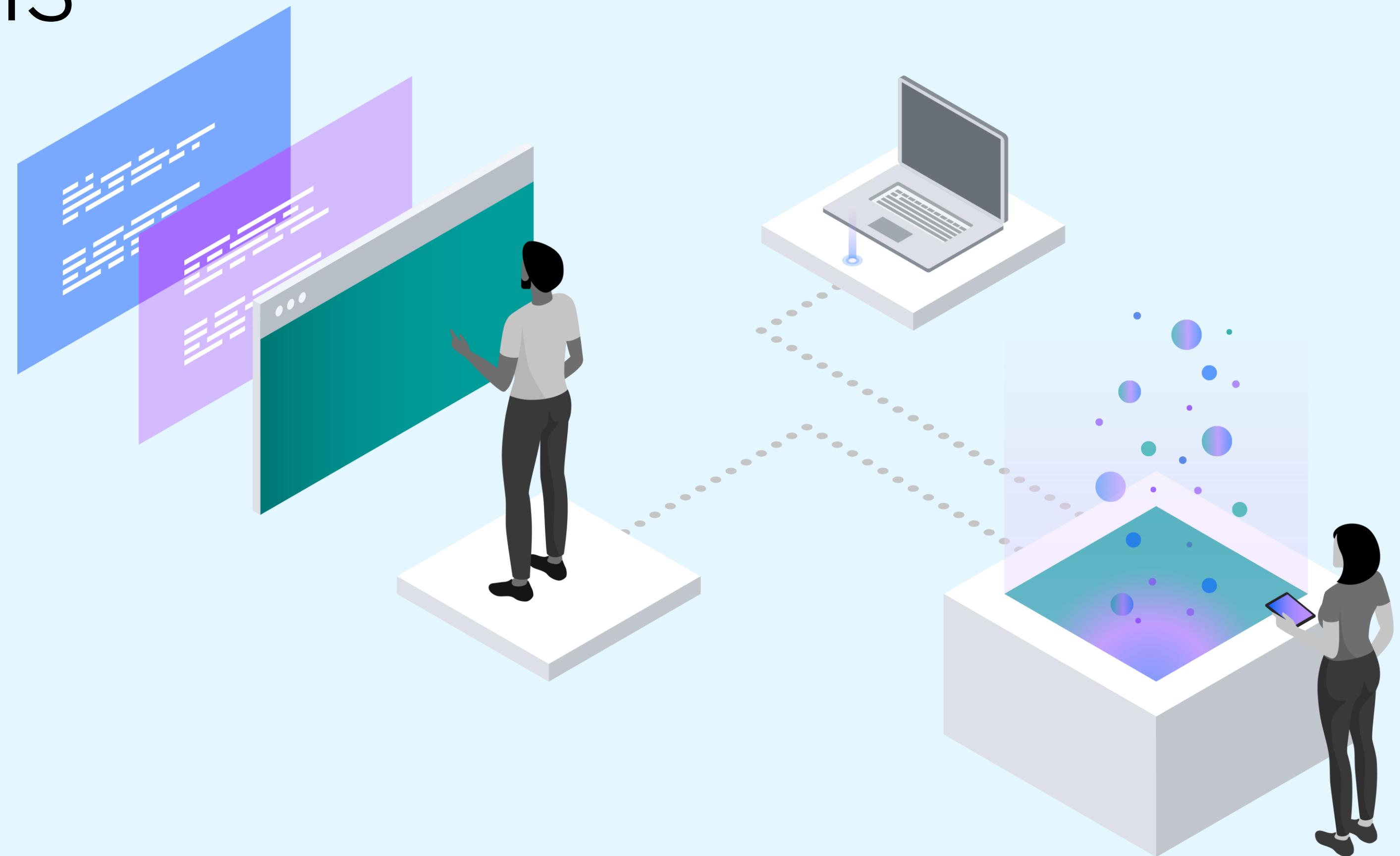


AIOps with IBM Z

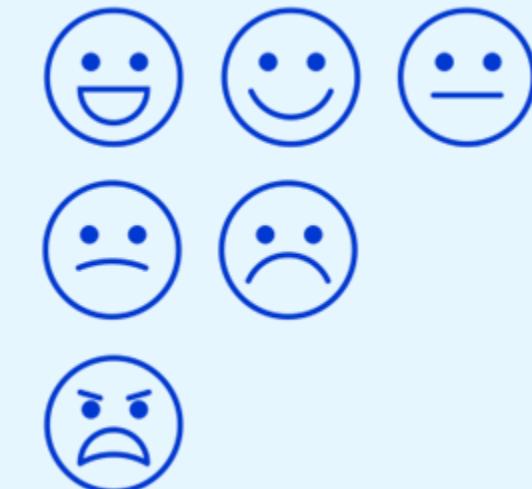
Overview & Solutions



IT under pressure: Meeting greater customer demands with fewer skilled employees

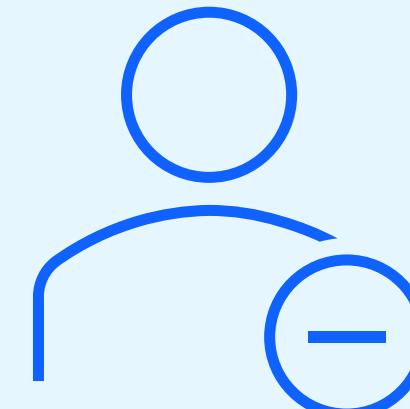
1 sec

of latency causes a 7% reduction in customer conversion and a **16% reduction in customer satisfaction**



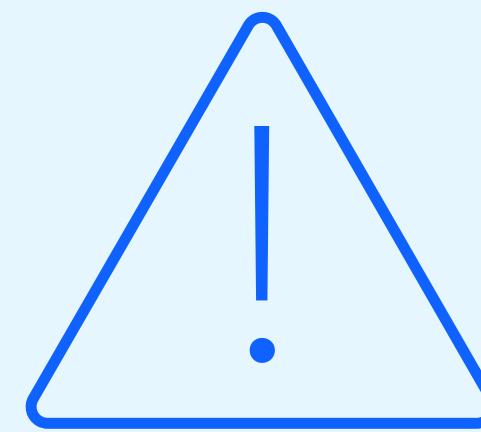
50%

of all employees need to upskill or **reskill by 2025** for responsibilities arising from automation and new technologies



\$250K

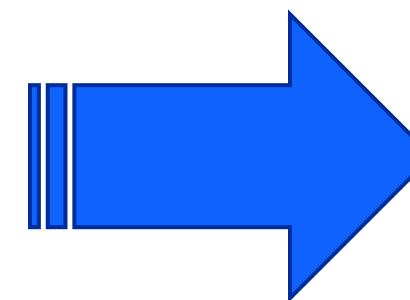
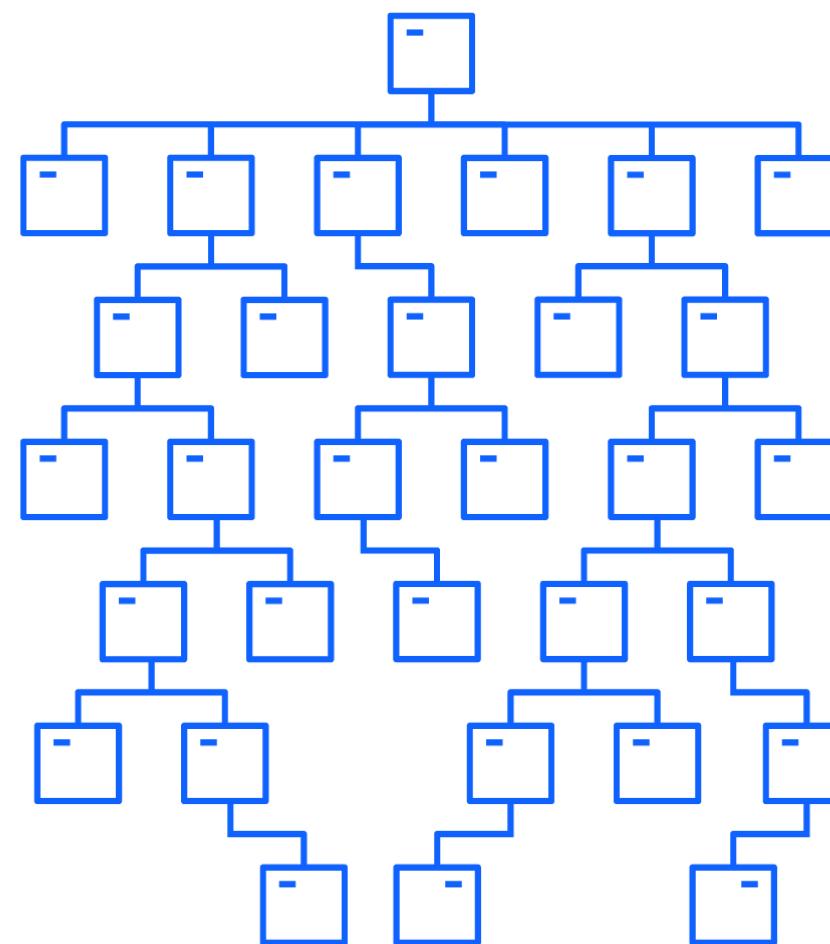
the average cost of an **hour of downtime** when a revenue generating production service is impacted



Current Landscape: Management Complexity

76% of companies use 2 or more public clouds

Organizations are using an average of over 1,000 applications across multiple clouds

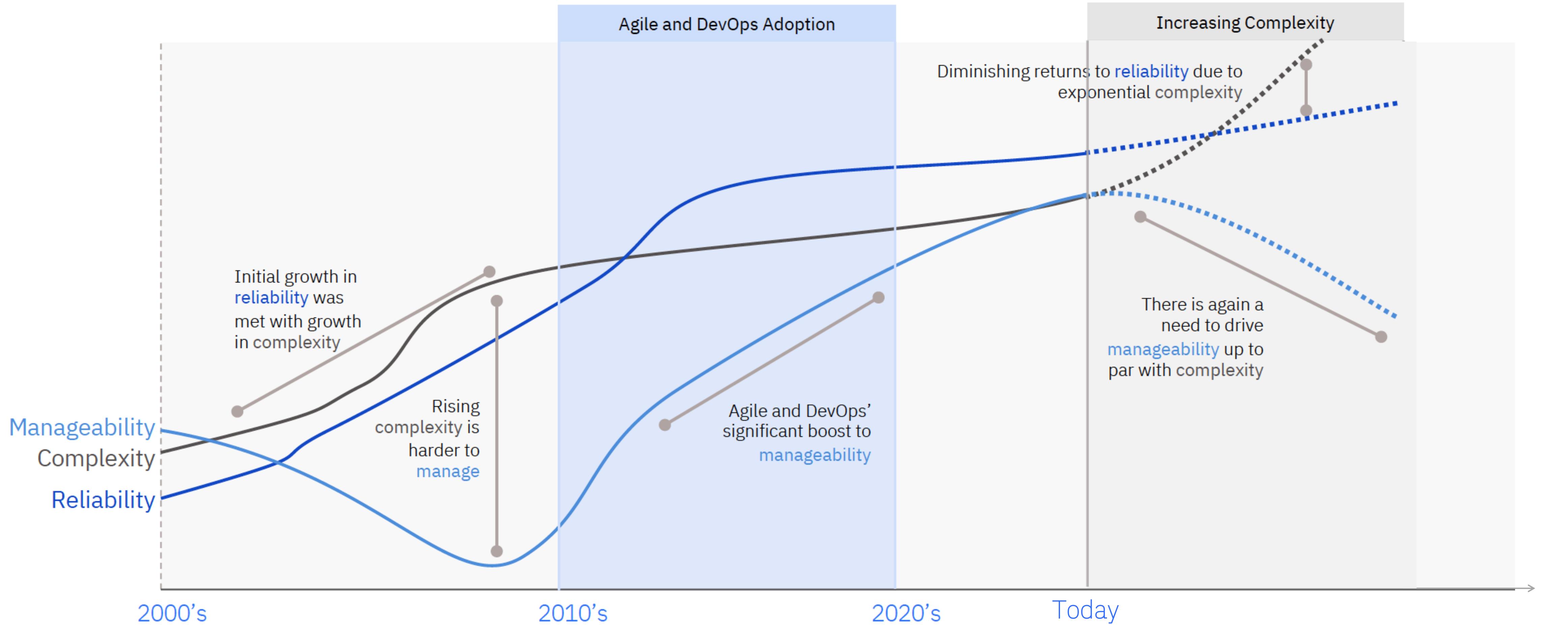


There's too much data for one person to handle

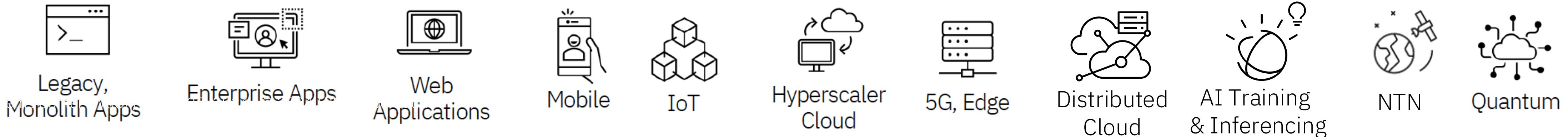
- Businesses need **real-time visibility** into their infrastructure and application estates to leverage actionable insights to **automate** and **enhance overall IT operations**
- Current **break-fix**, reactive approaches to IT management simply **cannot scale**
- Adopting **piecemeal** software solutions results in inconsistencies and inefficiencies, **undermining** integrated workflows and automations and **reducing visibility**

Why AIOps?

Modernization Accelerates Complexity



Example
Technology
Adoption



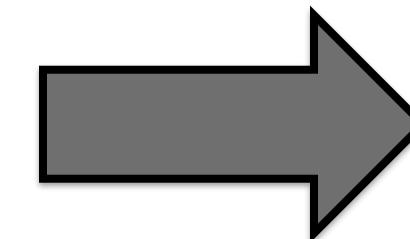


The capabilities of an AIOps Platform

Gartner defines an AIOps Platform as using machine learning to conglomerate insight, toward intelligent, AI powered Correlation & Automation solutions in the following areas:

AIOps Capabilities

- + Cross-domain data ingestion and integration
- + Topology generation
- + Event correlation and analytics
- + Incident and pattern recognition
- + Augmented remediation



Business Outcomes

- + Consolidate tools, teams and domains to work together and share understanding
- + See your entire IT estate and understand how incidents originate and propagate
- + Remove the toil of manual investigations, saving time and expanding operations capacity
- + Save time on repetitive fixes or deployments and empower operations to tackle complex problems

AIOps - Two IBM Z perspectives

“ZAIOps” – z/OS scope

- Encompasses z/OS monitoring & management solutions including the OMEGAMON suite, IBM Z Anomaly Analytics, IBM Z Operational Log and Data Analytics, IBM Z System Automation, and more.

“Hybrid Cloud” AIOps – Broader scope

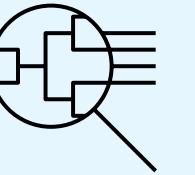
- Encompasses solutions that support Linux on IBM Z, distributed platforms, containers, public clouds, and more.
- Solutions include Instana, Turbonomic, IBM Cloud Pak for AIOps, SevOne, Apptio, and more.

These are not mutually-exclusive perspectives.

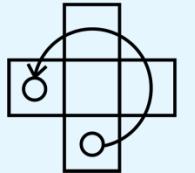
They work hand-in-hand to break down silos and bring IBM Z and z/OS into broader AIOps environments.

Observability & AIOps

Application & Infrastructure
Monitoring



Proactive Incident Resolution



Enterprise Observability

Enhance visibility and comprehension with full stack scalable application, infrastructure and network health and performance monitoring

Incident Management

Automate and manage end-to-end IT and network operations at scale with efficiency and resiliency

Integrated AI-powered IT Operations



Platforms

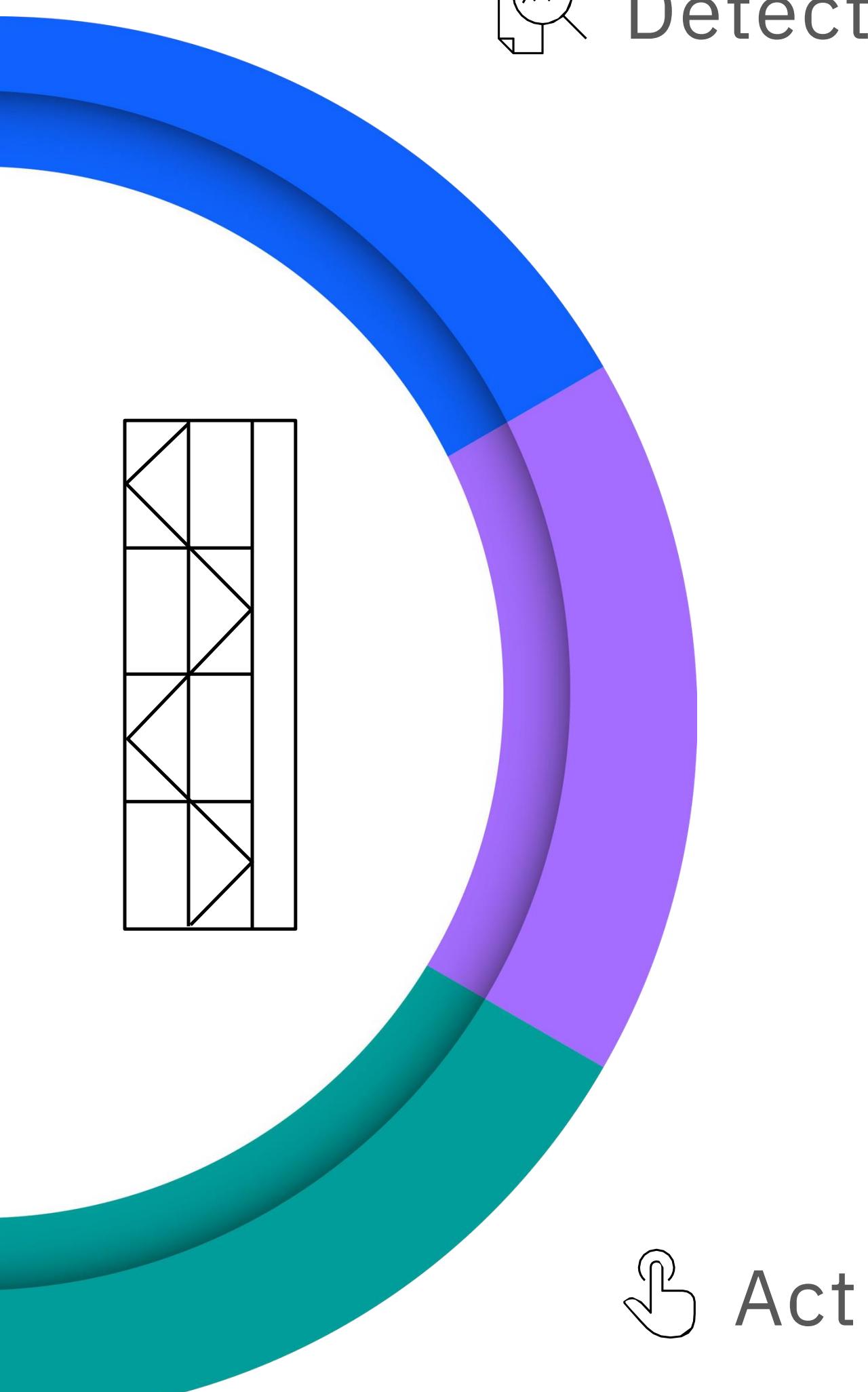


Hybrid Multicloud Networks



Data & Operations

Better together – Hybrid Cloud Integrations



Monitoring

IBM Z Monitoring Suite

Hybrid cloud observability

IBM Z APM Connect
IBM Observability by Instana APM on z/OS IBM zSystems Integration for Observability

Anomaly detection

IBM Z Anomaly Analytics

Deep-domain metrics & application trace analysis

IBM OMEGAMON

Log analytics

IBM Z Operational Log and Data Analytics

Performance & capacity management

IBM Z Performance and Capacity Analytics

Intelligent automation

IBM Z System Automation
IBM Z NetView

Predictive workload automation

IBM Z Workload Scheduler



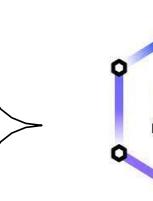
Hybrid Application Observability

IBM Instana®



3rd party solutions

App Dynamics



Hybrid Application Incident Management

IBM Cloud Pak for AIOps



3rd party solutions

Splunk
Elk
DataDog
ServiceNow
Other 3rd party products



Enterprise Automation

RedHat Ansible

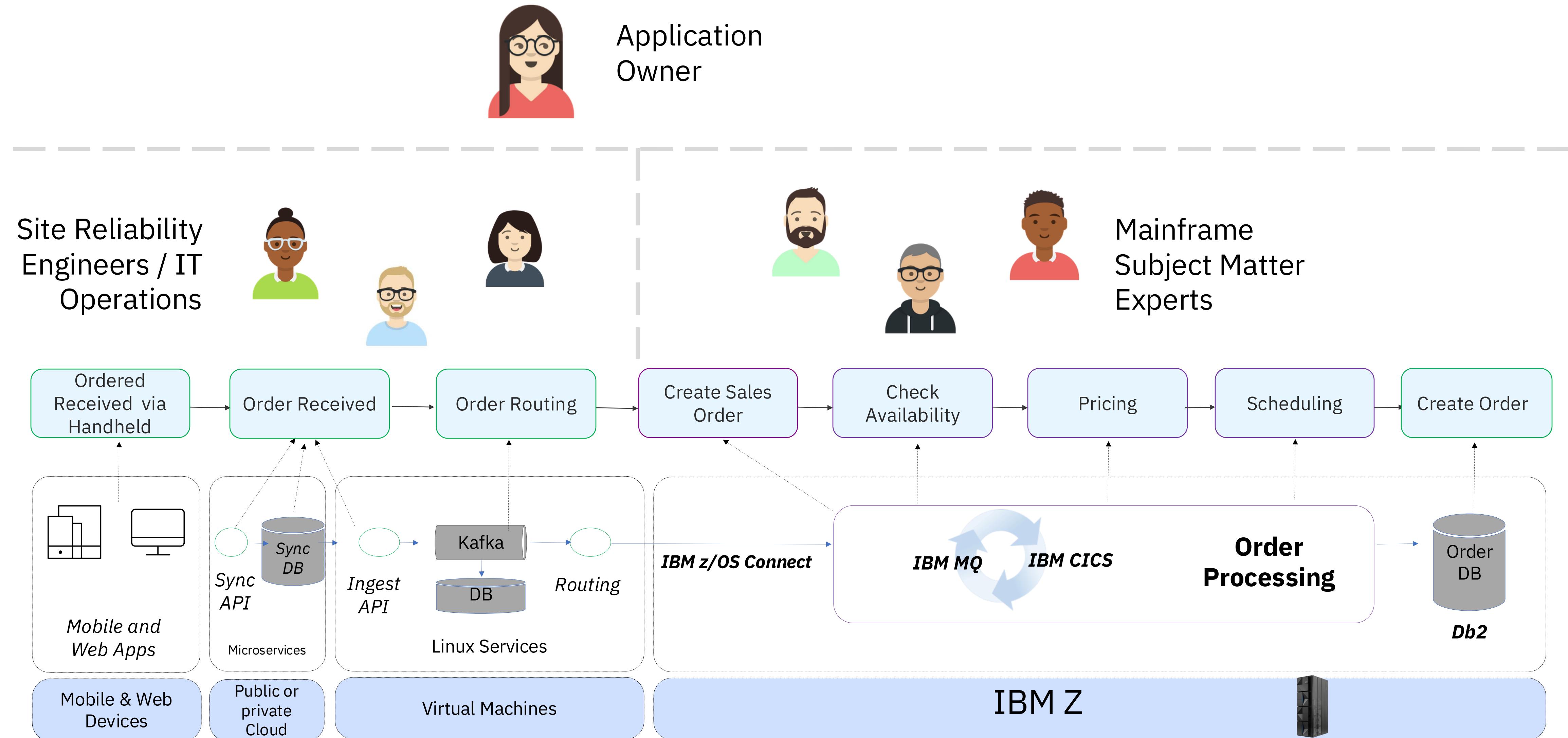


Automation hub

with 100+ plugins for hybrid cloud and other integrations

IBM Observability by Instana

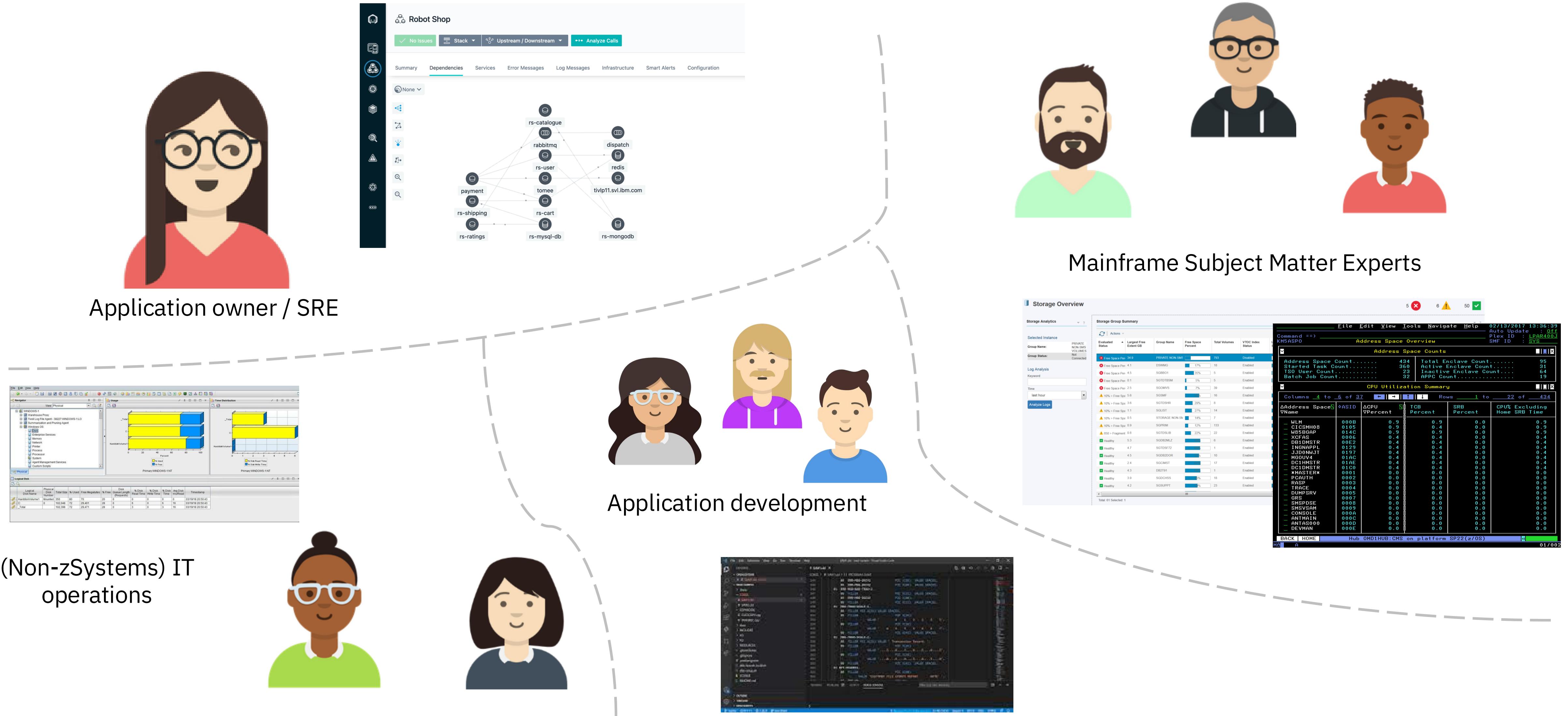
The challenge of enterprise observability



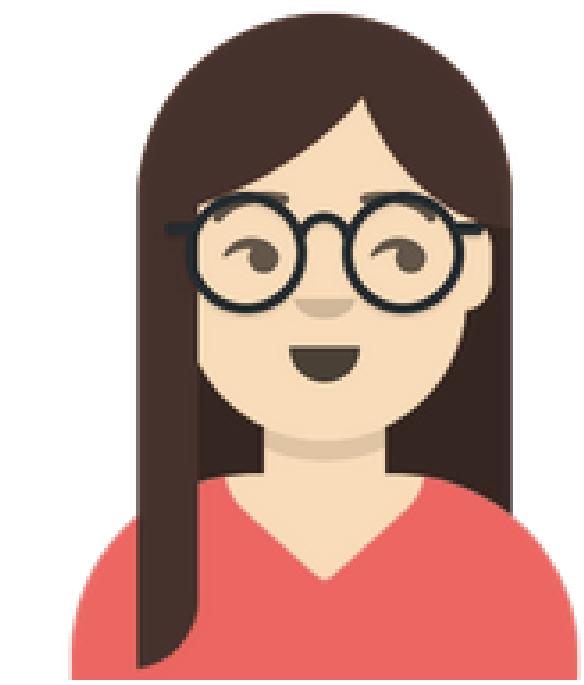
The mainframe is essential to the successful operations and business workflows of major enterprises...

Yet the majority of IBM Z users **lack integration of this key platform** into their enterprise-wide observability strategy

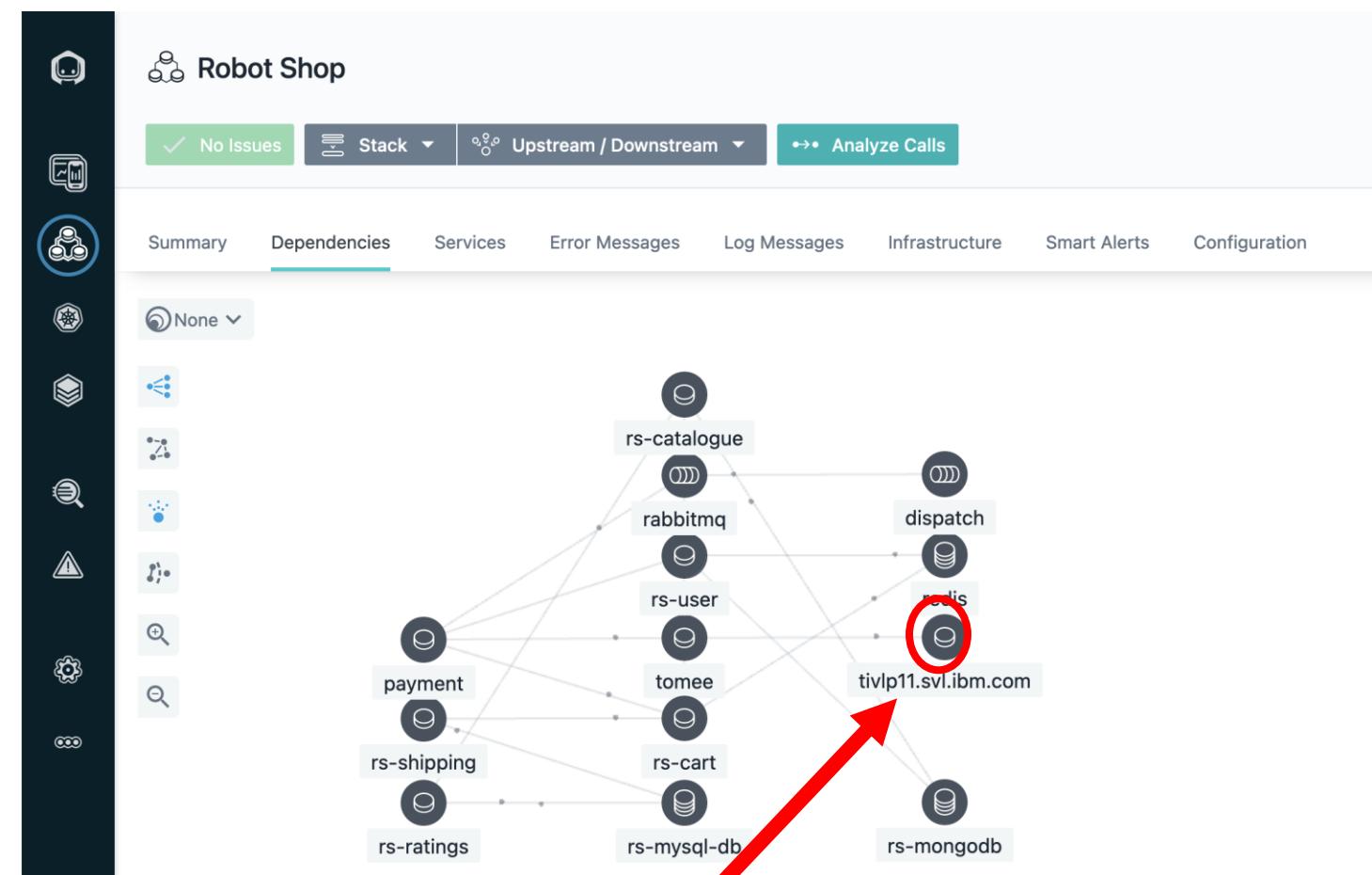
The ongoing challenge of Enterprise Observability



The absence of end-to-end observability...



Application
Owner



The response time of our principal customer-facing application has increased significantly over the past 30 minutes...**it looks like the mainframe is where the slowdown is occurring, but I can't see any details.**

MQ is looking good according to my dashboards. Not our problem. Have you spoken to the IMS team?



MQ SME

No problems with IMS. I don't think IMS is part of this application.



IMS SME

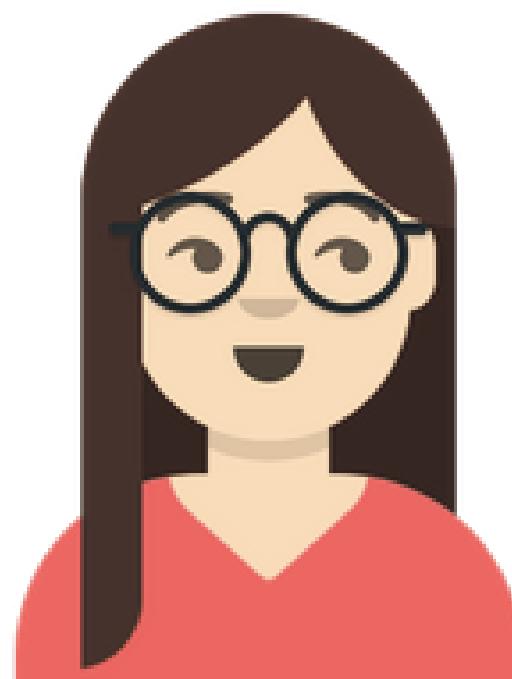
Uh-oh. One of our CICS regions is experiencing a slowdown. I'll fix it right now



CICS SME

Improved experience with enterprise observability

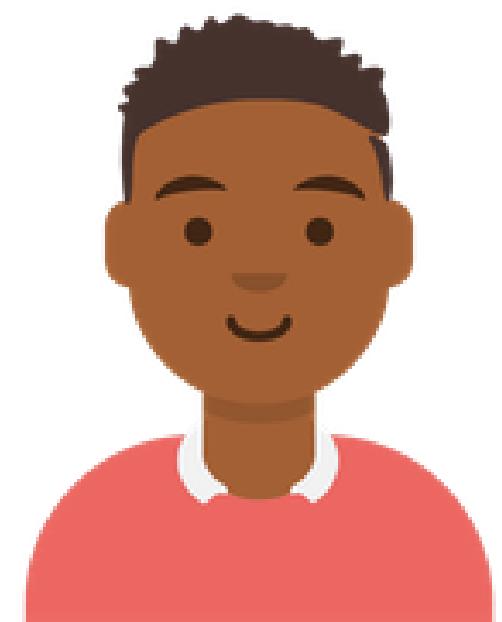
The response time of our principal customer-facing application has increased significantly over the past 30 minutes...**it seems there is a slowdown coming from CICS. It appears to be stemming from CICST11A and task 56177 is associated.**



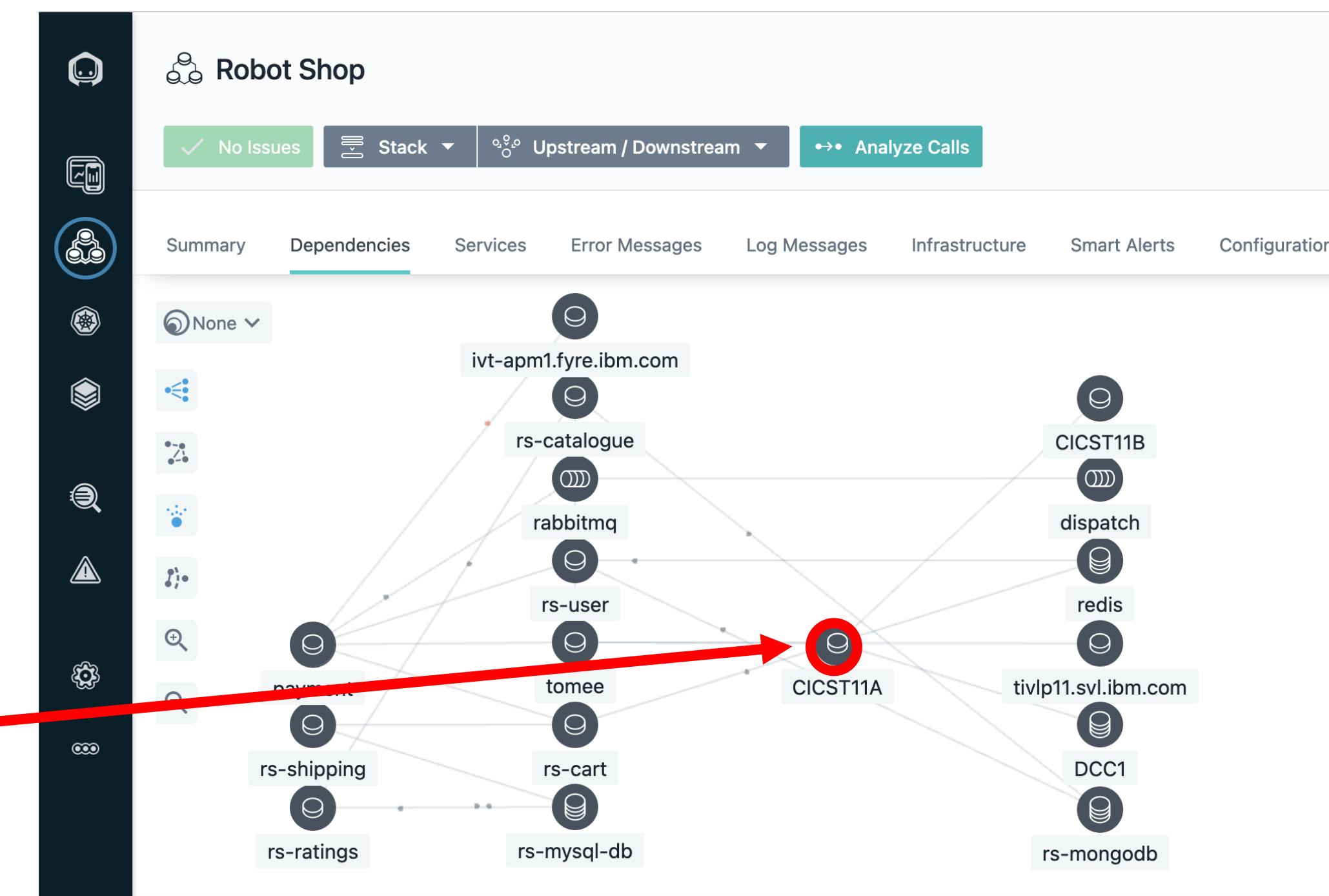
Application
Owner

Thanks for the heads up.

I'm going to look at that CICS region in OMEGAMON, review the CICS task history, and take action immediately.

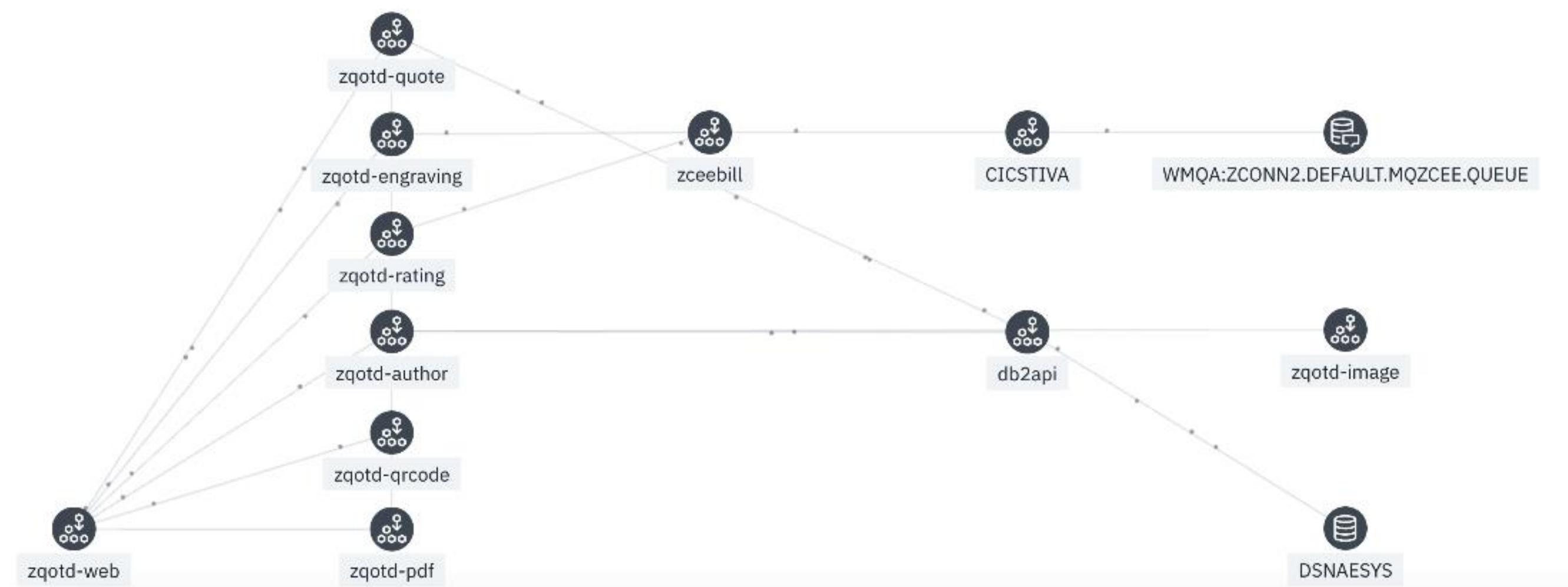
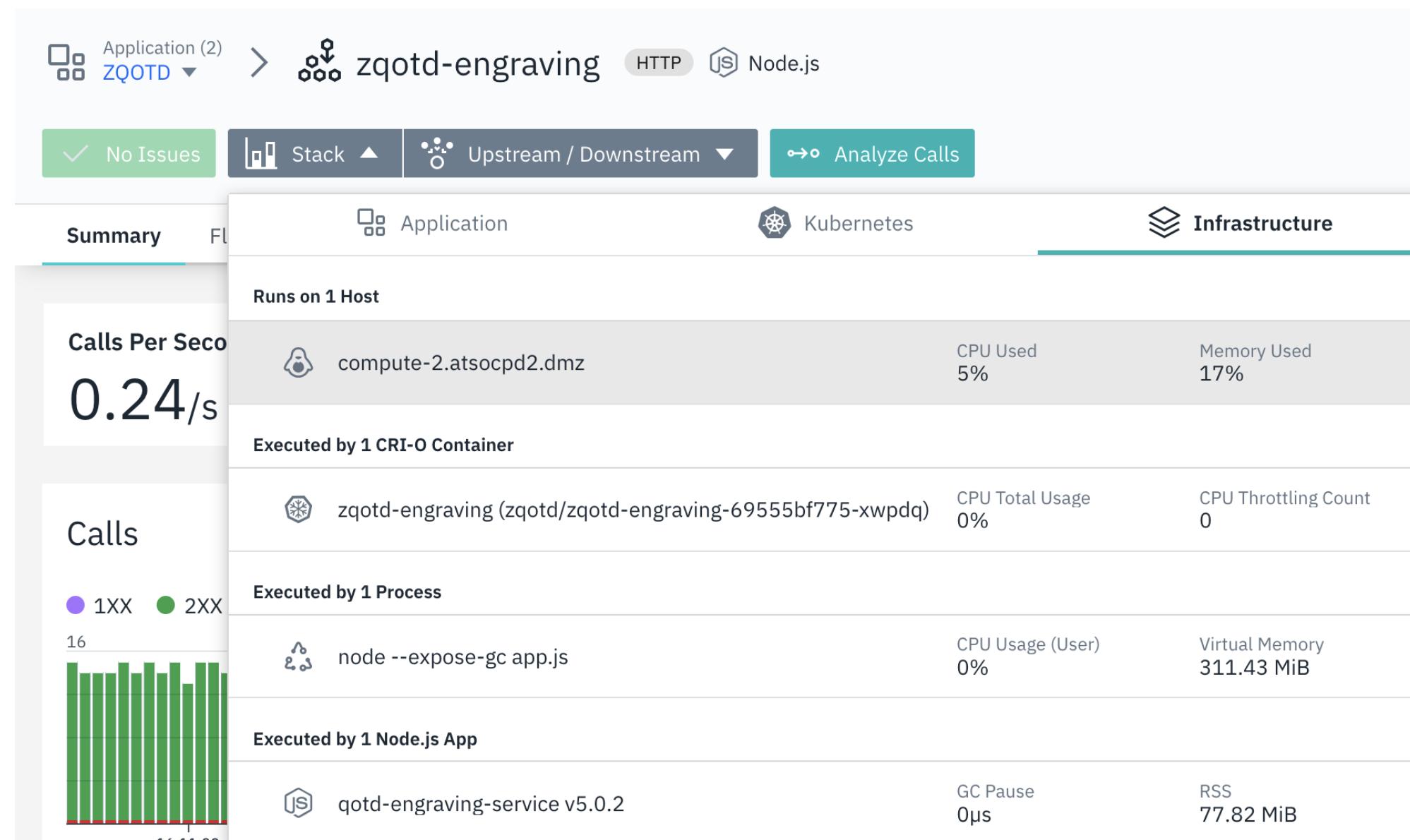


CICS SME



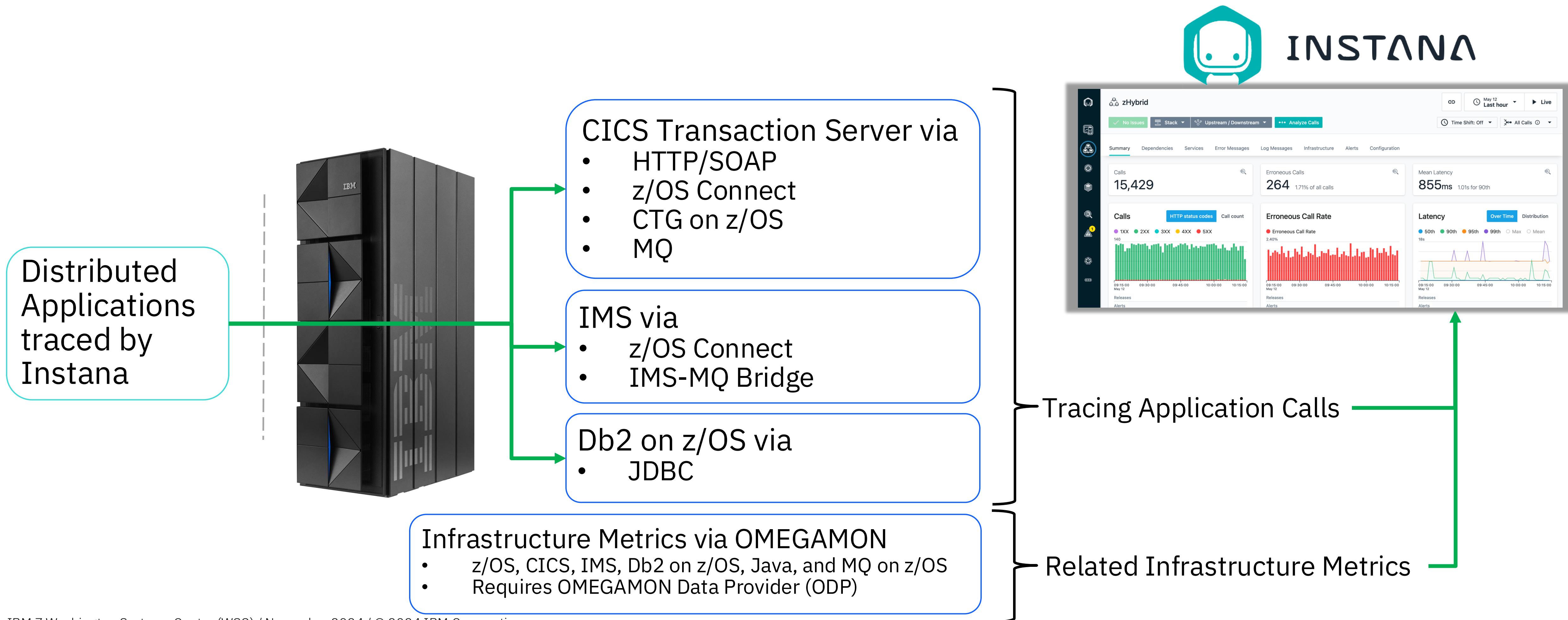
Collect accurate data in context

Real-time detection and mapping of all interdependencies reduces risk and decreases MTTR (Mean Time to Restore) by ensuring that you're always looking at accurate information.



Instana Capabilities on z/OS

- Designed to observe hybrid applications that start on distributed systems and call into z/OS transactions
- Instana tracing isolates the location of the problem and provides data about the likely cause
- Integration with OMEGAMON shows correlated metrics related to the problem in Instana (Optional)



IBM Cloud Pak for AIOps

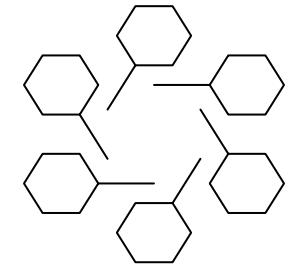
IBM Cloud Pak for AIOps

Proactive problem determination, remediation and avoidance



Proactive incident resolution using AI to eliminate unnecessary down time

Cross Domain Data Ingestion

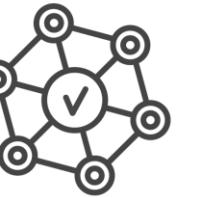


Events, metrics, alerts, topology, CMDB

Tickets, defects, CI/CD events

On-Prem, Cloud, SaaS, VM's and containers, systems, apps, network

Event Correlation



Correlate across all relevant data sources

Detect hidden anomalies, group based on patterns

Find deviations in performance metrics

Proactive Incident Management



Prioritize incidents based on business criticality

Dynamically update application topologies

Recommend fixes based on analysis of past tickets

Runbook Automation



Create runbooks to automate recurring remediations

ChatOps and prescriptive next best actions

Centralize policies across cloud and VM environments



Comprehensive AIOps approach to Real Business Outcomes

Multi-Domain Data Ingest

Automated Data Ingest

Unstructured

CI/CD

Logs

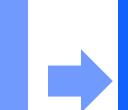
Tickets

Structured

Events / Alerts

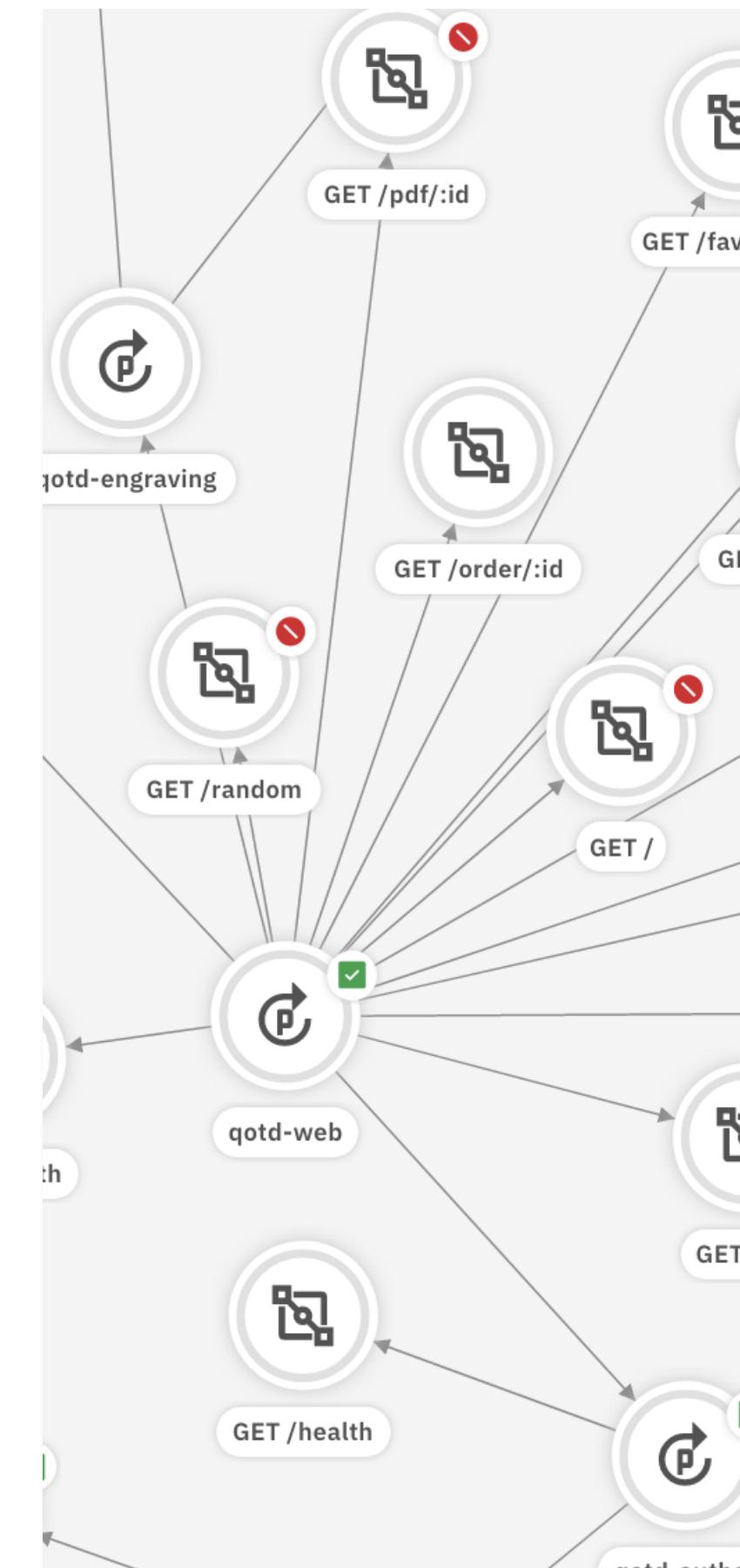
Metrics

Topology / Changes



Informed, Actionable Insights

Acclimate & Enrich Data



Augment Ops

Take Actions

Change Tracking

Anomaly Detection

Event Processing Correlation

& Enrichment

Fault Localization

Blast Radius

Probable Cause Analysis

Story Creation

Contextual side-launch

Act Manually (with a click)

Semi | Full Automation

Pipelines & Workflows

Explainability

Collaboration Integration

Together Ops teams
in near real-time...

Assure Performance



Accelerate rates of change



Free staff from toil



Reduce tickets by up to 70%

Environment and Tooling Data Connectors

The screenshot shows the 'Data and tool connections' page. At the top, there's a header with the IBM Cloud Pak logo and a search bar. Below the header, a sub-header reads 'Data and tool connections' with a sub-sub-header 'Connect to your tools to provide data that will help gather insights for your environment.' A blue 'Add connection +' button is located at the top right. The main area has a 'Learn more ▾' link. Below it, there are two tabs: 'Manage connections' (selected) and 'Schedule connections'. A search bar follows. A table lists various connections:

Connection type	Total connections	Connection status	Categories
ELK	1	✓ 1	Logs
Instana	2	✓ 2	Events Metrics ...
ServiceNow	1	✓ 1	Tickets Topology
Slack	1	✓ 1	ChatOps
SSH	1	✓ 1	Runbooks

At the bottom, there's a 'Add connections' section with a search bar and a list of categories: Checks, Events, Logs, Metrics, Prometheus, Tickets, Topology.

Over 160 industry standard connectors out-of-the-box

Ingest [Events & Alerts](#), [Metrics](#), [Topology](#) and [Logs](#) from across your estate and tooling

Create your own custom connectors using generic connectors and SDKs

Leverage your existing [Netcool Probes](#)

Easy configuration and management

AIOps Incident View

Probable Cause alerts are prominently displayed and ordered by likelihood, with additional details only one click away.

Topology view of affected and associated resources, and historical change tracking to quickly pinpoint the source of an incident and its impact

Recommended runbooks based on incident context and user feedback.

The screenshot shows the IBM Automation AIOps Incident View interface. At the top, there's a navigation bar with 'IBM Automation' and a search bar. Below it, tabs for 'Overview', 'Alerts', and 'Topology' are visible, with 'Alerts' being the active tab. A header bar displays 'Stories and alerts' with counts for 'Internal Server Error', 'Log anomaly', and 'Metric anomaly'. It also includes 'Priority 1' status, 'Assigned' tasks, and 'Related stories (3)'.

The main area is divided into several sections:

- Probable cause alerts:** Three alerts are listed:
 - Response time high for ts-ticketinfo-service-ts-ticketinfo-service-68cc7ff6c56-frcrzs-ticketinfo-services
 - Log Anomaly - HTTP Response Anomaly (503) detected for services: ts-ticketinfo-service-68cc7ff6c56-frcrzs (1)
 - MemoryUtilization is Higher than expected. Actual: 1345.8800m Expected: 300.8648m
- Alert topology:** A diagram showing the relationships between resources like 'Distribution dashboard' and 'Fuel tracker'.
- Resources:** A list of resources including 'Pod 1:Fuel tracker'.
- Similar past resolution tickets:** Two ticket entries are shown:
 - 'Noticing 500 internal server error and out-of-memory error' (Status: Failed, Last updated: 4 Mar 2020)
 - 'Noticing 500 internal server error and out-of-memory error' (Status: Failed, Last updated: 4 Mar 2020)
- Topology churn:** A chart showing the number of relationships and property changes over time, with a specific point highlighted on 11/5/2020 at 11:08:38 AM.
- Status severity breakdown:** A bar chart showing the distribution of status severities over time.

Access to ChatOps for team coordination and shortcuts to actions

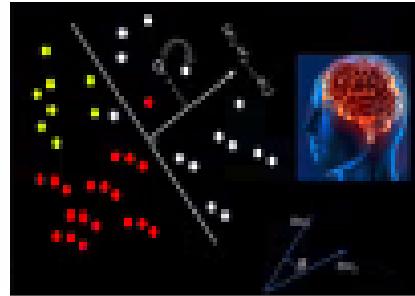
Direct link to ServiceNow ticket or other ITSM systems

Similar incident tickets, to inform operators of rapid resolution steps as well as tracking recurring types of incidents.



AI Analytics in Cloud Pak for AIOps

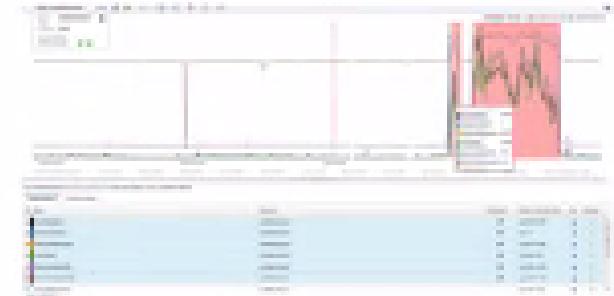
Log Anomaly Detection



Detect anomalies from log messages

- Anomalous time period prediction
- Entity mentions in error logs
- Explanation & Pointer to log messages from anomalous time periods

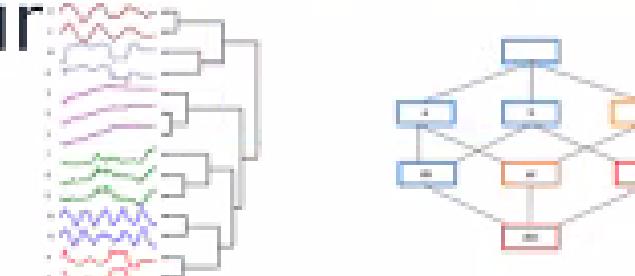
Metric Anomaly Detection



Detect anomalies from time series metrics

- Deviation from normal operating range
- Change from variable to flat
- High & low range changes
- Exceed previous range
- Exceed normal range variance

Event Grouping with Entity Linking



Group events, alerts, anomalies to reduce tickets

- Topological: Group events that are related and/or connected (e.g. "runs on").
- Temporal: To automatically discover events that tend to co-occur
- Scope: Automatically group events based on scope
- Super-Group: Group of Groups

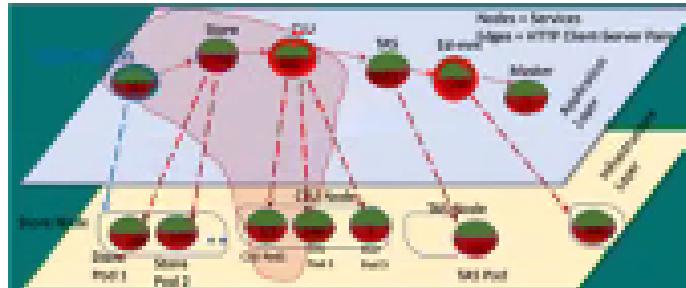
Event Seasonality



Automatically discovers events that occur with a regular pattern

- Identify chronic issues that may go un-detected
- Provide valuable insights into problem solving
- Continual learning over days, weeks, months, and years

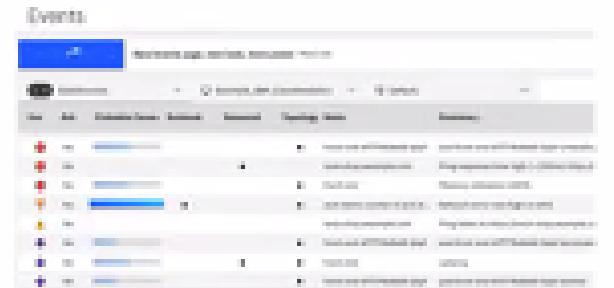
Fault Localization & Blast radius



Derive full scope of components using vertex-weighted topology graph traversal and a Reasoning engine to understand the meaning of the topology relationships

- Blast-radius via directional dependency analysis of the related components that interact with the localised source of the issue.

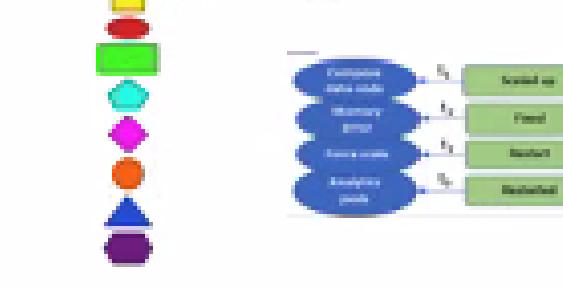
Probable Cause



Derive probable fault component using vertex-weighted topology graph traversal and a Reasoning engine to understand the meaning of the topology relationships

- Probable Cause localisation to the most likely source of an issue within the application topology

Incident Similarity



For a given problem description, find top k ranked similar incidents from the past. Helps understand the current issue and previous successful resolve actions. Consumes tickets and any data from the ticket progression to closure including human written investigation and resolution actions.

Uses Entity-Action extraction and Action sequence mining to understand tickets and summarize what was done.

Change Risk Prediction



Assess the risk for each proposed change based on issues caused by historical changes.

- Harvest and analyse the change ticket history to identify changes that implicitly failed when applied.
- Identify changes that resulted in subsequent issues if they rolled out



AI Management

IBM Cloud Pak | Automation

AI model management

Training Application coverage Data assets

Models-generating algorithms

Change risk
Training started: 8/4/2022 8:38:54 PM
Version trained v10
Data quality ● No tickets data available

Log anomaly detection - natural language
Last trained: 7/17/2022 1:47:46 PM
Version trained v4
Data quality ● Good

✗ Error

Temporal grouping
Last trained: 7/5/2022 4:06:39 AM
Version trained v2
Data quality ● -

✓ Complete Deployed

Online algorithms

Log anomaly detection - statistical baseline
Discovers abnormal behavior in log data using a statistical moving average.
Logs On

✓ Enabled

Log anomaly detection - natural language
Last trained: 7/17/2022 1:47:46 PM
Version trained v4
Data quality ● Good

✓ Complete v3 deployed

Metric anomaly detection
Last trained: 6/28/2022 6:13:19 AM
Version trained v5
Data quality ● -

✓ Complete

Similar incidents
Discover details about similar messages, anomalies, and events that occurred in the past and are impacting the current application.
Tickets

✓ Complete

IBM Cloud Pak | Automation

AI model management

AI algorithms Manage Coverage Data assets

Trained AI algorithms

These are your most recently trained AI algorithms.

Name	Version	Deployed version	AI algorithms	Schedule	Last trained	Status
similar_incidents_configuration	v1	v1	Similar incidents	Run manually	3/24/2022 9:50:32 AM	✓ Training complete
change_risk_configuration	v1	v1	Change risk	Run manually	3/24/2022 9:52:44 AM	✓ Training complete
metric_anomaly_detection_configuration	v2	v2	Metric anomaly detection	Run manually	3/25/2022 10:10:44 AM	✓ Training complete

Items per page: 10 ▾ 1-3 of 3 items

1 ▾ of 1 page ▶ ▷

Log anomaly detection - natural language

Overview Versions Coverage

Training status

3 of 3 complete

✓ Models created

- Training started: 7/17/2022, 01:47 PM
- Queued
- Preparing data
- Training

● Jobs: 9 jobs View

Log data

Name OGvqDYIBVPLMfCLDWy1F

Start date 07/16/2022 4:00 PM UTC

End date 07/17/2022 8:00 PM UTC

Data quality

✓ Good

3 recommendations

? Your data was inspected and looks good for training.

We have detected that a portion of this data is in an unsupported language and could impact the quality of this model.

We recommend that you remove any data containing unsupported languages. Then, run training again.

Models

9 Resources

- Resources with models
- Resources without models

Start training

Deploy v4

Delete configuration

Overview details

AI type Log anomaly detection - natural language

Version v4

Version deployed v3

Created on 6/21/2022, 9:35:26 AM

Created by jconallen

IBM Washington Systems Center (WSC) / March 20, 2024 / © 2024 IBM Corporation

23



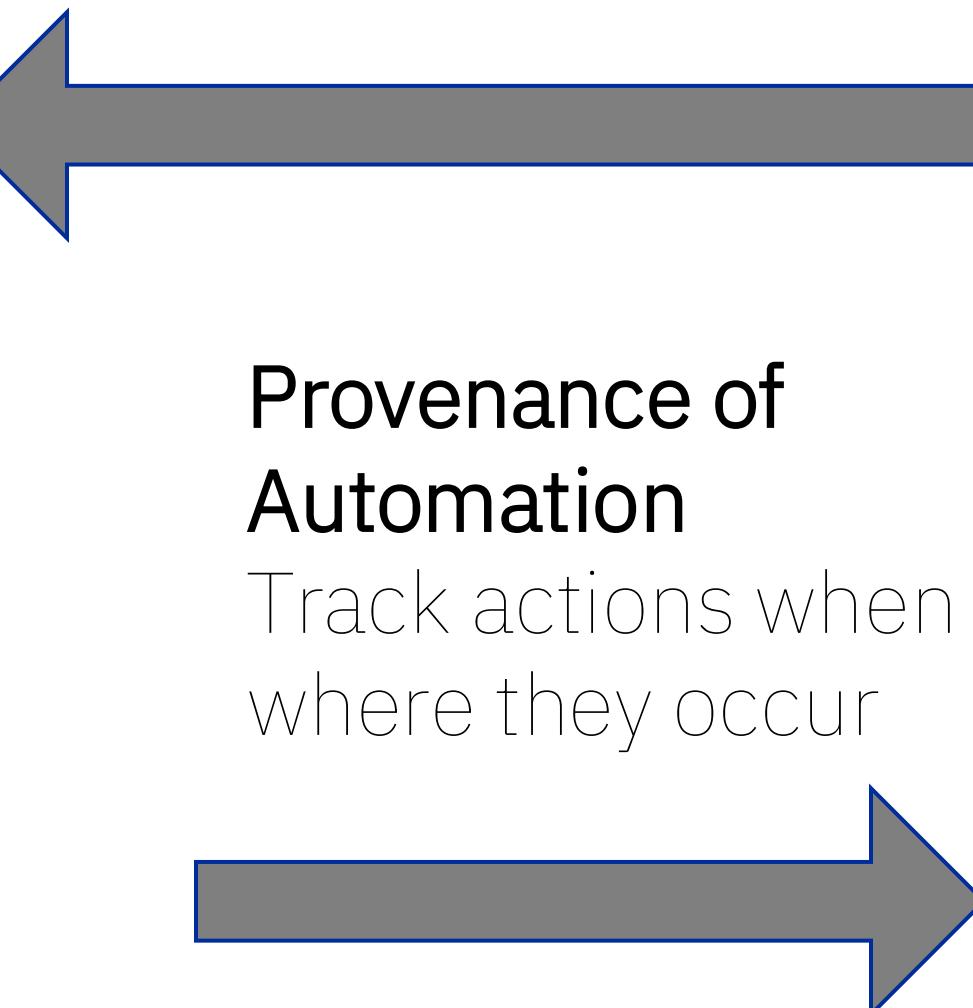
Ansible Automation Platform & Cloud Pak for AIOps

Accelerate IT Transformation & use of Automation. Improve Scalability and tolerance of Change.

The screenshot shows the Red Hat Ansible Automation Platform dashboard. It includes a top navigation bar with the Red Hat logo and 'Ansible Automation Platform'. Below it is a sidebar with various icons. The main area displays three summary boxes: 'HOSTS' (3691), 'FAILED HOSTS' (83), and 'INVENTORIES' (3). A 'JOB STATUS' chart shows the number of jobs over time, with a green line peaking at approximately 350 around 1:30 AM. A 'RECENTLY USED TEMPLATES' section lists five entries: 'Deployment pipeline', 'Rollback deployment', 'Deploy to development', 'Test application', and 'Deploy database', each with a progress bar and a rocket icon. The bottom of the page has a footer with links like 'Ansible', 'Documentation', 'Community', 'Support', and 'Contact Us'.

Direct Integration

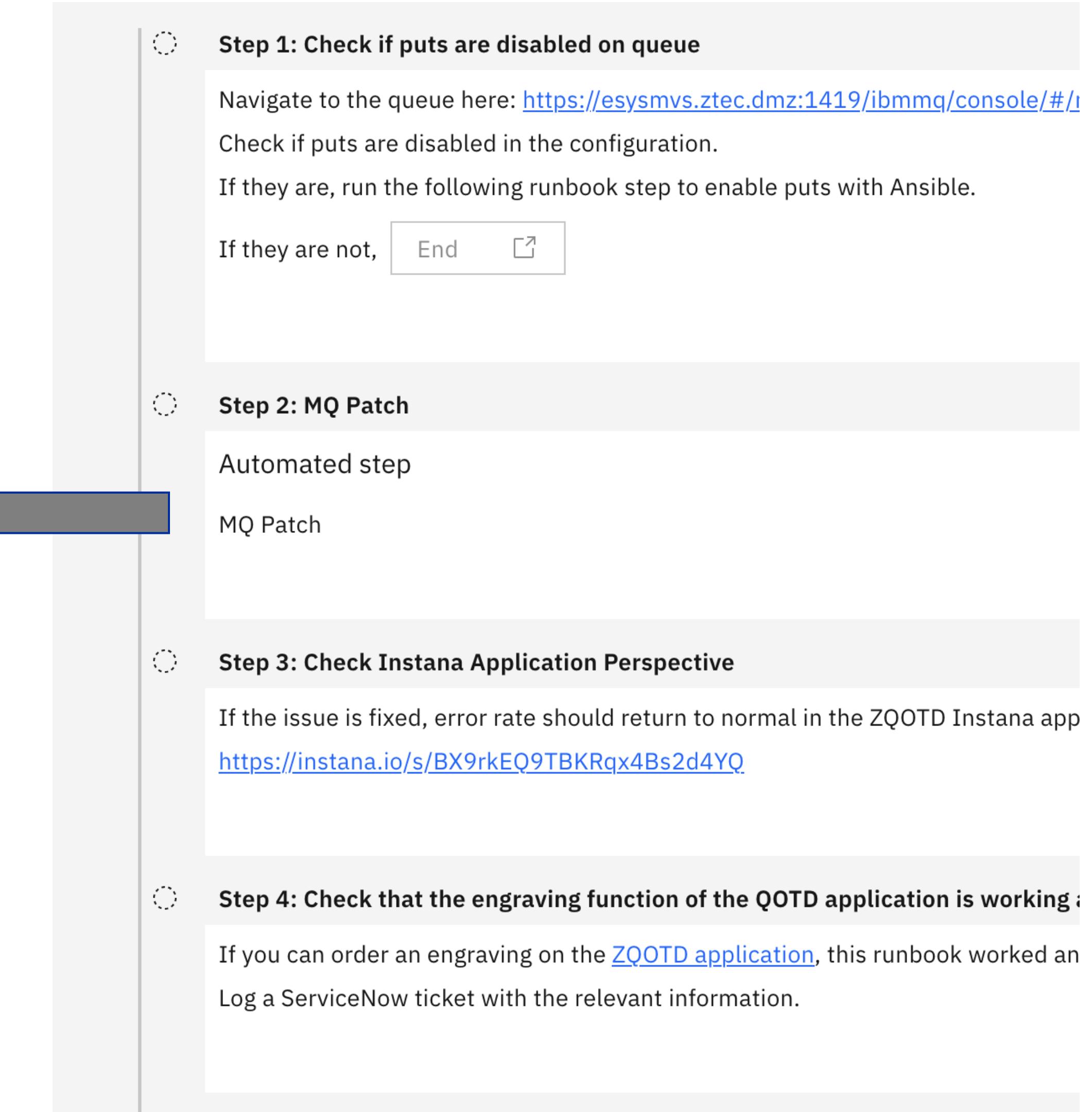
Register & Invoke Job and Workflow Templates into actions



Provenance of Automation

Track actions when & where they occur

...this action occurred on these elements...



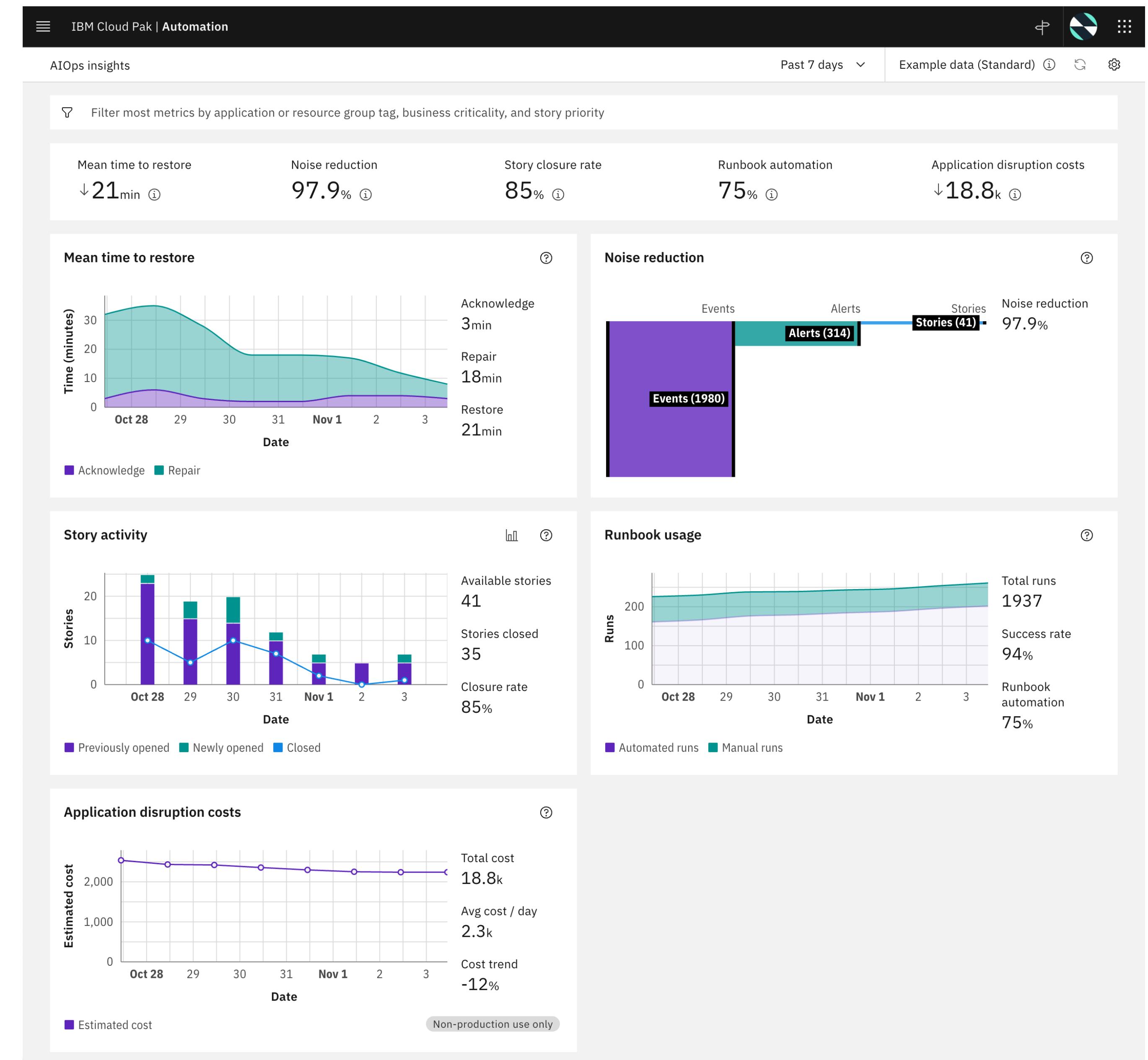
AIOps Insights Dashboard

Understanding Operations Performance

Track KPI's and automation utilization to ensure operations teams are benefiting from AIOps and identify new opportunities for automation.

Observe trends and understand application and service performance over time.

Analyze cost impacts of outages, and savings realized with AIOps (Tech Preview)



Next steps/more information

- Want to learn more?
 - Reach out to me for a live demo or deep-dive presentation (matt.mondics@ibm.com)
- Interested in a POC of CP4AIOps running on the IBM Z platform?
 - Reach out to me
- Join the IBM AIOps for IBM Z community ([Link](#))

Thank you

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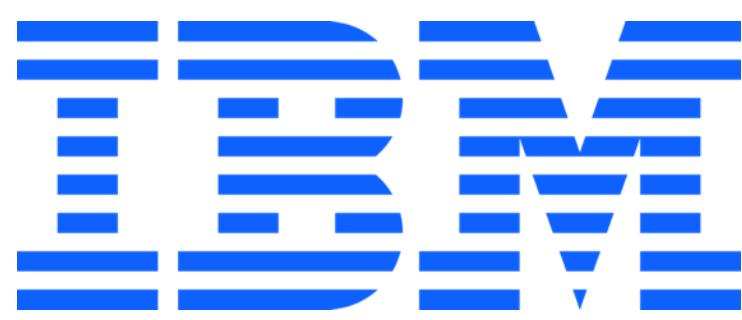
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Client examples are presented as illustrations of how those clients have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

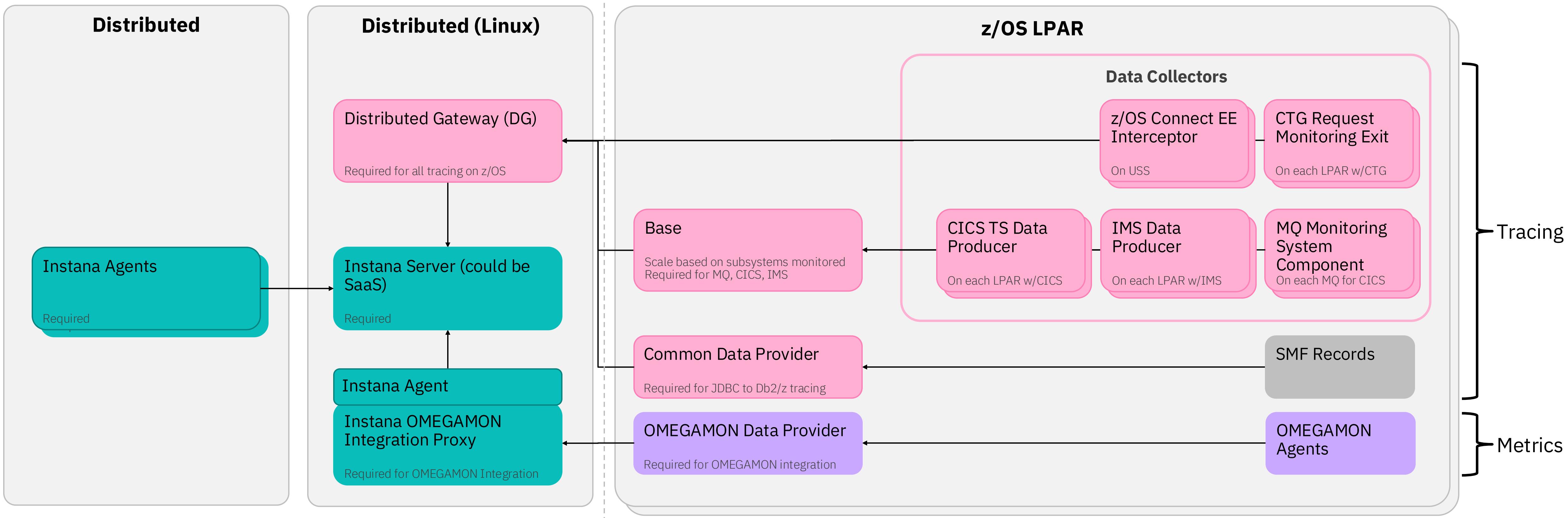
Not all offerings are available in every country in which IBM operates.

It is the user's responsibility to evaluate and verify the operation of any other products or programs with IBM products and programs.

The client is responsible for ensuring compliance with laws and regulations applicable to it. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the client is in compliance with any law or regulation.



Basic architecture for ingesting z/OS telemetry into Instana



What's in the Box?

The Instana on z/OS PID includes the following components:

- Instana self-hosted server
- “Z APM Connect” components
 - Distributed Gateway
 - Base
 - Data Collectors
- Common Data Provider
- [Instana on z/OS prerequisites](#)

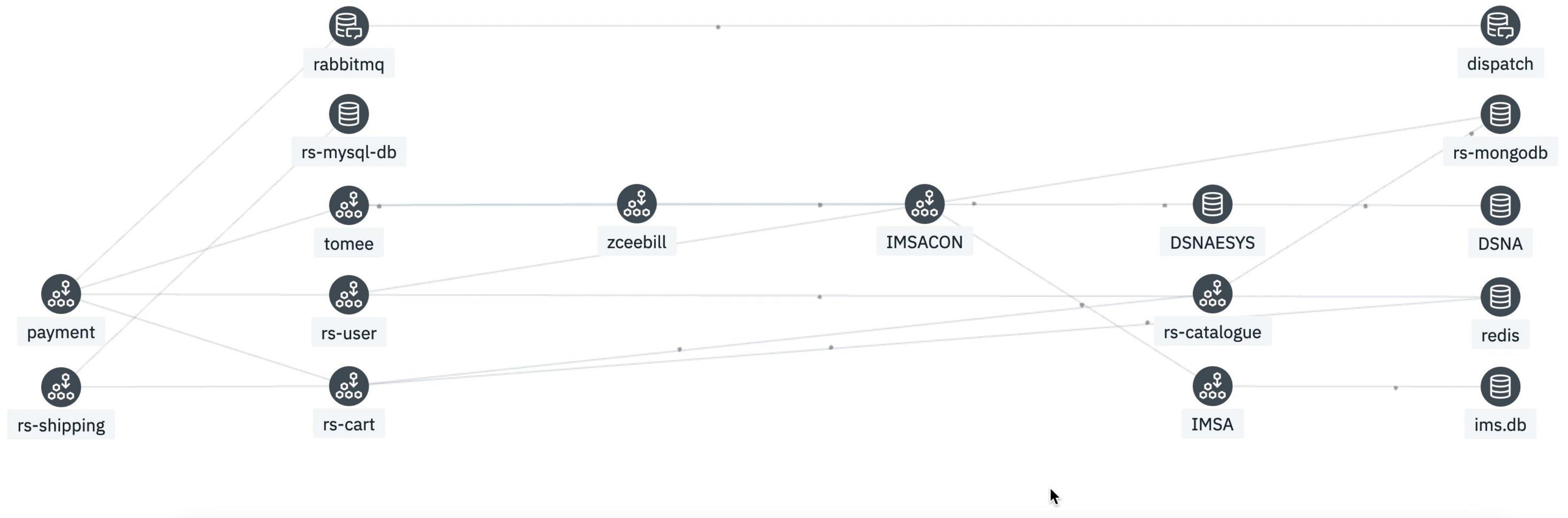
For OMEGAMON integration, the following additional components are required:

- OMEGAMON agents
- OMEGAMON Data Provider
- Instana Integration Proxy

} NOT provided by Instana on z/OS

Delivered with:
Instana on z/OS
Instana
OMEGAMON
Existing

Monitor your: End-to-end application with distributed (x86) Linux services & z/OS



Monitor your End-to-end application with distributed (x86) Linux services & z/OS

IBM Instana

Robo Z Shop

No Issues | Stack | Upstream / Downstream | Analyze Calls

May 08 Last hour | Live | Time Shift: Off | All Calls

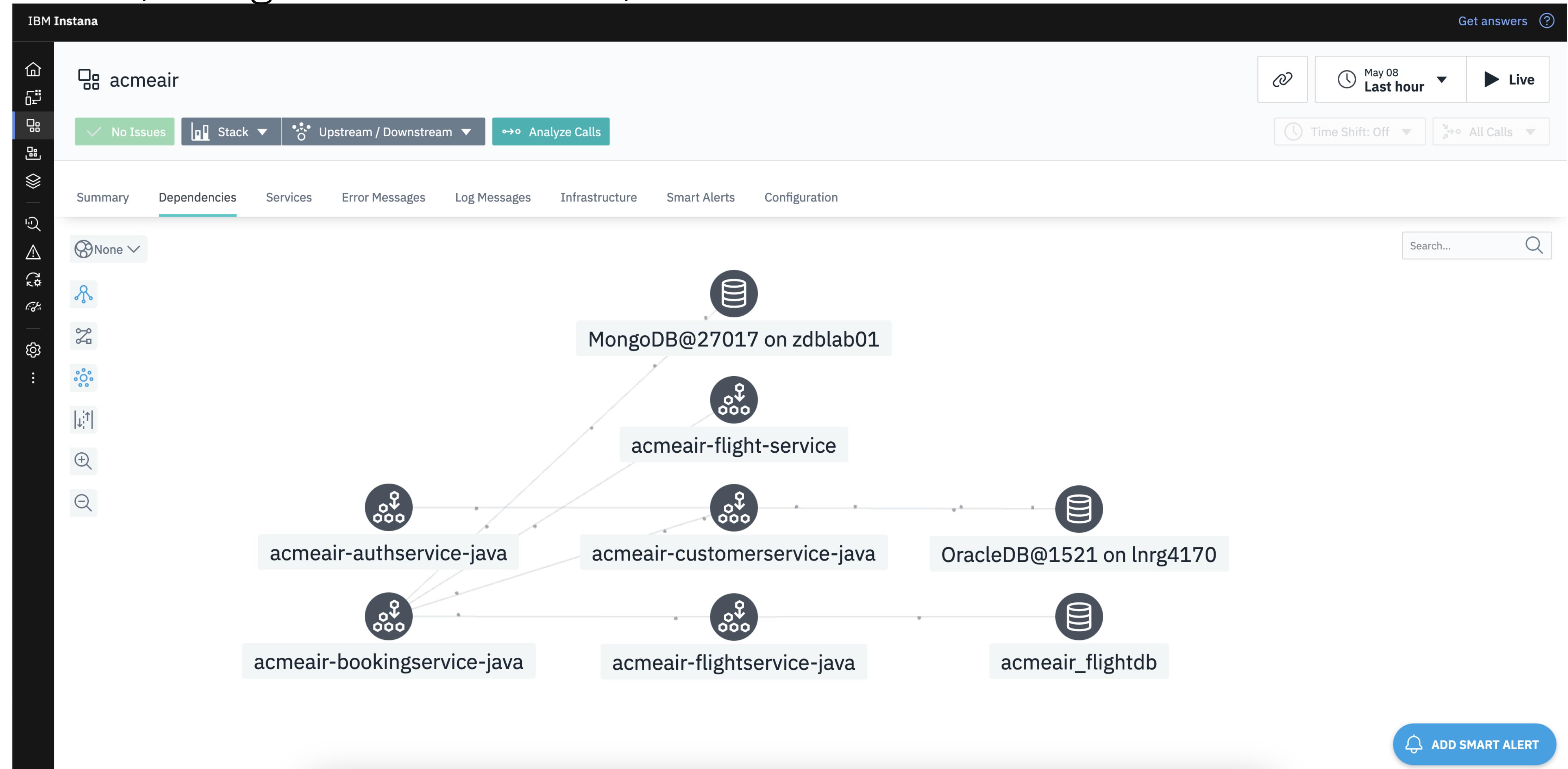
Summary | Dependencies | Services | Error Messages | Log Messages | Infrastructure | Synthetic Monitoring | Smart Alerts | Configuration

Services

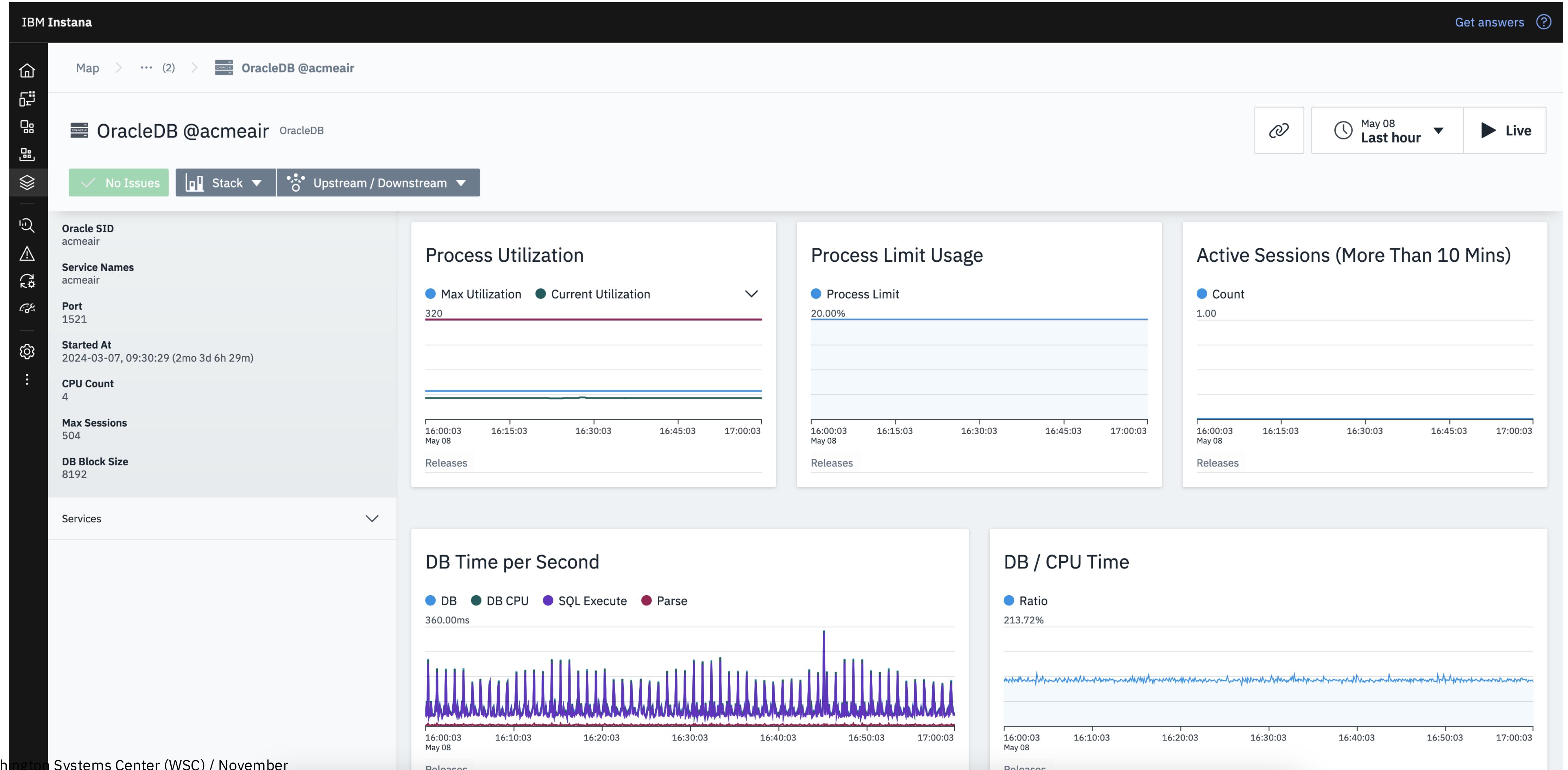
Name	Types	Technologies	Endpoints	Calls	Erroneous Calls	Erroneous Call Rate	Latency	Health
DSNAESYS	DATABASE	DB2 DB2	2	356	0	0.00%	1ms	✓
DSNA	DATABASE	DB2 DB2	1	337	0	0.00%	< 1ms	✓
dispatch	MESSAGING	Go	1	60	0	0.00%	120ms	✓
ims.db	DATABASE	IBM IMS	1	53	0	0.00%	0ms	✓
IMSACON	RPC	IBM IMS	1	53	0	0.00%	0ms	✓
IMSA	RPC	IBM IMS	1	53	0	0.00%	0ms	✓
zcebill	HTTP	IBM z/OS Connect	1	60	0	0.00%	9ms	✓
rs-shipping	HTTP	Spring Boot	4	243	0	0.00%	105ms	✓

ANALYZE SERVICES | Type... | Technology... | SEARCH | ADD SMART ALERT

Monitor your End-to-end application with OpenShift on IBM Z containers, MongoDB on LinuxONE, and OracleDB on LinuxONE



Monitor your OracleDB



Monitor your Linux on IBM Z/LinuxONE virtual machine

IBM Instana

Map > lnrg4170.dmz

lnrg4170.dmz Host RHEL on IBM Z

No Issues | Stack | Upstream / Downstream

May 08 Last hour | Live

System

OS: Linux 4.18.0-372.9.1.el8.s390x (s390x)

CPU: 4 x

Memory: 7.65 GiB

Max Open Files: 6,815,744

Hostname: lnrg4170

FQDN: lnrg4170.dmz

Machine ID: 3aee9a9a458c46e69dd8f6a0445e438d

Boot ID: 7a01737e-9072-4fb2-a95b-b37ffa00161d

Started At: 2023-11-17, 18:31:40 (5mo 21d 22h 30m)

Interfaces (1)

Instana Agent (1)

OracleDB (1)

Process (1)

CPU Usage: 1%

Memory Usage: 61%

CPU Load: 0.12

Context Switches: 1,600

CPU Usage

User System Wait Nice Steal

100%

16:02:11 16:17:11 16:32:11 16:47:11 17:02:11

May 08

Releases Actions

Individual CPU Usage

CPU ↑	User	System	Wait	Nice	Steal
CPU 1	0%	0%	0%	0%	0%
CPU 2	1%	0%	0%	0%	0%

Search...

Monitor your IBM Z Hardware (from HMC API)

IBM Instana

zHMCs > zHMC wschmc.dmz > FSYS

FSYS

Get answers

Summary Environmental And Power Partition Channel Adapter Network

HMC Version **2.16.0** API Version **4.10** CPC Processor Usage **5.00%** Power Consumption (Watts) **15,932**

All CPU Processor Usage
IIP Processor Usage (Blue), IFL Processor Usage (Green), ICF Processor Usage (Purple)
14.00%
16:03:11 16:13:11 16:23:11 16:33:11 16:43:11 16:53:11 17:03:11
May 08
Releases

Shared CPU Processor Usage
IFL Processor Usage (Blue), ICF Processor Usage (Green)
14.00%
16:03:11 16:13:11 16:23:11 16:33:11 16:43:11 16:53:11 17:03:11
May 08
Releases

Dedicated CPU Processor Usage
IFL Processor Usage (Blue), ICF Processor Usage (Green)
100.00%
16:03:12 16:13:12 16:23:12 16:33:12 16:43:12 16:53:12 17:03:12
May 08
Releases

Overall Processor Usage

Name ↓	Overall Processor Usage	SMT Usage	Thread 0 Usage	Thread 1 Usage
SAP2A	1.00%	—	—	—
SAP29	1.00%	—	—	—

Search...

Monitor your OpenShift cluster

IBM Instana

Kubernetes > vader-qotd2 (cluster)

vader-qotd2 (cluster) v1.11.0+d4cacc0 OpenShift Cluster

No Issues Stack Upstream / Downstream Analyze Calls

May 08 Last hour Live

Time Shift: Off

Summary Details Events Nodes (1) Namespaces (19) Deployments (18) Deployment Configs (4) DaemonSets (8) StatefulSets (2) Cron Jobs (0) K8s Services (34) Pods (326) Infrastructure (1)

10

CPU Requests 20.87% CPU Limits Alloc. 45.56%

Memory Requests 29.92% Memory Limits Alloc. 52.50%

Pods Alloc. 16.80%

CPU Resources

Requests Limits Capacity

8

16:09:00 16:19:00 16:29:00 16:39:00 16:49:00 16:59:00 17:09:00

May 08

Releases Actions

Memory Resources

Requests Limits Capacity

17.00 GiB

16:09:00 16:19:00 16:29:00 16:39:00 16:49:00 16:59:00 17:09:00

May 08

Releases Actions

Pods

Running Pending Allocated Capacity

260

16:09:00 16:19:00 16:29:00 16:39:00 16:49:00 16:59:00 17:09:00

May 08

Releases Actions

Logs

Error Warn Info

The screenshot shows the IBM Instana Kubernetes monitoring interface for the 'vader-qotd2' cluster. The top navigation bar includes 'IBM Instana', 'Get answers', and a sidebar with various monitoring icons. The main dashboard displays key cluster metrics: CPU Requests (20.87%), CPU Limits Alloc. (45.56%), Memory Requests (29.92%), Memory Limits Alloc. (52.50%), and Pods Alloc. (16.80%). Below these are three detailed sections: 'CPU Resources', 'Memory Resources', and 'Pods', each with a legend and time-series data. The 'Logs' section at the bottom shows log levels: Error, Warn, and Info. The sidebar on the left provides quick access to other cluster components like Nodes, Namespaces, Deployments, and Infrastructure.

Monitor your z/OS LPAR (via OMEGAMON)

IBM Instana

Map > ESYSMVS:MVS1:MVSSYS > ESYSMVS

ESYSMVS:MVS1:MVSSYS IBM z/OS

No Issues | Stack | Upstream / Downstream

May 08 Last hour | Live

IBM z/OS

Workload Management Mode Goal

Sysplex Name ESYSMVS

SMF ID MVS1

Managed System ESYSMVS:MVS1:MVSSYS

Product Code km5

Physical CPU Count 200

IBM CICS for z/OS (20)

IBM Db2 for z/OS (5)

IBM IMS for z/OS (5)

JVMs (6)

CPU Usage 13%

LPAR MSU Capacity 13%

Average Unused Group MSUs 0

Four Hour MSUs 55

Hiperdispatch Management On

Average Workload CPU

100%

Average CPU Average IFA Average IFA on CP Average zIIP Average zIIP on CP MVS Overhead

16:15:59 16:20:59 16:25:59 16:30:59 16:35:59 16:40:59 16:45:59 16:50:59 16:55:59 17:00:59 17:05:59 17:10:59 17:15:59

May 08

Releases

Undispatched Tasks

Undispatched Tasks

Monitor your CICS region (via OMEGAMON)

IBM Instana

Map > z/OS ESYSMVS:MVS1:MVSSYS > MVS1:CICSTIVA

MVS1:CICSTIVA IBM CICS for z/OS

No Issues Stack Upstream / Downstream

May 08 Last hour Live

IBM CICS for z/OS

Origin Node MVS1.CICSTIVA

System ID MVS1

CICS Region Name CICSTIVA

CICS Version 7.2.0

CICSPlex Name DEMOPLEX

CPU Utilization 0.00%

Storage Violations 0

Enqueue Waits 0

AIDS 0

ICES 6

SOS No

Transaction Rate

Transaction Rate

16:14:14 16:24:14 16:34:14 16:44:14 16:54:14 17:04:14 17:14:14
May 08

Releases

Maximum Tasks Percent

Maximum Tasks Percent

16:14:14 16:24:14 16:34:14 16:44:14 16:54:14 17:04:14 17:14:14
May 08

Releases

Rates

CPU Utilization IO Rate Page Rate

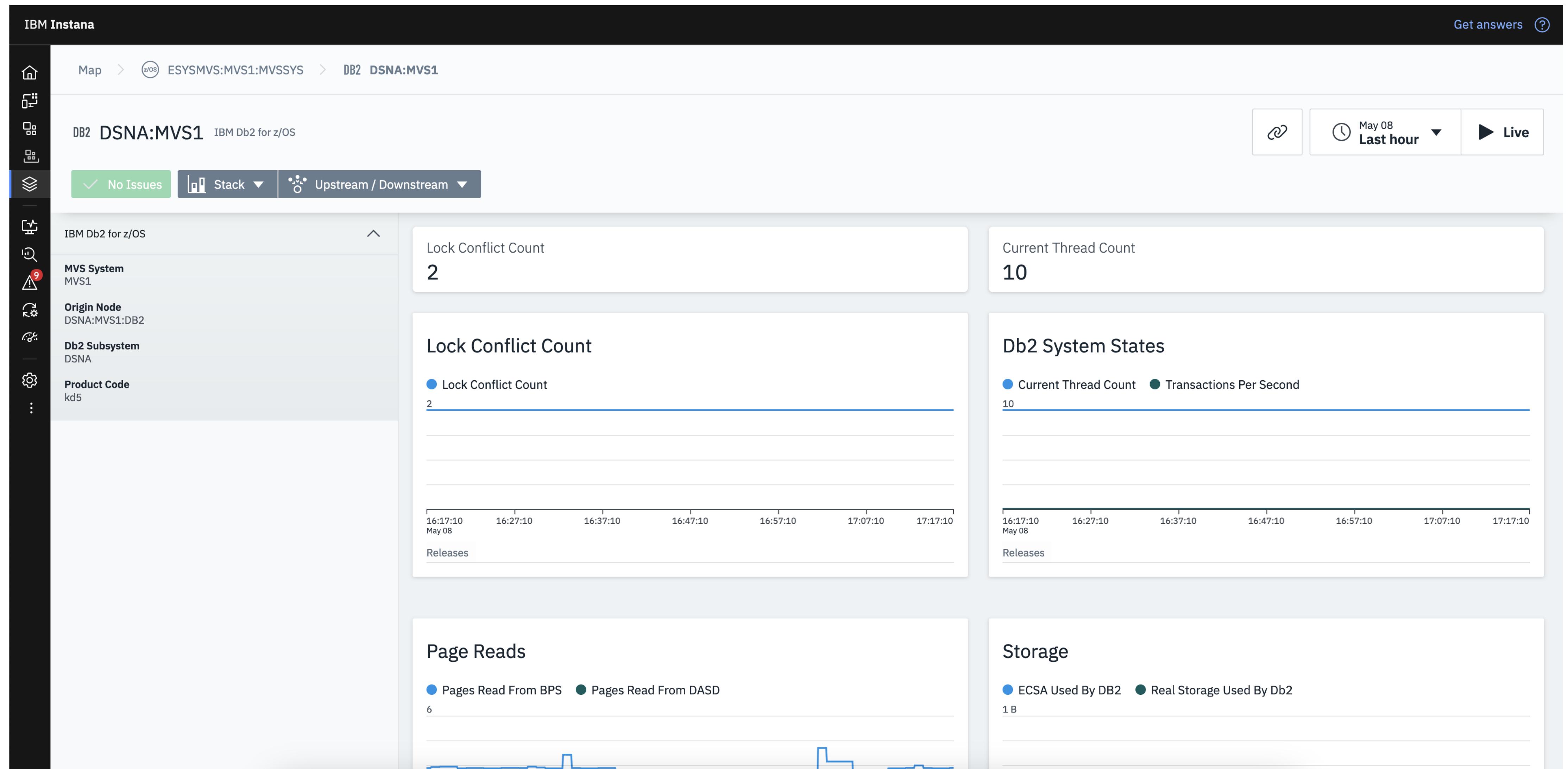
16:14:14 16:24:14 16:34:14 16:44:14 16:54:14 17:04:14 17:14:14
May 08

Performance

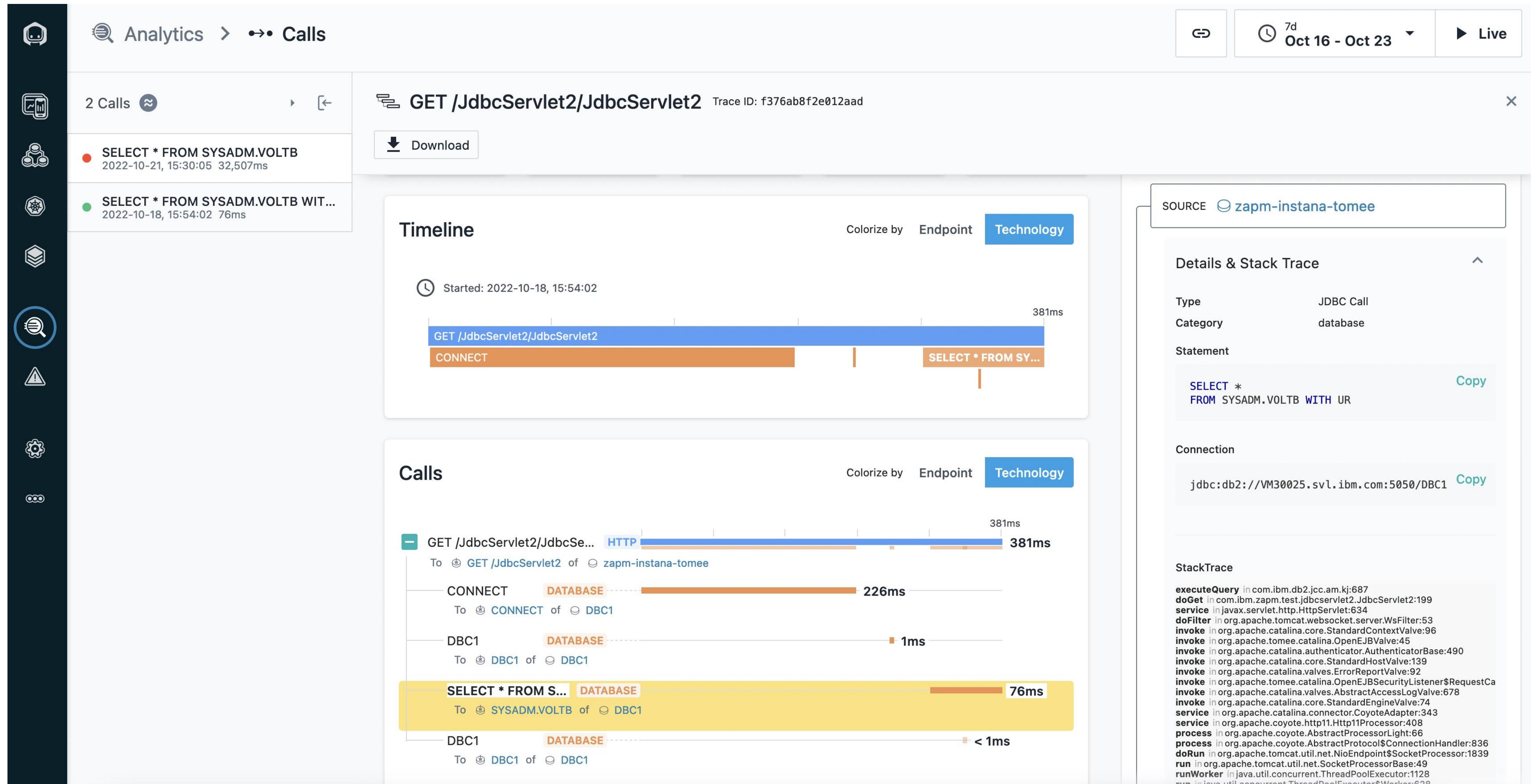
Worst Region Performance Index Queued Remote Requests

4 kiB

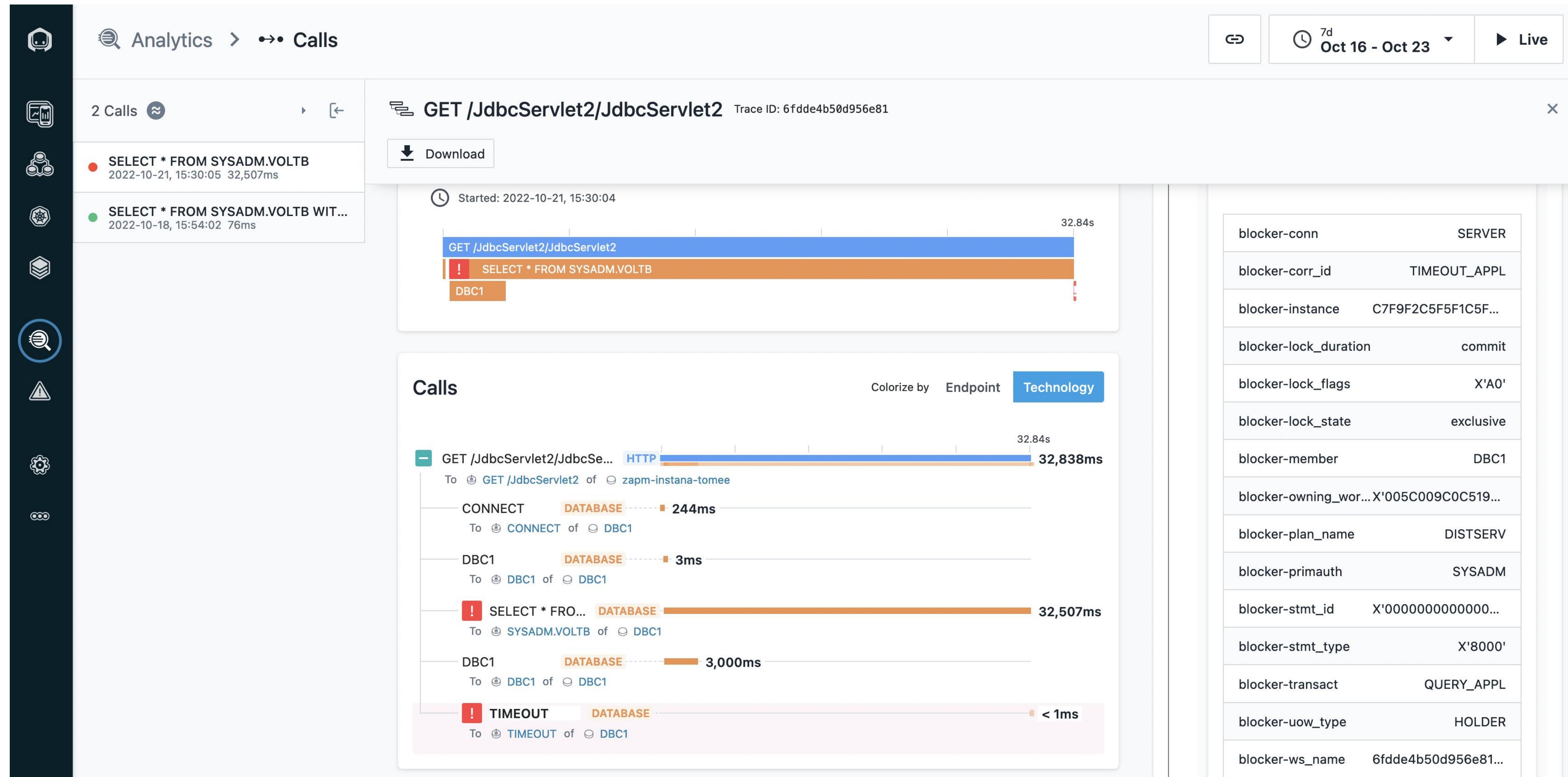
Monitor your Db2 on z/OS database (via OMEGAMON)



Example tracing into Db2 on z/OS



Example timeout delay in Db2 on z/OS



Link from transaction trace to infrastructure

The screenshot illustrates the integration between transaction trace analysis and system monitoring for an IBM zSeries environment.

Left Panel: Infrastructure Monitoring (JA0:CICS1AAA)

- Summary Metrics:** CPU Utilization: 0, Storage Violations: 0, Enqueue Waits: 0, AIDS: 0, ICES: 6, SOS: N.
- Transaction Rate:** A line chart showing transaction rate over time (Jun 02). It shows a significant spike starting around 10:45:20.
- Maximum Tasks Percent:** A line chart showing maximum tasks percent over time (Jun 02). It shows a peak around 10:45:20.
- Rates:** A line chart showing CPU Utilization, IO Rate, and Page Rate over time (Jun 02).
- Performance:** A line chart showing Worst Region Performance Index and Queued Remote Requests over time (Jun 02).

Top Right Panel: Transaction Trace (Analytics > Calls)

- Unspecified Trace ID:** 35ef223928a27ff
- Call Details:** Five calls were made:
 - cics /CICS/CWBA/UOWID03A (2022-06-02, 09:07:47) - Duration: 5,127ms
 - cics /CICS/CWBA/UOWID03A (2022-06-02, 09:00:55) - Duration: 5,043ms
 - cics /CICS/CWBA/UOWID03A (2022-06-02, 08:58:56) - Duration: 5,142ms
 - cics /CICS/CWBA/UOWID03A (2022-06-02, 07:48:13) - Duration: 5,092ms
 - cics /CICS/CWBA/UOWID03A (2022-06-02, 07:34:47) - Duration: 5,263ms
- Call Timeline:** A detailed timeline of the transaction flow, color-coded by technology. The root call (HTTP to JA0:CICS1AAA) took 35,585,329ms. Subsequent calls to DBW2, CSMI, and VSAM took 3ms, 15ms, and <1ms respectively.
- Details:** Shows the source as Unspecified and destination as cics /CICS of CICS1AAA. A red box highlights the Infrastructure section, which lists the host as CICS1AAA and request path as /CICS/CWBA/UOWID03A.

When there are issues, integrate with your existing platforms to notify the team or remediate the problem

Custom Dashboards



Events and Metrics



Logging Integrations



Coralogix



logDNA



Google Chat



Email



Webhooks



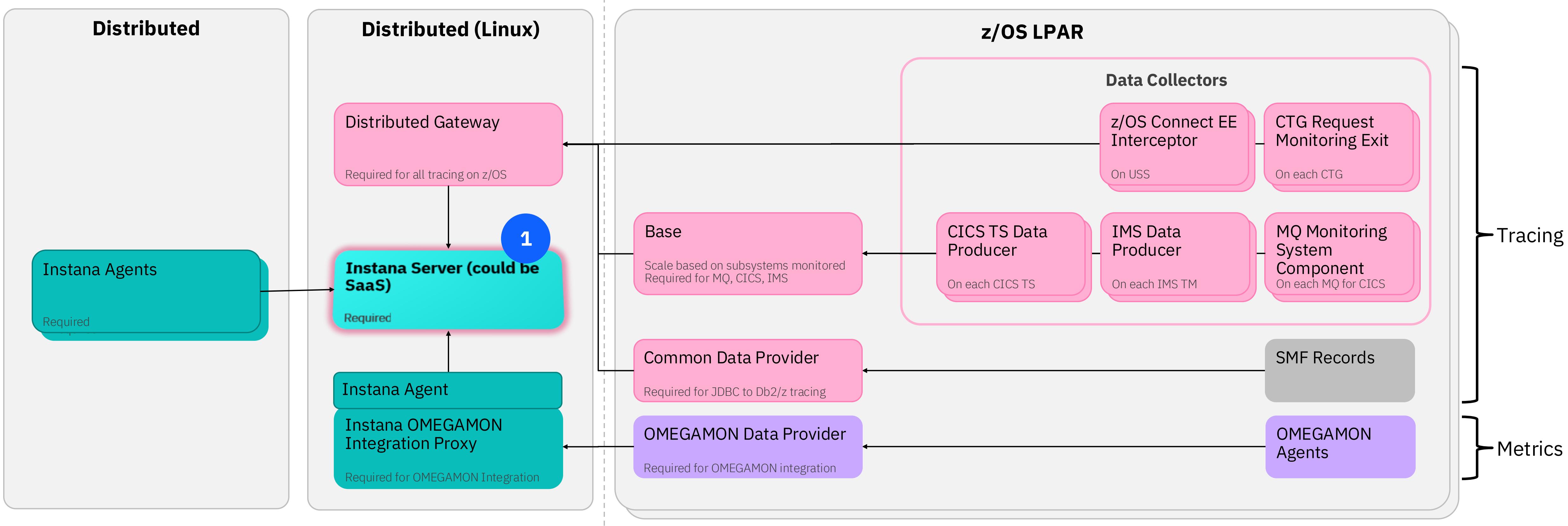
**ATLASSIAN
Opsgenie**

pagerduty



slack

Instana Server



What is it?

- The backend server that consumes all telemetry data from all sources, including z/OS
- Stitches together tracing spans received from host agents on distributed platforms with related spans and metrics from z/OS for a cohesive end-to-end view

Is it Required? Where is it deployed?

Required: Yes, for all Instana on z/OS deployments

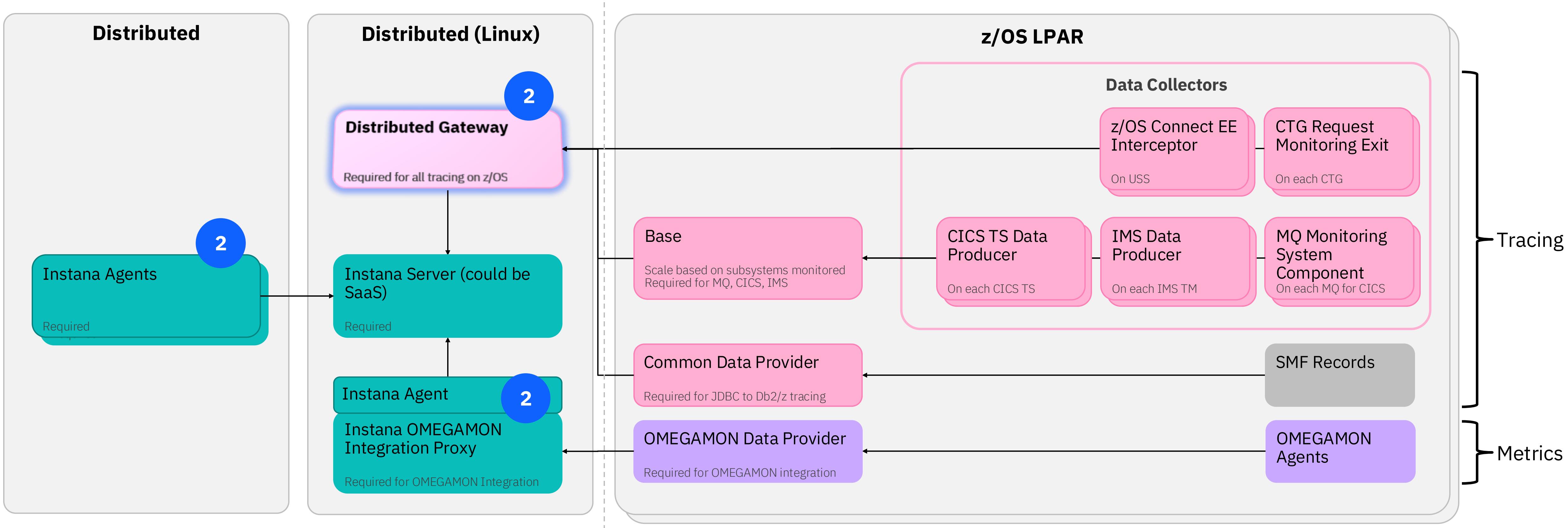
Deployment:

- SaaS based tenant/units are available to collect telemetry
- Can also be deployed for self-hosted scenarios on Linux (x86)
- [deployment of Instana self-hosted to zLinux is expected later in 2023]
- [Installing the Instana backend](#)

Delivered with:

- Instana on z/OS
- Instana
- OMEGAMON
- Existing

Distributed Gateway



What is it?

- Bridge between the tracing components and the Instana Server
- Receives trace data from tracing components
- Formats the data into proper Instana tracing “spans”
- Sends spans to the Instana backend

Is it Required? Where is it deployed?

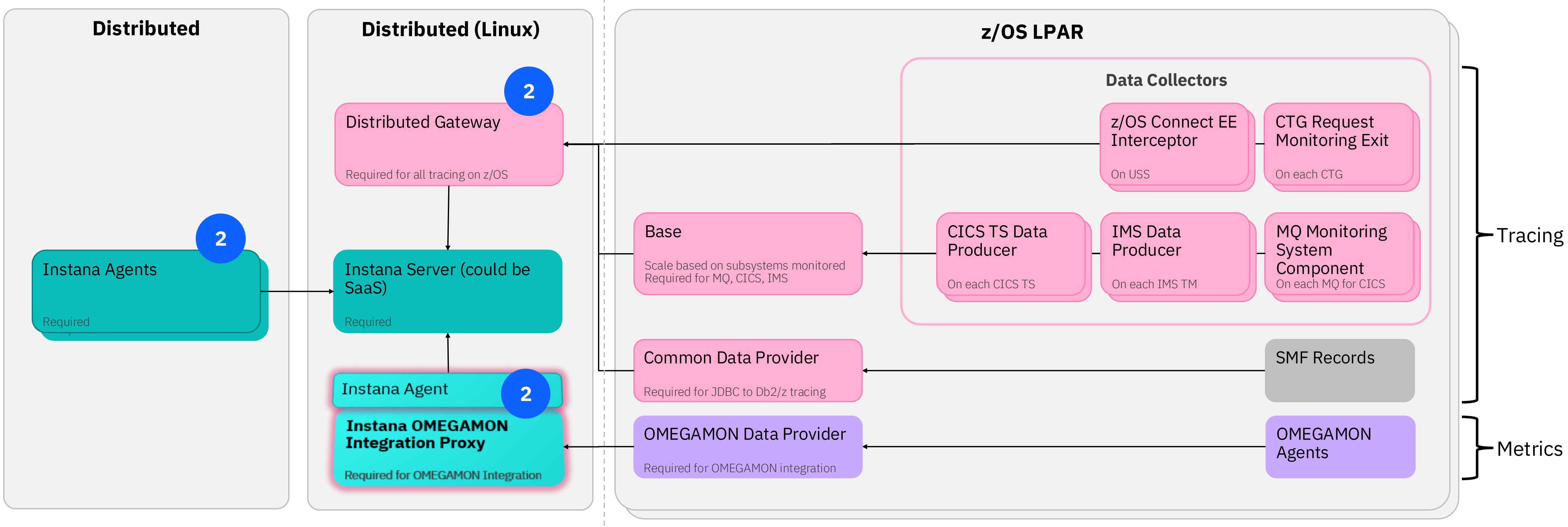
Required: Yes, for all Instana on z/OS deployments

Deployment:

- On a Linux server – this offloads processing from z/OS
- Recommend a Kubernetes based deployment (like OpenShift) for scalability
- [Distributed Gateway installation prerequisites](#)
- [Deploying the Distributed Gateway](#)

Delivered with:
Instana on z/OS
Instana
OMEGAMON
Existing

OMEGAMON Integration Proxy



What is it?

- Collects metric data from the OMEGAMON Data Provider
- Transforms it into a format that Instana can consume
- Sends metrics to a sensor in an Instana host agent named: `com.instana.plugin.ibmapmproxy`
- The Instana host agent then sends the payloads to the Instana server where entities are created and metrics saved.

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Is it Required? Where is it deployed?

Required: Only if planning to integrate OMEGAMON metrics within Instana. OMEGAMON is not a pre-req for transaction tracing.

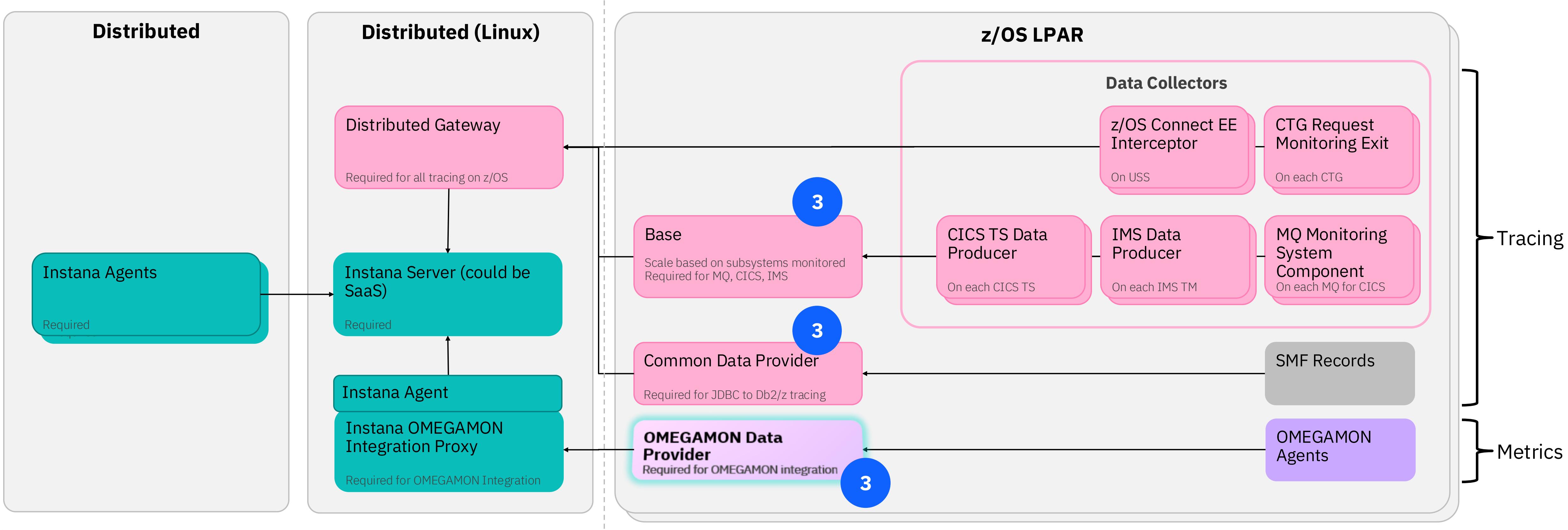
Deployment:

- The proxy is downloaded from Instana's GitHub repository (<https://github.com/instana/ibm-monitoring-integration>) and is deployed into a Kubernetes or OpenShift cluster
- [OMEGAMON Integration Proxy Prerequisites](#)
- [Integrating with OMEGAMON](#)

Delivered with:

- Instana on z/OS
- Instana
- OMEGAMON
- Existing

OMEGAMON Data Provider



What is it?

- Streams selected metrics for key z/OS subsystems that OMEGAMON is collecting – selected to compliment Instana's transaction tracing
- Metrics are streamed simultaneous to OMEGAMON and Instana's Server

Is it Required? Where is it deployed?

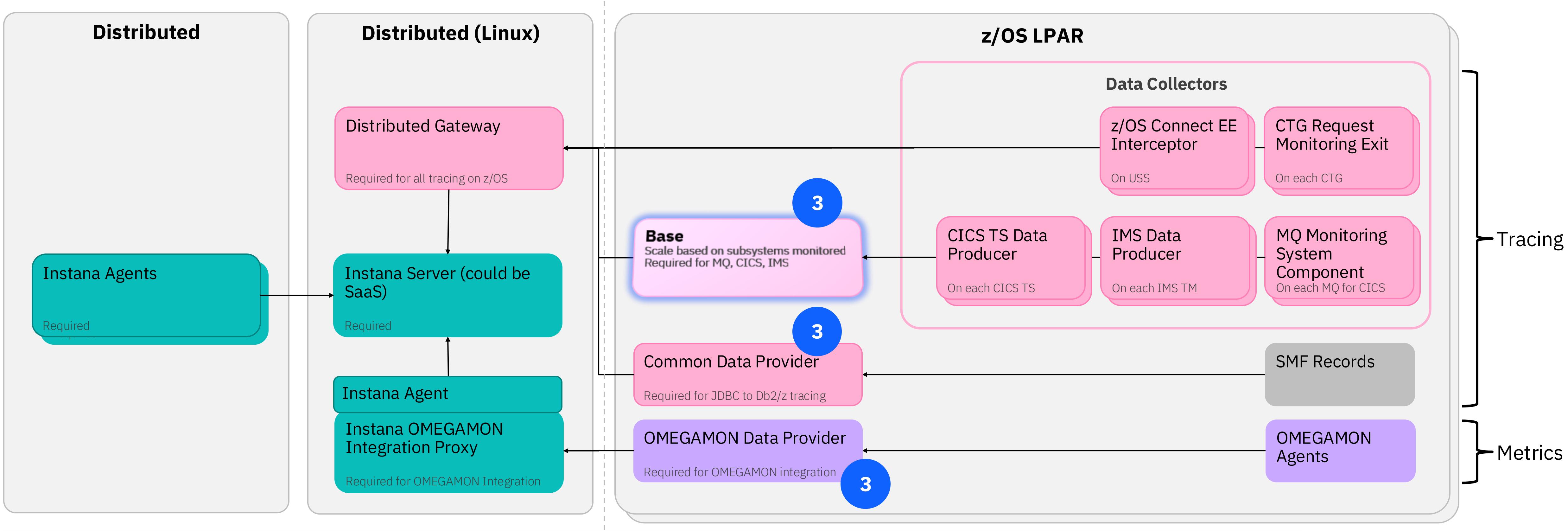
Required: Only if planning to integrate OMEGAMON metrics within Instana. OMEGAMON is not a pre-req for transaction tracing.

Deployment:

- Each LPAR to get data from OMEGAMON agents running on that LPAR
- A YAML file related to OMEGAMON's Data Connect Process specifies which attributes will be streamed to Instana
- [OMEGAMON Data Provider Prerequisites](#)
- [Integrating Instana with OMEGAMON Data Provider](#)

Delivered with:	
Instana on z/OS	Instana
Instana	OMEGAMON
OMEGAMON	Existing
Existing	

Base



What is it?

- Receives trace data from potentially high-volume subsystems like CICS, IMS, and MQ
- Internal architecture made up of “couriers” – number of couriers can be increased to handle more volume
- Is a z/OS “Started Task”

Is it Required? Where is it deployed?

Required:

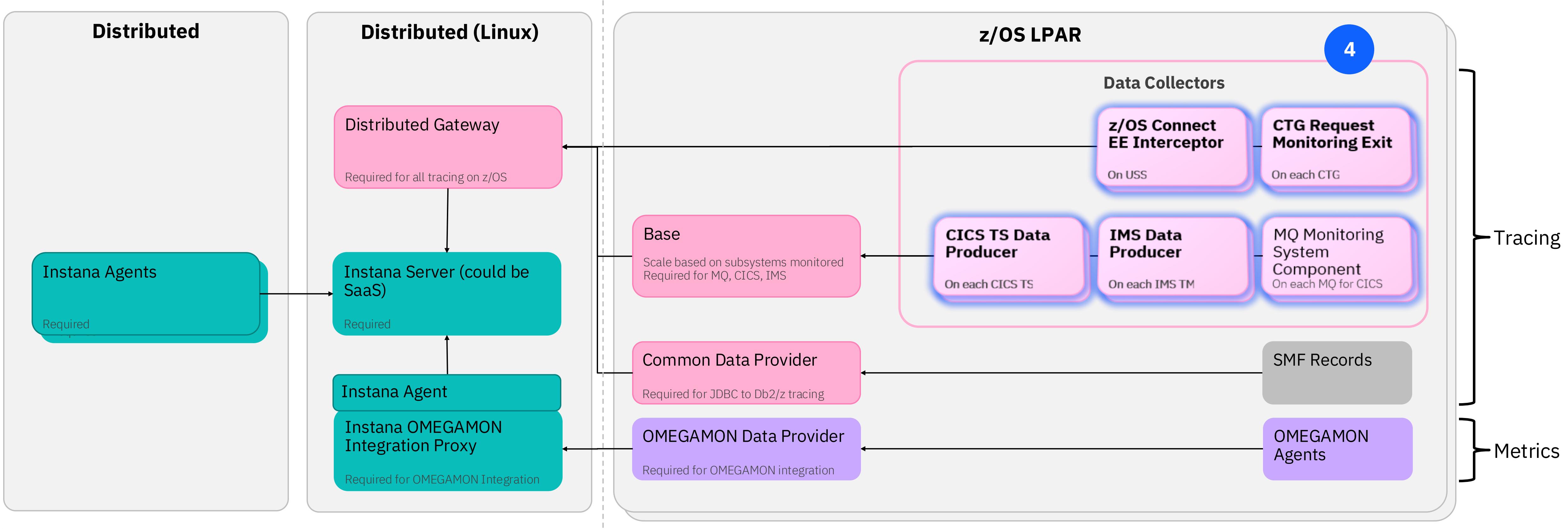
- Yes – when tracing CICS, IMS or MQ
- No – when tracing distributed calls via JDBC into Db2 on z/OS

Deployment:

- To each LPAR where a CICS or IMS Data Collector is being used
- For high volume environments, multiple Bases may be started
- [Instana on z/OS Base prerequisites](#)
- [Installing Instana on z/OS Base](#)

Delivered with:	
Instana on z/OS	Instana
Instana	OMEGAMON
OMEGAMON	Existing
Existing	

Data Collectors



What is it?

- Data Collectors gather trace data for all calls through the various z/OS subsystems supported
- Minimal data is captured for each call
- Data is sent to the DG for processing into Instana Spans

Is it Required? Where is it deployed?

Required:

- Yes – when tracing calls into CICS, IMS, or MQ via z/OS Connect or CTG
- No – when tracing distributed calls via JDBC into Db2 on z/OS

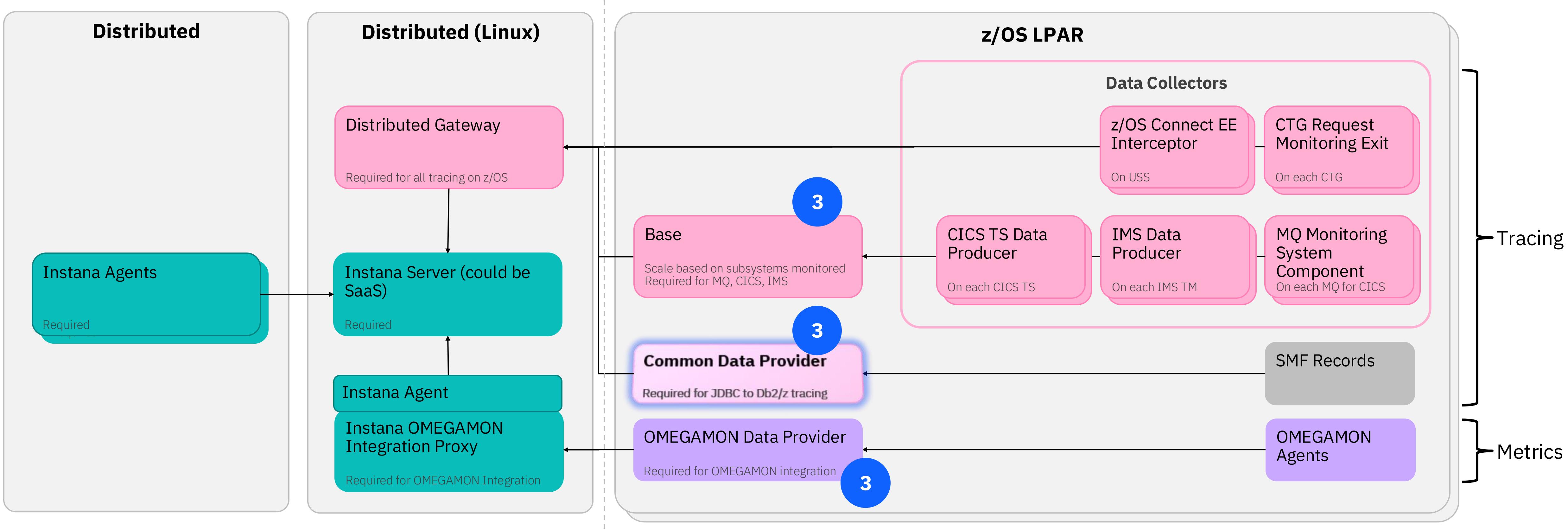
Deployment:

- In z/OS LPAR's, into the subsystems being observed
- One data collector will be deployed to each environment
- Prereqs: [CICS](#); [IMS](#); [z/OS Connect](#); [CTG 1](#); [CTG 2](#)
- Install: [CICS](#); [IMS](#); [MQ](#); [z/OS Connect](#); [CTG](#)

Delivered with:

	Instana on z/OS
	Instana
	OMEGAMON
	Existing

Common Data Provider



What is it?

- Accesses operational data from z/OS systems stored in SMF
 - SMF records have Instana's trace context for filtering
- Collects, formats and filters transaction data related to JDBC requests to Db2 on z/OS
 - Performance metrics for SQL calls
 - Db2 timeouts and Db2 deadlocks
- Sends the filtered SMF data to the Distributed Gateway

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Is it Required? Where is it deployed?

Required: Only when tracing distributed calls via JDBC into Db2 on z/OS

Deployment:

- In each LPAR where SMF 101/102 records will be needed to help provide details on Db2 on z/OS traces
- Already deployed CDP may be leveraged
- [Common Data Provider prerequisites](#)
- [Deploying Common Data Provider](#)
- [APAR/PTF requirements; Db2 for z/OS prerequisite](#)

Delivered with:

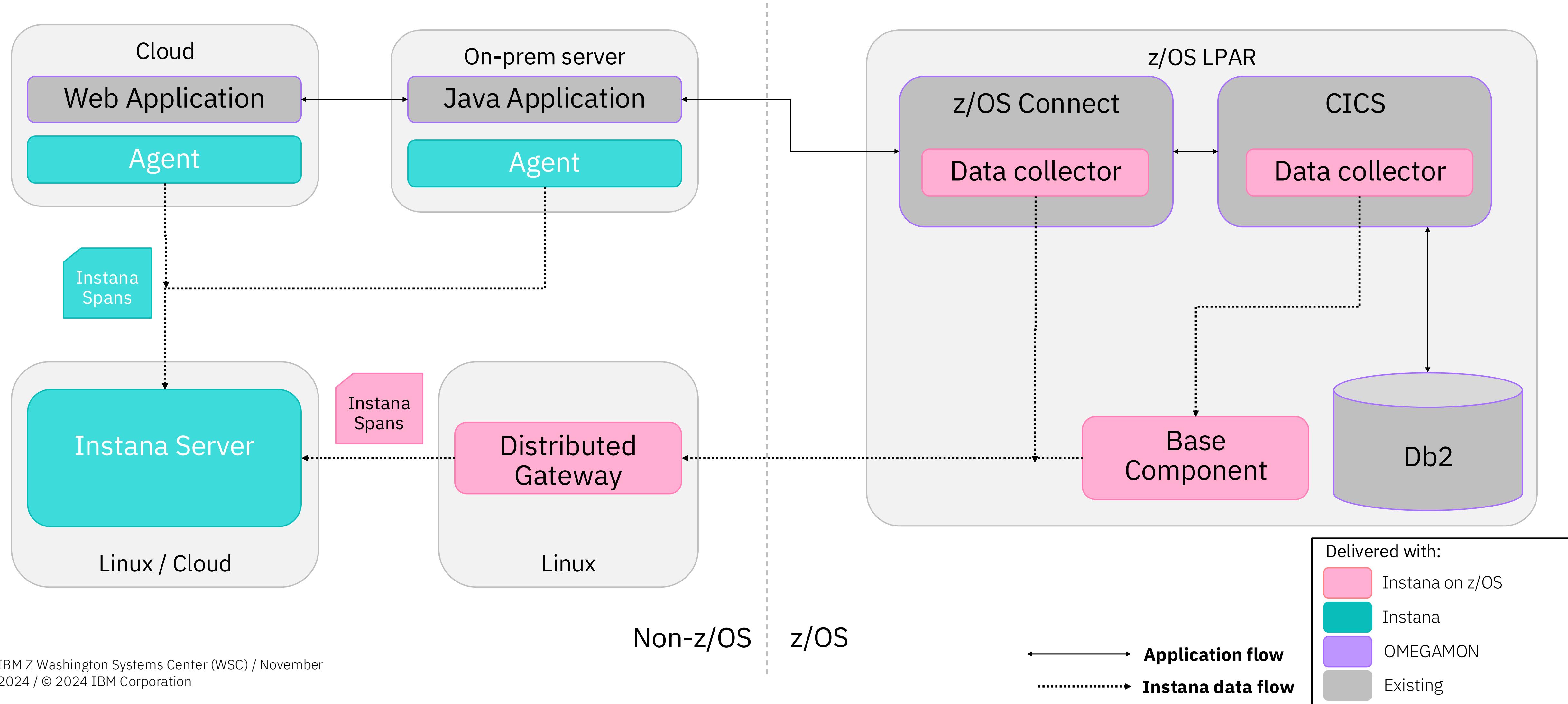
Instana on z/OS

Instana

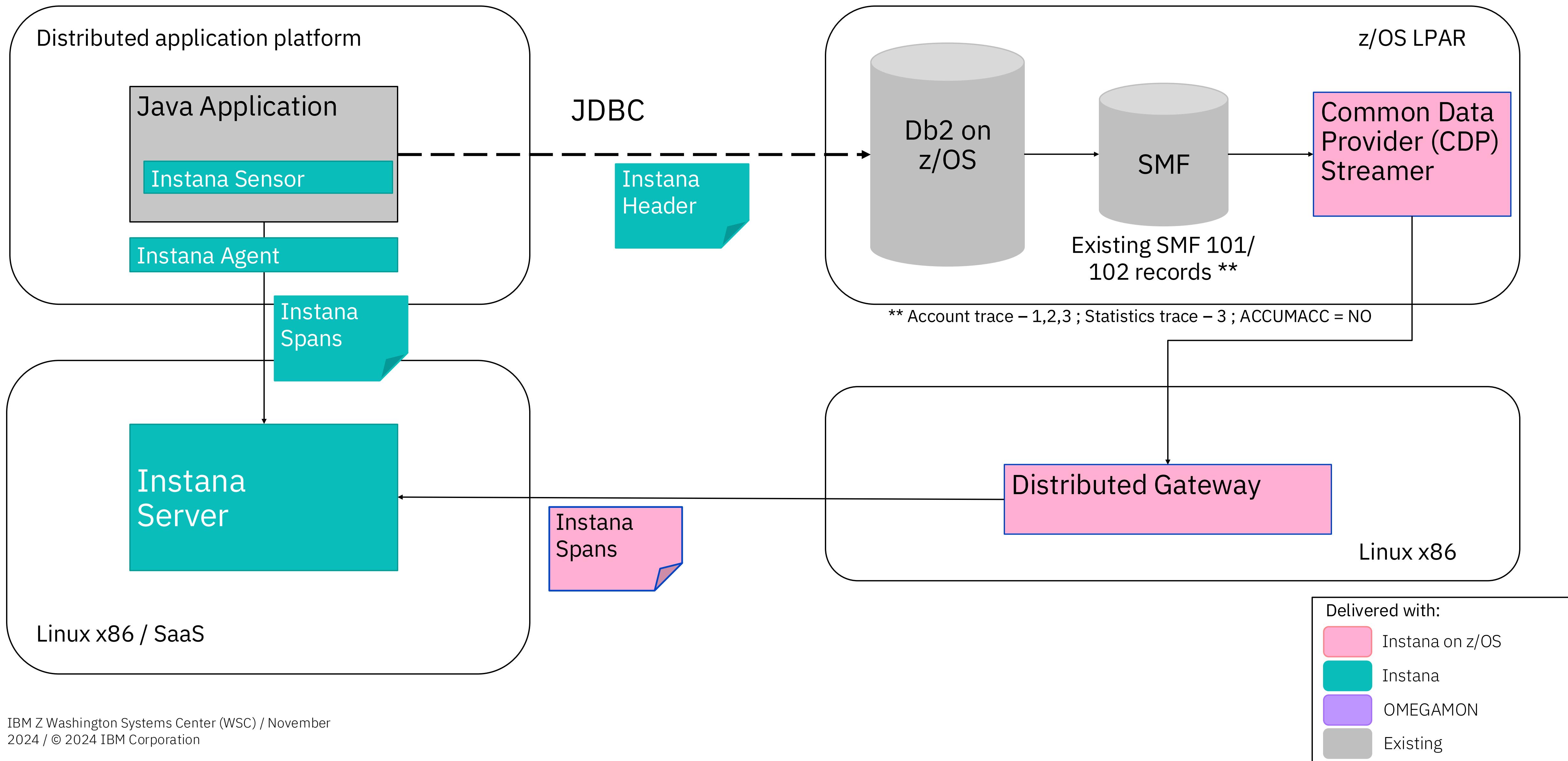
OMEGAMON

Existing

Example Instana on z/OS flow for tracing



Flow for Db2 on z/OS via JDBC tracing



Instana + OMEGAMON flow

