

# Hands-on Lab: Observability in Action with Instana

Estimated time needed: **60 minutes**

Welcome to the hands-on lab on Observability in Action with Instana.

## Introduction to Application Performance Management (APM)

Application Performance Management (APM) refers to the practices, tools, and strategies used to monitor, manage, and optimize the performance and availability of software applications.

The primary goal of APM is to proactively identify and address performance issues, bottlenecks, and inefficiencies within an application's infrastructure, codebase, or dependencies.

By monitoring key performance indicators (KPIs) and collecting relevant data, APM enables organizations to understand how their applications are performing. It helps them detect anomalies or deviations from normal behavior, take corrective actions to improve performance, and thus enhance customer satisfaction, reduce downtime, and improve overall business productivity.

## Instana Overview

Instana is a modern application performance management (APM) solution designed for monitoring and observability in cloud-native and microservices environments. Instana collects and analyzes data from various sources within an application stack to provide real-time visibility into the application's health and performance.

Where modern-day application stacks can be a complex mixture of technologies and infrastructure with many dependencies and interactions, Instana provides a full stack observability solution.

In this lab, you will learn about the Instana observability solution. You will explore the **Play with Instana**, a sandbox with a pre-configured e-commerce application and services running in it. Using Play with Instana, you will examine its features and understand how it is used in a pre-configured live application performance monitoring sandbox. Furthermore, you will explore various microservice applications used in the Instana sandbox to learn various Monitoring techniques.

## Objectives

After completing this lab, you will be able to:

1. Use Play with Instana sandbox to learn about the Instana observability solution.
2. Explore and analyze the features of Play with Instana.
3. Explore different monitoring capabilities that Instana offers.
4. Analyze the performance of the pre-configured applications and infrastructure components.
5. Use various microservice applications and apply various monitoring techniques available in the Instana sandbox.

You will practice through seven various exercises to learn about the Instana observability solution in detail. So, let's get started!

## About the Robotshop Application

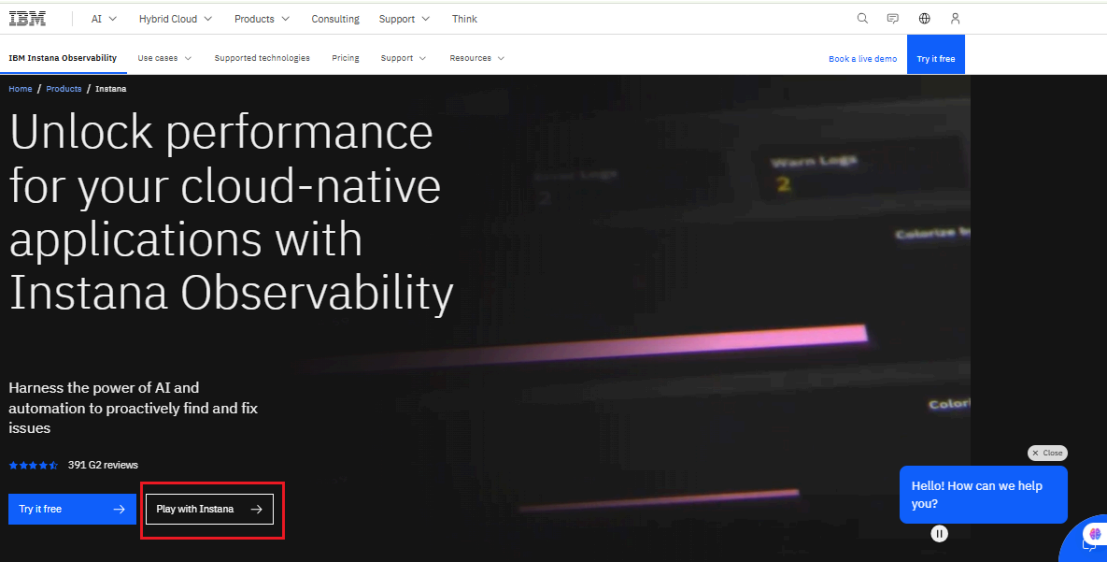
To test and learn various monitoring techniques in the Instana sandbox, you will use Robotshop, a sample microservice application.

The various services in the sample application already include all required Instana components installed and configured. The Instana components provide automatic instrumentation for complete end-to-end tracing and complete visibility into metrics and analytics for all the technologies.

To see the application performance results in the Instana dashboard, you will first need an Instana account.

## Exercise 1: Create a free Instana account

1. As a first step, click [Instana](#) to launch it.
2. Click on **Play with Instana**



5. Enter your email in the space provided and click **Continue**.

Instana's APM Observability Sandbox

We recommend using a desktop device to experience Instana Sandbox at its best

Business email

☒

I'd like IBM to use my contact details to keep me informed about products, services, and offers. More information on how IBM uses data and ways to [opt-out](#) can be found in the [IBM Privacy Statement](#).

Submit

6. Fill in the further details, and click on **Submit**.

First name
Last name

John
Doe

E-mail ⓘ

Country or region of residence

India

Are you a student?

☐ Yes ☒ No

Company

XYZ Inc

Preferred IBM Business Partner (optional)

☐ I'd like IBM to share my contact details with its [certified business partners](#) so they can keep me informed about IBM offers and related solutions for my business. Business partner use of data, including opt out, will be governed by business partner privacy policies.

I'd like IBM to use my contact details to keep me informed about products, services, and offers. More information on how IBM uses data and ways to [opt out](#) can be found in the [IBM Privacy Statement](#).

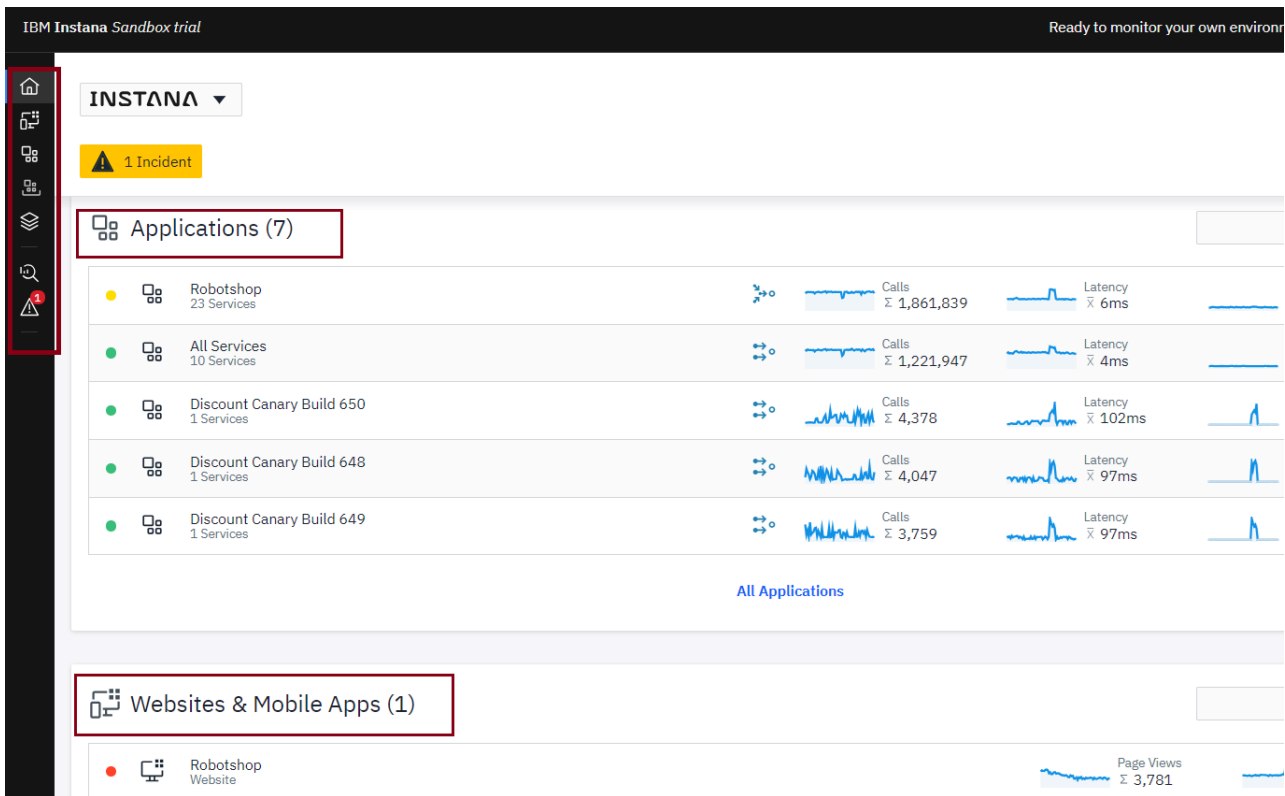
☐ Email

Submit

7. You will now be redirected to the Instana Sandbox Trial page.

## Exercise 2: Explore Play with Instana Dashboard

1. Observe the annotations highlighted in the screenshot below:



2. You will find the following on the Instana dashboard:

- Play with Instana:** The landing page gives a summary of everything that is being monitored.
- Website and Mobile Apps:** This section helps you monitor the data coming from end-user web browsers and native mobile apps
- Applications:** This section lists all apps and services monitored by Instana.
- Navigation Panel:** You can find the lists of various monitoring applications in this section.

## Exercise 3: Monitor Websites and Mobile App

- Click the navigation menu and select **Websites and Mobile App**
- Through this, Instana enables you to monitor data coming from end-user web browsers and native mobile apps.
- On the dashboard, you can check the performance of the websites and the mobile applications and dive into analytics to analyze specific end-user data.
- Instana monitors every request from every server and correlates that with server activity.



IBM Instana Sandbox trial Ready to monitor your own environment? Free trial →

INSTANA

1 Incident

### Applications (7)

Robotshop	23 Services	Calls Σ 1,853,947	Latency x 6ms	Erroneous Call Rate x 0.37%	☆
All Services	10 Services	Calls Σ 1,212,998	Latency x 4ms	Erroneous Call Rate x 0.16%	☆
Discount Canary Build 649	1 Services	Calls Σ 4,289	Latency x 100ms	Erroneous Call Rate x 0.76%	☆
Discount Canary Build 648		Calls	Latency	Erroneous Call Rate	☆

7. To determine the health of the **Robotshop** application, click Robotshop to view the various options for monitoring the health and performance of the application.

### Robotshop

1 Issue Stack Upstream / Downstream Analyze Calls Time Shift: 1h May

Summary Dependencies Services Error Messages Log Messages Infrastructure Smart Alerts

Calls Per Second

525.29/s 1,859,523 total calls

Erroneous Call Rate

0.37% 6,963 total erroneous calls

Mean Latency

6ms 3ms for 90th

Calls

HTTP status codes Call count

1XX 2XX 3XX 4XX 5XX Non-HTTP

34,000

17:33:00 17:48:00 18:03:00 18:18:00 18:33:00

Erroneous Call Rate

Erroneous Call Rate

0.50%

17:33:00 17:48:00 18:03:00 18:18:00 18:33:00

Latency

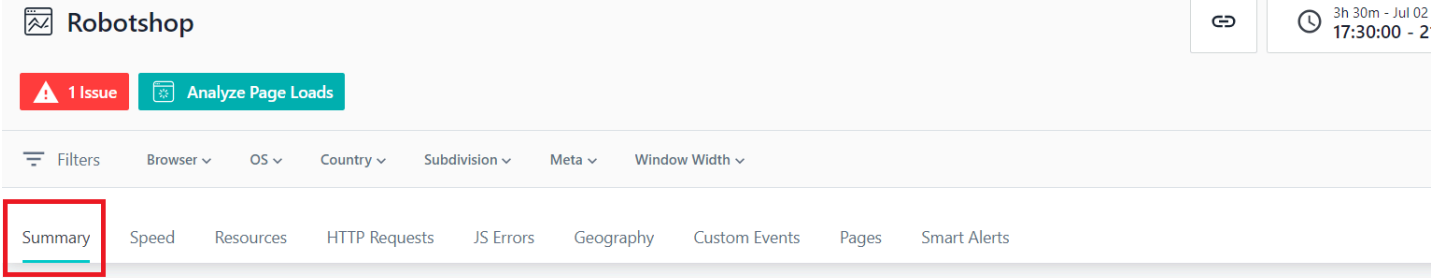
50th 90th 95th

160ms

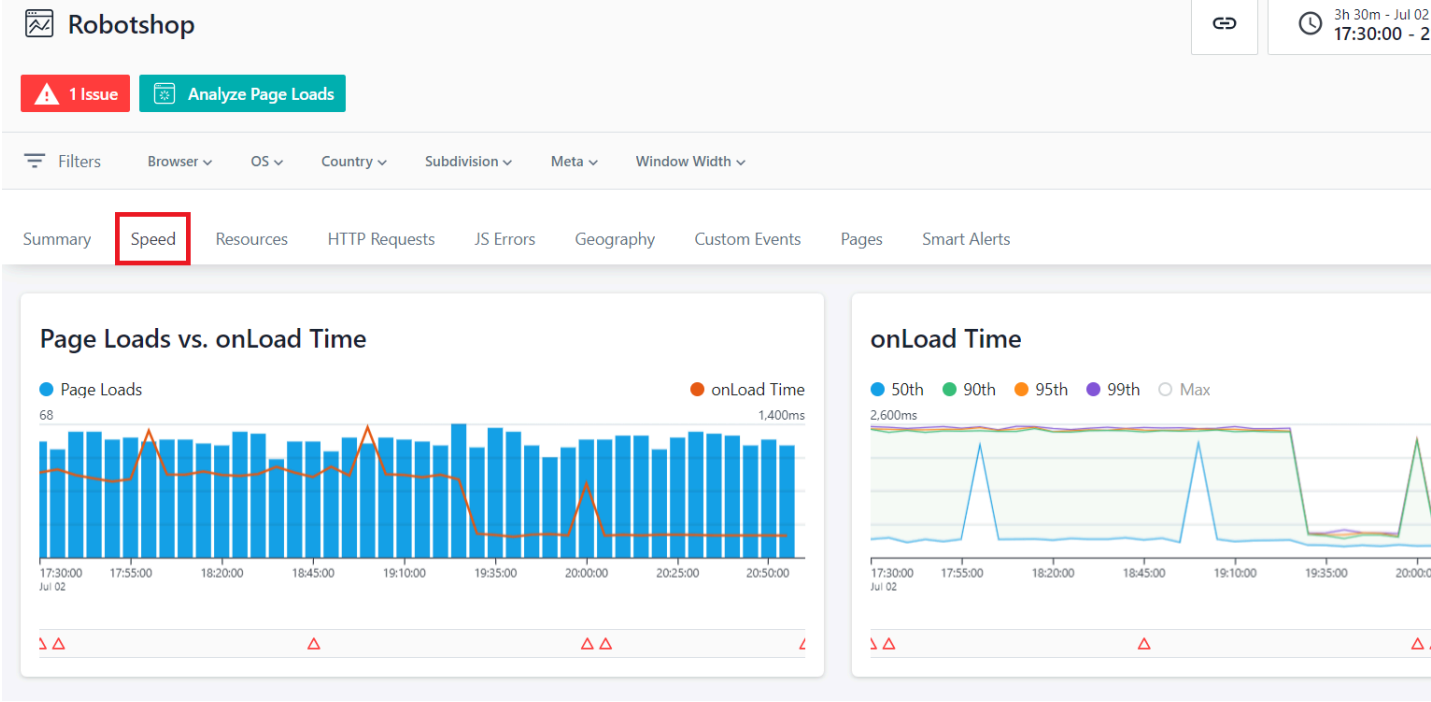
17:34:00 17:44:00 17:54:00 18:04:00

8. Let's look at the various monitoring options available in the Robotshop. You can select the specific option to delve deeper into analytics.

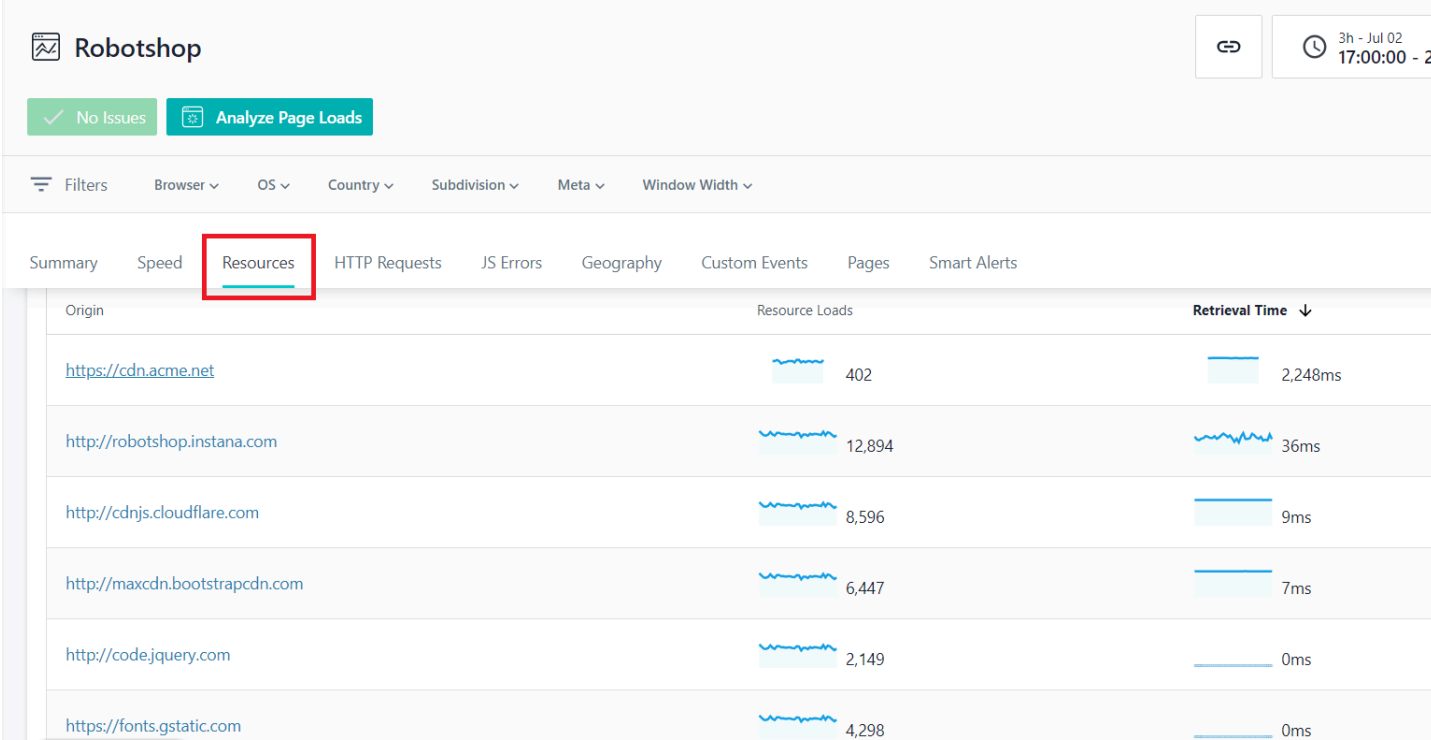
a. **Summary** - To get an overall performance summary of the application



b. **Speed** - To get various comparisons such as page load time/ onLoad time/navigation timing, and so on.



c. **Resources** - To look at resource load times to see if they impact the general onLoad time.

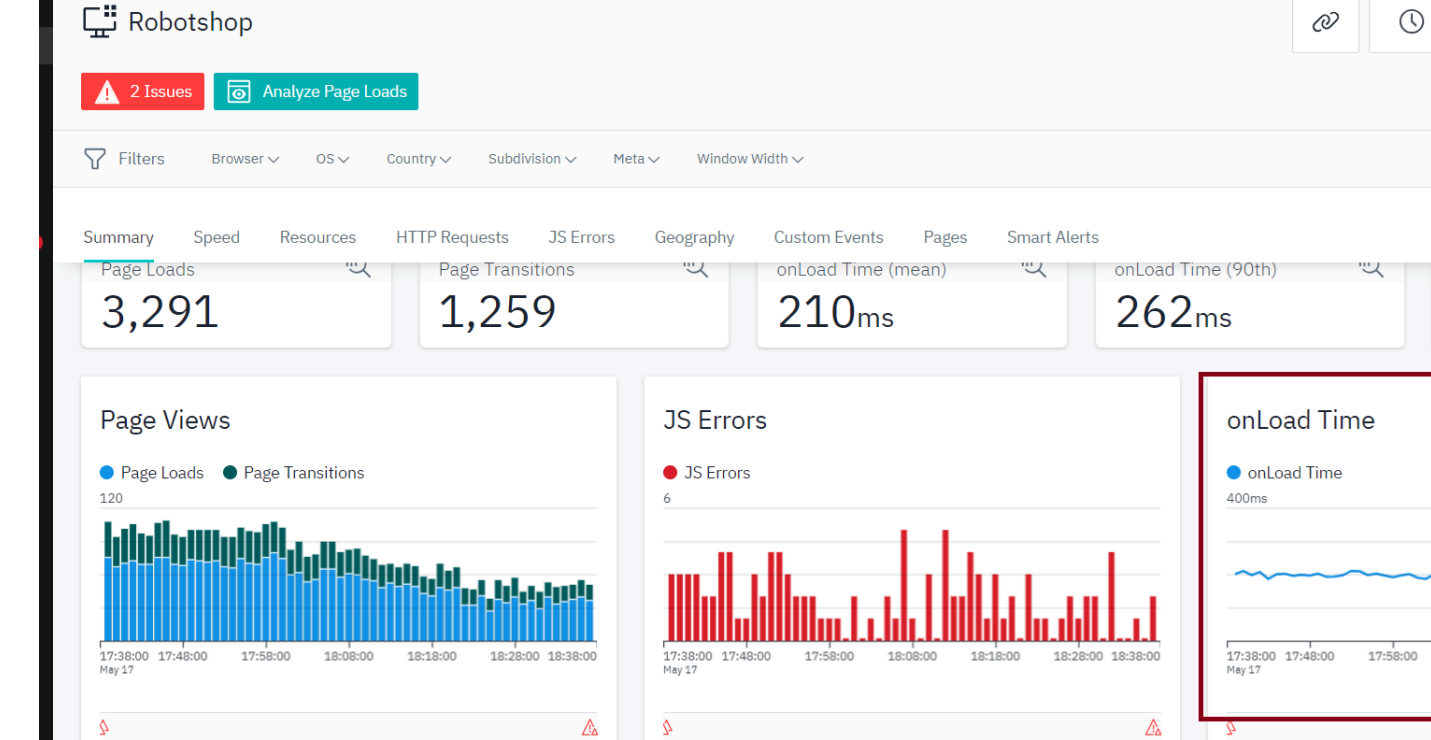


Exercise 3.1: Check for LoadTime Latency

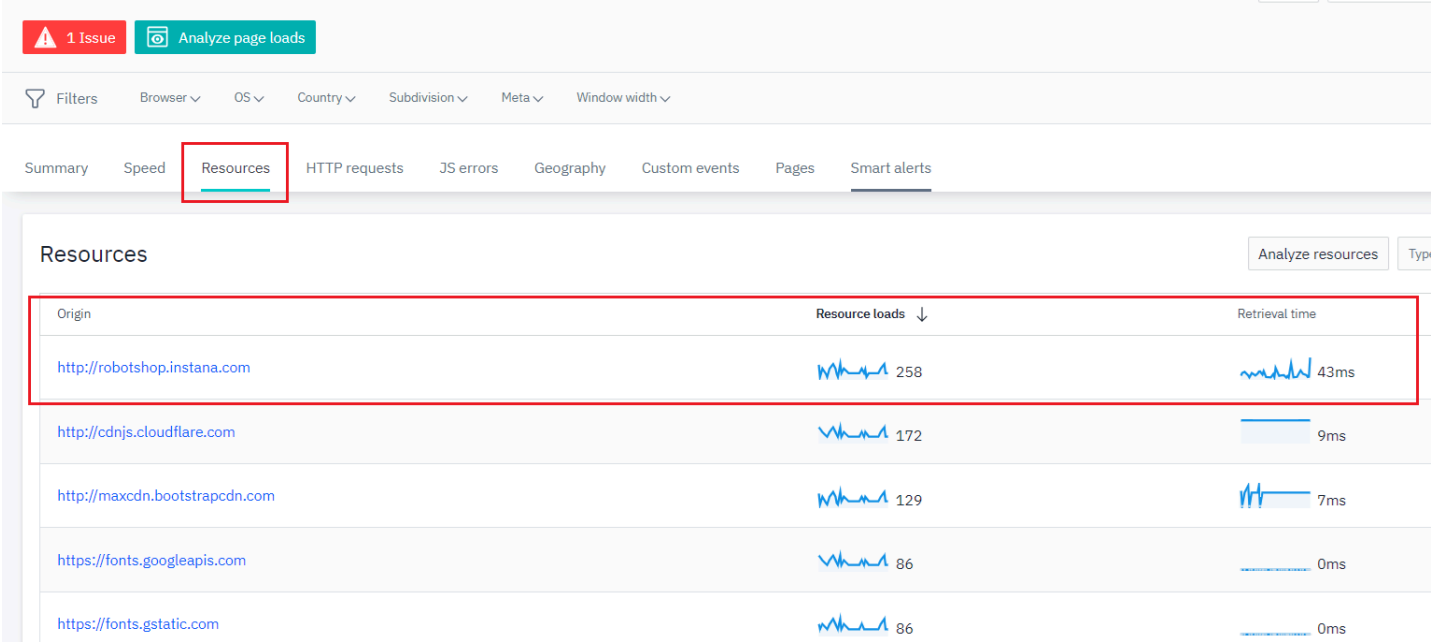
Load time latency is checked to measure the time it takes for a web page or application to load and become interactive for the user fully. It is an important metric because it directly impacts user experience and can significantly affect user satisfaction & engagement.

By regularly monitoring load time latency, you can identify performance bottlenecks, optimize infrastructure, and improve the overall user experience, leading to higher customer satisfaction.

1. Let's check the onLoad time graph to see where/what components show latency.
- a. Select the onLoad Time graph area, which shows a peak in activity.
- b. Drag and select the area over the peak and click on **Zoom to time range**.

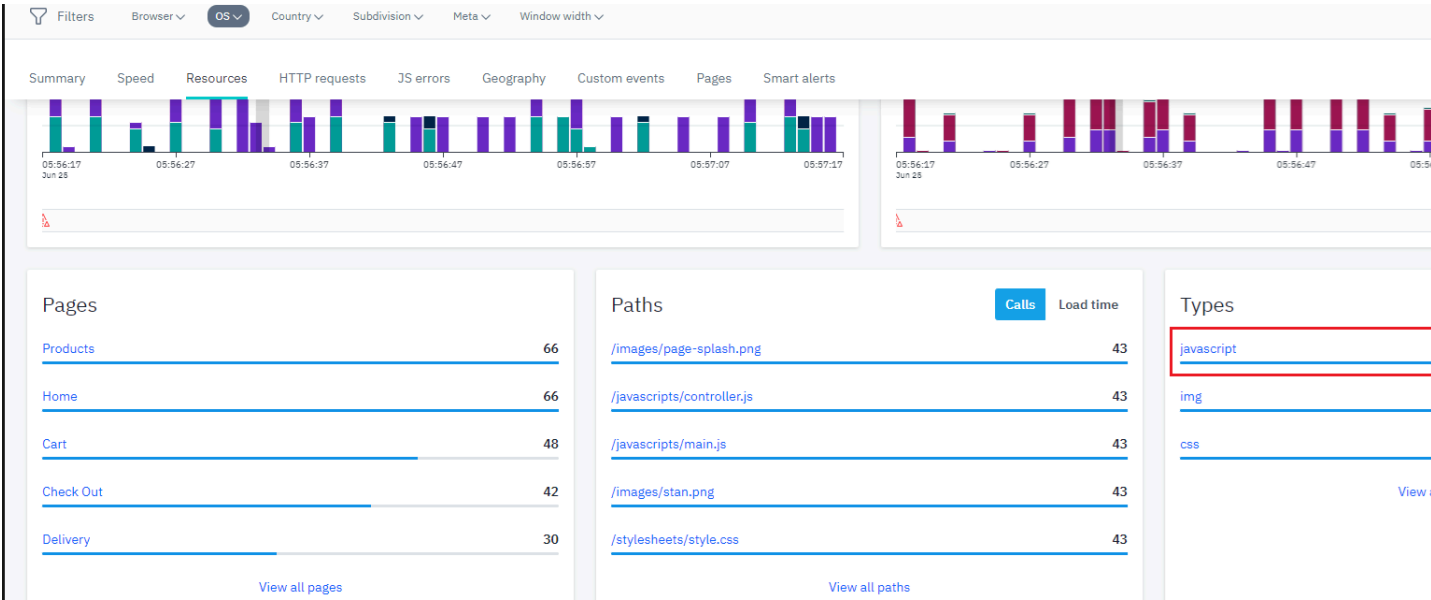


c. If you click on the Resources tab, you will notice that <http://robotshop.instana.com> has the highest retrieval time.

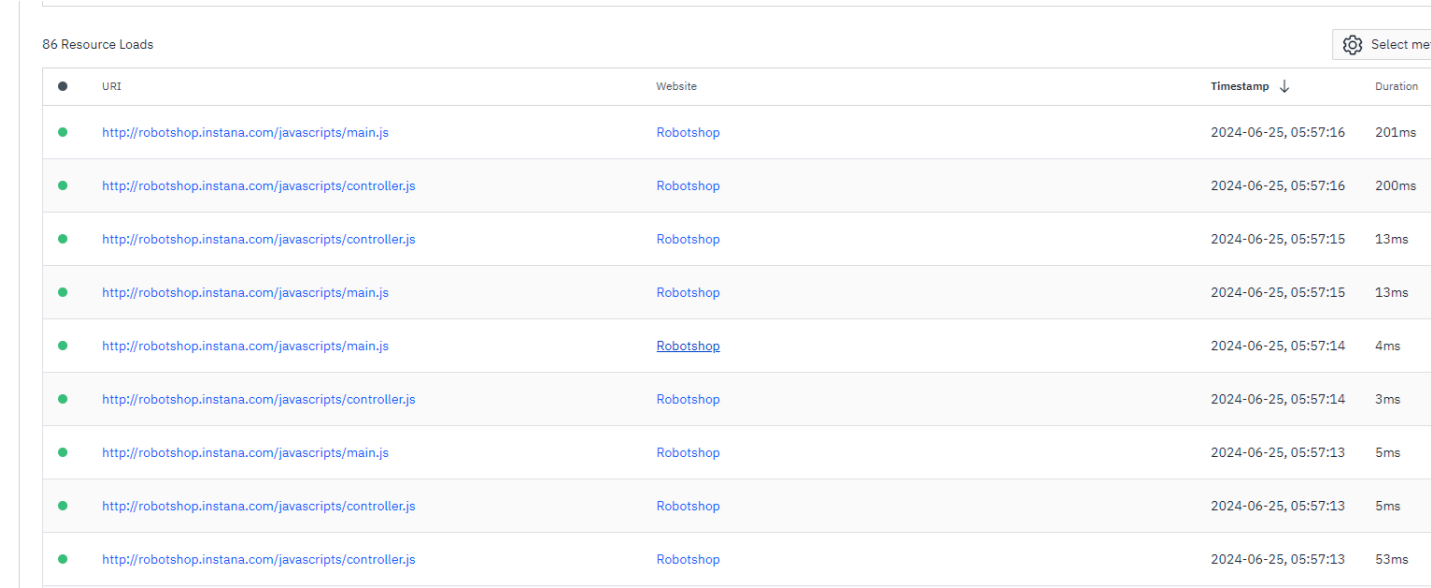


d. To review details about the resources loaded from this resource, click on the <http://robotshop.instana.com> link under the **Origin** column.

e. To determine which resource which is causing the Load time latency, you can review details in the **Load Time** tab. You will observe the Javascript related content takes maximum time to load.

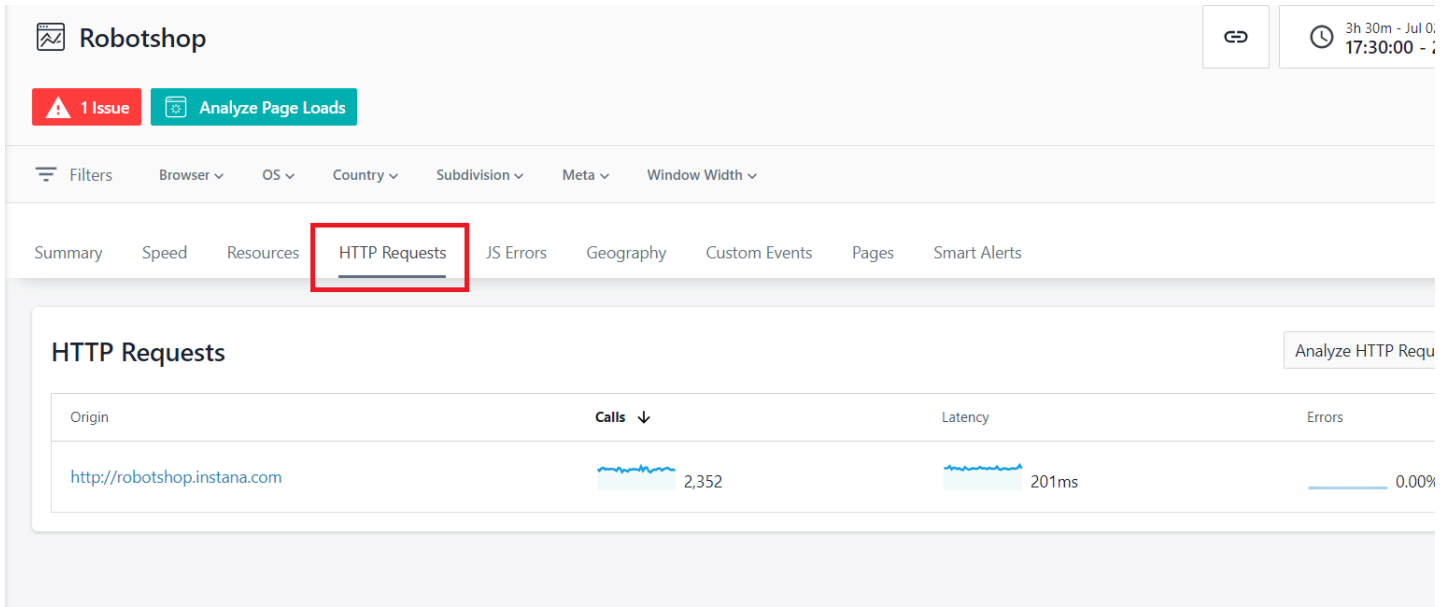


f. Click on **javascript**. It will take you to the below page having the list of URLs based on loading time.

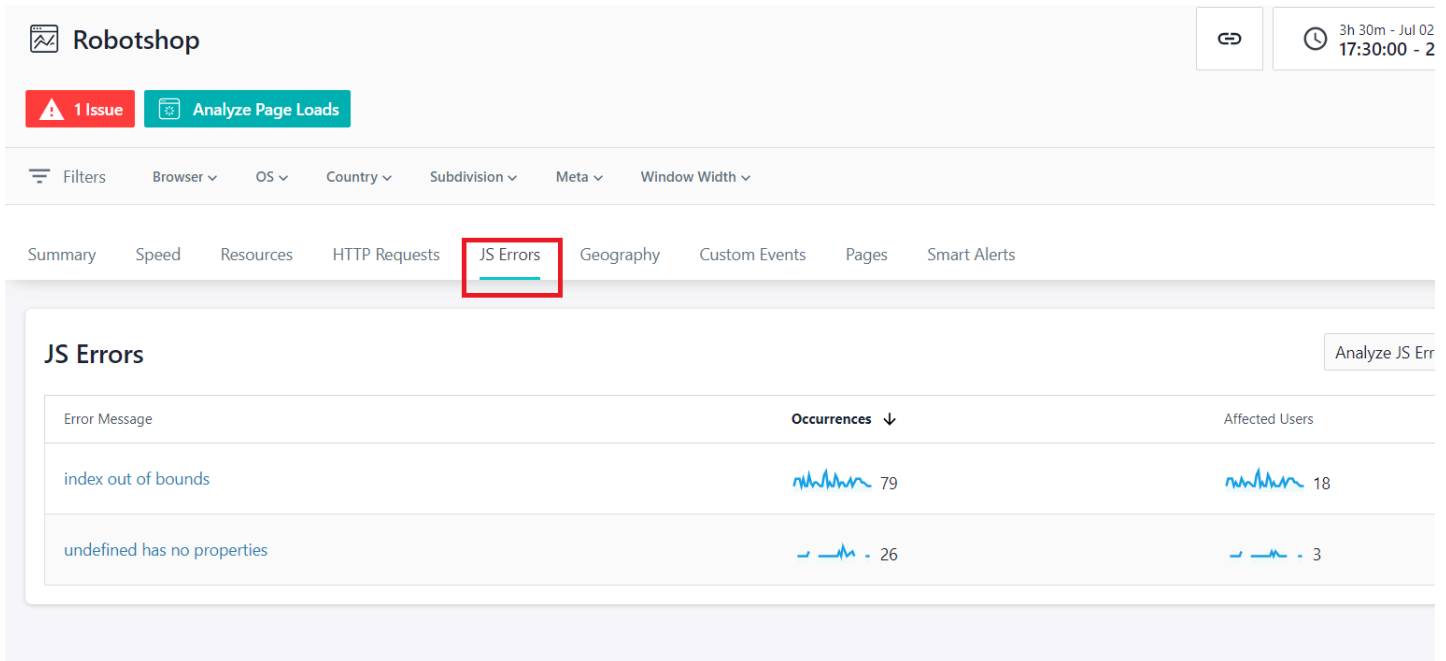


g. You can click on each URL to view its details and address the issues accordingly.

2. **HTTP Requests** - To get insights into the HTTP requests made by the application. It offers detailed information about each request's performance, status, and timing, which helps analyze and optimize the interactions between the application and external services.



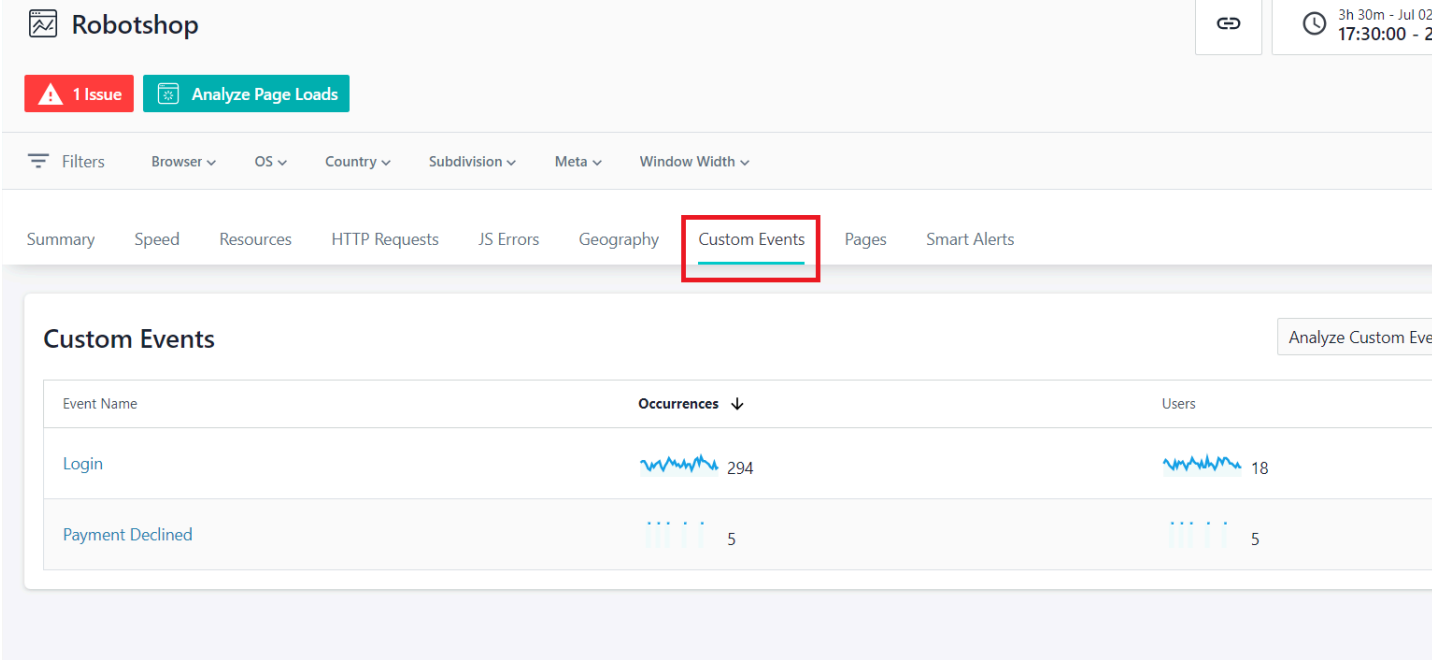
3. **JS Errors** - To get insights into JavaScript errors that occur within the application. It helps identify, monitor, and troubleshoot errors, which can improve the user experience, ensure application stability, and enhance overall performance.



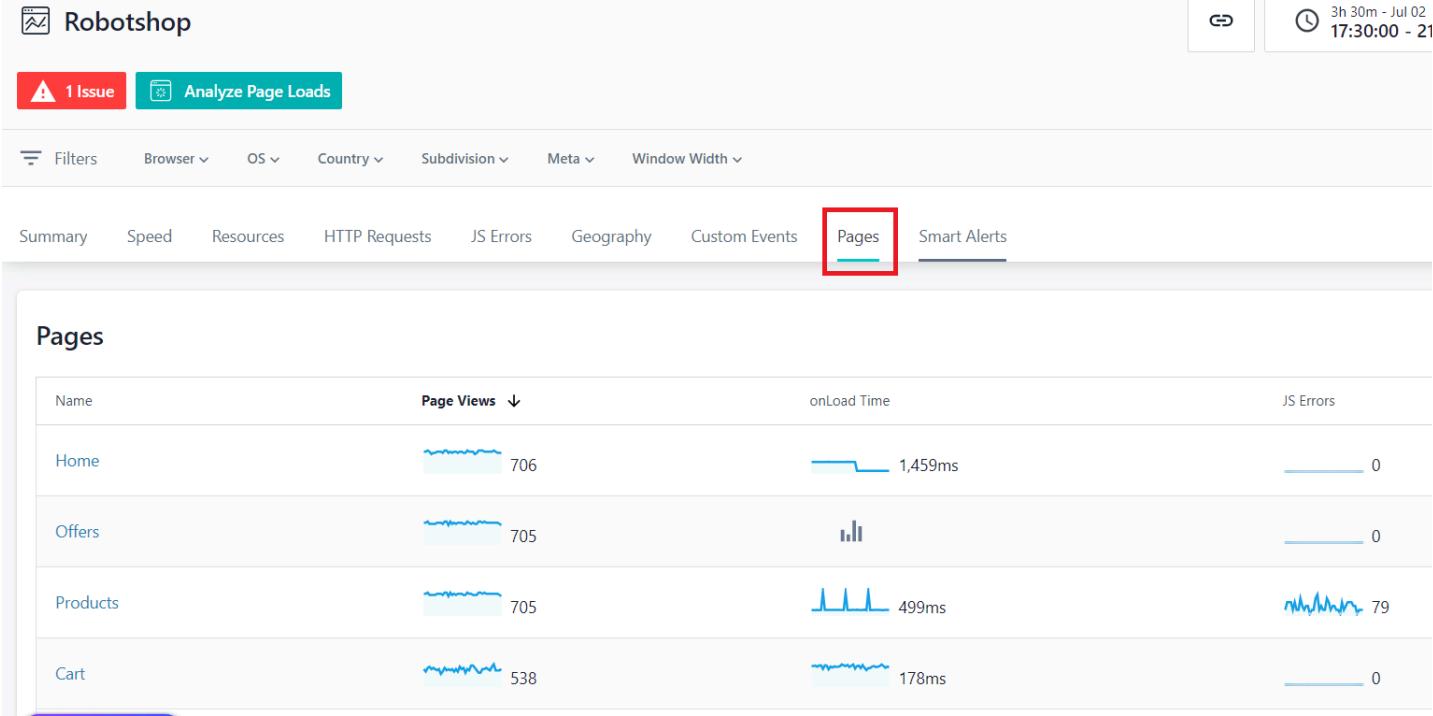
4. **Geography** - To get geographical insights into the distribution and performance of your application across different regions or locations. It allows you to understand where your users are located, how your application is performing in different regions, and identify potential performance issues or variations based on geographic locations.

5. **Custom Events** - To track and monitor the application's custom or business-specific events. It provides a way to define and capture events relevant to the application's specific use cases, workflows, or business logic.





6. **Pages** - To get insights into the performance and behavior of the web pages within the application. It helps monitor and analyze key metrics related to page load times, user experience, and dependencies.



7. **Smart Alerts** - To know the details on custom alerts configured based on specific conditions. They help notify users of important events or issues within their monitored environments.

🏠

🔍

📊

🔧

📁

🔔

1

📈 Robotshop

🔗

🕒 3h 17

🚨 1 Issue

Analyze Page Loads

🔍 Filters

Browser ▾

OS ▾

Country ▾

Subdivision ▾

Meta ▾

Window Width ▾

Summary

Speed

Resources

HTTP Requests

JS Errors

Geography

Custom Events

Pages

Smart Alerts

Configured Alerts (3)

Name ▾ 🔍

🚨

HTTP Status Code(s):4XX  
Static Threshold, Status Code Count ≥ 50

📈 Robotshop

🚨

onLoad Time (90th) is too high  
Static Threshold, onLoad Time (99th) ≥ 2,000ms

📈 Robotshop

🚨

Resp. Time slow for gold members  
Static Threshold, onLoad Time (90th) ≥ 500ms

📈 Robotshop

Exercise 4: Monitor Applications and Services

1. Click the navigation menu and select **Applications**

IBM Instana Sandbox trial

🏠 Home

🌐 Websites & Mobile A...

📊 Business Monitoring

🔍 Applications

🔧 Kubernetes

📁 Infrastructure

📈 Synthetic Monitoring

🔍 Analytics

🔔 Events

2. Here, you can find the **Robotshop** application and also **All Services** that are detected and monitored by Instana. It Displays KPI's and health indicators for each service.

🔍 Applications

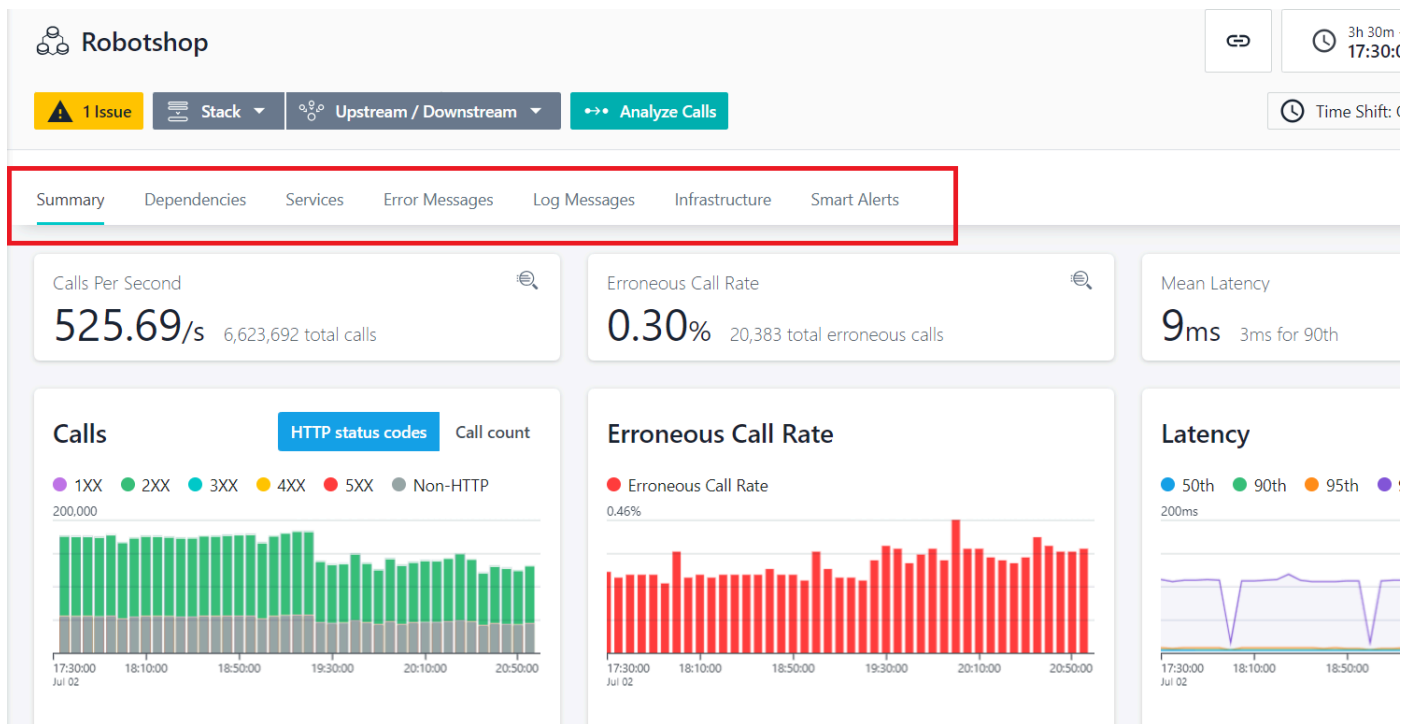
🔍 Services

🔔 Smart Alerts

Applications

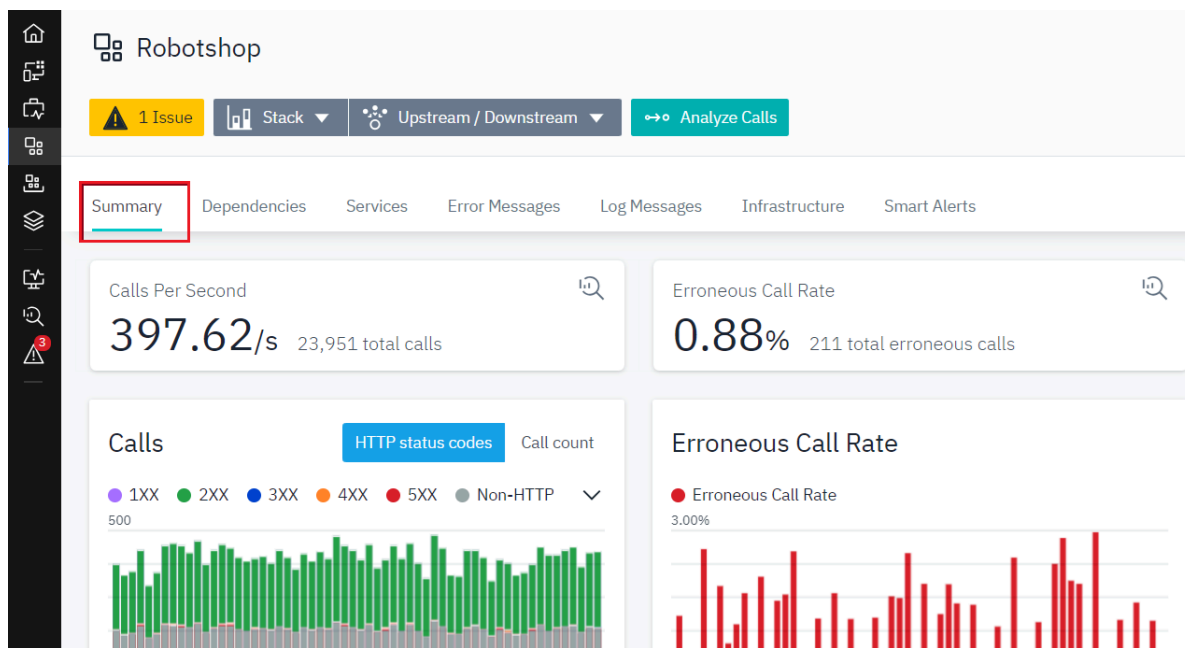
Name	Scope	Services	Calls ↓	Latency	Erroneous C
Robotshop	🔍	23	23,951	21ms	
All Services	🔍	10	16,030	9ms	
Discount Canary Build 917	🔍	1	34	590ms	
Discount Canary Build 918	🔍	1	33	548ms	

3. By clicking the “Robotshop” application, you can drill into the summary dashboard, where a lot of metrics & information are captured by tracing. It reveals how the application is running and performing and how well the services are interacting with each other.

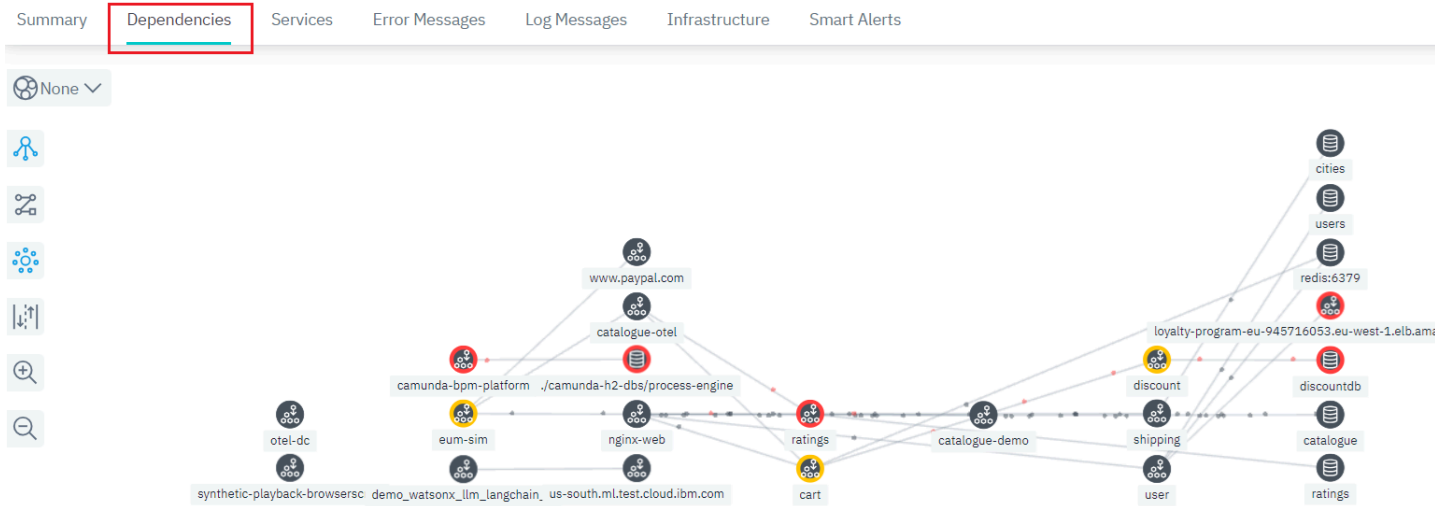


4. Let's look at the options available in the Robotshop dashboard. You can select the specific option to delve deeper into analytics.

a. **Summary** - To get an overall performance summary of the monitored applications. It offers key information about the health, performance, and other relevant metrics.



b. **Dependencies** - To get insights into the various dependencies of the application that is being monitored. It allows you to visualize and understand the relationships between various components, services, APIs, databases, and external resources that your application relies on.



c. **Services** - To get insights into the individual services or components that make up the monitored application. It helps analyze the performance, health, and dependencies of each service within the application stack.

Robotshop

1 Issue Stack Upstream / Downstream Analyze Calls

Summary Dependencies **Services** Error Messages Log Messages Infrastructure Smart Alerts

### Services

Name	Types	Technologies	Endpoints	Calls ↓
nginx-web	HTTP	Nginx	5	
catalogue-demo	HTTP	Spring Boot	5	
catalogue	DATABASE	MongoDB	1	
eum-sim	HTTP	Node.js	17	
discount	HTTP	Spring Boot	2	

d. **Error Messages** - To get insights into the specific error messages and exceptions that occur within the monitored application. It helps track, analyze, and troubleshoot errors or exceptions that affect the performance and reliability of the application.

Summary Dependencies Services **Error Messages** Log Messages Infrastructure Smart Alerts

### Error Messages

Analyze

Error Message ↓

- Erroneous call without error message
- HikariPool-1 - Connection is not available, request timed out after 2000ms.
- The database has been closed [90098-214]
- org.camunda.bpm.engine.ProcessEnginePersistenceException: An exception occurred in the persistence layer. Please check the server logs for a detailed message and the entire...
- getaddrinfo ENOTFOUND loyalty-program-eu-945716053.eu-west-1.elb.amazonaws.com loyalty-program-eu-945716053.eu-west-1.elb.amazonaws.com:9090

#### e. Log Messages

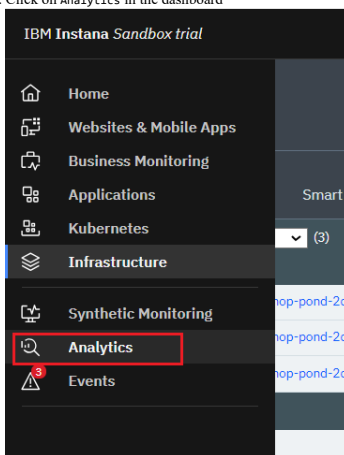
- To see and analyze log messages generated by the applications and infrastructure.

Summary Dependencies Services Error Messages **Log Messages** Infrastructure Smart Alerts

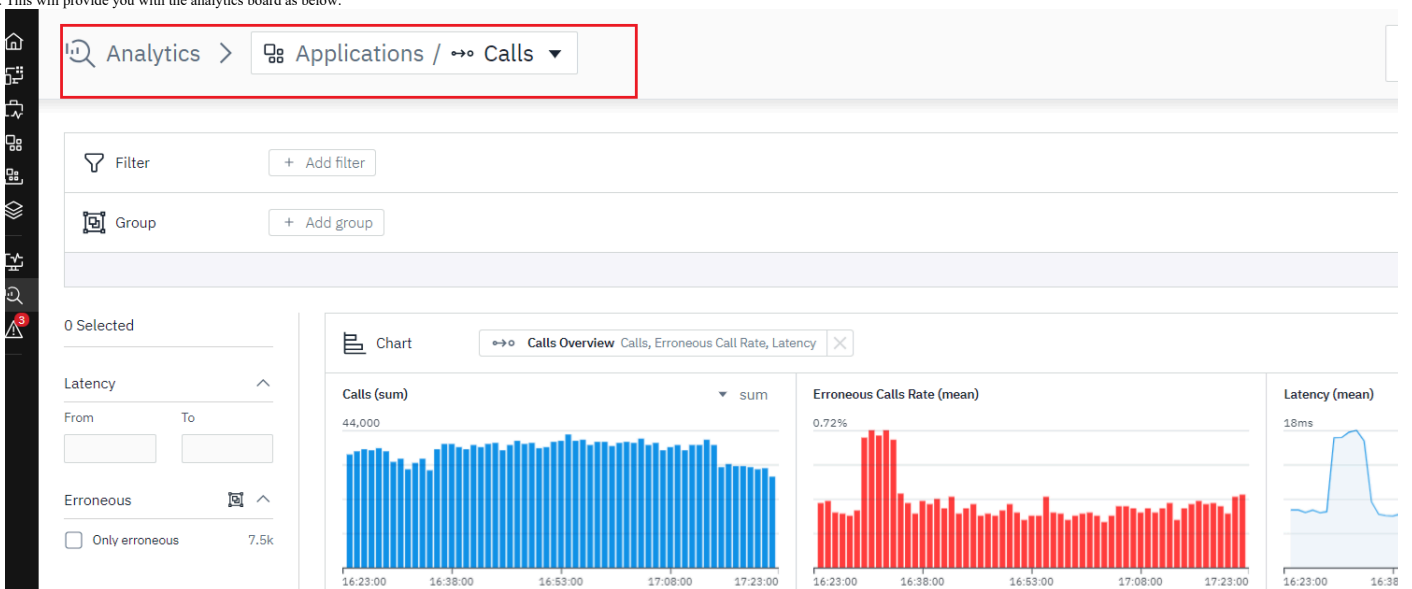
Log Level	Log Message
ERROR	HikariPool-1 - Connection is not available, request timed out after 2000ms.
ERROR	Communications link failure The last packet sent successfully to the server was 0 milliseconds ago. The driver has not received any packets from the server.
ERROR	Error ocured during fetching discount from DB: Unable to acquire JDBC Connection; nested exception is org.hibernate.exception.JDBCConnectionException: Unable to ac
WARN	SQL Error: 0, SQLState: 08S01
ERROR	Error ocured while calling discount service: 500 : [no body]
ERROR	failed to connect to catalogue
ERROR	{ msg: 'Backend Error', error: 500 }

- To analyze the log further, you can click the log and delve deeper into the analytics board.

1. Click on Analytics in the dashboard



2. This will provide you with the analytics board as below:



f. **Infrastructure** - To get insights into the health and performance of the underlying infrastructure that supports the monitored application.

If you have containerized or virtualized environments, Instana often provides visibility into the containers, virtual machines, or other virtualization technologies in use. It helps you monitor their health, resource consumption, and performance.

InfrastructureClusterPro

Process	Calls ↓	Latency	Errors
Node @9568	7,808	13ms	0.
Instana Demo - Catalogue app 2.0.0	7,780	12ms	0.
Unmonitored	7,704	11ms	0.
eum-sim v2.0.0	393	79ms	3.
-Fz_Jp12_he6kBJEfopbdw74Ijs	41	1,443ms	70
Instana Demo - Discount Application 2.0			

g. **Smart Alerts** - To configure and manage intelligent alerts for the monitored applications. It enables setting up custom alert rules based on specific conditions, thresholds, or patterns related to your applications' performance, health, or behavior.

1 Issue

Stack

Upstream / Downstream

Analyze Calls

Time Sh

SummaryDependenciesServicesError MessagesLog MessagesInfrastructureSmart Alerts

Global Application Smart Alerts (0)

Application Smart Alerts (3)

NameAscend

	Calls are slower than usual Static Threshold, Latency (90th) ≥ 2,260ms	Application Smart Alert per Service	Robotshop
	Erroneous call rate is higher than normal Static Threshold, Error Rate ≥ 25%	Application Smart Alert aggregated	Robotshop
	Erroneous call rate is higher than normal Static Threshold, Error Rate ≥ 0.27%	Application Smart Alert aggregated	Robotshop

5. Clicking **All Services** will launch the dashboard, showing the summary of the various analytics or metrics of the Services monitored by Instana.

- For this click on **Home** from the Navigation mmenu

Home

Websites & Mobile Apps

Business Monitoring

Applications

Kubernetes

Infrastructure

Synthetic Monitoring

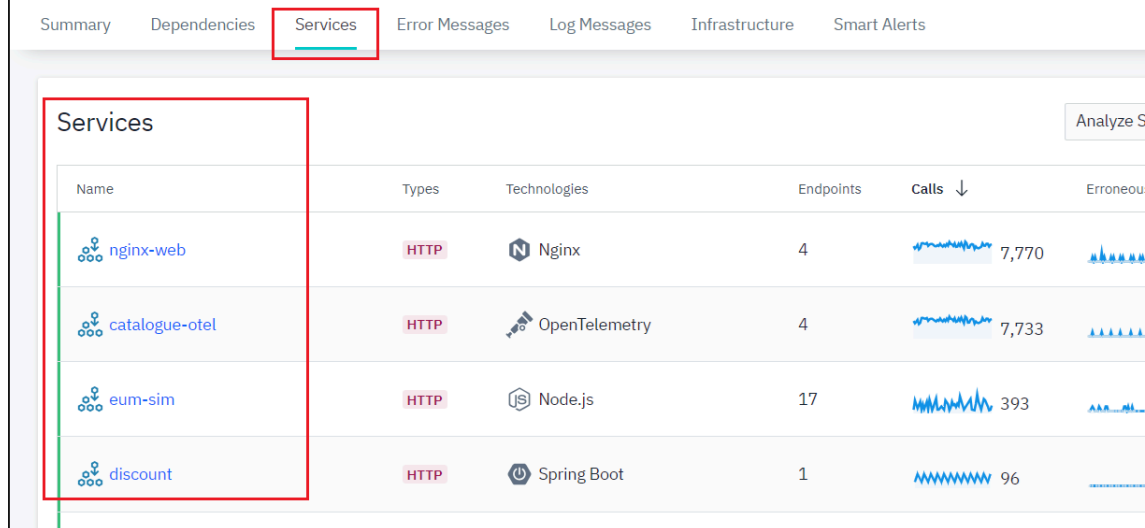
Analytics

Events

- Select **All Services**



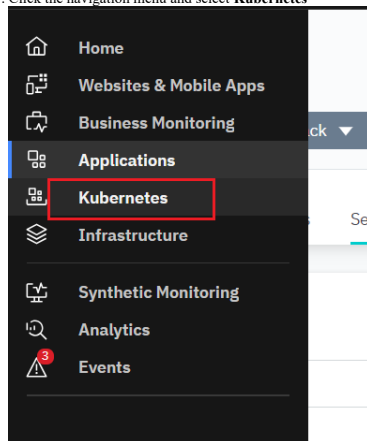
- Please note that this also has a **Services** tab and lists the same services you visited by navigating through **Robotshop** application services.



**Note:** The other tabs provide similar meaning/analytics as mentioned above for the Robotshop application.

## Exercise 5: Kubernetes

1. Click the navigation menu and select **Kubernetes**



2. The Kubernetes tab in the Navigation menu of Instana provides insights and monitoring capabilities specifically tailored for Kubernetes environments.
3. It allows you to gain visibility into your Kubernetes clusters, monitor their health and performance, and analyze the behavior of your containerized applications.
4. It aids in giving a Cluster Overview, monitors nodes and pods, and gives detailed container visibility.
5. Cluster topology and visualization are key features of Instana, which provides a visual representation of your Kubernetes cluster topology, showcasing the relationships and dependencies between nodes, pods, and containers which helps to understand the overall structure of your cluster and the interactions between its components.
6. Select the **Robotshop** cluster, which will take you to the analytics dashboard of the cluster. Various details/analytics and metrics related to Events, Nodes, Namespaces, Deployments, CronJobs, Pods, Infrastructure, and so on can be found here.

Kubernetes

Clusters Namespaces

Name ↑	Namespaces	Nodes	Services	Pods	Deployments	DaemonSets	StatefulSets
<a href="#">robotshop (cluster)</a>	13	3	45	58	40	15	1

7. You can click each of them and drill down to get further Analysis and Metrics.

robotshop (cluster) v1.27.11-gke.1062004 GKE Cluster

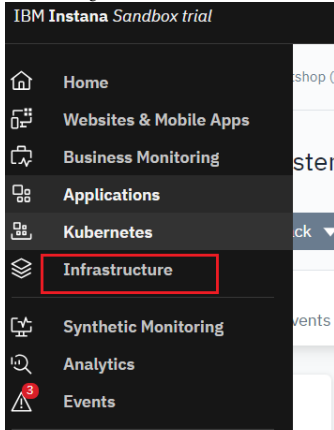
No Issues Stack Upstream / Downstream Analyze Calls

Summary Details Events Nodes (3) Namespaces (13) Deployments (40) DaemonSets (15) StatefulSets (1) Cron Jobs (0) K8s Services (45)

CPU Requests 75.56%	CPU Limits Alloc. 159.52%	Memory Requests 23.92%	Memory Limits Alloc. 79.12%	Pods Alloc. 17.57%
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## Exercise 6: Infrastructure

1. Click the navigation menu and select **Infrastructure**



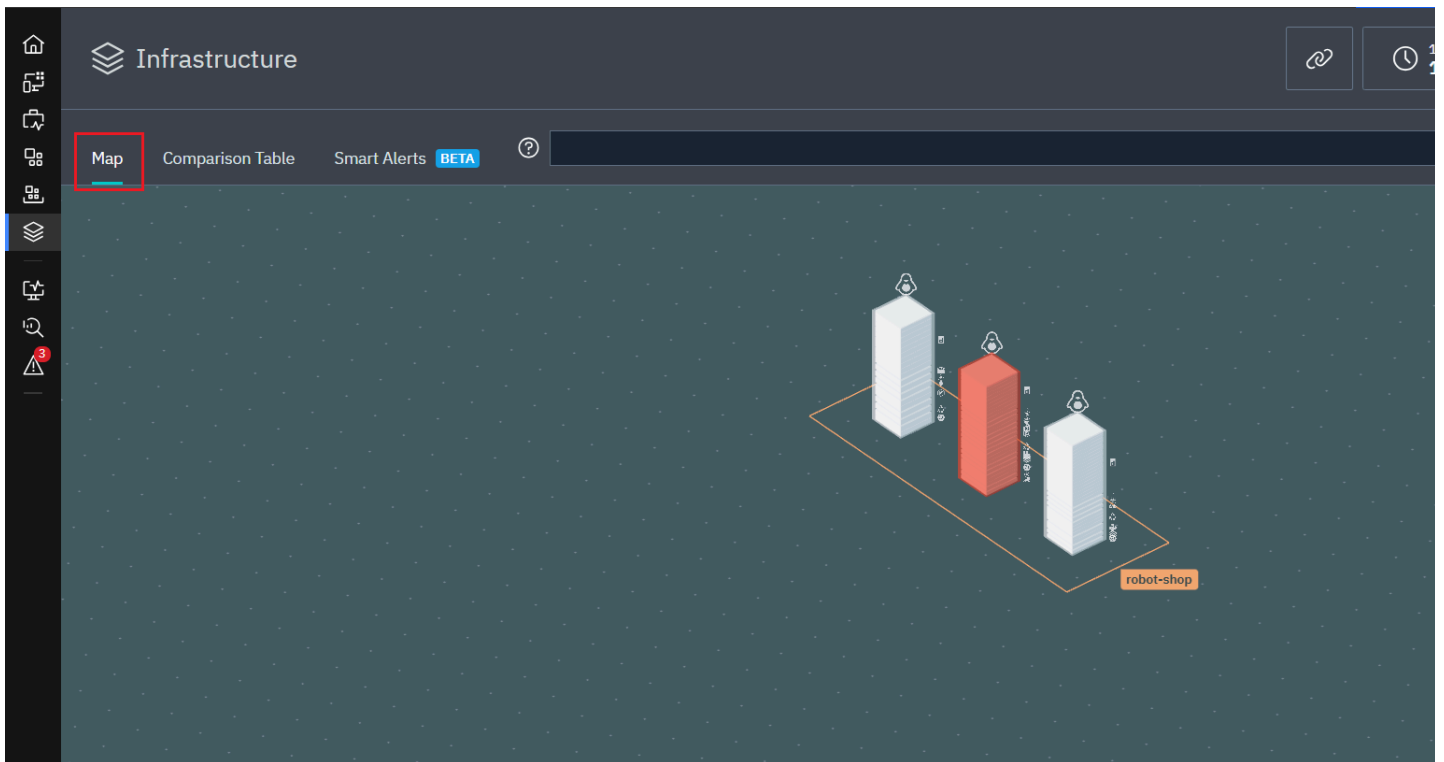
2. Instana provides visibility into the underlying infrastructure components that support the applications as part of its application monitoring capabilities.

3. This includes monitoring the performance and health of hosts, servers, containers, and other infrastructure elements. The information related to infrastructure can be found within the specific application or service views.

### 4. Infrastructure Map

- Instana's infrastructure map gives you a summarized view of all monitored systems that help you visualize every aspect of your application infrastructure easily.
- The infrastructure pillar's block represents the software components running on that system, changing color to reflect any incidents, events, or changes.



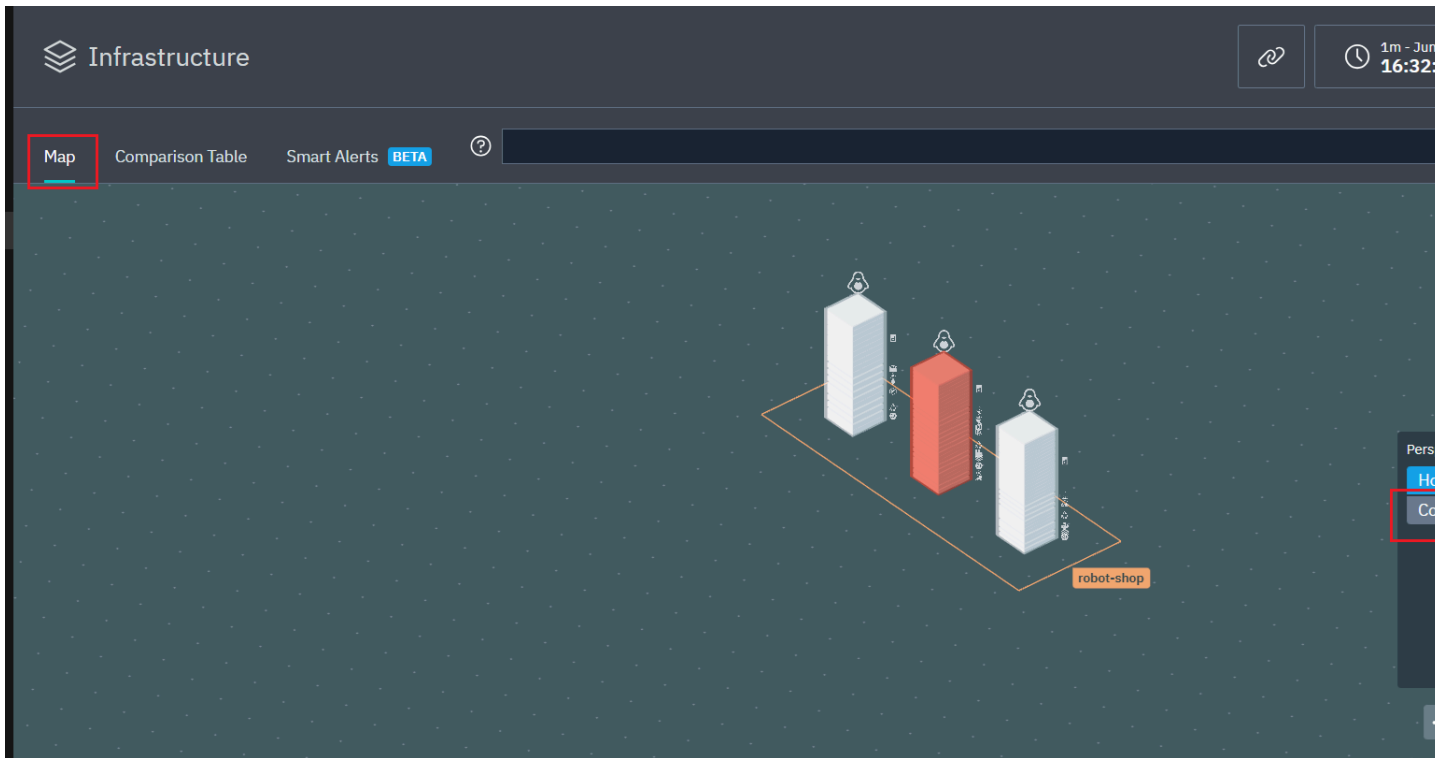


**Exercise 6.1: Configuring and Grouping Containers:**

Configuring and grouping containers serve several purposes in container-based environments, some of them being Application Isolation, Resource Management, Load Balancing, and so on.

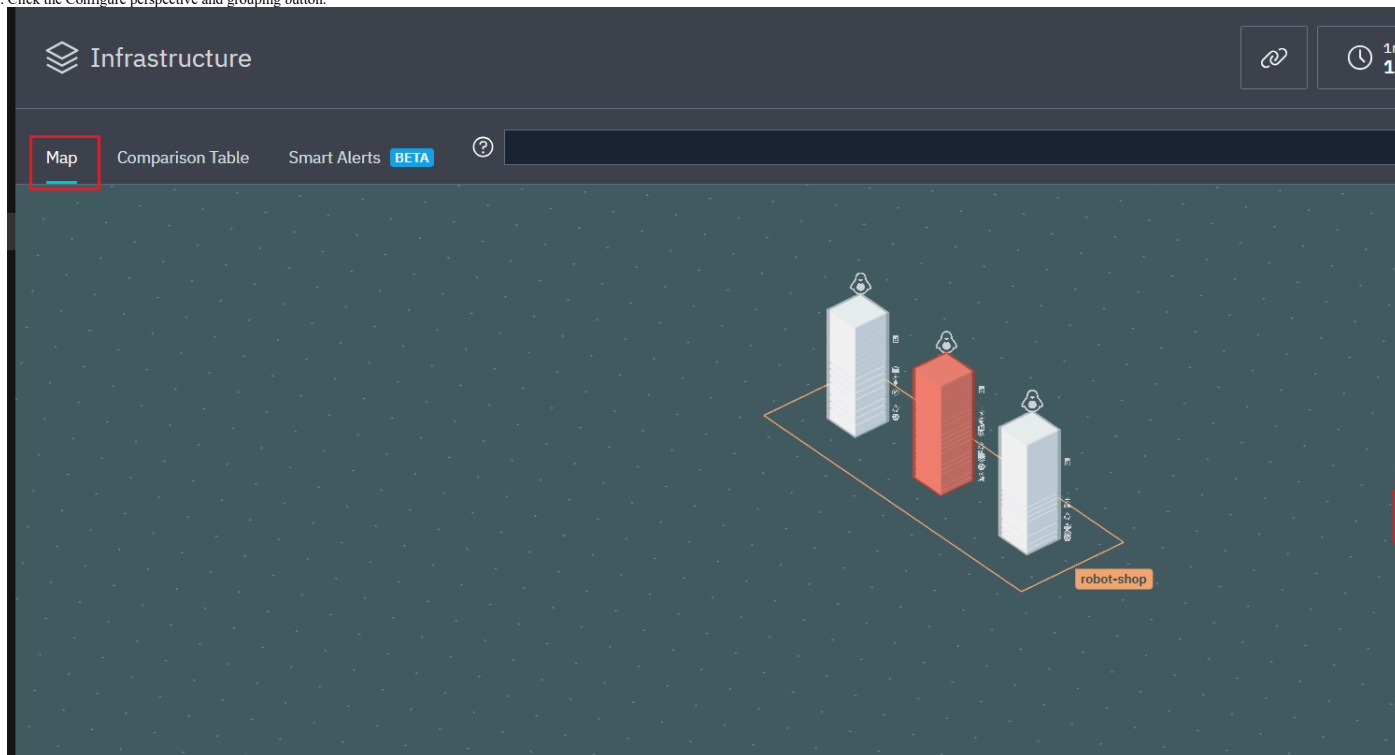
Container visibility is challenging, but with Instana, you can toggle between hosts and containers to pick the angle you prefer.

1. Click the Configure perspective and grouping button.

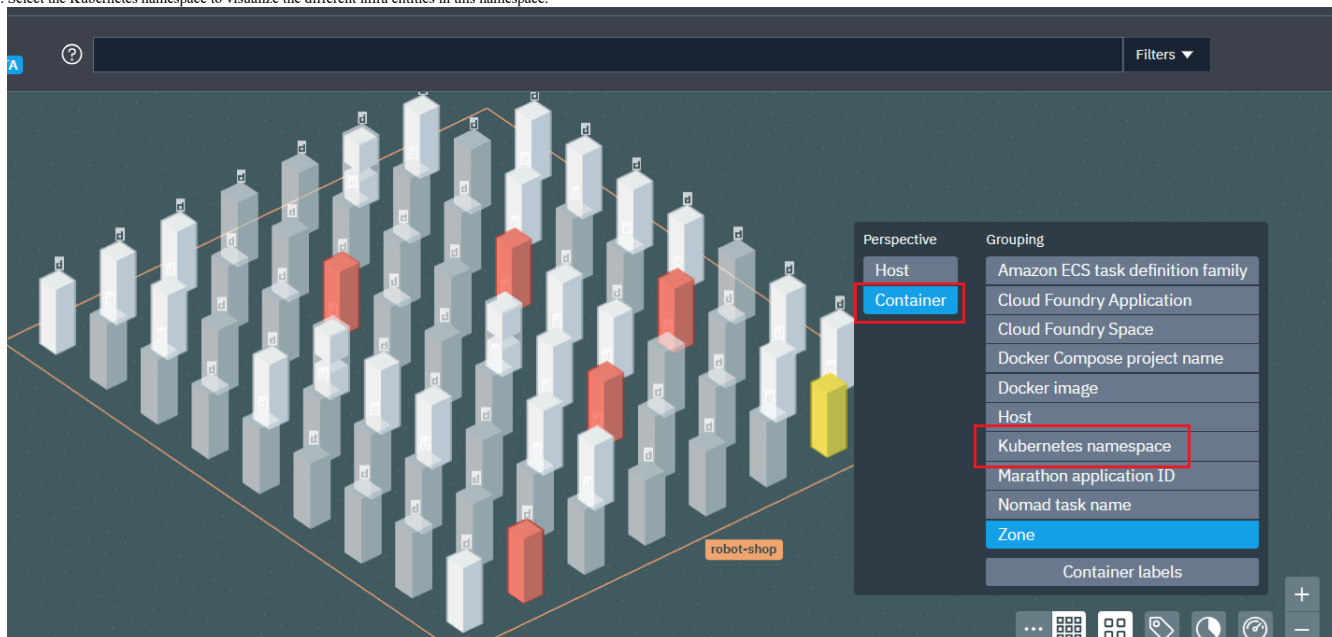


2. You can use filtering to enhance visibility by changing the grouping of your containers according to the filter you want to use.

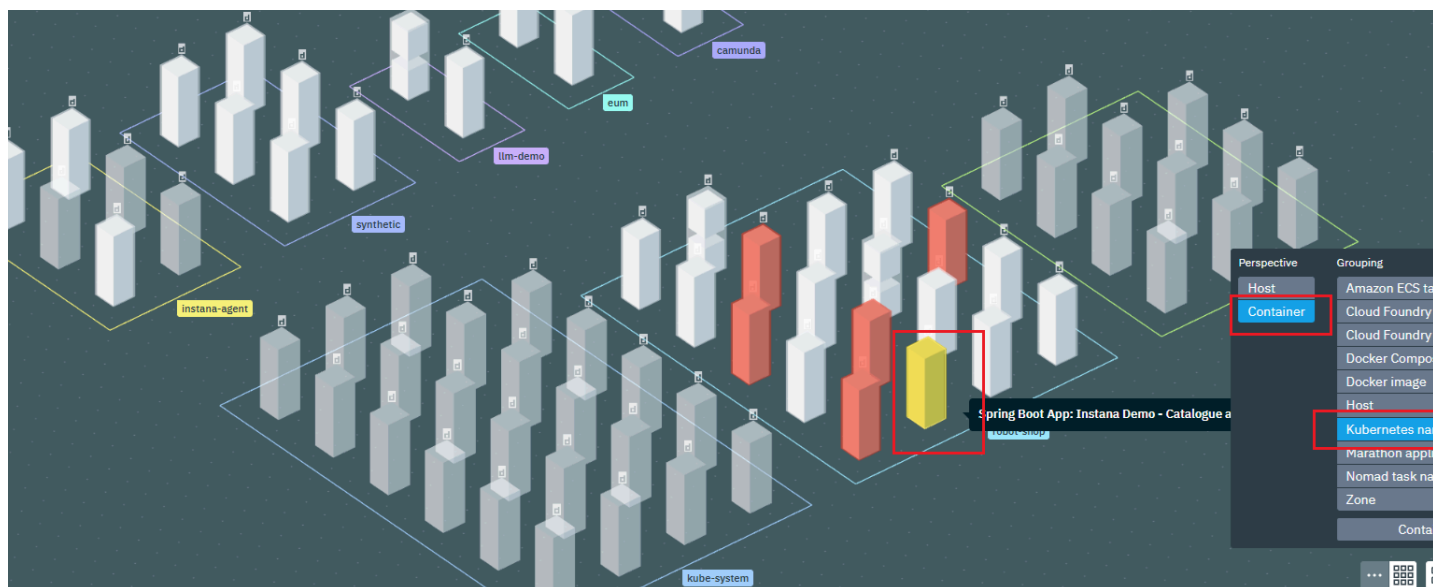
3. Click the Configure perspective and grouping button.



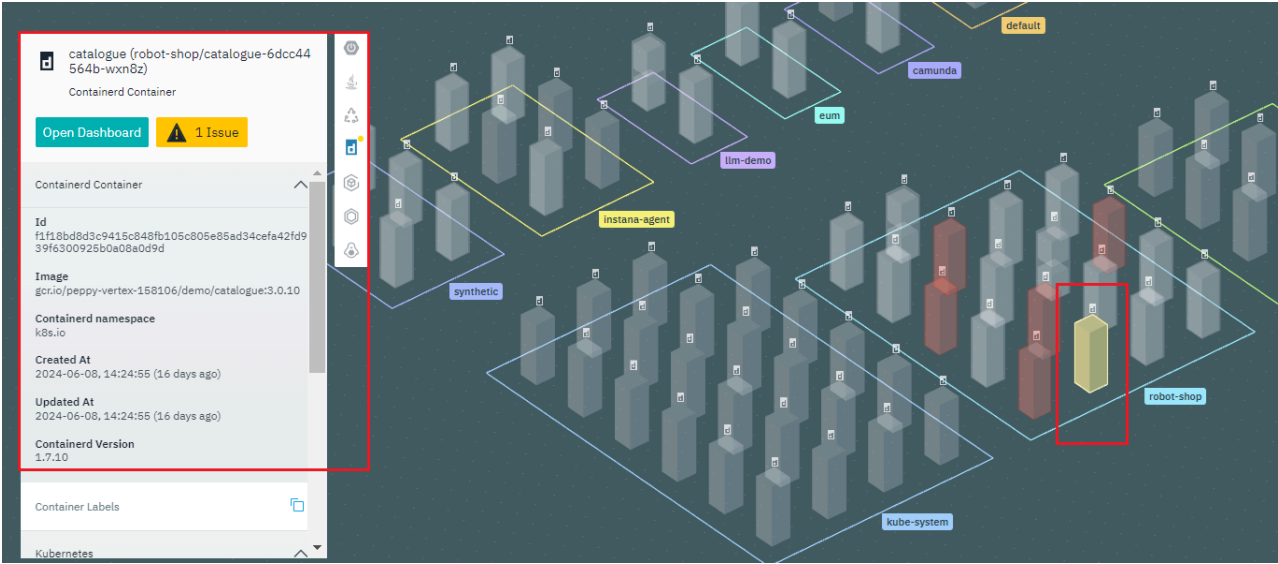
4. Select the Kubernetes namespace to visualize the different infra entities in this namespace.



5. Click the yellow hosts to see what is problematic for a host.



6. A dashboard view shows you how each container fits within the stack.



Every infra entity in Instana has its own dashboard. You can explore and understand the performance metrics for that entity and the relationship between that entity and other entities within the infra/platform and the application.

7. Infrastructure Comparison Table

- a. The comparison table makes it simple to identify application components that are critical to the performance of an application or service.
- b. To see if new changes or deployments are improving or degrading performance, you can sort by metrics, including CPU usage, memory consumption, and compare metrics over time.

MapComparison TableSmart AlertsBETA?

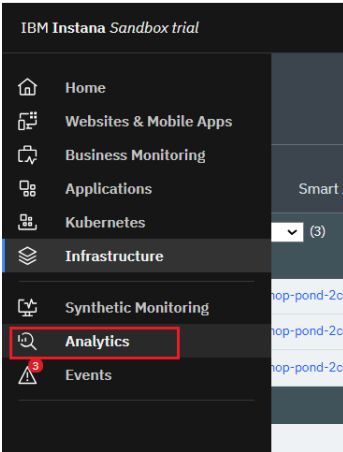
Table content: Hosts(3)Visualize metric for selected HostsPlease select

Zone	Name	Hostname	OS	Type	#CPUs	CPU Usage
robot-shop	gke-robotshop-pond-2cc3f2ea-2j5e.c.peppy-vertex-158106.internal	gke-robotshop-pond-2cc3f2ea-2j5e	5.15.146+ (amd64)	n1-standard-4	4	21%
robot-shop	gke-robotshop-pond-2cc3f2ea-3s0p.c.peppy-vertex-158106.internal	gke-robotshop-pond-2cc3f2ea-3s0p	5.15.146+ (amd64)	n1-standard-4	4	18%
robot-shop	gke-robotshop-pond-2cc3f2ea-jbv6.c.peppy-vertex-158106.internal	gke-robotshop-pond-2cc3f2ea-jbv6	5.15.146+ (amd64)	n1-standard-4	4	15%

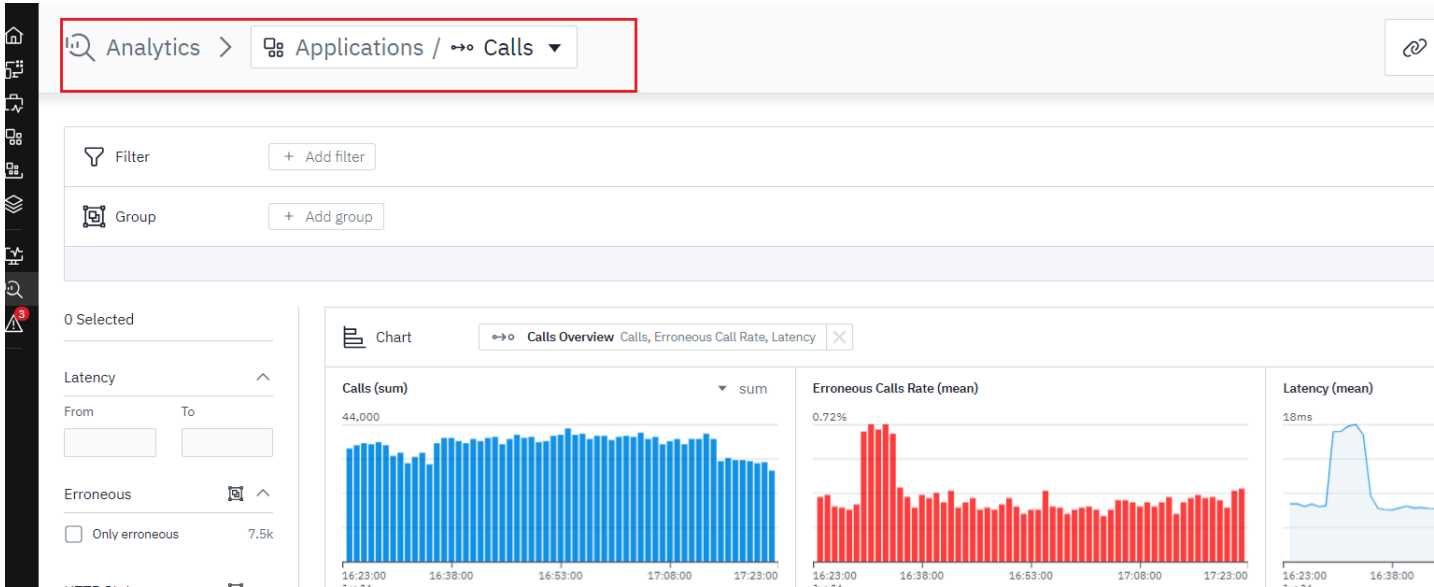
Exercise 6: Analytics and Events

Instana's analytics features enable us to gain deep insights into the performance and behavior of the applications, infrastructure, and services.

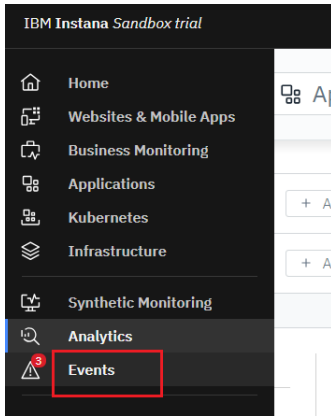
- 1. Click the navigation menu and select Analytics



- 2. This dashboard presents a deeper view of Analytics, including the various services' different calls.
- 3. You can also use filters and groups to customize the searches and drill down the Analytics
- 4. You can access this area through the other dashboards and thus access all tracing data.

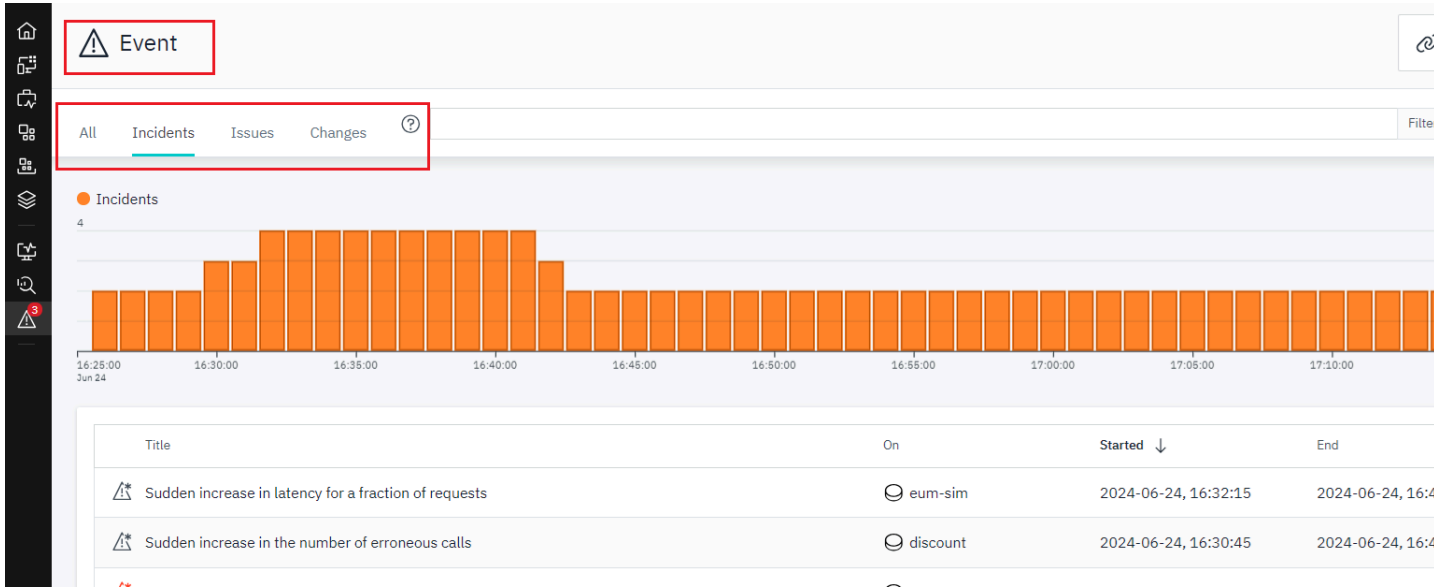


5. Click the navigation menu and select **Events**



6. The Events dashboard presents the details of all events, such as Incidents, Issues, and Changes that have occurred.

7. This data is based on a combination of Instana health rules and any custom events that have been created and can be viewed to see what triggered the issues and can drill into analytics for further analysis.



## Summary

Congratulations! You have completed the hands-on lab on Observability in Action with Instana.

In this lab, you have used Play with Instana, a sandbox with a pre-configured e-commerce application Robotshop and its services. You explored the sandbox to experiment with the tool's features and the different monitoring capabilities of Instana. You gained insights into the health and performance of the pre-configured application and its Infrastructure Components.

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