

ORACLE

Tenancy Management

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Topics

- Costs
 - Economics
 - Tenancy Explorer
 - Quotas Policies
 - Limits, Quotas & Usage
 - Observability
 - Architecture Center
-



OCI Cost Analysis

The screenshot shows the Oracle Cloud Cost Analysis dashboard. At the top, there's a navigation bar with the Oracle Cloud logo, a search bar, and account information. On the left, a sidebar lists Billing, Cost Analysis (which is selected), Payment Method, Budgets, and Usage Report. The main area is titled "Cost Analysis". It displays a summary bar with "Free Trial", "Trial Credits Used" (progress bar), "US\$1,007.16 / US\$5,000.00", "Total Days Used" (progress bar), and "175 / 365". A "Upgrade account" button is also present. Below this is a "Filters" section with fields for START DATE (Feb 1, 2019), END DATE (Mar 15, 2019), COMPARTMENT (dropdown), TAG KEY (dropdown), and TAG VALUE (input field). A "Total Usage Charges" summary is shown as "US\$734.81". The main content area shows a table of service costs:

| Service | Total Cost | Total Cost Trend (Feb 1, 2019 - Mar 15, 2019) |
|----------------|------------|---|
| Compute | US\$676.81 | |
| Block Storage | US\$58.00 | |
| Object Storage | US\$0.00 | |

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- Visualization tools Help understand spending patterns at a glance
- Filter costs by Date, Tags and Compartments
- Trend lines show how spending patterns are changing
- To use Cost Analysis you must be a member of the Administrators group

OCI Cost Analysis

1. Open the navigation menu. Under **Governance and Administration**, go to **Billing** and click **Cost Analysis**.
2. In **Start Date**, select a date.
3. In **End Date**, select a date (within six months of the start date).
4. Click **Apply Filters**.

The screenshot shows the Oracle Cloud Cost Analysis interface. On the left, there's a sidebar with 'Billing' selected, followed by 'Cost Analysis' (which is highlighted in blue), 'Payment Method', 'Budgets', and 'Usage Report'. The main area is titled 'Cost Analysis' and shows 'Days elapsed in billing cycle 23 / 31'. At the top, there are filter options: 'Filters', 'START DATE' (set to Feb 28, 2019), 'END DATE' (set to Aug 28, 2019), 'COMPARTMENT' (with a dropdown 'Filter by Compartment'), 'TAG KEY' (with a dropdown 'Filter by Tag'), 'TAG VALUE' (an input field), and a 'Apply Filters' button. Below these filters, a summary box displays 'Total Usage Charges US\$ [REDACTED]' for the period 'Feb 28, 2019 - Aug 28, 2019'. At the bottom, there's a table with columns 'Service' and 'Total Cost'.

OCI Budgets

- Track actual and forecasted spending for the entire tenancy or per compartment
- Set alerts on your budgets at predefined thresholds to get notified
- View all of your budgets and spending from one dashboard



Account Management

Cost Analysis

Payment Method

Budgets

Usage Report

Tag Filters

[add](#) | [clear](#)

no tag filters applied

BUDGET SCOPE

- COMPARTMENT
- COST-TRACKING TAG

Budgets

You can use budgets to track costs in your tenancy. After creating a budget for a compartment, you can set up alerts that will notify you if a budget is forecast to be exceeded or if spending surpasses a certain amount.

| Create Budget | | | | | | |
|-------------------------------|--------------|--------------------------------------|--------------|-------|-------------------|--|
| Name | Budget Scope | Target | Amount | Spent | % Spent In Period | Forecast <i>i</i> |
| Dev-Test | Compartment | /ACME_CORP | US\$1,000.00 | N/A | N/A | N/A |
| talemos-costs | Compartment | /talemos_compartment | US\$100.00 | N/A | N/A | N/A |
| Showing 2 Items | | | | | | < Page 1 > |



Accessing OCI Budgets

| IAM Policy | Description |
|---|--|
| Allow group accountants to inspect usage-budgets in tenancy | Accountants can inspect budgets including spend. |
| Allow group accountants to read usage-budgets in tenancy | Accountants can read budgets including spend (same as list). |
| Allow group accountants to use usage-budgets in tenancy | Accountants can create and edit budgets and alerts rules. |
| Allow group accountants to manage usage-budgets in tenancy | Accountants can create, edit, and delete budgets and alerts rules. |

- To use budgets, you must be in a group that can use "usage-budgets" in the tenancy
- All budgets are created in the root compartment, regardless of the compartment they are targeting

Create Budgets

Create Budget

BUDGET SCOPE
 COMPARTMENT COST-TRACKING TAG

NAME
Dev-Test
Name can only contain alphanumeric characters, dashes, periods, and underscores.

DESCRIPTION
Dev and test

TARGET COMPARTMENT *(i)*
ACME_Corp
ocisateam (root)/ACME_Corp

MONTHLY BUDGET AMOUNT (IN US\$)
1000
The minimum allowed value is US\$1.00; the maximum allowed value is US\$999,999,999.999.

Budget Alert Rule (optional)

You can set up a budget alert rule now, or add it later. You can set up multiple alerts for the same budget.

THRESHOLD METRIC *(i)*
 ACTUAL SPEND FORECAST SPEND

THRESHOLD TYPE *(i)*
 PERCENTAGE OF BUDGET ABSOLUTE AMOUNT

THRESHOLD %

EMAIL RECIPIENTS

Enter one or more email addresses to receive the alerts. Multiple addresses can be separated using a comma, semicolon, space, tab, or new line.

EMAIL MESSAGE

Enter the body of the email message

[Show advanced options](#)

Create **Cancel**

Budgets Alerts

Create Budget Alert Rule

help cancel

THRESHOLD METRIC *i*

ACTUAL SPEND FORECAST SPEND

THRESHOLD TYPE *i*

PERCENTAGE OF BUDGET ABSOLUTE AMOUNT

THRESHOLD %

80

EMAIL RECIPIENTS

test@test.test

Enter one or more email addresses to receive the alerts. Multiple addresses can be separated using a comma, semicolon, space, tab, or new line.

EMAIL MESSAGE

test message

Enter the body of the email message

Create Cancel

Budget Alert Emails



Compartment: philpoc
Budget: Tenancy_Commitment
Monthly budget: \$700.00

Alert Type: Forecast
Threshold: 100%

Spend in cycle: \$362.49
Forecast: \$749.14
Time in cycle: 15 / 31 days

Message from your administrator

You are getting this alert because you are forecasted to overspend your budget this month. Please take action to reduce your spending. If your increase in spending is required and you cannot find ways to save money, refer to internal guidelines at <http://myintranetsite.com/accounting/budgets>.

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Usage Reports

- Detailed information about your OCI consumption
- CSV file with one record per resource per hour with metadata and tags
- Automatically generated daily, and stored in an Oracle-owned object storage bucket
- Contain 24 hours of usage data
- Retained for one year
- Can be used in conjunction with your rate card for:
 - Invoice reconciliation
 - Custom reporting
 - Cross-charging
 - Cost optimization
 - Resource inventory

Accessing Usage Reports

- Reports are generated in another tenancy and stored in an Oracle-owned object storage bucket
- Set up a cross-tenancy IAM policy to access your usage reports
 - *define tenancy usage-report as ocid1.tenancy.oc1..abc..*
 - *endorse group MyGroupName to read objects in tenancy usage-report*

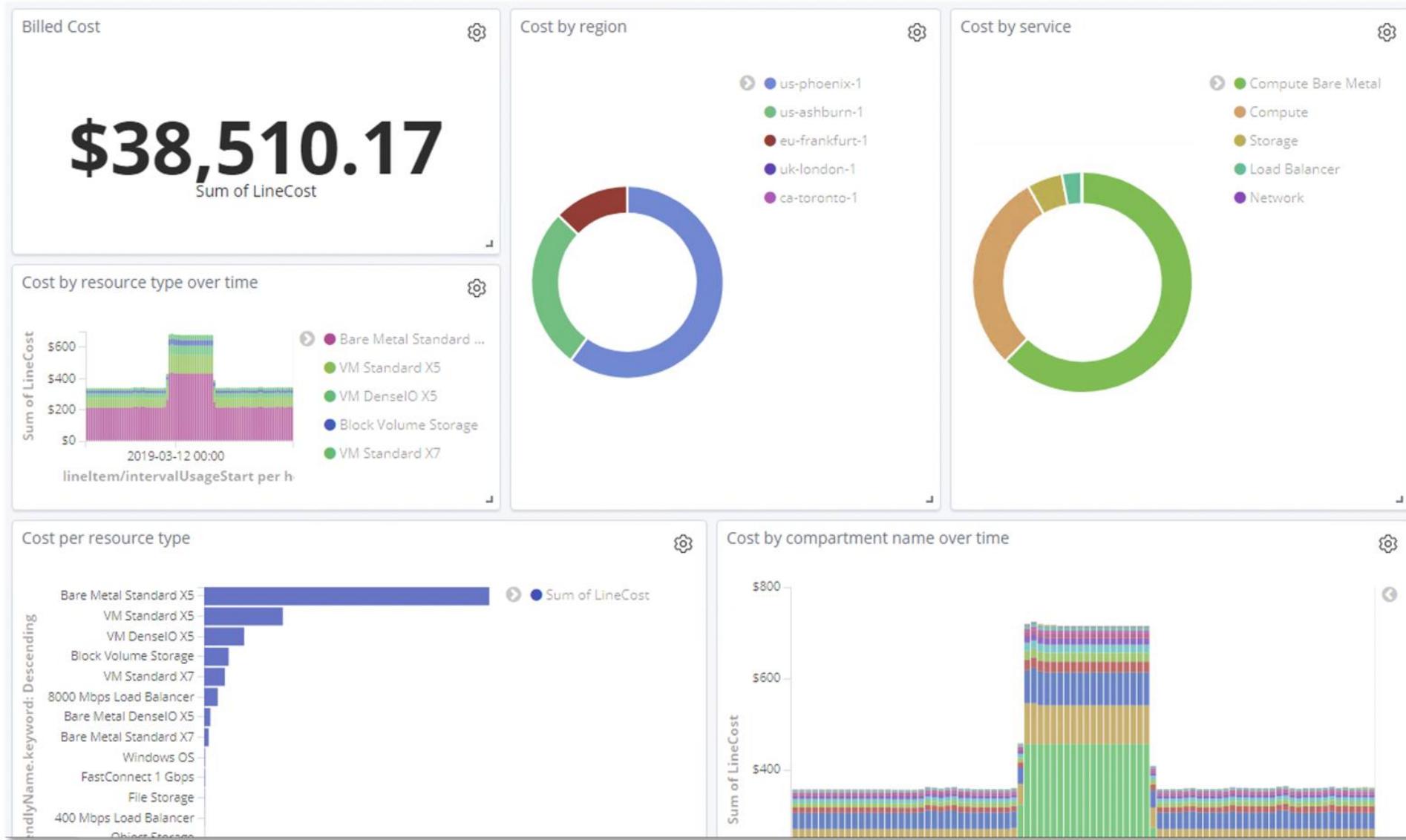
Download using console

1. Open the navigation menu. Under **Governance and Administration**, go to **Billing** and select **Usage Report**.
2. Click the report you want to download from the list, and follow your browser's instructions for downloading.

Download using API

- Use the Object Storage APIs
- stored in the tenancy's home region
- Object storage namespace used for the reports is bling; the bucket name is the tenancy OCID

Sample Dashboard from a Usage Report



Cost Management Best Practices

- Create a budget that matches your commitment amount and an alert at 100 percent of the forecast.
 - Gives you an early warning if your spending increases and you're at risk of getting an overage.
- Use compartments for cost management along with access-control. Many customers set up one compartment per department for cost management and cross-charging.
- Use cost-tracking tags (like cost-center) to allocate cost in more granular ways.
- Enable monitoring on all resources. You can merge monitoring data with cost data to gain powerful insights on how to improve resource utilization.
- Use the usage report to analyze costs and drive custom solutions.



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Economics

<https://www.oracle.com/cloud/economics/>

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Tenancy Explorer



Quotas Policies

Compartment Quotas

- Quotas give you better control over how resources are consumed by letting you allocate resources to projects or departments
 - Allocate high-value and expensive resources only to specific compartments
 - Restrict a compartment's usage to a small set of resources, restrict resource counts or disable services as necessary
- Similar to *Service Limits*; but service limits are set by Oracle, and compartment quotas are set by administrators
- Set using *policy statements* written in a simple declarative language that is similar to the IAM policy language

The screenshot shows the Oracle Cloud interface for managing quotas. At the top, there's a navigation bar with the Oracle Cloud logo, a search bar, and account information (us-ashburn-1). Below the header, the URL shows 'Governance > Quotas > Quota Details'. The main content area is titled 'ExadataAllocation'. It features a large green circle with a white 'Q' in the center. Below the circle are three buttons: 'Edit' (gray), 'Delete' (red), and 'Add Tags' (blue). A tab bar below the buttons has 'Quota Information' selected (gray) and 'Tags' (blue). The 'Quota Information' section contains the following details:

- Description: Allocates all exadata to a compartment
- OCID: ...pkckg7mbca [Show](#) [Copy](#)
- Created: Mon, 01 Jul 2019 14:36:11 GMT

On the left side, there's a sidebar titled 'Resources' with a 'Statements (2)' link. On the right side, under 'Statements', there are two entries:

| |
|---|
| Statement |
| Zero database quota /*exadata*/ in tenancy |
| Unset database quota /*exadata*/ in compartment ProductionApp |

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Quota Policies Examples

This example policy statement only allows one VM.Standard2.1 Compute instance in a single compartment in a single region:

- zero compute quotas in tenancy
set compute quota vm-standard2-1-count to 10 in compartment IT where request.region = us-phoenix-1

You can clear quotas by using an unset statement, which removes the quota for a resource - any limits on this resource will now be enforced by the service limits:

- zero compute quotas in tenancy
unset compute quota vm-dense-io1-16-count in tenancy

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Limits, Quotas & Usage

Service Limits and Usage

- When you sign up for Oracle Cloud Infrastructure, a set of service limits are configured for your tenancy.
- The service limit is the quota or allowance set on a resource.
- You can view your tenancy's limits, quotas, and usage in the Console.
 - You can check Limits and Quotas before a deployment
- You can submit a request to increase your service limits from within the Console.

The screenshot shows the Oracle Cloud console interface for managing service limits. The top navigation bar includes the Oracle Cloud logo, a search bar, and various user icons. On the left, a sidebar menu lists 'Governance' (Audit, Quota Policies, **Limits, Quotas and Usage**, Tag Namespaces). The main content area is titled 'Limits, Quotas and Usage'. It displays a summary message about predefined service limits and a link to request an increase. Below this is a filter section with dropdowns for 'SERVICE' (Compute), 'SCOPE' (ritx:US-ASHBURN-AD-1), 'RESOURCE' (VM.Standard2.1, VM.Standard2.2, VM.Standard2.4, VM.Standard2.8), and 'COMPARTMENT' (Demo (root)). A table then lists four service limits:

| Description | Limit Name | Service Limit | Usage | Available |
|----------------|------------------------------|---------------|-------|-----------|
| VM.Standard2.1 | vmlimit-vm-standard2-1-count | 100 | 4 | 96 |
| VM.Standard2.2 | vmlimit-vm-standard2-2-count | 80 | 1 | 79 |
| VM.Standard2.4 | vmlimit-vm-standard2-4-count | 80 | 1 | 79 |
| VM.Standard2.8 | vmlimit-vm-standard2-8-count | 40 | 2 | 38 |

At the bottom, it says 'Showing 4 Items' and has navigation arrows. The entire screenshot is framed by a light gray border.



Observability with OCI Native Services

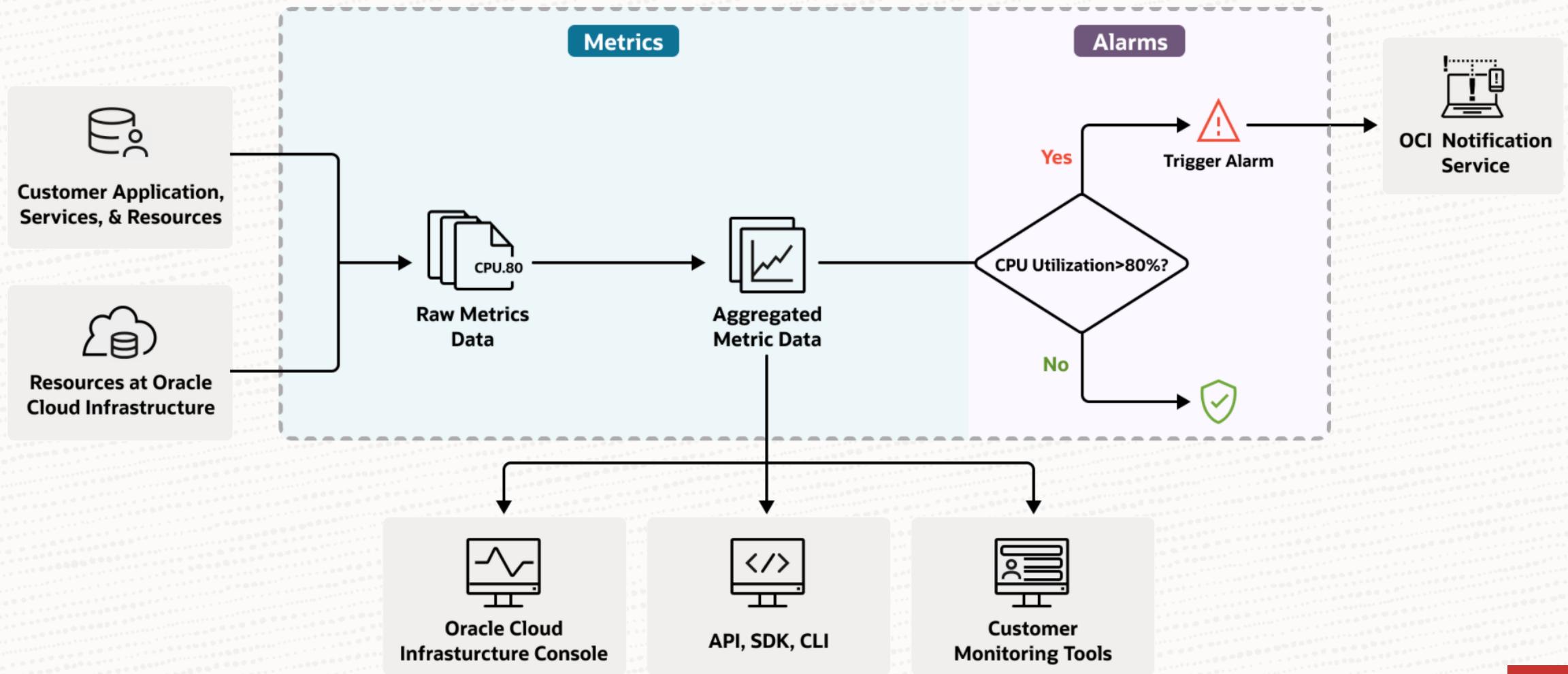
Monitoring & Notification

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



OCI Monitoring Service



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

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
- **IMPORTANT:**
 - Create custom metrics, understanding the workload of your customers
 - [Reference Link](#)
 - [OCI Reference Documentation](#)



Supported Services

The following services have resources or components that can emit metrics to Monitoring:

- API Gateway - see [API Gateway Metrics](#)
- Big Data - see [View Cluster Metrics](#)
- Block Storage - see [Block Volume Metrics](#)
- Blockchain Platform - see [Blockchain Platform Metrics](#)
- Compute - see these topics:
 - [Compute Instance Metrics](#)
 - [Instance Pool Metrics](#)
 - [Infrastructure Health Metrics](#)
 - [Compute Management Metrics](#)
- Container Engine for Kubernetes - see [Container Engine for Kubernetes Metrics](#)
- Data Catalog - see [Data Catalog Metrics](#)
- Data Integration - see [Data Integration Metrics](#)
- Database - see [Database Metrics](#)
- Digital Assistant - see [Digital Assistant Metrics](#)
- DNS - see [DNS Metrics](#)
- Events - see [Events Metrics](#)
- Email Delivery - see [Email Delivery Metrics](#)



Supported Services

OCI Documentation – Supported Services

- File Storage - see [File System Metrics](#)
- Functions - see [Function Metrics](#)
- Health Checks - see [Health Checks Metrics](#)
- Integration - see [Viewing Message Metrics](#)
- Load Balancing - see [Load Balancing Metrics](#)
- Management Agent - see [Management Agent Metrics](#)
- MySQL Database - see [MySQL Database Metrics](#)
- Networking - see these topics:
 - [VNIC Metrics](#)
 - [FastConnect Metrics](#)
 - [VPN Connect Metrics](#)
 - [Service Gateway Metrics](#)
- NoSQL Database Cloud - see [Service Metrics](#)
- Notifications - see [Notifications Metrics](#)
- Object Storage - see [Object Storage Metrics](#)
- OS Management - see [OS Management Metrics](#)
- Streaming - see [Streaming Metrics](#)
- Vault - see [Vault Metrics](#)
- WAF - see [WAF Metrics](#)



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OCI Notification Service

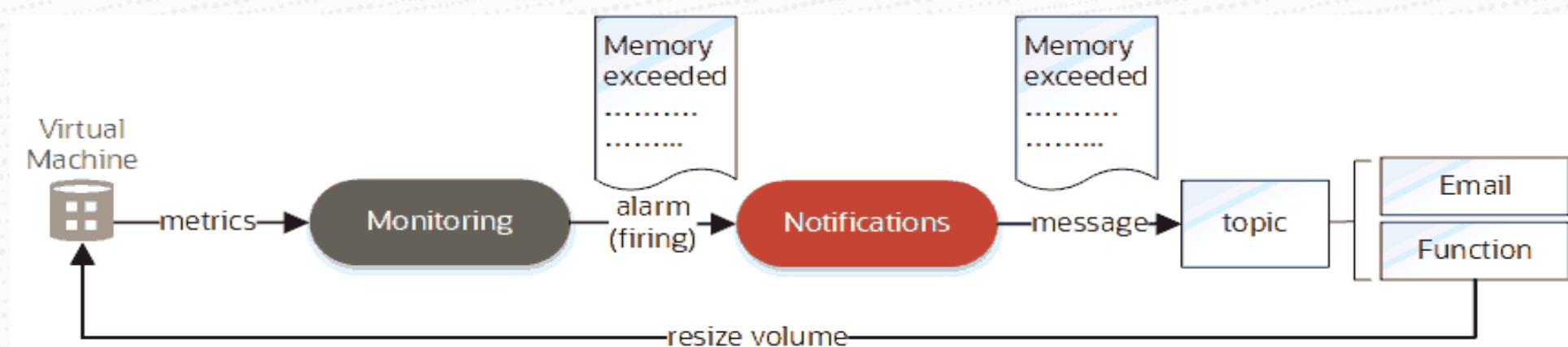
Use case

- The Oracle Cloud Infrastructure Notifications service broadcasts messages to distributed components through a publish-subscribe pattern, delivering secure, highly reliable, low latency and durable messages for applications hosted on Oracle Cloud Infrastructure and externally.
- Use Notifications to get notified when event rules are triggered or alarms are breached, or to directly publish a message. 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)
- How Notifications Works:
 - The Notifications service enables you to set up communication channels for publishing messages using topics and subscriptions . When a message is published to a topic, the Notifications service sends the message to all of the topic's subscriptions.

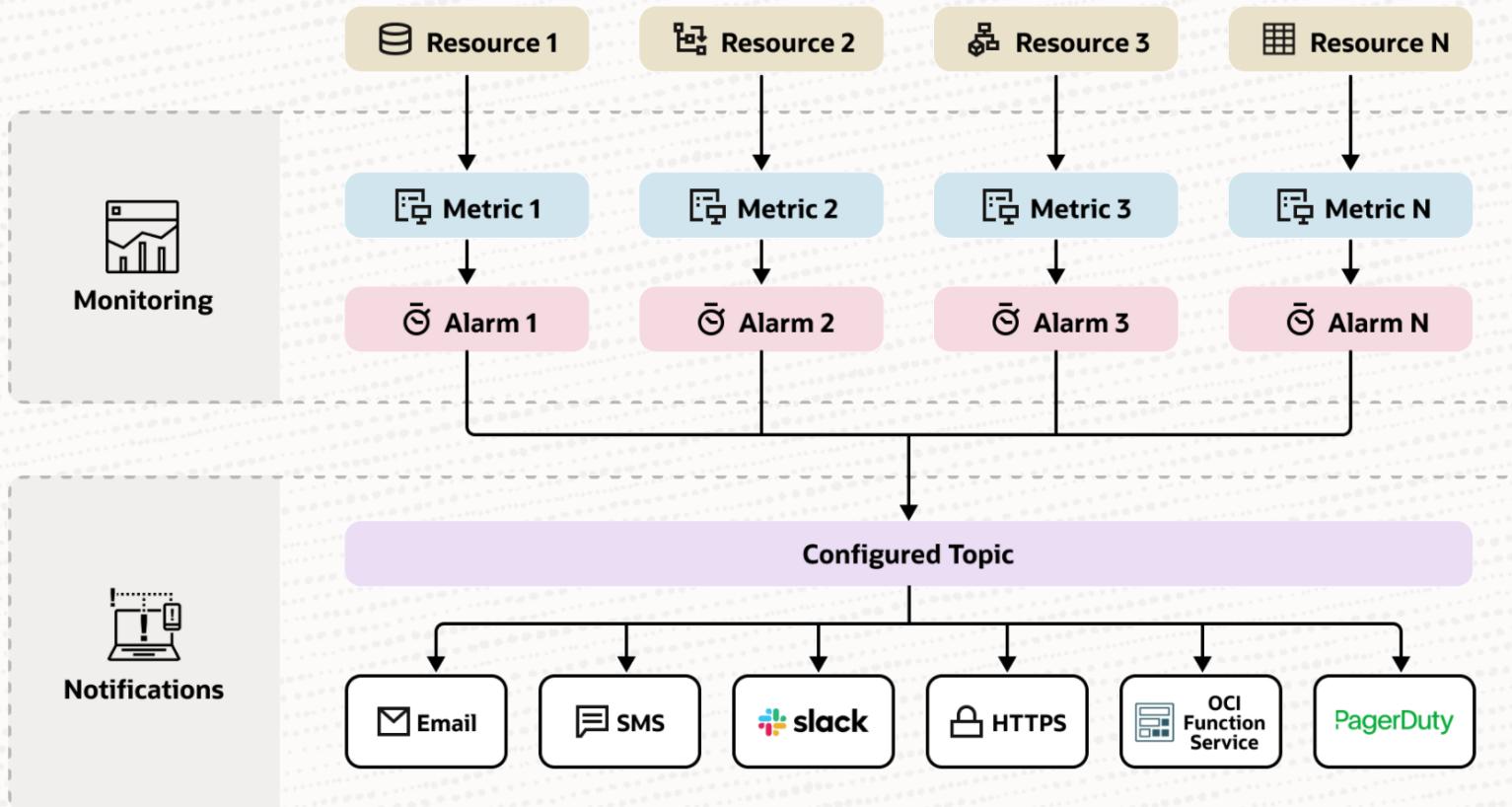


OCI Notifications Scenarios

- Automatic Resize VM
 - This scenario involves writing a function to resize VMs and creating an alarm that sends a message to that function. When the alarm fires, the Notifications service sends the alarm message to the destination topic, which then fans out to the topic's subscriptions. In this scenario, the topic's subscriptions include the function as well as your email. The function is invoked on receipt of the alarm message. The Notifications service has no information about a function after it's invoked.



OCI Notification with monitoring





Architecture Center

<https://www.oracle.com/cloud/architecture-center/>



Oracle Cloud Trial

OCI training and certification:

- <https://learn.oracle.com/>
- <https://education.oracle.com/tech-exam>

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[OCI hands-on labs / Learning Library - GitHub](#)

[Oracle learning library videos on YouTube](#)

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Feedback/Comments/Ask for help

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- Thank you

