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The bridge to possible

Cloud Infrastructure Observability using APIs, Terraform and Workflows

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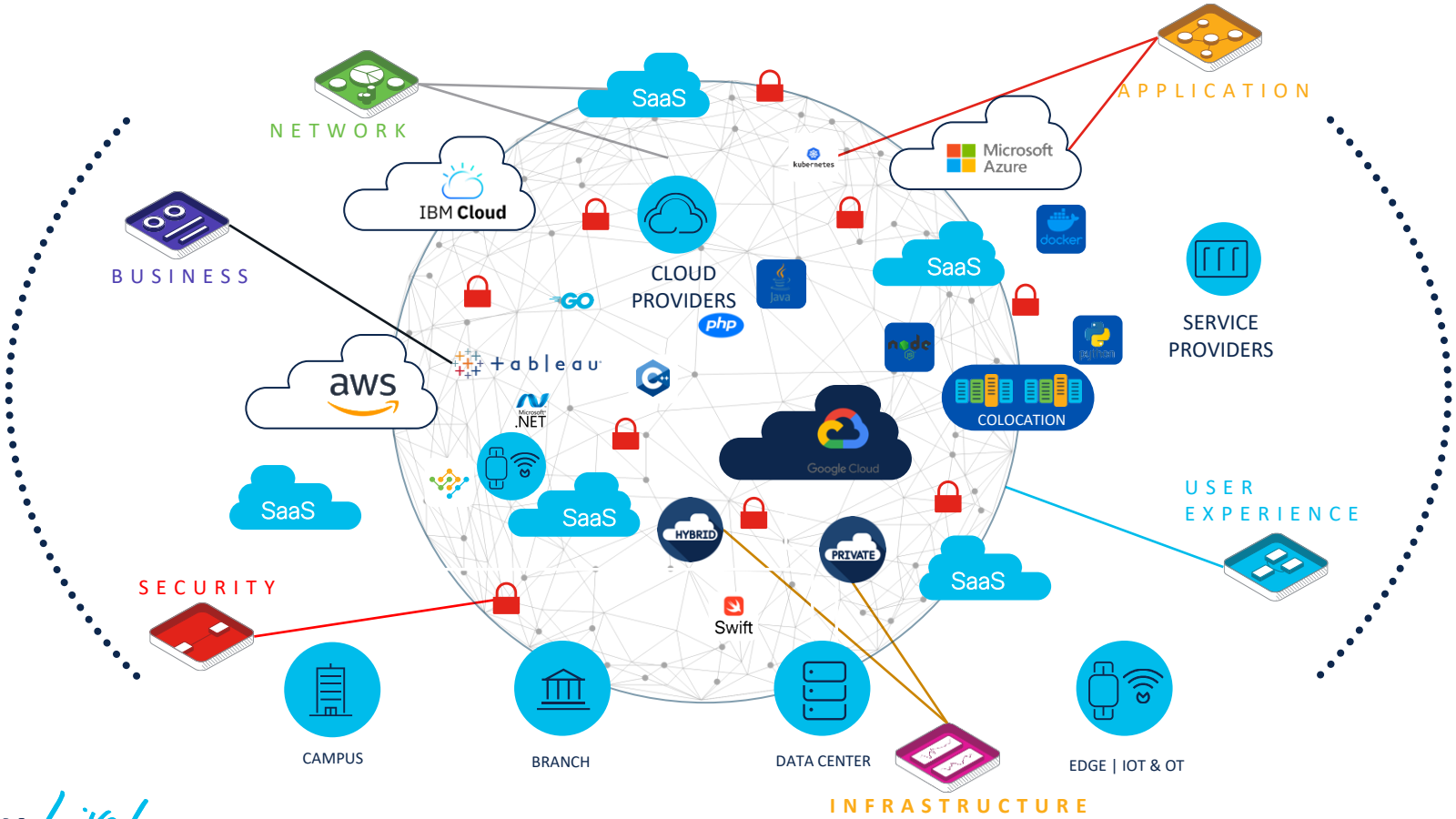
DEVWKS-2718

Agenda

- Challenges of Cloud Observability
- Overview of Cisco's Cloud Observability Platform
- Setting up Cloud Observability with API's
- Setting up Cloud Observability with Terraform
- Setting up Cloud Observability with Intersight ICO Workflows
- Lab
- Additional Resources

Challenges of Cloud Observability

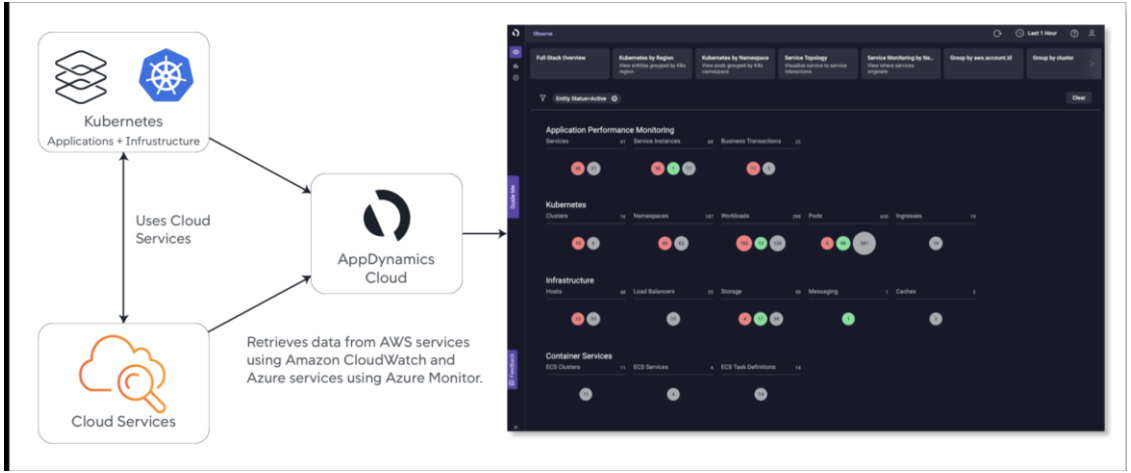


Challenges of Cloud Observability

- When Frost & Sullivan surveyed U.S.-based decision makers, it learned that cloud was top of mind for that population. 92% agreed that the cloud was “the most critical part” of their digital transformation strategy.
- Good Job! You may be one of the 92% and have decided to move your workloads to the cloud.
- But, how do you address obtaining the right kinds and levels of visibility and understanding? This is where **Cloud Observability** comes in.
- At its core, cloud observability means proactively monitoring the availability, performance and security of cloud-based IT infrastructures. This is the basis from which visibility into applications and underlying cloud infrastructure comes, including databases and networking.
- Cloud native observability means measuring and tracking a new, modern breed of applications built using cloud provider application services – such as those from Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP) – along with modern container based technologies, especially Kubernetes.
- Cloud native observability needs a platform to provide visibility and understanding of cloud assets - that’s where Cisco Cloud Observability Platform comes in.

Cisco Cloud Observability Platform

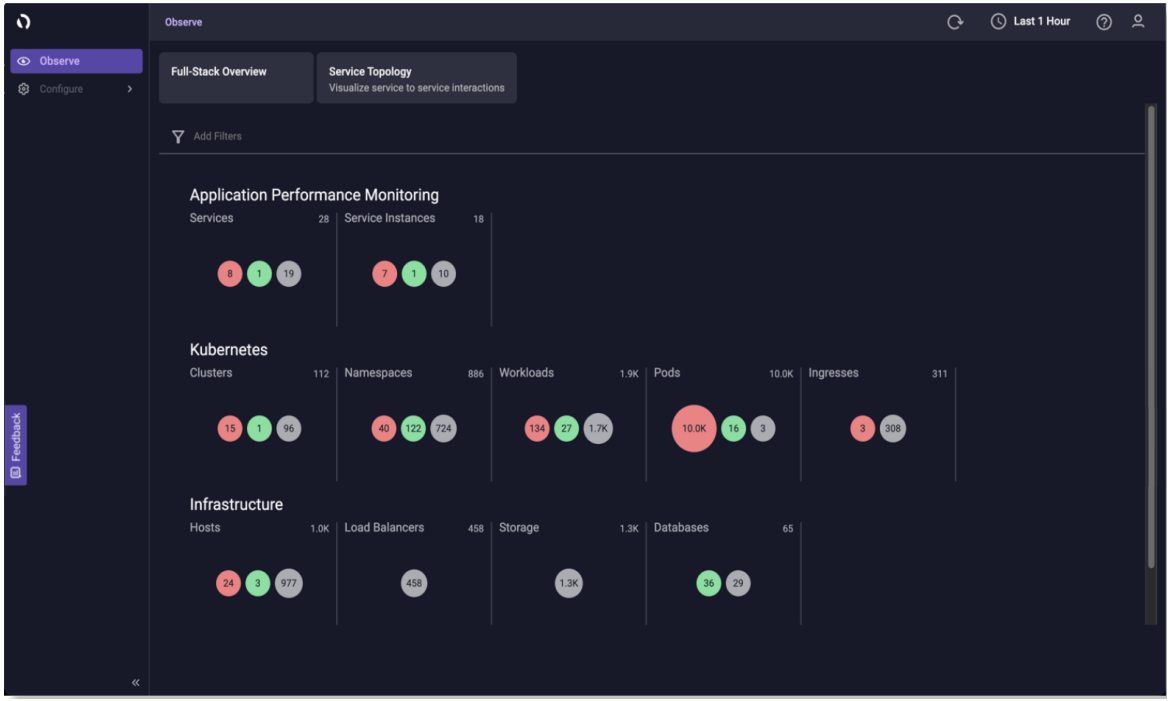
- Cisco Cloud Observability Platform is a software-as-a-service (SaaS) product that offers cloud native and full-stack observability for large, managed Kubernetes deployments on public clouds (Amazon Web Services, Microsoft Azure, and GCP). It provides real-time observability across your entire technology stack: applications, software-defined compute, storage, services, network, and other infrastructure, through the collection and correlation of metrics, events, logs, and traces (MELT).
- Single Observability platform with single-pane-of-glass visibility into their various applications running multi cloud.
- Cisco Cloud Observability built on Cisco Observability Platform is our Application Performance Monitoring solution for cloud native applications. It helps you to monitor cloud-native applications with business context. Ensure performance, prioritize and reduce risk, and optimize workloads.



Observability Cloud Stack

Cisco's Cloud Observability Platform collects and analyzes a broad spectrum of data, including application health and performance, business metrics like conversion rates, user experience mapping, and infrastructure and network telemetry — to resolve issues **before** they impact business KPIs. It comprises three layers of observability:

- **APM** (Application Performance Monitoring) represents the services that are being monitored using OpenTelemetry
- **Kubernetes** represents the monitoring of the components in your cluster including namespaces, workloads, pods, and ingresses.
- **Infrastructure** represents the monitoring of the Amazon Web Services (AWS) and Microsoft Azure cloud services that have been integrated through Amazon CloudWatch and Azure Monitor



AWS Cloud Infrastructure Observability

- Observability is an evolution of Monitoring. Monitoring is reactive and tells you when something is not working based on a predefined set of metrics. Observability is proactive and provides visibility across multiple domains using the three pillars – metrics, logs, traces. Monitoring tells you when something is wrong, Observability gives you the root cause of the problem.

- Monitoring is an important part of maintaining the reliability, availability and performance of your compute/storage/network infrastructure. The data you collect should be comprehensive so you can easily troubleshoot a multipoint failure if one were to occur.

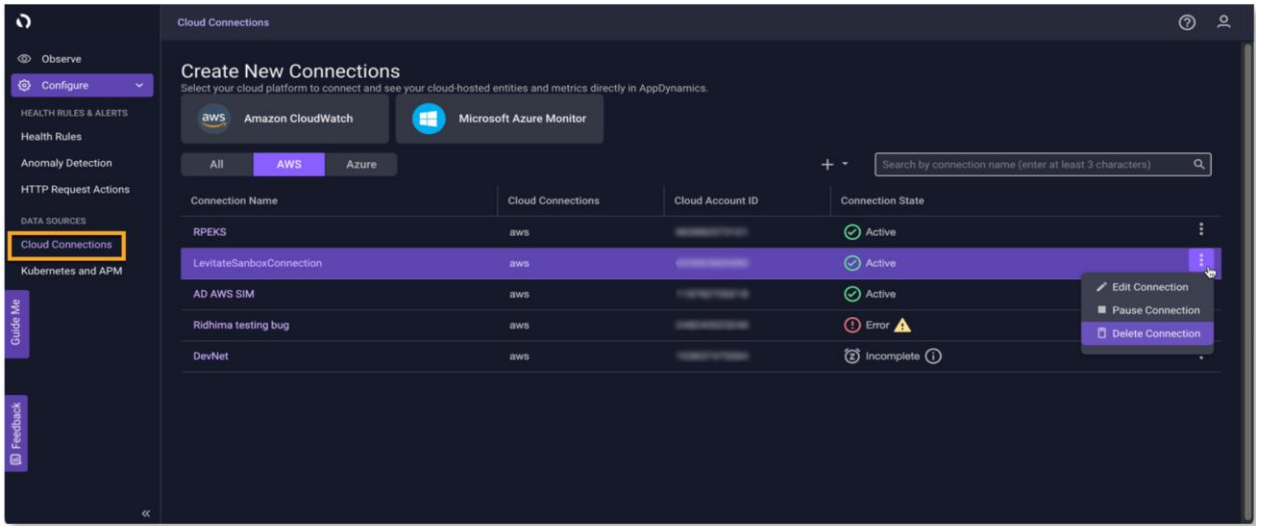
- Cisco's Cloud Observability Platform provides end-to-end visibility into the performance of the infrastructure running your applications. The cloud monitoring solution for AWS:

  •Ingests data from Cloud Services automatically. For example, Amazon CloudWatch provides metrics for a better understanding of your resource availability and utilization.

  •Enables you to manage alerts based on infrastructure metrics and monitors the cloud service's health and performance.

- Multi cloud deployments are here to stay. Cisco's Cloud Observability Platform is that single pane of glass that normalizes observability across AWS, Azure, and GCP

Getting started with AWS Cloud Infrastructure Observability



- Set up Data Sources
  - Cloud Connections
- Set up Health Rules & Alerts
  - Health Rules
  - Anomaly Detection
  - HTTP Request Actions

Using Automation Methodologies

Case Study: AWS Infrastructure Observability

We will explore the following automation methodologies in this lab to help you get started with including cloud observability for your AWS deployments. What we do here for AWS can be extended to Azure and GCP using these same methodologies:

- Cisco's Cloud Observability Platform API
- Cisco's Cloud Observability Platform Terraform Provider
- Cisco Intersight Cloud Orchestrator

Cisco's Cloud Observability Platform APIs

Cisco Cloud Observability Platform offers several APIs that let you extend and customize various aspects of the application such as cloud connections, data ingestion, authentication, and so on.

- Service Principals - enable your developed code to securely connect to AppDynamics public APIs on your Cloud Tenant.
- Cloud Connections - connect Cisco Cloud Observability Platform to one more cloud provider accounts.
- Common Ingestion Service - publish OpenTelemetry metric data to the common ingestion pipeline
- Health Rules - enables you to programmatically create, update, and manage one or more health rules for the monitored entities.
- Anomaly Detection - create Anomaly Detection configurations for specific entities and entity types, helps determine whether every service in your application performs within the acceptable performance limits
- Actions - enables you to create, configure, and manage various actions which are predefined, reusable, automated response to an event such as a health violation or an anomaly
- Query Service - allows you to retrieve observation MELT (metrics, events, logs, traces) using AppDynamics domain-specific language called Unified Query Language (UQL).

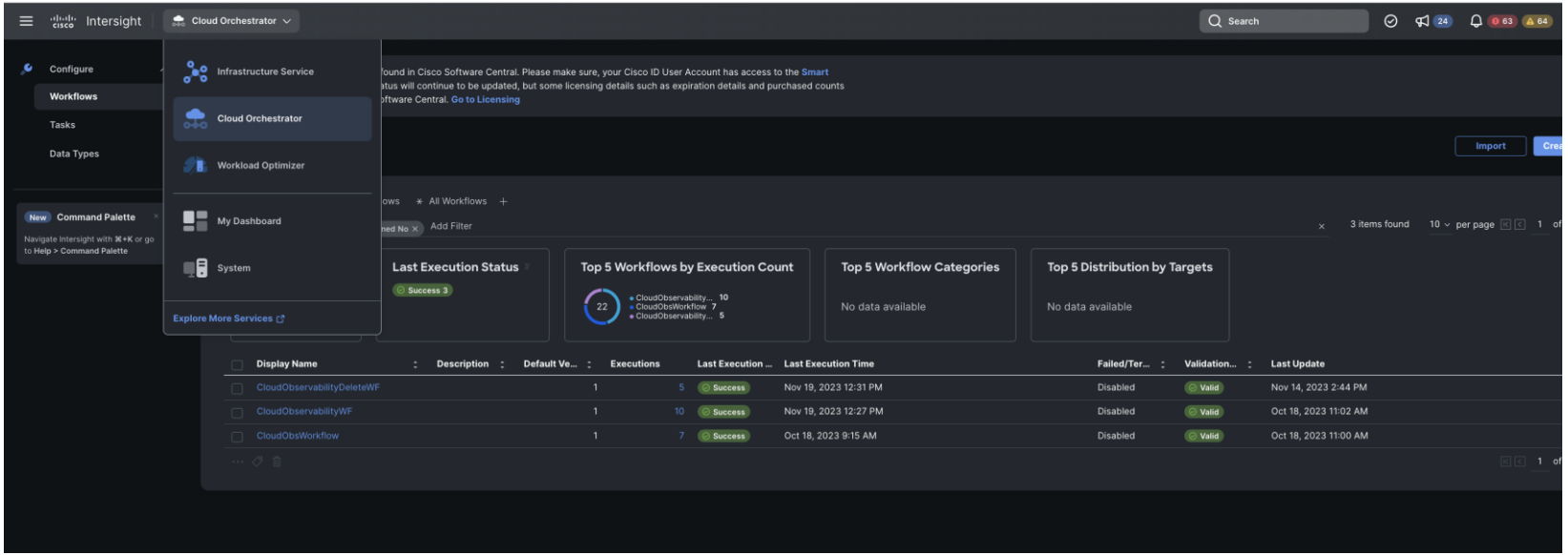
Cisco's Cloud Observability Platform Terraform Provider

- Terraform Provider details can be found here:

https://github.com/cisco-open/terraform-provider-appd

- Current focus on cloud connections
- Extensions leveraging API's will be demonstrated in this lab

Cisco Intersight Cloud Orchestrator



- With Intersight Cloud Orchestrator you can streamline automation with a user-friendly designer that enables you to build and run sophisticated workflows without coding. We will exercise a simple workflow to setup everything that you did with API and Terraform above.
- For more details on Intersight Cloud Orchestrator, check out:

  https://us-east1.intersight.com/help/saas/orchestration/overview_orch

Lab case Study

- We will use a simple example to walk through automation for observability with API, Terraform and ICO
- Use API’s/Terraform/ICO to set up Observability for EC2 instances in Cisco's Cloud Observability Platform:
  - Setup Cloud Connection to AWS Account
  - Setup Health Rules, Actions & Triggers
  - Setup Anomaly Detection, Actions, Triggers

Observe AWS Entities

Load Balancers

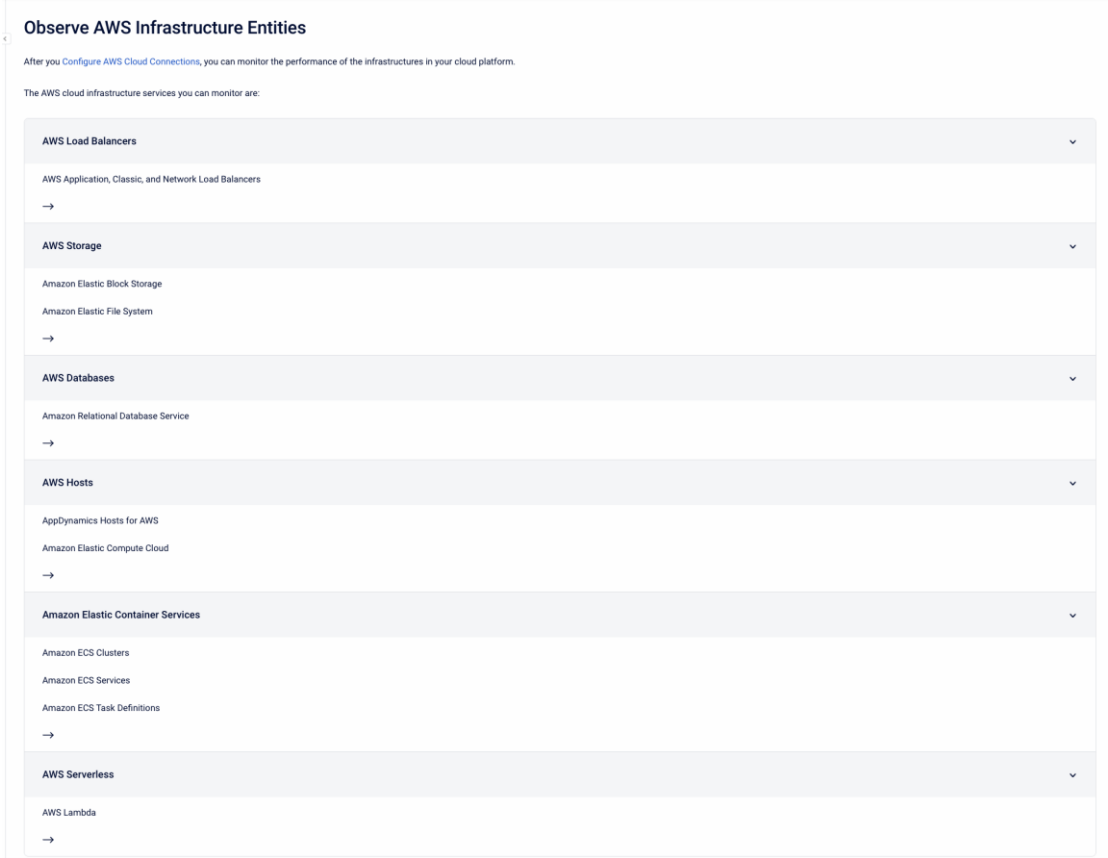
Storage

Databases

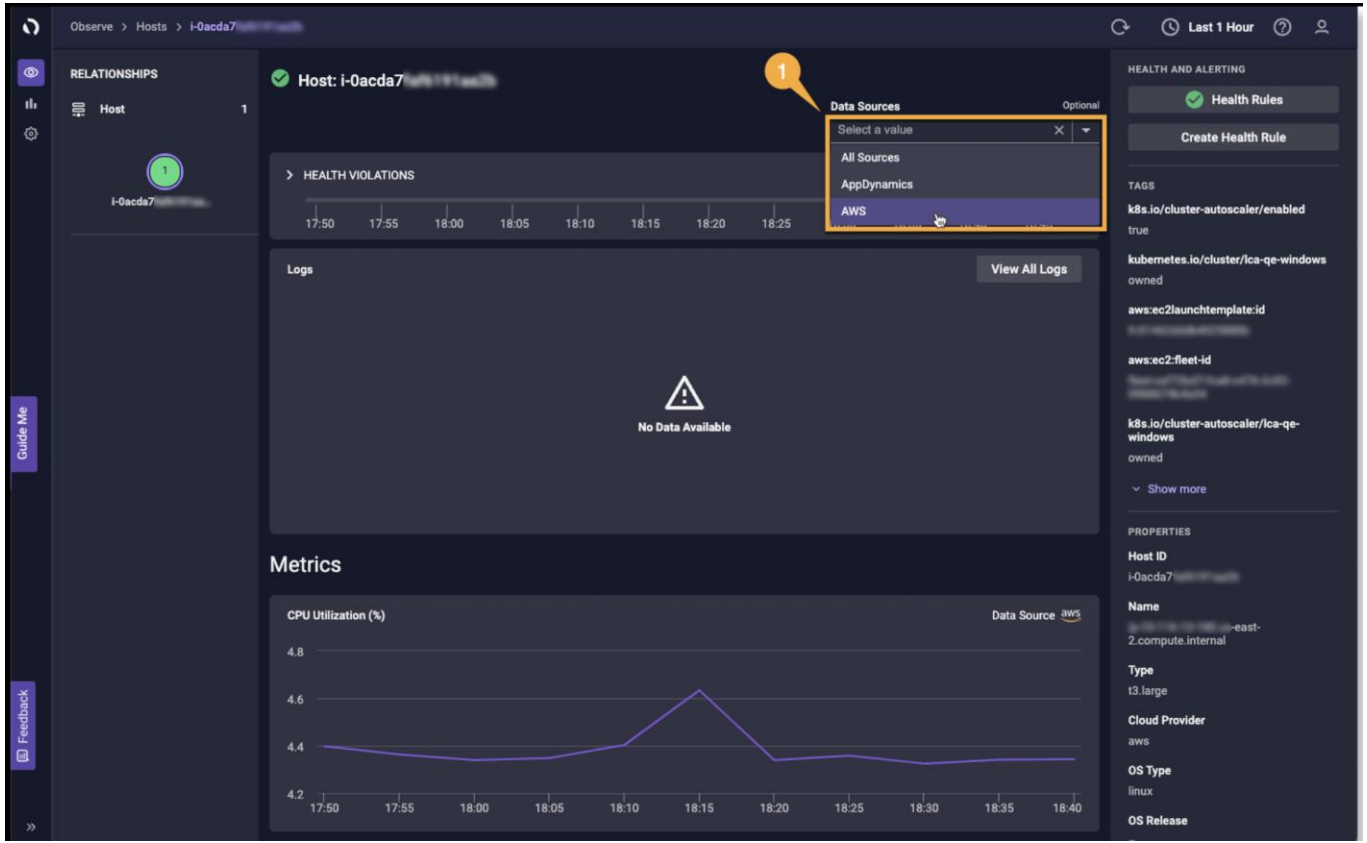
Hosts

ECS

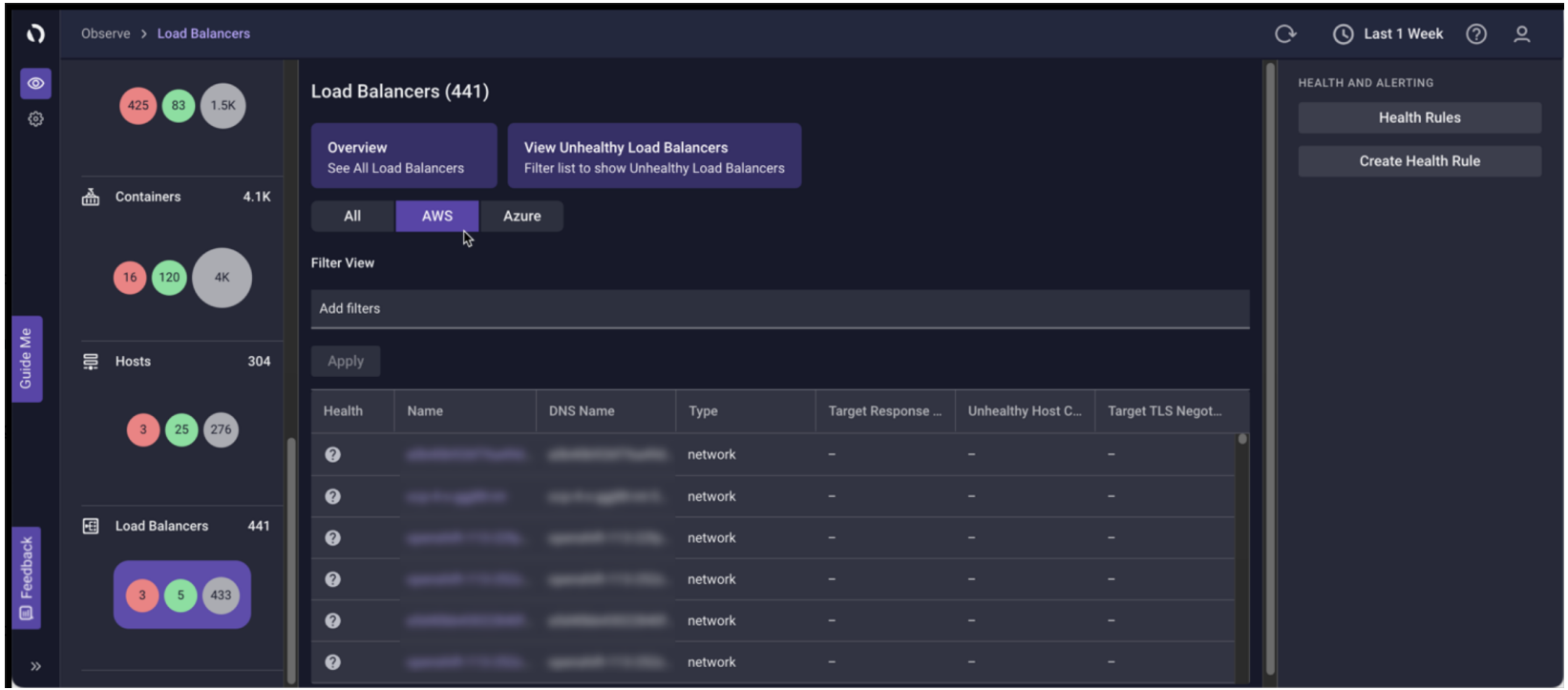
Serverless



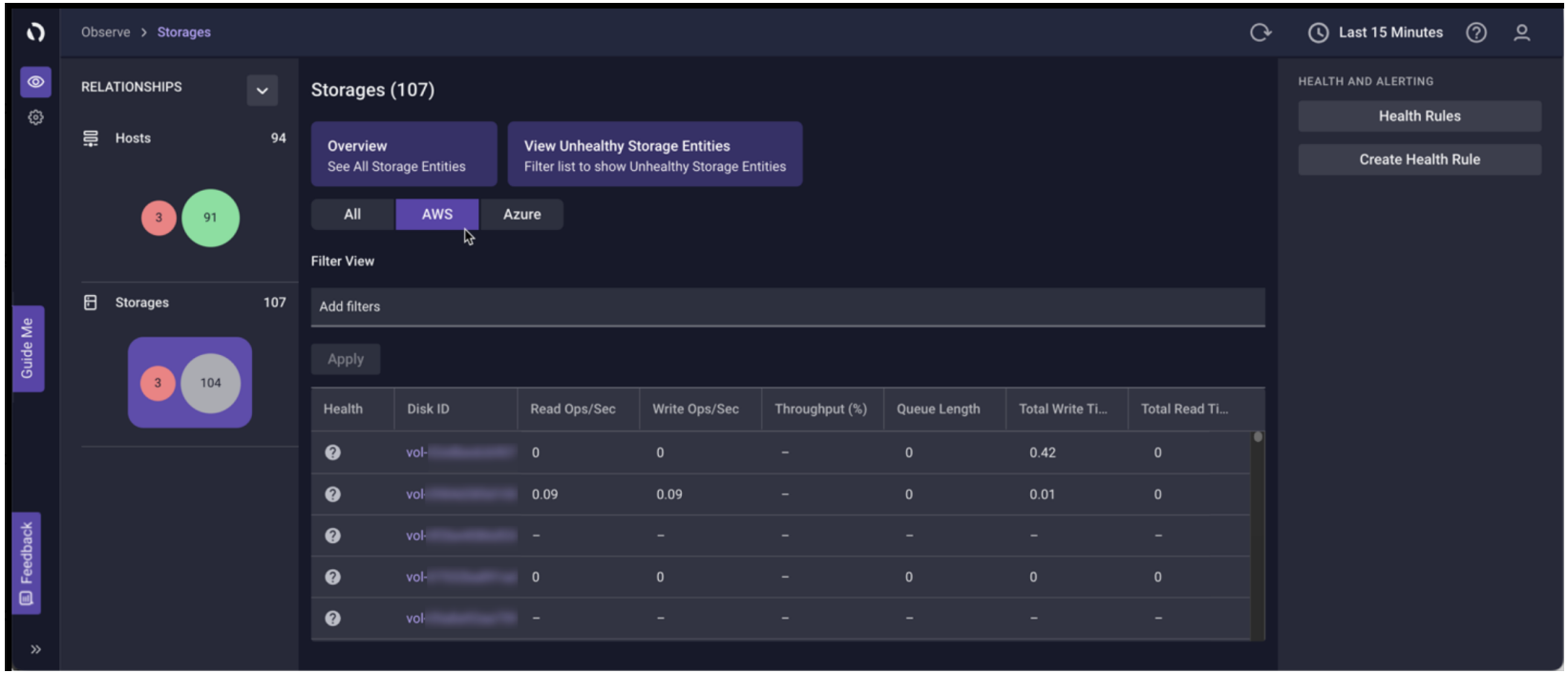
Observe AWS Hosts



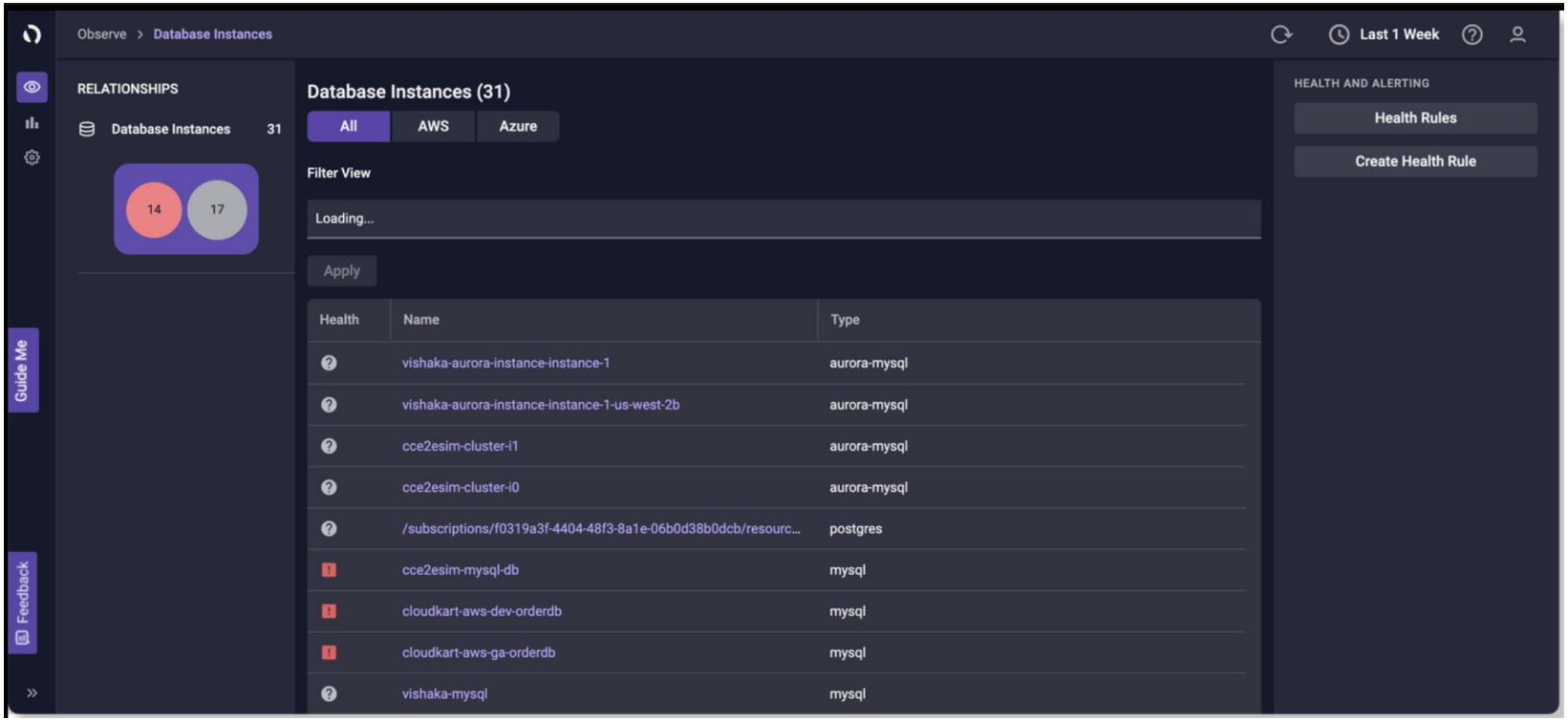
Observe AWS Load Balancers



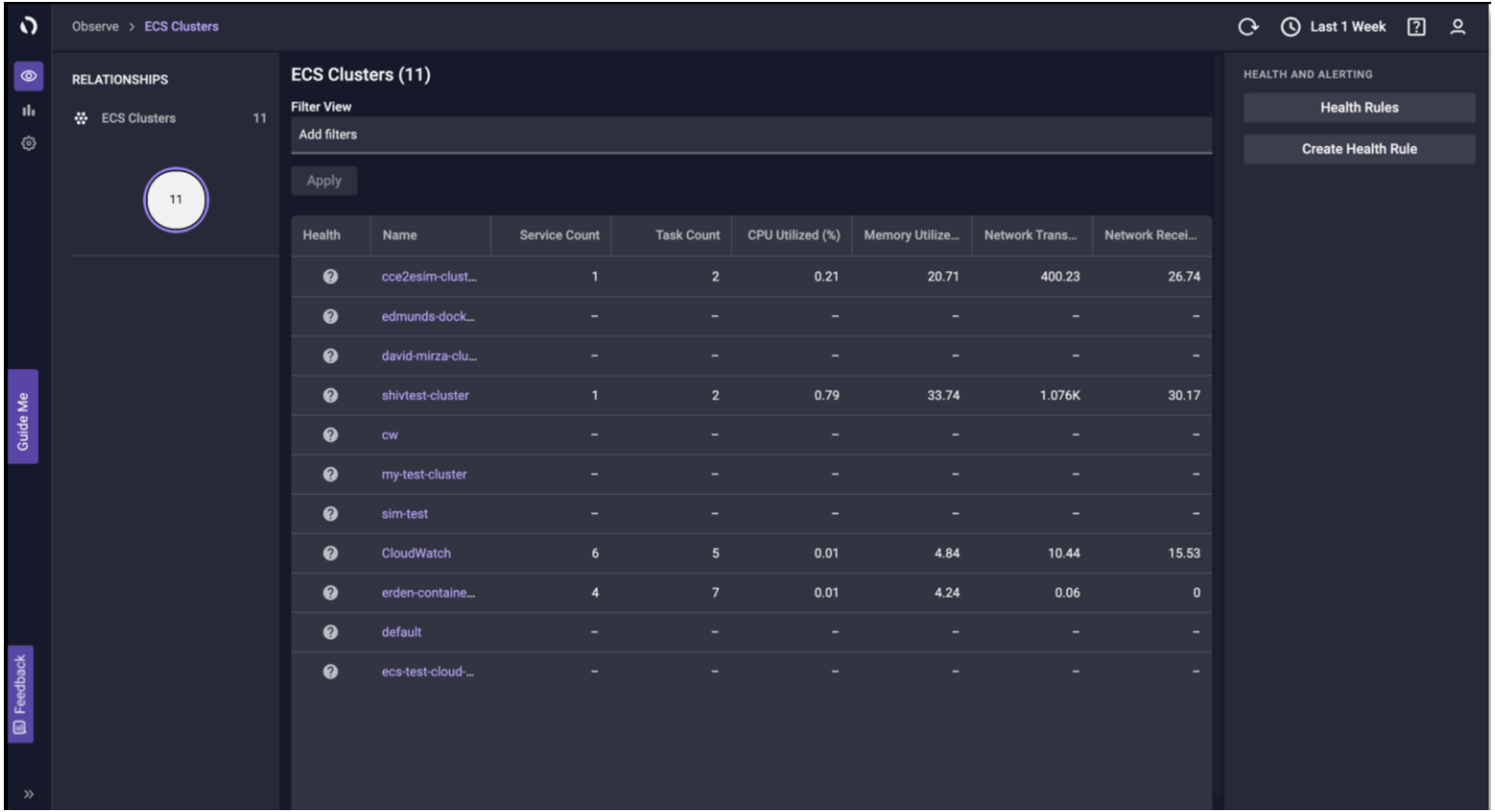
Observe AWS Storage



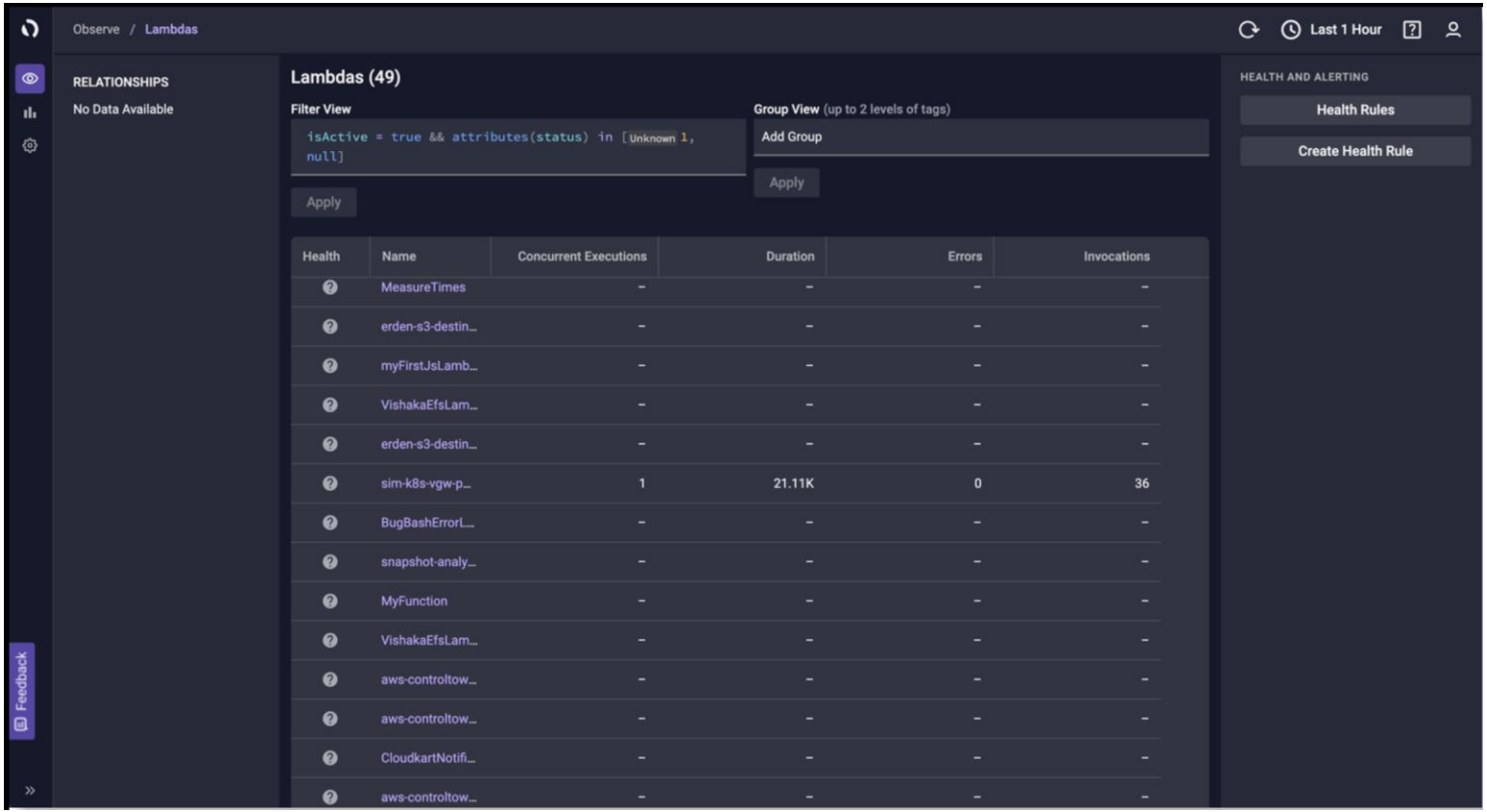
Observe AWS Databases



Observe AWS ECS Clusters



Observe AWS Lambdas



Additional resources

Cisco Cloud Observability Platform Developer API's: https://developer.cisco.com/docs/appdynamics/#!introduction

Cisco Cloud Observability:

https://docs.appdynamics.com/appd-cloud/en/about-appdynamics-cloud
https://www.appdynamics.com/product/cisco-cloud-observability#xd_co_f=YmUyZmEwMGEtOGEwZi00MzRkLWFkYTEtNGQ3YjA2YmY3Yjk4~

Useful Blogs to get started:

https://blogs.cisco.com/developer/appdynamicscloudapis01
https://blogs.cisco.com/news/cisco-further-delivers-on-full-stack-observability-ecosystem-vision
https://www.appdynamics.com/resources/ebook/how-to-solve-your-biggest-cloud-problems
https://blogs.cisco.com/applications/delivering-application-performance-to-maximize-business-kpis

Observability & Monitoring:

https://www.cisco.com/c/en/us/solutions/full-stack-observability/what-is-observability.html
https://blogs.cisco.com/developer/observabilityvsmonitoringdevops01

Learning lab link:

https://developer.cisco.com/learning/labs/appd-fso-clapj2/introduction/
https://developer.cisco.com/learning/labs/appd-fso-clapj/introduction/

Sandbox link: https://dcloud2-rtp.cisco.com/

Postman collection: https://www.postman.com/ciscodevnet/workspace/cisco-fso-platform/overview

Homework!

Reserve the DevNet sandbox:

Sandbox: https://dcloud2-rtp.cisco.com/content/instantdemo/appdynamics-observability-in-aws?returnPathTitleKey=content-view

Exercise the learning lab but with your own AWS account:

Learning Lab:

https://developer.cisco.com/learning/labs/appd-fso-clapj2/introduction/

https://developer.cisco.com/learning/labs/appd-fso-clapj/introduction/

In the section where it lists the AWS account, put in your own AWS account details and make the cloud connection to your own cloud assets.

Related Cisco Live DevNet Sessions

Thursday, Dec 7
12:30 PM - 1:15 PM AEDT
DevNet Workshop 2 Infrastructure Observability for AWS/Azure/GCP with CNAO using APIs, Terraform and Workflows [DEVWKS-2178]

Friday, Dec 8
12:00 PM - 12:45 PM AEDT
DevNet Workshop 2Infrastructure Observability for AWS/Azure/GCP with CNAO using APIs, Terraform and Workflows [DEVWKS-2178]

Friday, Dec 8
10:15 AM - 11:00 AM AEDT
DevNet Workshop 1 - Leveraging the Cisco FSO Platform: Integrating with Cisco Intersight for Enhanced Observability [DEVWKS-2795]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