Azure Monitor

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Overview of Azure Monitor

Azure Monitor is a comprehensive monitoring solution for collecting, analyzing, and acting on telemetry from your cloud and on-premises environments.

Purpose: Helps you maximize the availability and performance of your applications and services.
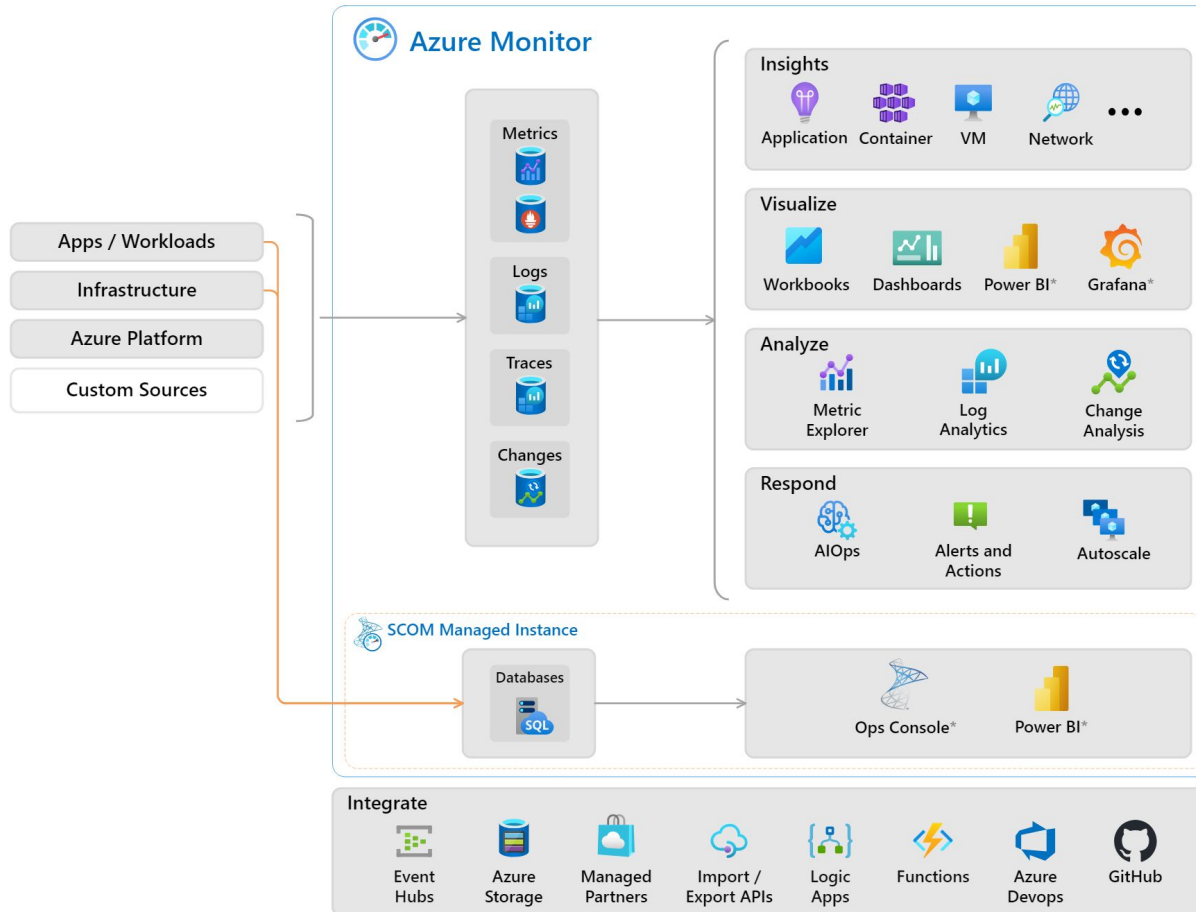
Data Collection and Analysis

- **Sources:** Application, Guest OS, Azure resources, Azure subscription, and custom sources.
- **Data Types:** Metrics, logs, traces, and telemetry.
- **Tools:** Log Analytics, Application Insights.
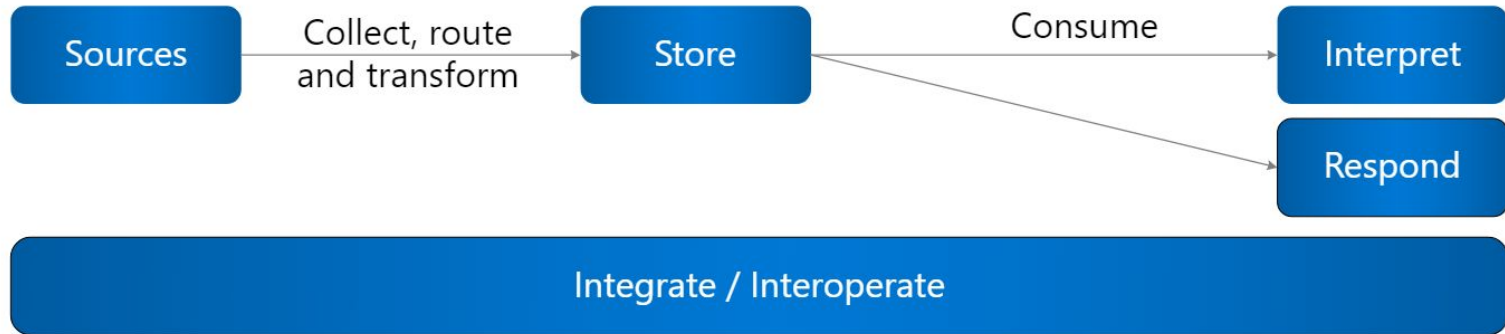
Azure Monitor Insights

What are Insights?

- Insights provide deep visibility into your applications and infrastructure.
- They offer out-of-the-box insights for common applications like VMs, containers, and applications.

Types of Insights:

- **Application Insights**: For monitoring live applications, detecting performance anomalies, and diagnostics.
- **Container Insights**: For monitoring the health and performance of container workloads.
- **VM Insights**: For monitoring virtual machines with dependency views and performance metrics.

https://learn.microsoft.com/en-us/azure/azure-monitor/essentials/data-platform-metrics

··· Monitor | Insights Hub ···
Microsoft

Insights (11)

Search

Service Name	Description
Compute (2)	
Virtual Machines	Performance, health, and running processes for VM and VMSS
Containers	Performance, health, and utilization of managed and self managed Kubernetes clusters including AKS.
Networking (1)	
Networks	Health and metrics for all deployed network resource without any configuration
Storage (2)	
Storage accounts	Performance, Capacity, and availability of storage accounts
Backup PREVIEW	Gain visibility into backup job statistics, consumption trends and optimization opportunities across your Recovery Services vaults
Databases (2)	
Azure Cosmos DB	Performance, failures, capacity, and operational health of all your Azure Cosmos DB
Azure Cache for Redis	Performance, operations, usage, and failures of all your Azure Cache for Redis
Analytics (1)	
Azure Data Explorer Clusters PREVIEW	Performance (query, export, ingestion, streaming) of all your Azure Data Explorer Clusters
Security (1)	
Key Vaults	Requests, failures, operations, and latency of all your Azure Key vaults
Monitor (1)	
Applications	Monitor your live applications - performance anomalies, diagnose issues and understand user acitivity
Other (1)	
Windows Virtual Desktop PREVIEW	Diagnostics, performance, and usage for Windows Virtual Desktop.

Metrics

Metrics are numerical values that describe the performance of resources at a specific point in time. It is used to track performance, identify trends, and diagnose issues.
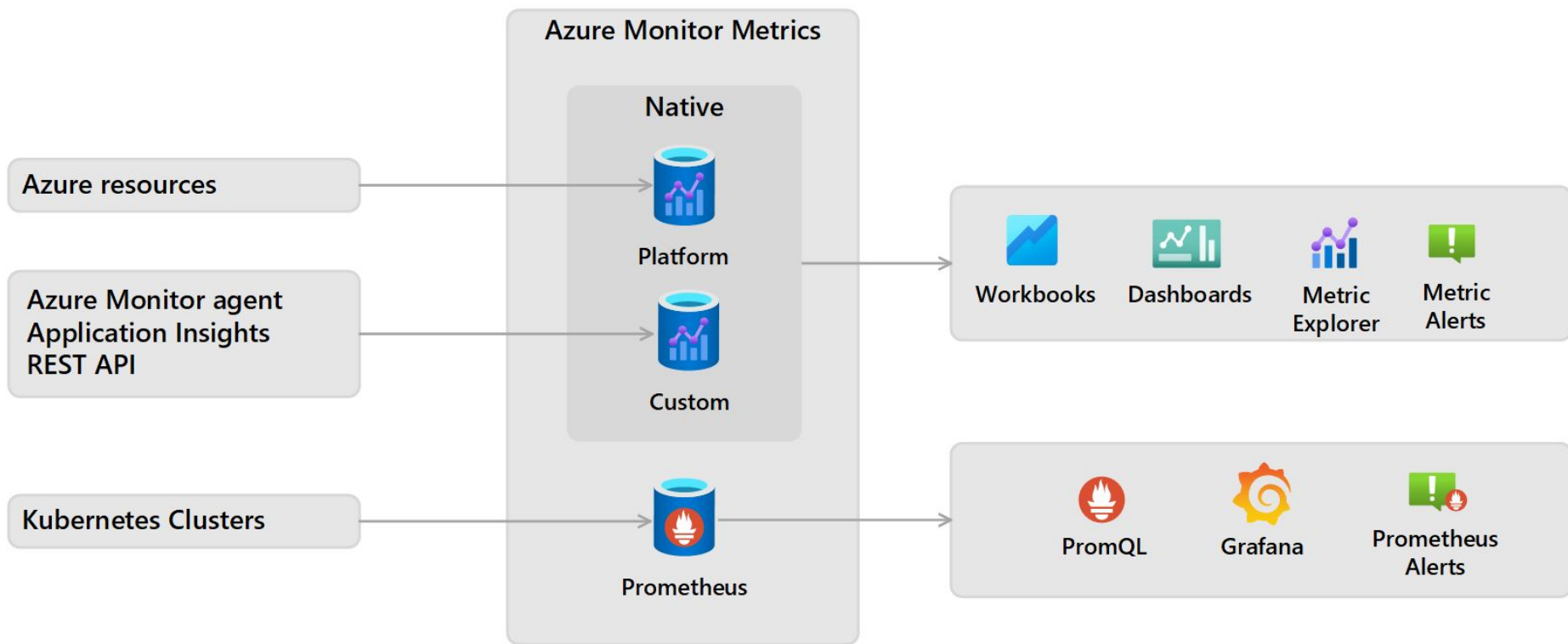
Types of Metrics:

- **Platform Metrics**: Default metrics collected by Azure (e.g., CPU usage, memory usage).
- **Custom Metrics**: User-defined metrics for specific scenarios.

Features:

- Real-time monitoring.
- Configurable retention periods.

https://learn.microsoft.com/en-us/azure/azure-monitor/essentials/data-platform-metrics
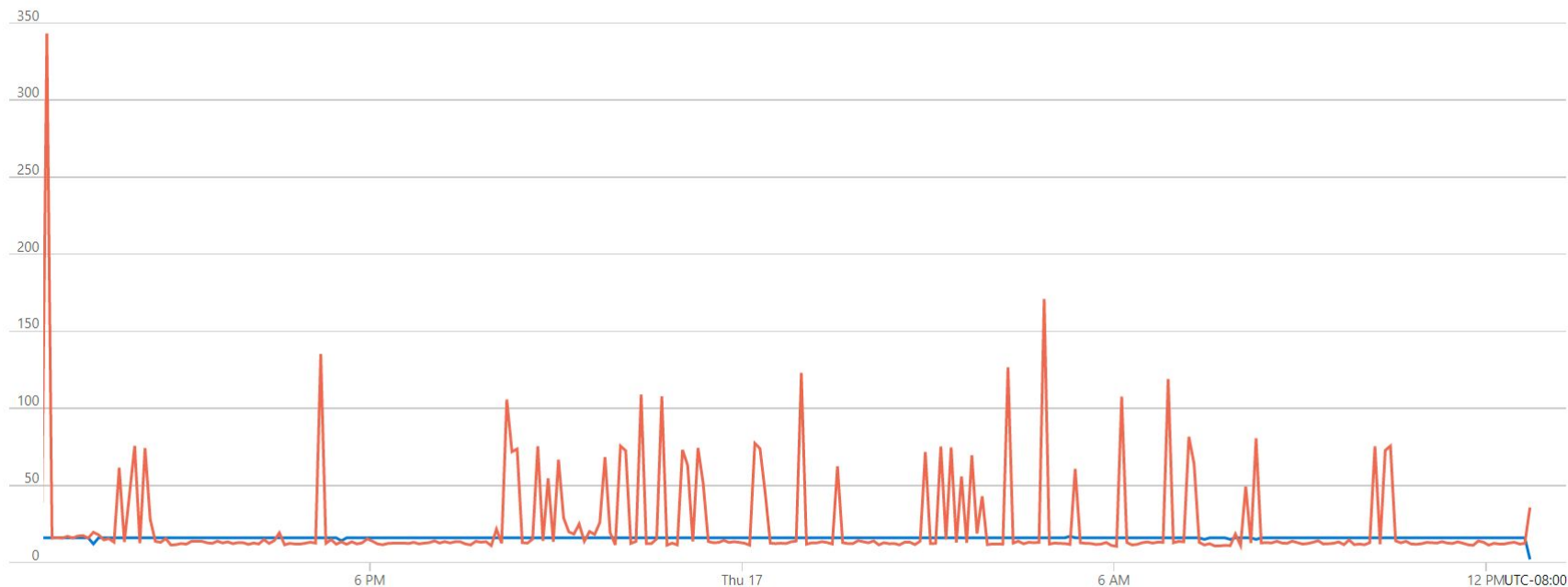
Sum Server requests, Avg Server response time, and Sum Failed requests for tailspintoyswebapp ✎

✢ Add metric | ✢ Add filter | ⁘ Apply splitting | ⬚ Line chart ∨ | ⬚ Drill into Logs ∨ | ⚠ New alert rule | ⚲ Pin to dashboard | ⋯

💡 tailspintoyswebapp, **Server requests,** Sum ⊗ | 💡 tailspintoyswebapp, **Server response time,** Avg ⊗ | 💡 tailspintoyswebapp, **Failed requests,** Sum ⊗

■ Server requests (Sum) tailspintoyswebapp	■ Server response time... tailspintoyswebapp	■ Failed requests (Sum) tailspintoyswebapp
4.59 k	**24.30** ms	**0**

Logs

Logs provide detailed data about resource activity and usage.

Types of Logs:
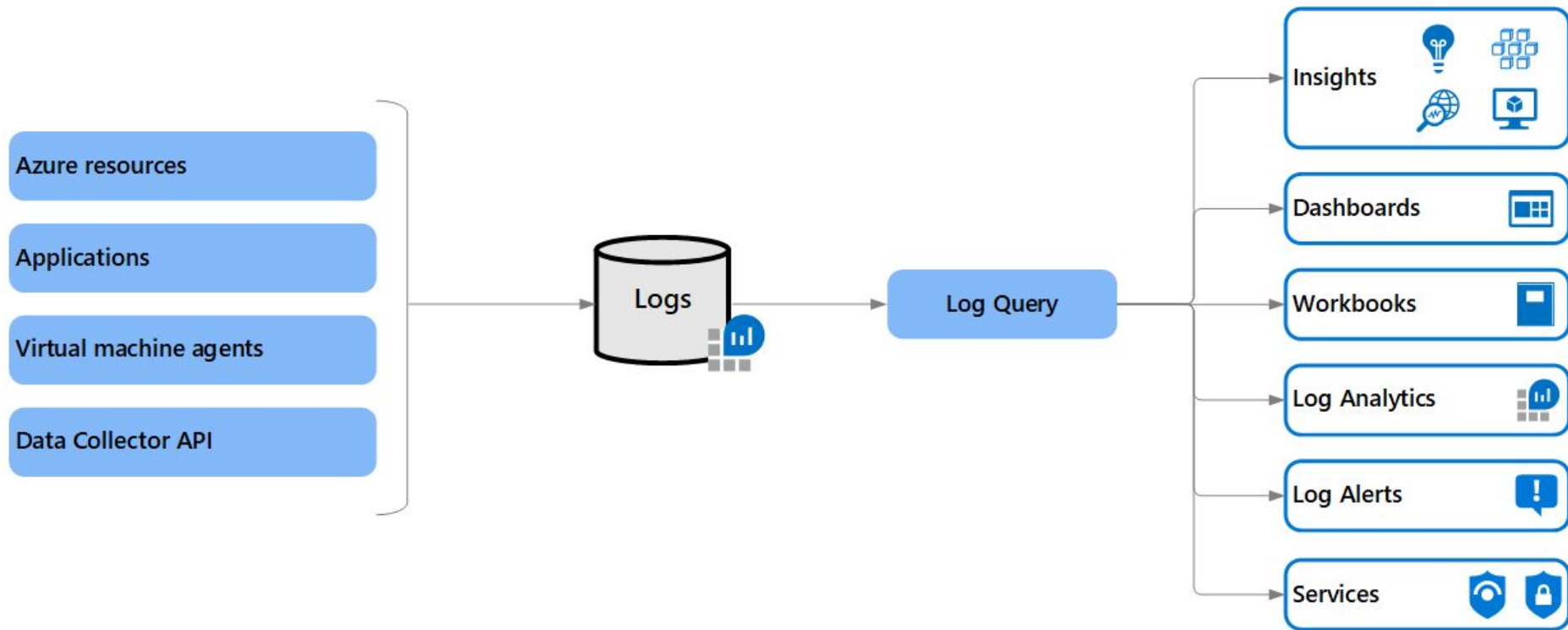
- **Activity Logs**: Provide insight into operations that were performed on resources.
- **Resource Logs**: Contain information about the operation of an Azure resource.

Features:

- Centralized log collection and analysis.
- Integration with Azure Log Analytics for advanced queries and analysis.

https://learn.microsoft.com/en-us/azure/azure-monitor/essentials/data-platform-metrics

Azure resources

Applications

Virtual machine agents

Data Collector API

Logs

Log Query

Insights

Dashboards

Workbooks

Log Analytics

Log Alerts

Services

Log Analytic Workspace

Log Analytics collects data from a variety of sources and uses a powerful query language to give you insights into the operation of your applications and resources.

Log analytic workspace is a centralized repository for log data collected by Azure Monitor.

Uses:

- Query, analyze, and visualize log data.
- Perform advanced searches and set up alert rules.

Configuration:

- Create and configure workspaces in the Azure Portal.
- Connect multiple Azure resources to a single workspace for consolidated monitoring.

https://learn.microsoft.com/en-us/azure/azure-monitor/logs/log-analytics-workspace-overview
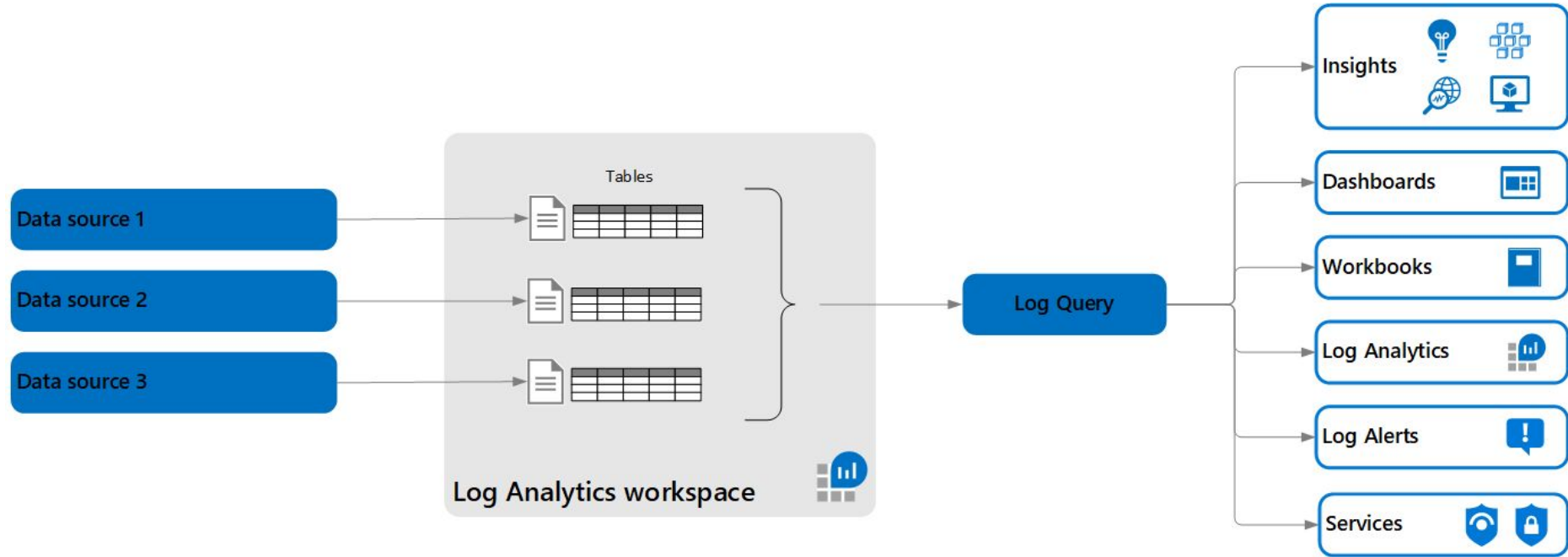
Diagnostic Settings

Diagnostic settings configure how and where resource logs and metrics are collected.

It is used to send platform logs and metrics to different destinations (e.g., Log Analytics workspace, Azure Event Hubs, storage account).

Configuration:

- Set up for each resource to capture logs and metrics.
- Choose what data to collect and where to send it.

Alerts

Alerts notify you about critical conditions in your resources. They help you take immediate action to mitigate issues.

Types of Alerts:

- **Metric Alerts**: Triggered based on performance metrics.
- **Log Alerts**: Triggered based on log data queries.
- **Activity Log Alerts**: Triggered based on Azure activity logs.

Features:

- Define alert conditions and actions.
- Integration with email, SMS, webhooks, and ITSM systems.

2 Alert Rules

Scope/Resources (VM_1) **+** Signal (CPU utilization) **+** Conditions (avg CPU > 80%)

Alert Evaluation Engines (metrics, logs, activity logs, Prometheus)

Scheduled Evaluation

Evaluate Telemetry

1 Azure Resources

Emit Telemetry

Azure Monitor Metrics, Logs

Condition Met

3 Fired Alerts

Create Alert

Alert Processing Rule (suppress / add actions)

Action Group (notifications, actions)

Invoke Actions

4 Actions

Alerts boundary

External boundary

https://learn.microsoft.com/en-us/azure/azure-monitor/alerts/alerts-overview
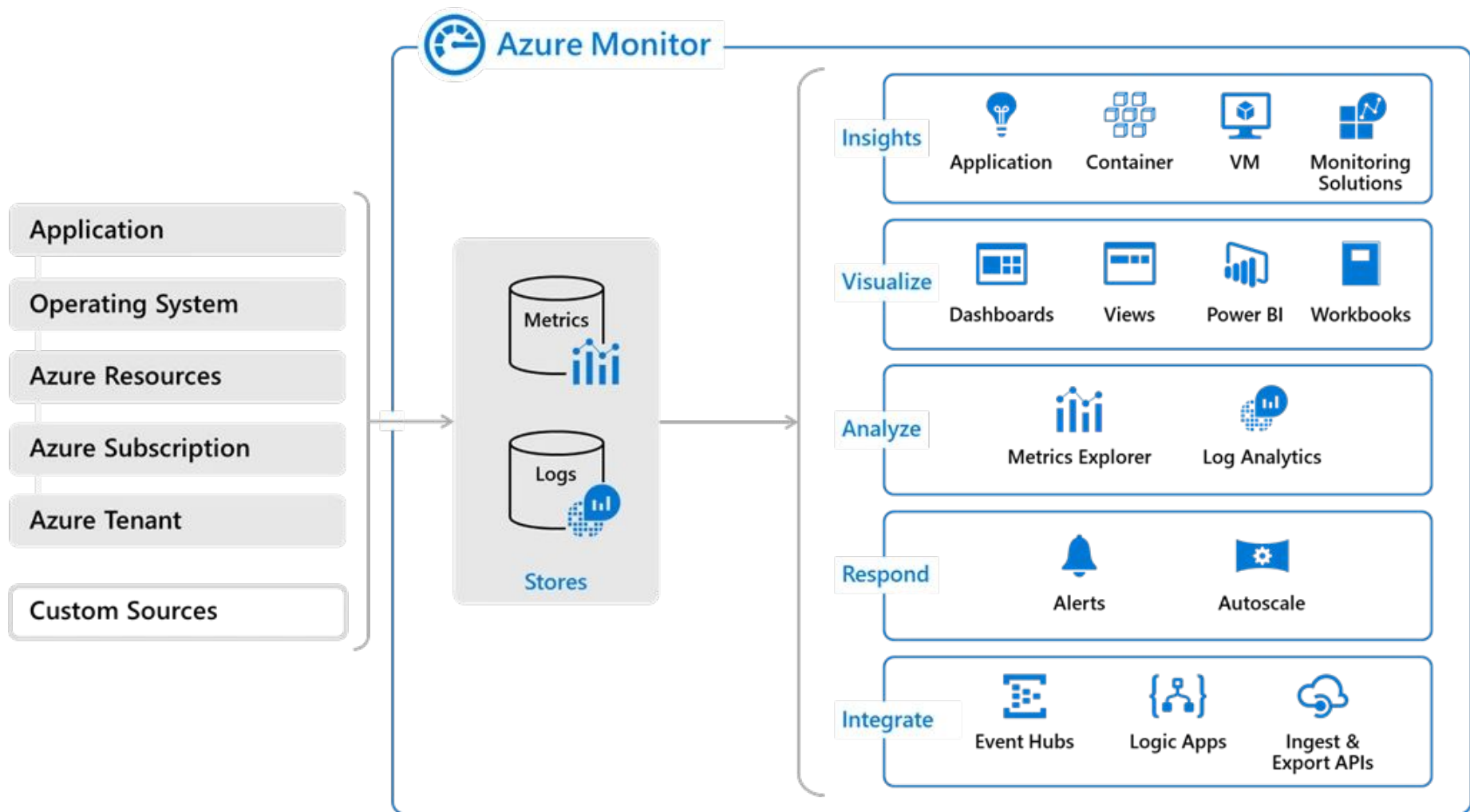
Visualizations

Visualization is key to interpreting monitoring data effectively. Azure offers a variety of visualization tools to help analyze and display data from different resources.

Dashboards: Customizable dashboards for visualizing data.

Workbooks: Interactive reports combining text, analytics queries, and visualizations.

Power BI Integration: Advanced analytics and visualization capabilities

https://learn.microsoft.com/en-us/azure/azure-monitor/visualize/workbooks-overview

Azure Monitor

Sources (left column):
- Application
- Operating System
- Azure Resources
- Azure Subscription
- Azure Tenant
- Custom Sources

Stores:
- Metrics
- Logs

Insights: Application, Container, VM, Monitoring Solutions

Visualize: Dashboards, Views, Power BI, Workbooks

Analyze: Metrics Explorer, Log Analytics

Respond: Alerts, Autoscale

Integrate: Event Hubs, Logic Apps, Ingest & Export APIs

Lab

- Set up Azure Monitor and configure it to monitor an Azure Virtual Machine (VM).

Get Certified!

Deploy and configure Azure Monitor

- https://learn.microsoft.com/en-us/credentials/applied-skills/deploy-and-configure-azure-monitor/

Guided Project

- https://microsoftlearning.github.io/APL-1004-deploy-configure-azure-monitor/

Cost Management in Azure

Cost Management, Budgeting, Service Level Agreements (SLAs), Pricing Calculator, and Total Cost of Ownership (TCO).

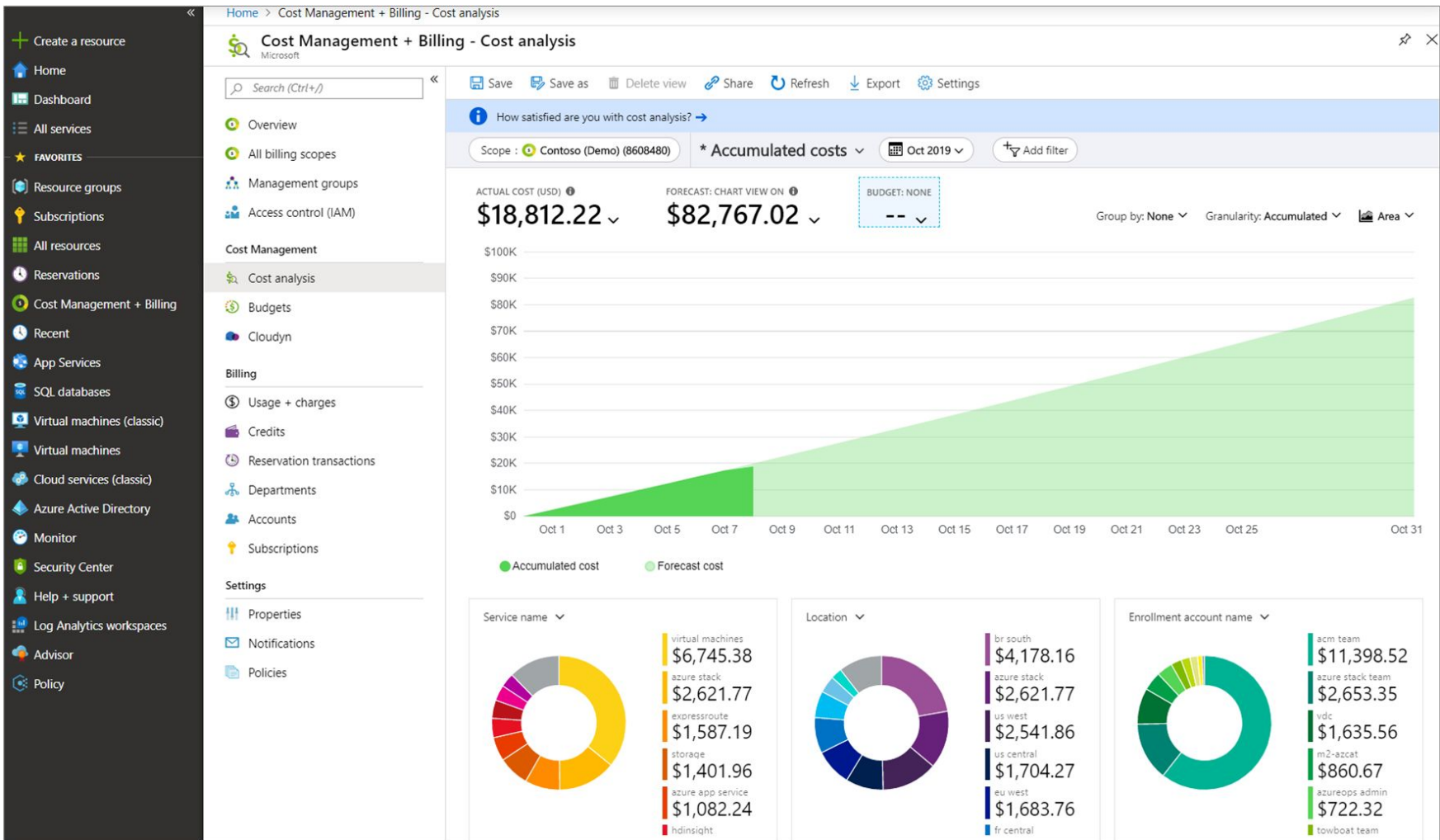# Azure Cost Management

Azure Cost Management helps you monitor, allocate, and optimize cloud spending.

Features:

- **Cost Analysis**: Visualize and analyze your spending.
- **Budgets**: Create and manage budgets to avoid overspending.
- **Recommendations**: Receive optimization recommendations.
- **Alerts**: Set up alerts for cost overruns.

Budget

A budget in Azure Cost Management is a financial target for your cloud spending.

Benefits:

- Prevents unexpected costs.
- Encourages efficient resource use.
- Facilitates financial planning and control.

https://learn.microsoft.com/en-us/azure/cost-management-billing/costs/tutorial-acm-create-budgets?tabs=psbudget

← → C 🔒 ms.portal.azure.com/?feature.arm_canary=true&feature.budget_forecast=true&feature.canmodifystamps=true&microsoft_azure_costmanage... 🔍 ☆ 🧩 B ⋮

Microsoft Azure (Preview) 🐛 | 🔍 Search resources, services, and docs (G+/) | >_ 🗔 🔔 ⚙ ? ☺ user@contoso.com CONTOSO

Home > Cost Management: Contoso (Demo)

Cost Management: Contoso (Demo) | Budgets 📌 ⋯
Billing account

✕

🔍 Search (Ctrl+/) «

| Overview |
| Access control |
| Diagnose and solve problems |

Cost Management

| Cost analysis (preview) |
| Cost analysis |
| Cost alerts |
| Budgets |
| Advisor recommendations |
| Cloudyn |

Billing

| Usage + charges |
| Credits |

Products + services

| Azure subscriptions |
| Reservations |

Settings

| Configuration |

+ Add   🔄 Refresh   ? Help ⌄

ℹ How satisfied are you with defining and enforcing spending limits? →

Scope : 🟠 **Contoso (Demo)** | Search by name | All periods ⌄

ℹ Budget evaluations now include reserved instance and purchase charges. To learn more, visit the budgets documentation. ✕

Name ↑↓	Scope ↑↓	Reset period ↑↓	Creation date ↑↓	Expiration date ↑↓	Budget ↑↓	Forecasted ↑↓	Evaluated spend ↑↓	Progress
EAAccount-BoFTest-...	8608480 (Billing acc...	Monthly	2/1/2021	1/31/2023	$100.00	$0.00	$0.00	0.00%
EAAcount-BoFTest-A...	208903 (Enrollment ...	Monthly	2/1/2021	1/31/2023	$100.00	$0.00	$0.00	0.00%
Pri_Forecast	8608480 (Billing acc...	Monthly	2/1/2021	2/28/2022	$100.00	$120.5K	$26,046	100.00%
Pri_actualForecast	8608480 (Billing acc...	Monthly	2/1/2021	1/31/2023	$200.00	$120.5K	$26,046	100.00%
EAAccount-BoFTest-...	84820 (Department)	Monthly	2/1/2021	1/31/2023	$100.00	$4,572	$1,088	100.00%
Pri_EdgecaseTest	8608480 (Billing acc...	Monthly	2/1/2021	2/28/2022	$100.00	$515.23	$131.43	100.00%
ACM_Department_B...	84820 (Department)	Monthly	10/1/2019	9/30/2021	$55,000.00	ℹ	$4,272	7.77%
Enrollment_budget	8608480 (Billing acc...	Monthly	4/1/2020	3/31/2022	$45,000.00	ℹ	$26,046	57.88%
ACM	8608480 (Billing acc...	Monthly	8/1/2020	7/31/2022	$30,000.00	ℹ	$0.00	0.00%
JoTestBudget	8608480 (Billing acc...	Monthly	11/1/2020	10/31/2022	$50,000.00	ℹ	$26,046	52.09%
DemoTestBudget	8608480 (Billing acc...	Monthly	12/1/2020	11/30/2022	$40,000.00	ℹ	$26,046	65.12%
ClaroTIGT	8608480 (Billing acc...	Monthly	12/1/2020	11/30/2022	$35,000.00	ℹ	$26,046	74.42%

Service Level Agreement (SLA)

An SLA is a contract that defines the expected performance and availability of Azure services.

Key Components:

- **Uptime Guarantee**: Specifies the guaranteed uptime (e.g., 99.9%).
- **Service Credits**: Compensation provided if the service falls below the guaranteed performance.
- **Scope of Services**: Details the services covered under the SLA.

Examples:

- Virtual Machines: 99.9% availability.
- Azure SQL Database: 99.99% availability.

Pricing Calculator

The Azure Pricing Calculator helps estimate the cost of Azure services.

Features:

- Comprehensive list of Azure services.
- Customizable options to fit specific needs.
- Ability to save and share estimates.

Benefits:

- Provides accurate cost predictions.
- Helps in budgeting and financial planning.
- Facilitates comparison of different configurations.
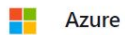
Total Cost of Ownership (TCO)

TCO includes all costs associated with the purchase, deployment, use, and maintenance of Azure services over a specified period.

Components of TCO:

- **Direct Costs**: Subscription fees, usage charges, licensing costs.
- **Indirect Costs**: Administrative expenses, training costs, downtime costs.
- **Savings**: Cost savings from efficiencies, automation, and reduced infrastructure needs.

Benefits:

- Provides a holistic view of expenses.
- Aids in making informed decisions about cloud investments.
- Helps identify potential savings and ROI.

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Total Cost of Ownership (TCO) Calculator

Estimate the cost savings you can realize by migrating your workloads to Azure

1 ——————— **2** ——————— **3**

Define your workloads   Adjust assumptions   View report

📁 Bulk Upload   📊 My saved reports   👤 yourtechieng@gmail.com

Define your workloads

Enter the details of your on-premises workloads. This information will be used to understand your current TCO and recommended services in Azure.

Servers

Enter the details of your on-premises server infrastructure. After adding a workload, select the workload type and enter the remaining details.

⊕ Add server workload

Databases

💬 Chat with Sales

https://azure.microsoft.com/en-us/pricing/tco/calculator/

Best Practices

- Regularly monitor and analyze costs using Azure Cost Management.

- Set realistic budgets and adjust them as needed.

- Understand SLAs and choose services that meet your reliability requirements.

- Use the Pricing Calculator for accurate cost estimations.

- Evaluate the TCO to understand the full financial impact of your Azure investments.

Summary

- Effective cost management and budgeting are crucial for optimizing Azure spending.

- SLAs ensure service reliability and performance.

- The Pricing Calculator and TCO tools provide valuable insights for financial planning.

Quiz Time!

- https://quizizz.com/admin/quiz/669c6b843ad550e9a093a6e5

Assignment

- Write a blog showing a practical use of TCO and Pricing Calculator for cost management.

- New Relic:
    - https://learn.newrelic.com/path/foundations
    - https://learn.newrelic.com/path/observability-practitioner
    - https://learn.newrelic.com/full-stack-observability-exam