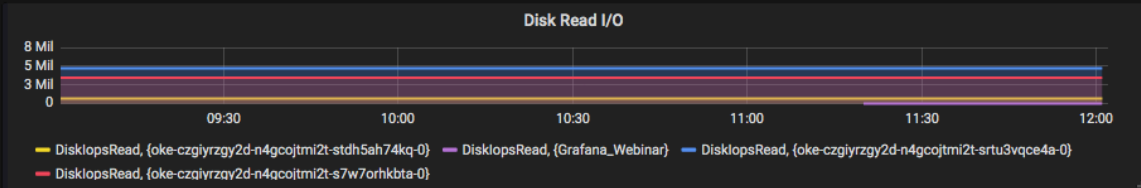
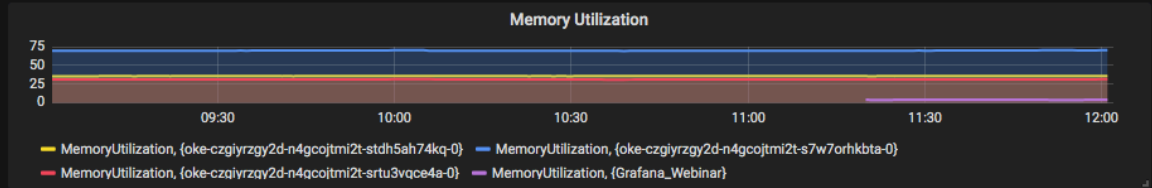
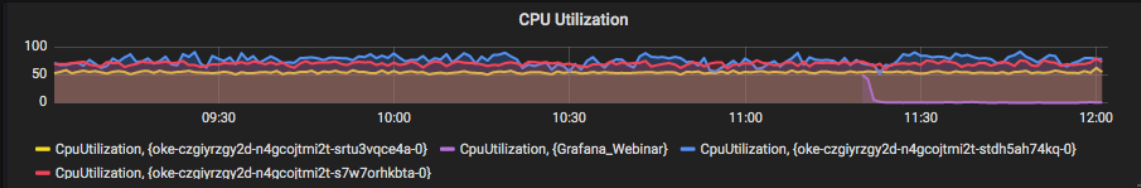


- Dynamically interact with graphs using templating
- Change graphs on the fly to visualize additional information
- For example: switch the **region** being queried for all graphs on a given dashboard from **PHX** to **IAD**



Oracle Compute Agent Service Metrics -

region PHX compartment kube-1 namespace oci_computeagent metric CpuUtilization





Oracle Compute Agent Service Metrics -

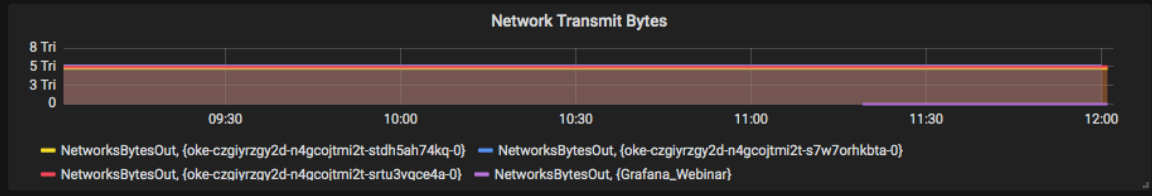
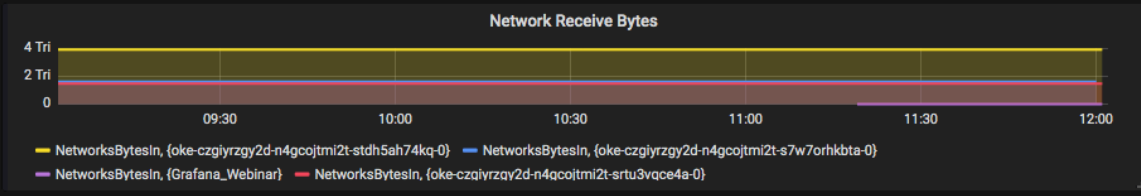
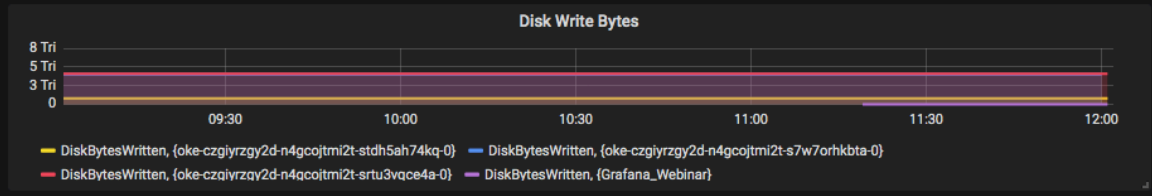
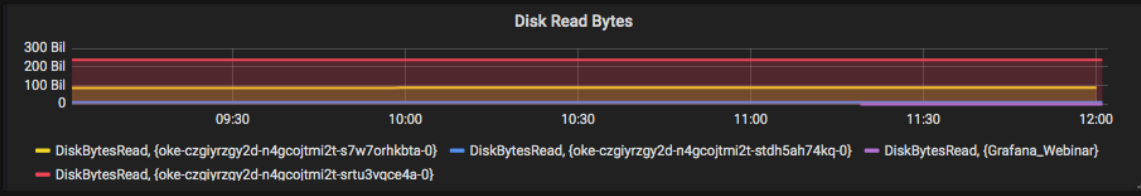
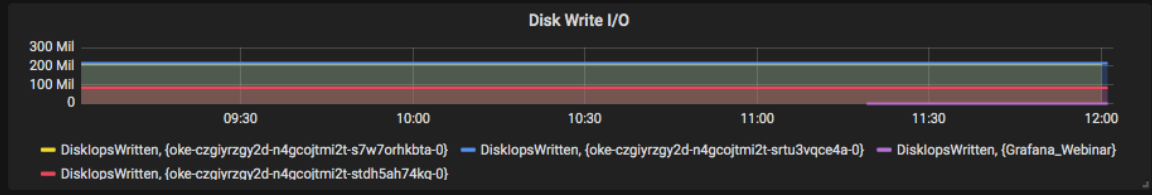
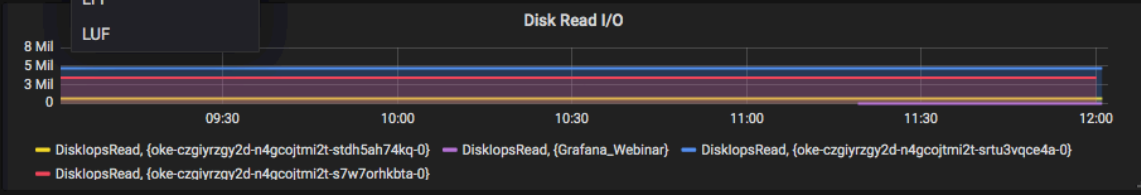
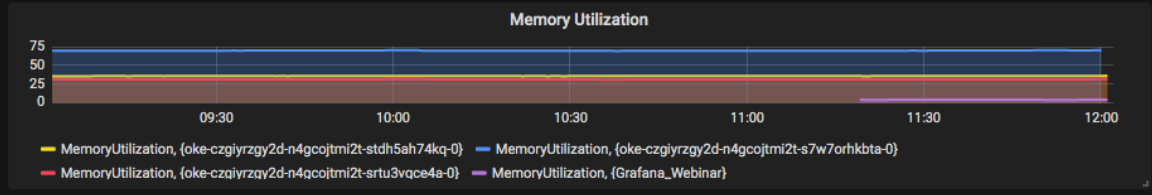
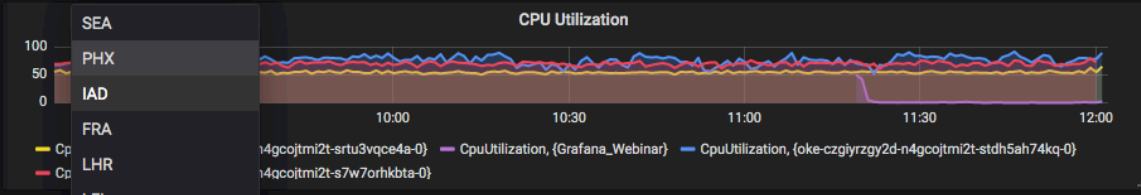
Last 3 hours Refresh every 5s

region

compartment kube-1

namespace oci_computeagent

metric CpuUtilization

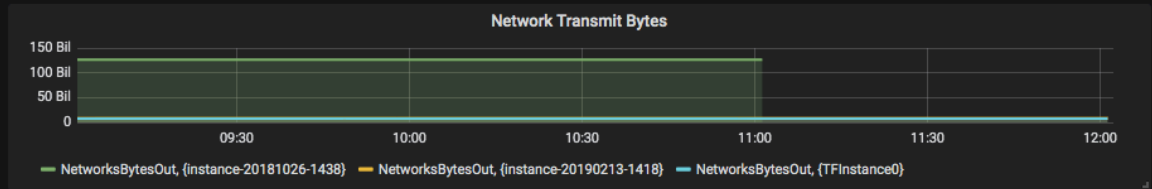
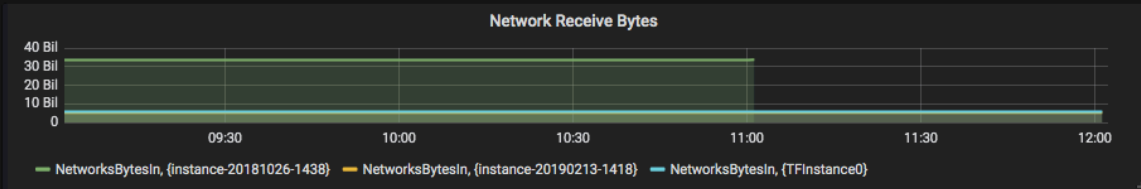
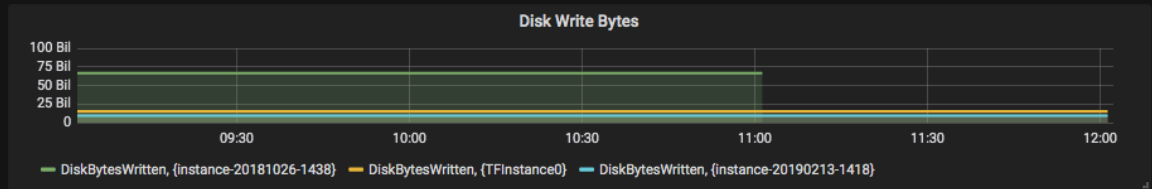
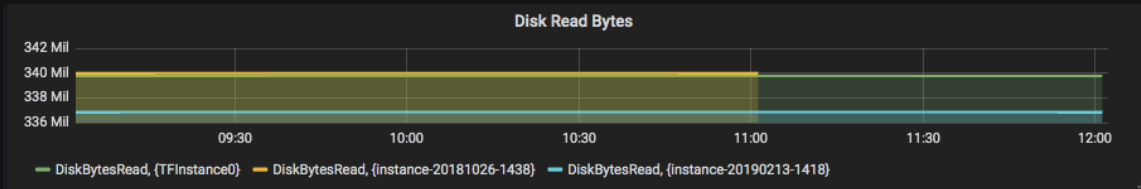
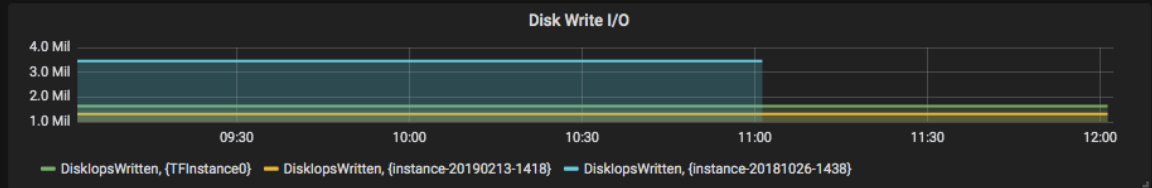
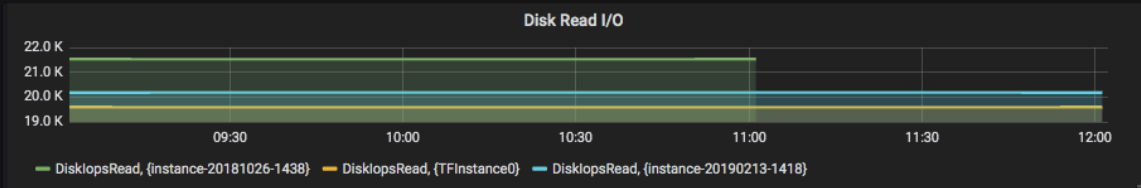
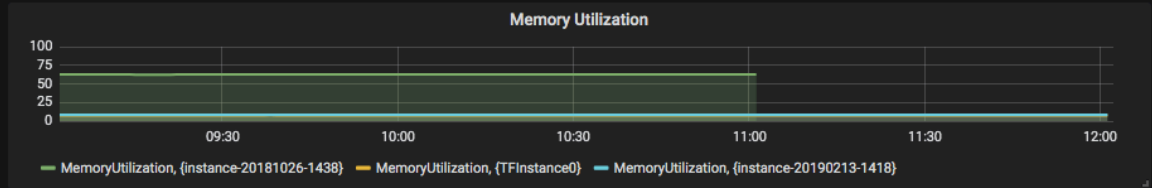
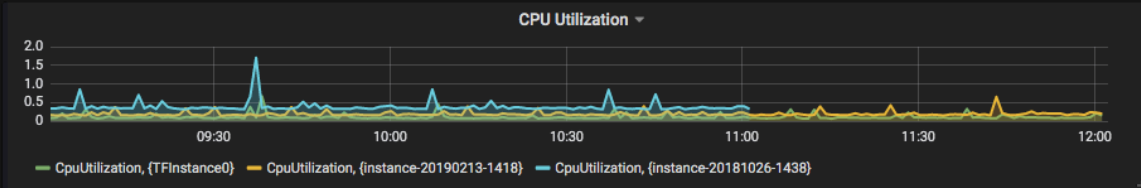




Oracle Compute Agent Service Metrics -

📊 ⭐ 🔄 📄 ⚙️ 🗨️ ⌚ Last 3 hours Refresh every 5s 🔍 ↺

region IAD compartment kube-1 namespace oci_computeagent metric CpuUtilization



Custom Metrics



- Publish custom metrics data points to the Monitoring service using **PostMetricData** in the Monitoring API
- Query those metrics from the Grafana UI as you would any other resource metrics

Key Takeaways



- The Oracle Cloud Infrastructure Data Source for Grafana provides access to monitoring data for Oracle Cloud resources
- Grafana can be used as a centralized dashboard to view helpful data from Oracle and non-Oracle resources side by side



Questions?

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Thank You!



And special thanks to Grafana for hosting this webinar!

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