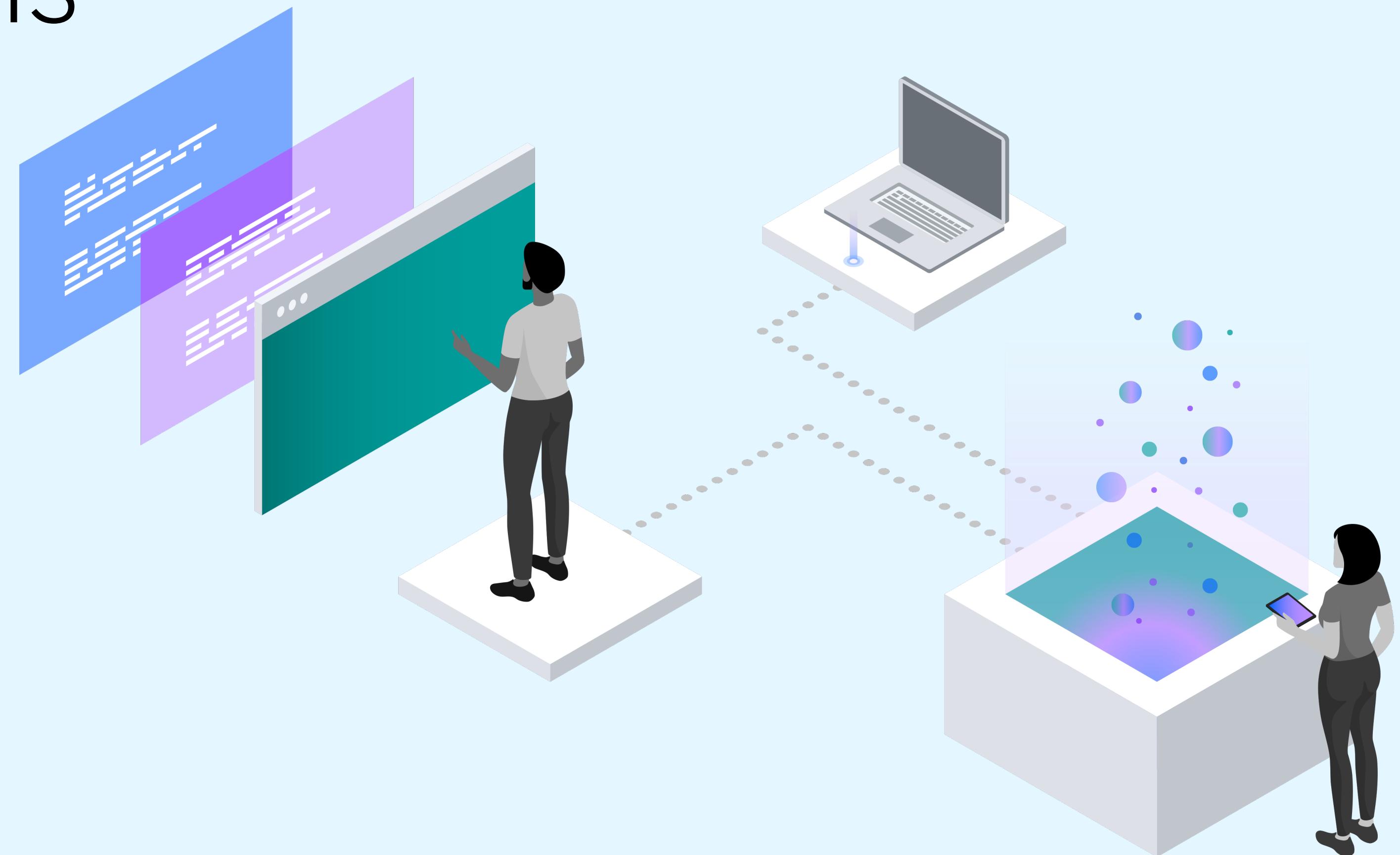


AIOps with IBM Z

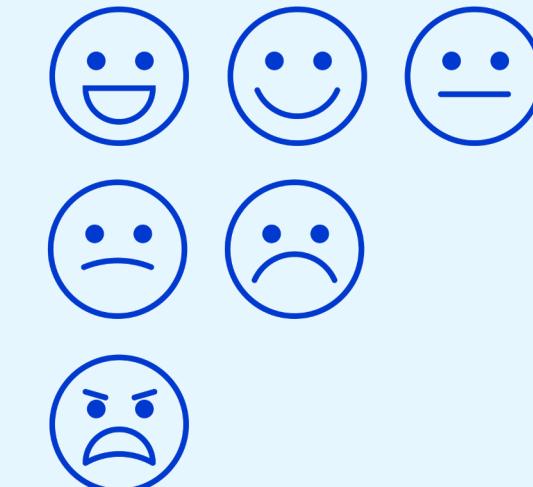
Overview & Solutions



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

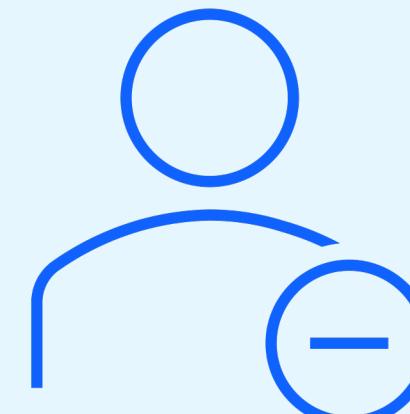
1 sec

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



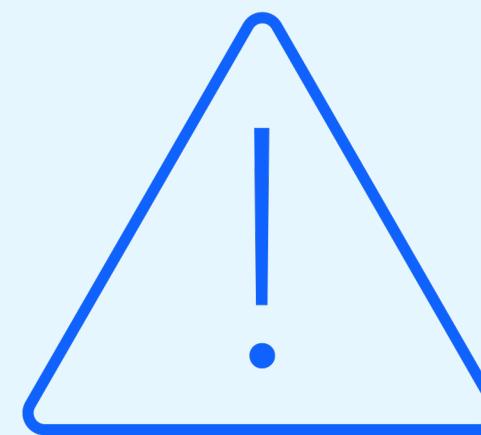
50%

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



\$250K

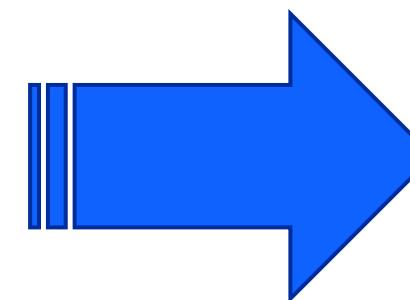
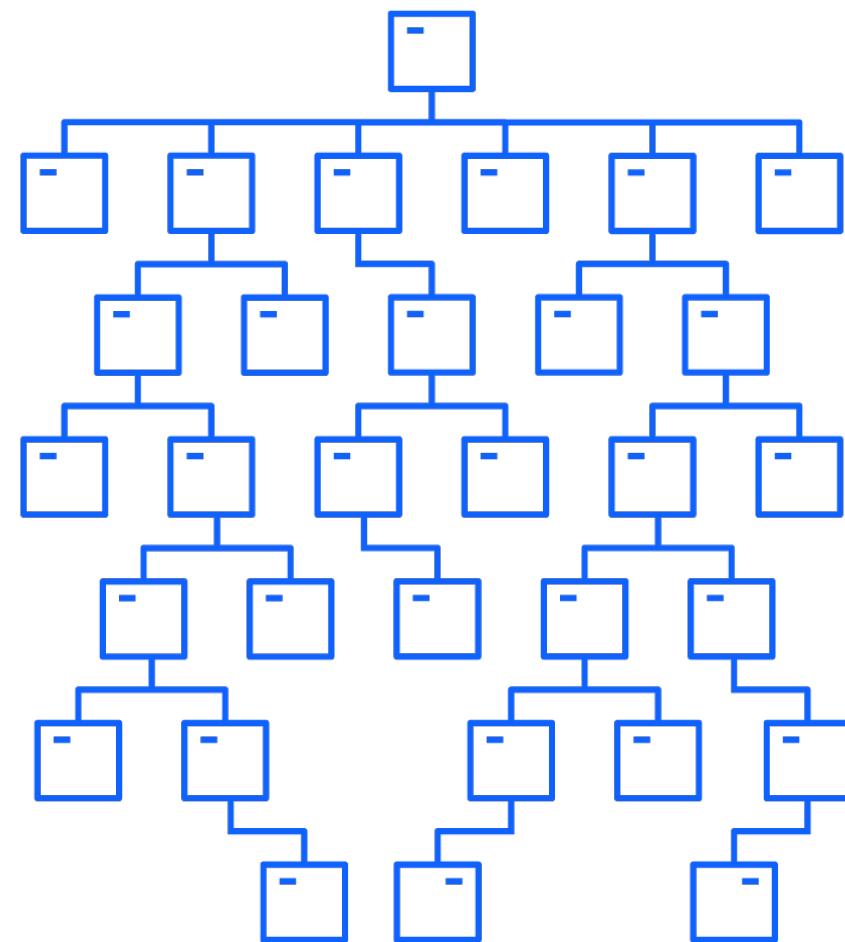
the average cost of an **hour of downtime** when a revenue generating production service is impacted



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

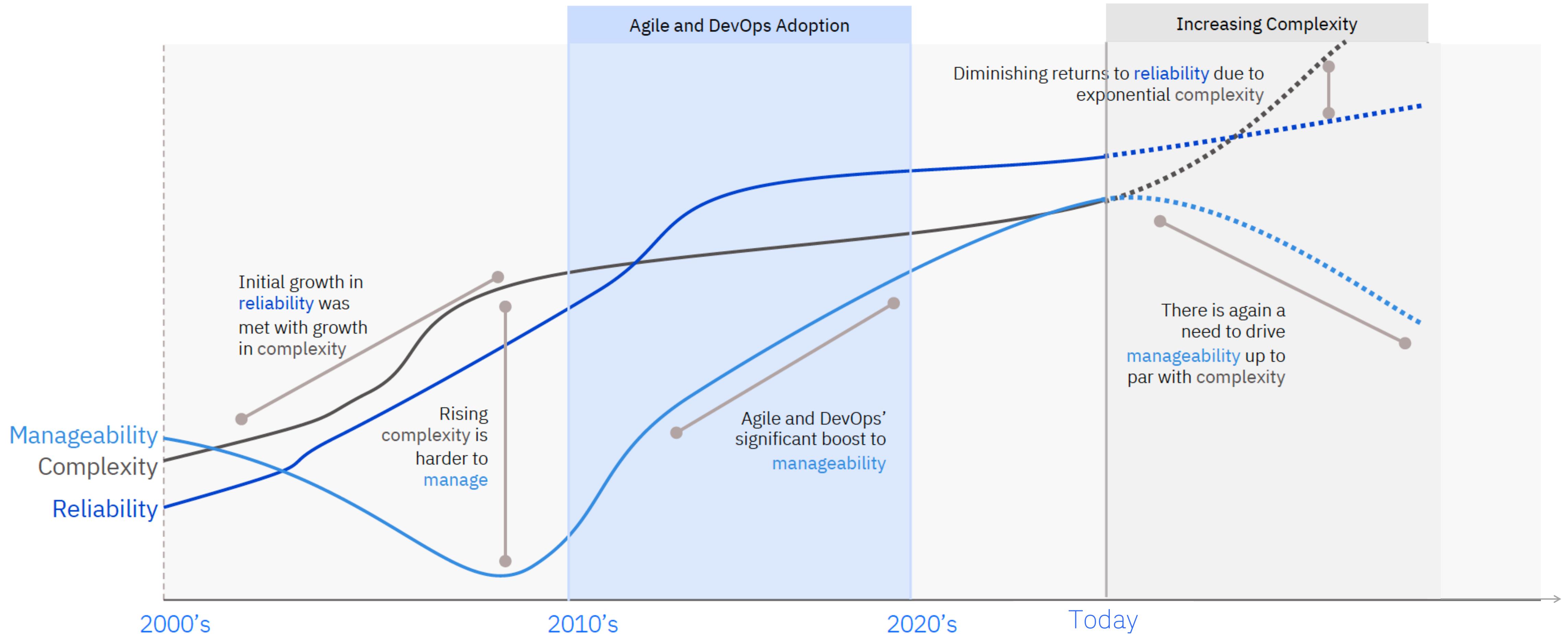


There's too much data for one person to handle

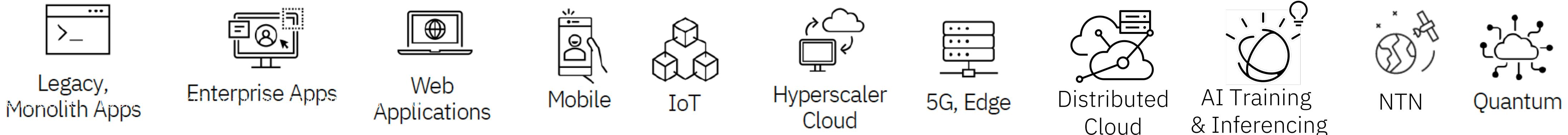
- Businesses need **real-time visibility** into their infrastructure and application estates to leverage actionable insights to **automate** and **enhance overall IT operations**
- Current **break-fix**, reactive approaches to IT management simply **cannot scale**
- Adopting **piecemeal** software solutions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

Why AIOps?

Modernization Accelerates Complexity



Example
Technology
Adoption



AIOps can help

Artificial Intelligence for IT Operations

The application of data, AI, and machine learning to improve and automate IT operations

Reduce the operational difficulty in adopting the hybrid cloud model.

AIOps helps to:

- **Collect and aggregate** the ever-increasing volumes of data generated by IT infrastructure components, applications, performance-monitoring tools, and service ticketing systems
- Intelligently shift ‘signals’ out of the ‘noise’ to identify **significant events and patterns** related to application performance and availability issues
- Diagnose root causes and report them to IT and DevOps for rapid response and remediation —or, in some cases, **automatically resolve** these issues without human intervention

AI on IBM z16 strategy: Designed for Business Insights and Intelligent Infrastructure



REAL TIME BUSINESS INSIGHTS

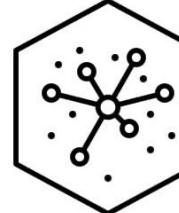
Infuse AI in Real-time into Every
Business Transaction



Db2 for z/OS® with
SQL Data Insights



Watson® Machine
Learning for z/OS

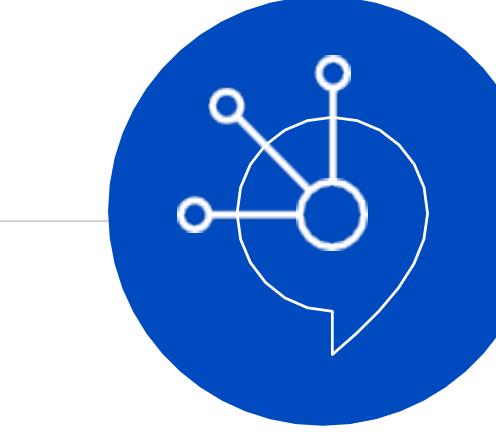


Cloud Pak for Data

Uncover hidden
insights in
Db2 for z/OS data

Unprecedented AI
inferencing performance
for every transaction while
meeting SLAs

Cloud native solution
to put your data to
work and generate
meaningful insights

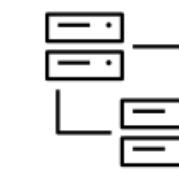


INTELLIGENT INFRASTRUCTURE

Improve Security, Data Privacy,
IT Operations with AI



Cloud Pak for Watson AIOps &
IBM Z Anomaly Analytics



Db2 AI
for z/OS



Data Privacy for
Diagnostics

Deploy advanced,
explainable AI across
the ITOps toolchain

Enhance database
performance with
machine learning

Leverage machine
learning to detect
and redact PII from
diagnostic dumps

Enable a leading
AI portfolio &
ecosystem



Db2 Analytics Accelerator
for z/OS



XGBoost

Watson Machine
Learning for z/OS



Keras



IBM Cloud Pak for Data



Observability and AIOps



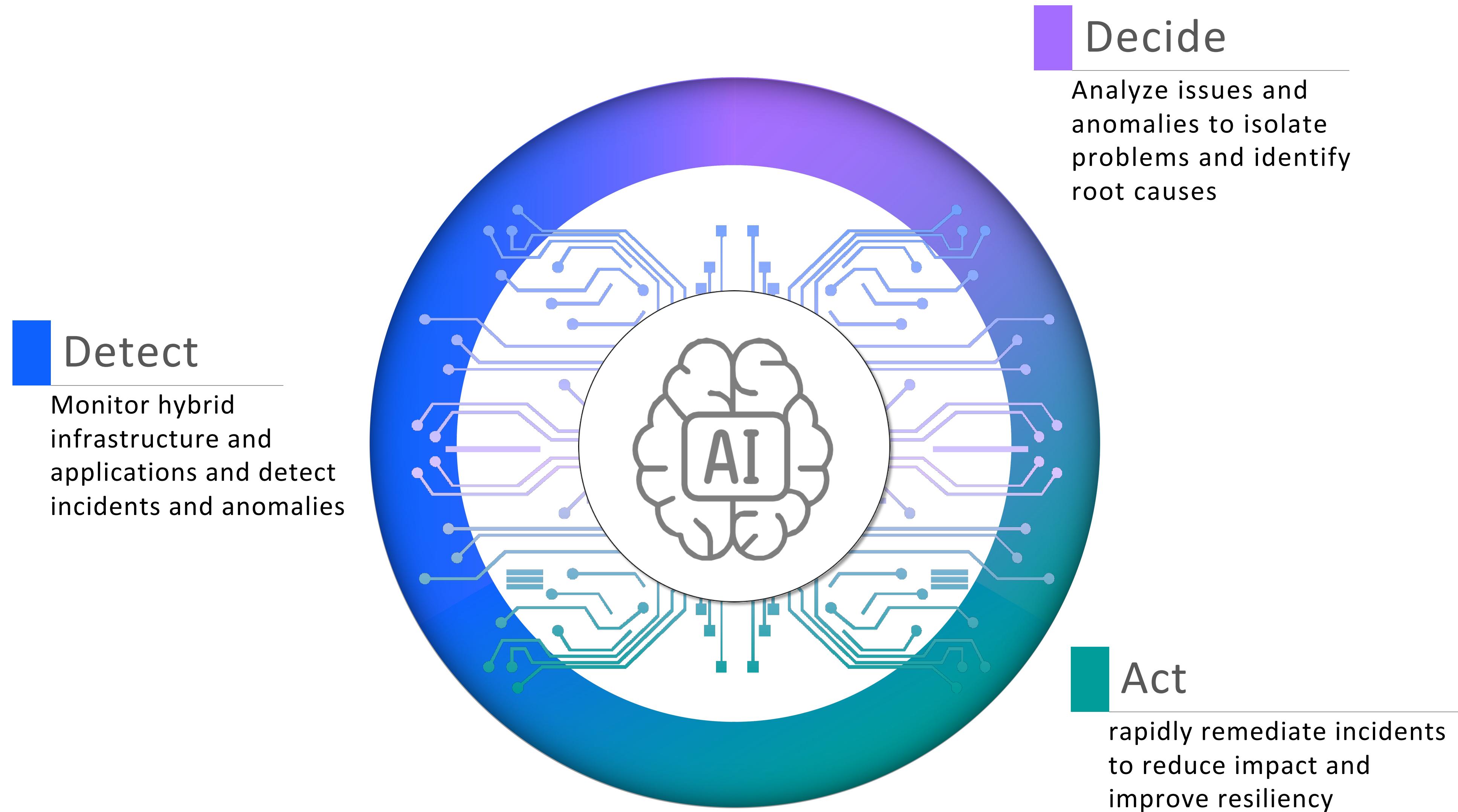
Observability is the ability to measure a system's current state based on data it generates, such as metrics, traces, and logs.



AIOps is the application of machine learning and data science to IT operations problems.

*Observability depends on AI to provide deep insights.
AIOps requires observability to get complete visibility into operations data*

IBM AIOps Framework



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.

IBM ZAIOps Solutions

Detect

Monitoring and observability

IBM Z Monitoring Suite and IBM Z Service Management Suite

Full-stack monitoring with best practices for early detection of Z incidents

Decide

Cross domain metrics and trace analysis

IBM Z Monitoring Suite and IBM Z Service Management Suite

Detect bottlenecks in code, server resources or with external dependencies

Act

Collaborative incident remediation

IBM Z ChatOps and IBM Service Management Unite

Improved collaboration and faster incident resolution through chat-based operations and user-friendly dashboards

Predictive workload automation

IBM Z Workload Scheduler

End to end workload automation with embedded predictive scheduling for SLA management

Application performance management

IBM Observability by Instana on z/OS and IBM Z APM Connect

End-to-end tracking visibility across hybrid cloud application

Log analytics

IBM Z Operational Log and Data Analytics

Accelerate hybrid incident identification with real-time operational analytics

Anomaly correlation

IBM z/OS Workload Interaction Navigator

Correlate anomalous activities across z/OS subsystems

Anomaly detection

Z Anomaly Analytics

Intelligent anomaly detection to avoid costly incidents

Performance and capacity planning

IBM Z Performance and Capacity Analytics

Performance analysis, capacity forecasting, and modelling

Intelligent automation

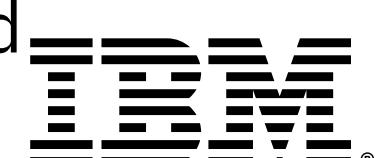
IBM Z System Automation

End to end, goal-driven and policy-based system automation for a consistent and reliable automation across the enterprise

Storage automation

IBM Advanced Storage Management Suite for z/OS

Machine aided storage resource management and automated storage tasks across the enterprise for improved SLAs



Detect

Monitoring

IBM OMEGAMON®
IBM Z® Monitoring Suite

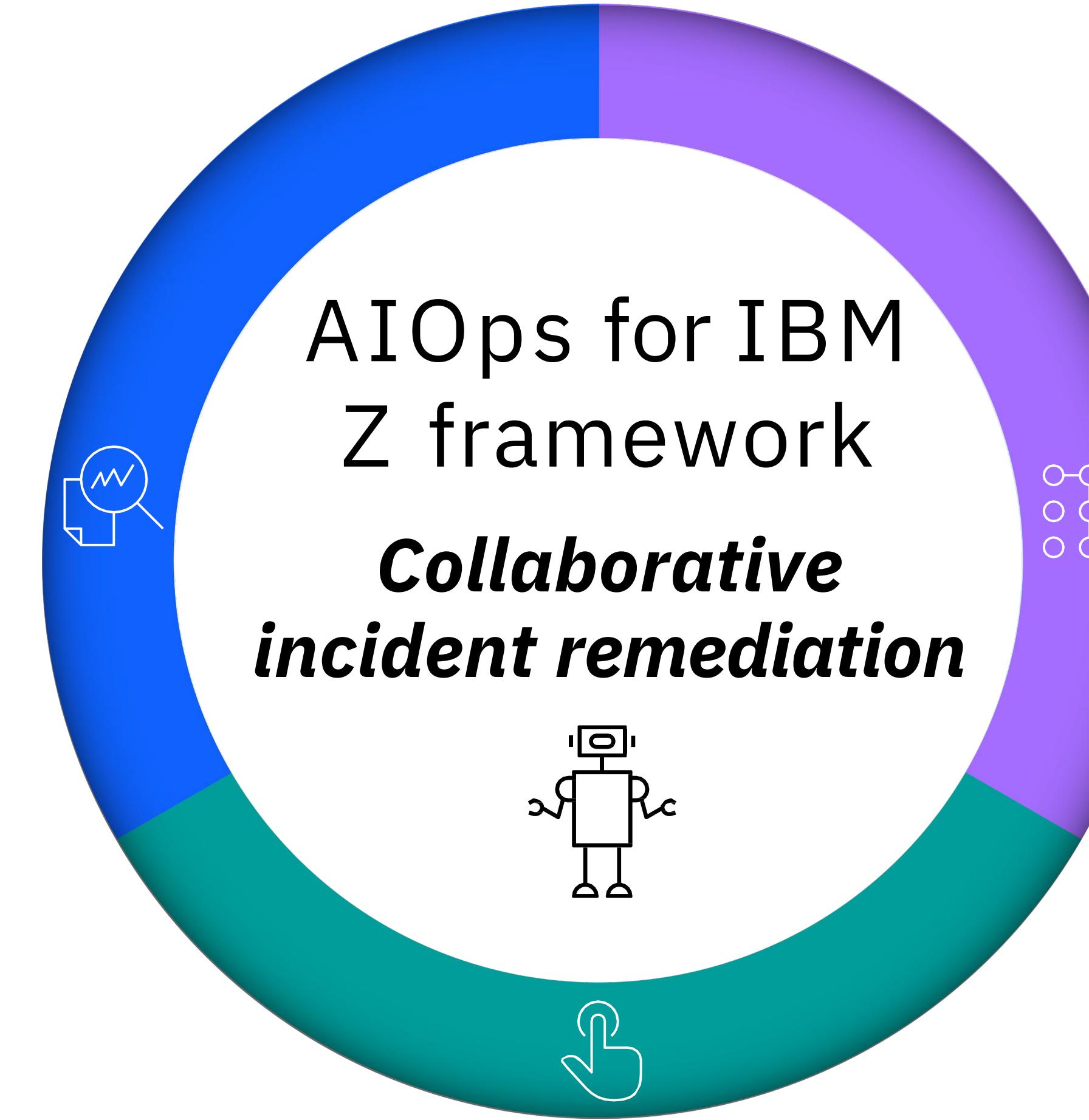


Hybrid cloud observability

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

Anomaly detection

IBM Z Anomaly Analytics



Act

Intelligent automation

IBM Z System Automation
IBM Z NetView®



Predictive workload automation

IBM Z Workload Scheduler



Storage automation

IBM Z Advanced Storage Management Suite



Resiliency

IBM Z Batch Resiliency

Our focus today – Hybrid Cloud AIOps

- Today we are focusing on Hybrid Cloud AIOps. Specifically with three solutions – Instana, Turbonomic, and IBM Cloud Pak for AIOps.
- If you are interested in a workshop for the ZAIOps portfolio, there is one available.
 - See the most recent iteration on the IBM Z Council website here:
 - <https://ibm-zcouncil.com/events/aiops-dec-6/>

Discover the value of AIOps in-action on IBM live Z systems.

This is a Bring Your Own Device event, however there will be a limited number of IBM provided laptops on the day
(on a first come basis)

Date: Wednesday 6th December 2023

Time: 09:30 am – 16:00 pm UKT

Hands-on Lab work-units at your choice

IBM Service Management Unite and zChatOps – Discover the value of SMU and zChatOps for a modern collaborative incident remediation experience.

IBM OMEGAMON Monitoring – Explore the latest OMEGAMON real-time performance monitoring for z/OS, JVM, Db2, CICS, IMS, MQ, Networks and Storage.

IBM Instana Observability for z/OS – Learn about Enterprise Observability with deep insights of application performance.

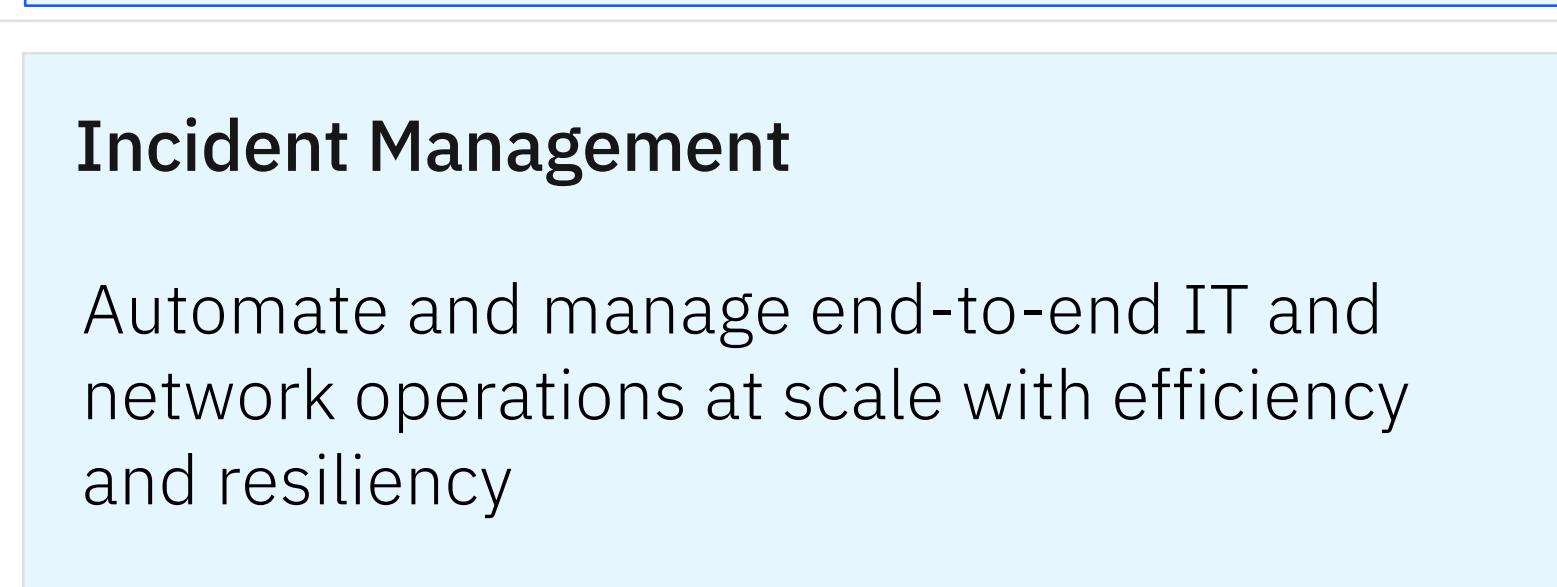
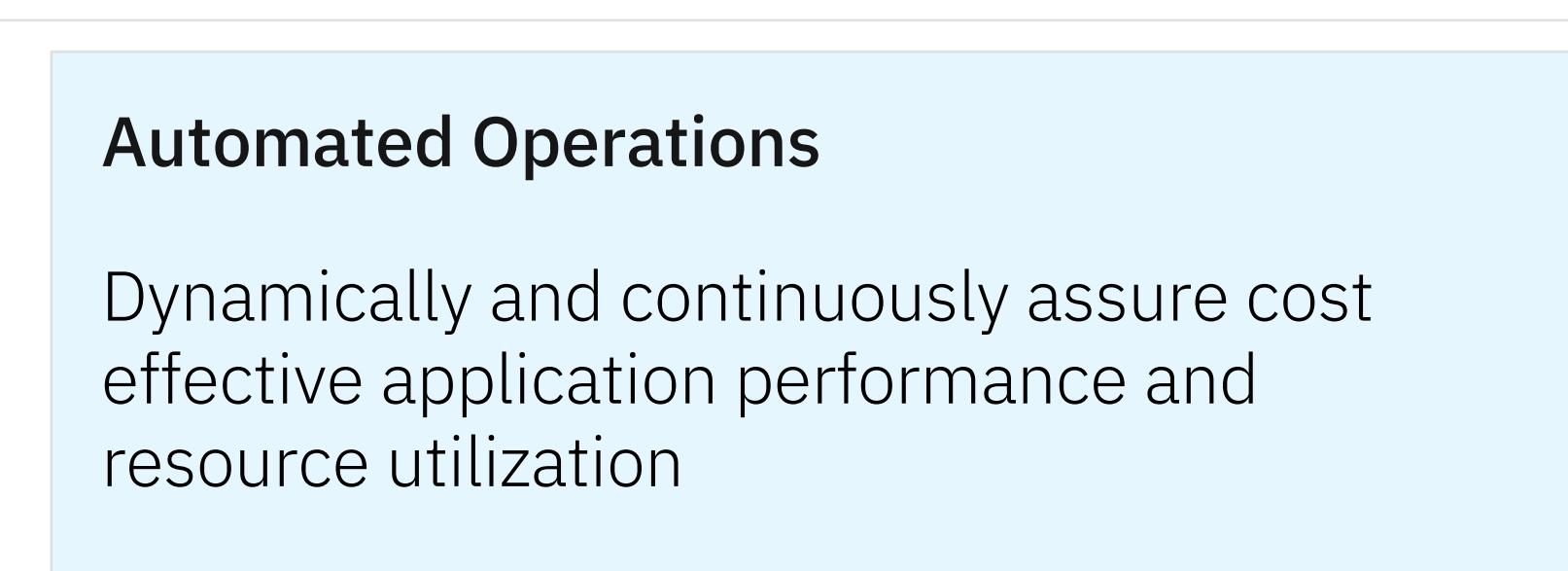
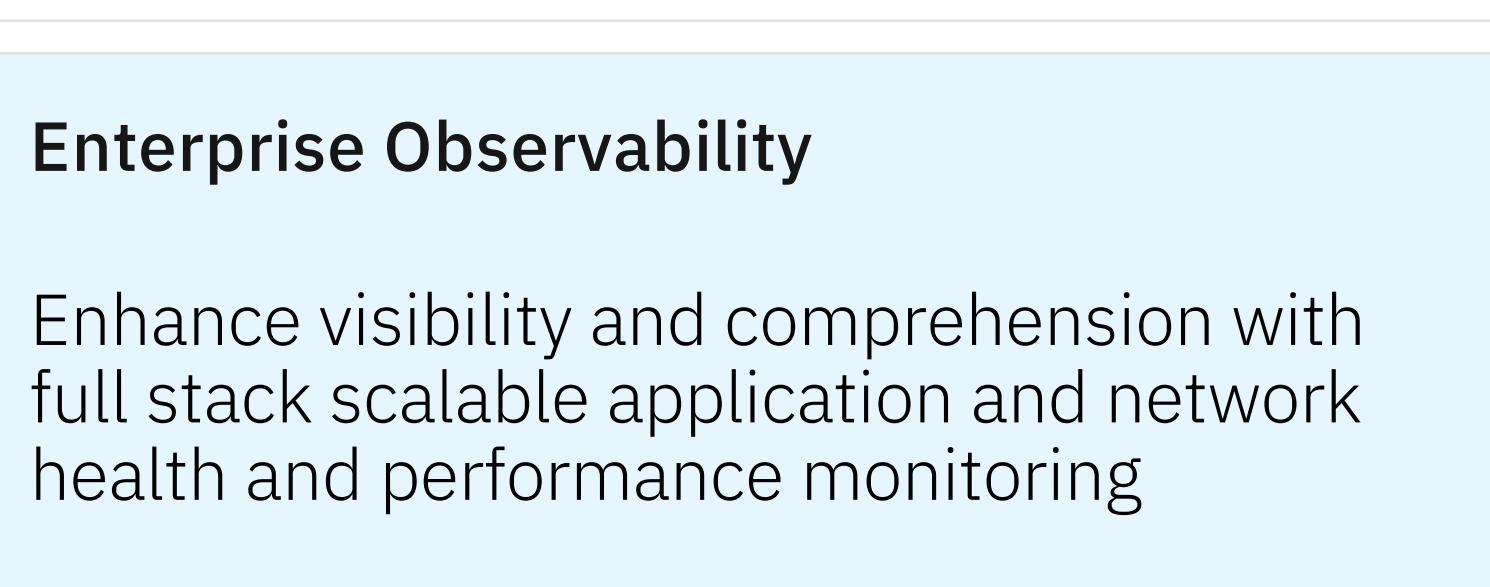
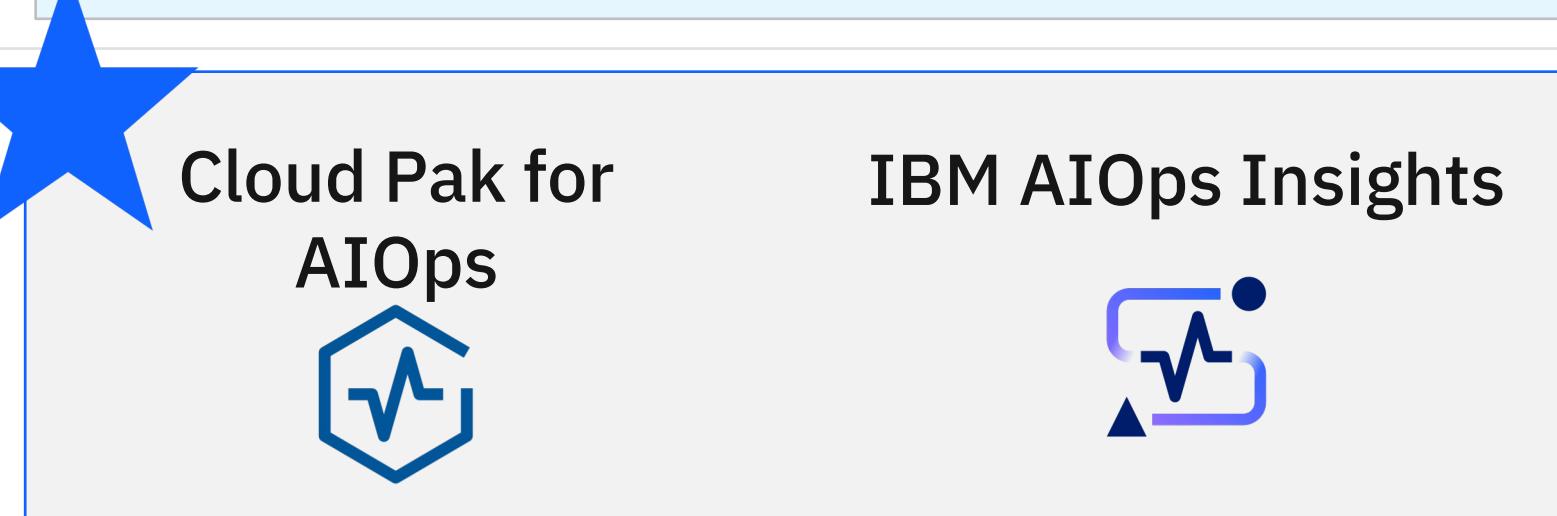
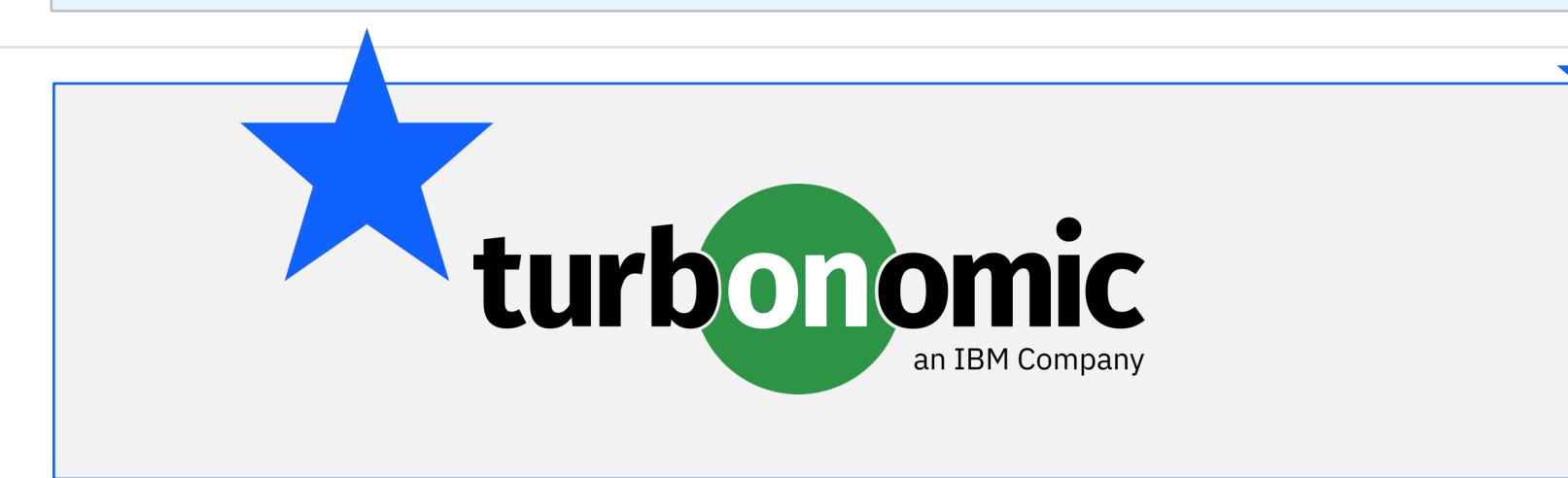
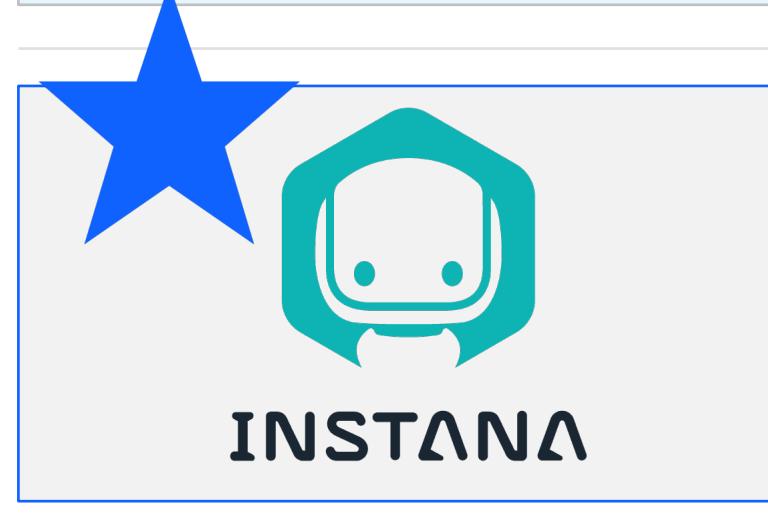
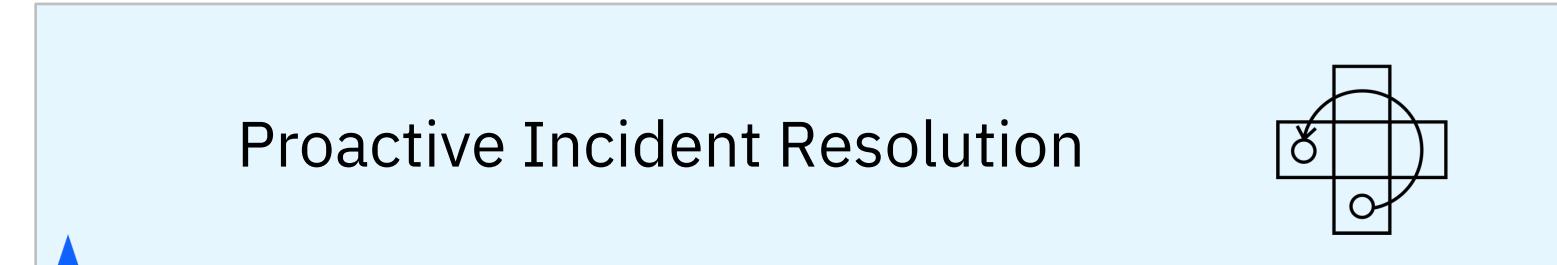
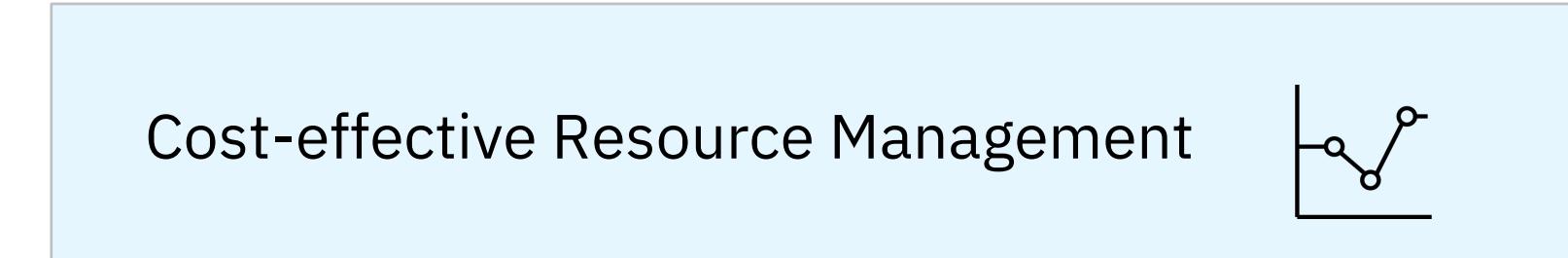
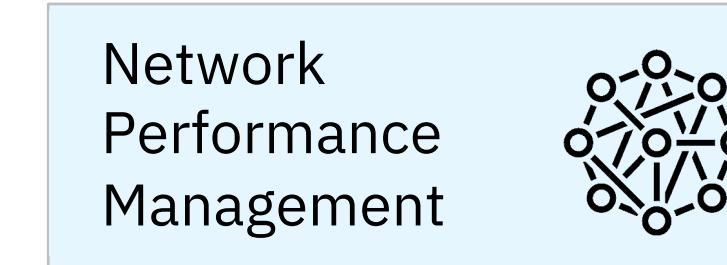
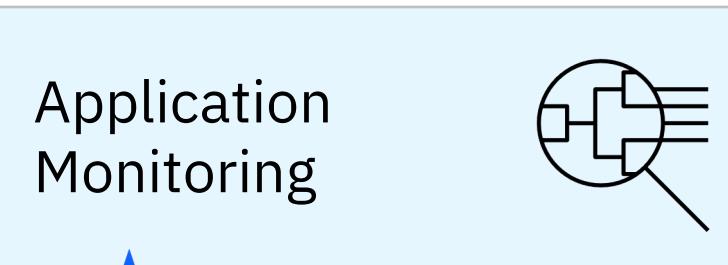
IBM Z Anomaly Analytics with Watson Machine Learning – Learn how AI-ML can detect anomalous system behavior with SMF and SYSLOG data.

IBM Z Performance and Capacity Analytics – Explore the new web reporting for capacity management and health check.

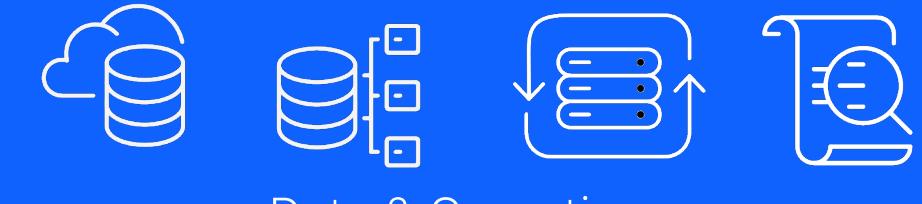
Audience: IT Operations, IT Administrator, Site Reliability Engineer, Sysprog, Automation Administrator, IT manager, Technical Support, Application Performance Analyst

IT Automation with IBM

The most complete and integrated set of modular automation technologies

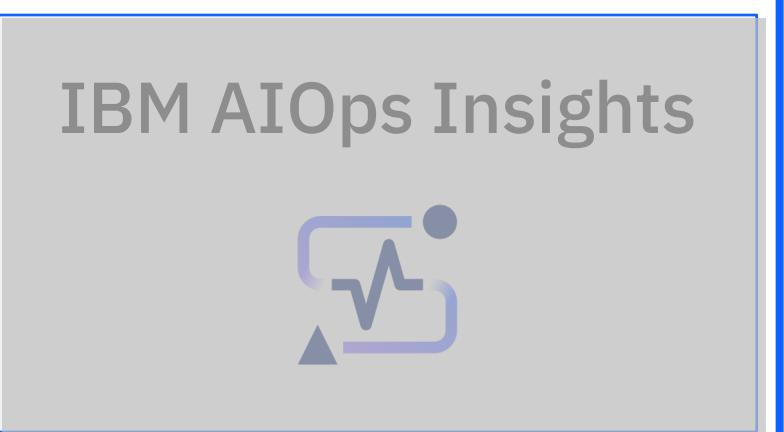
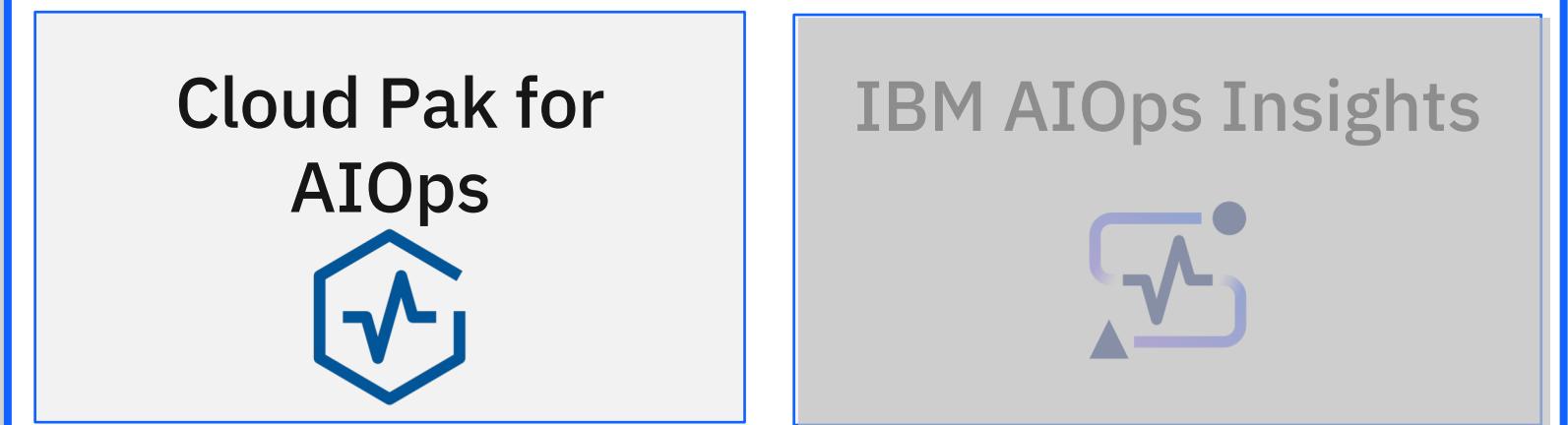
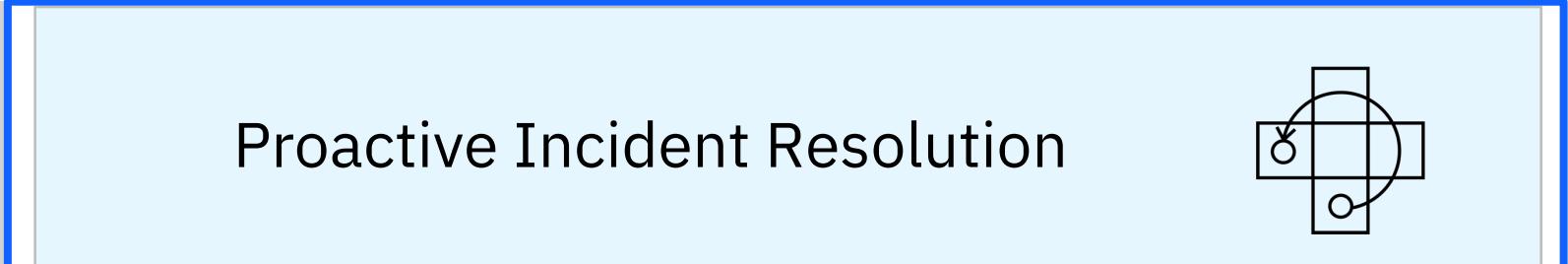
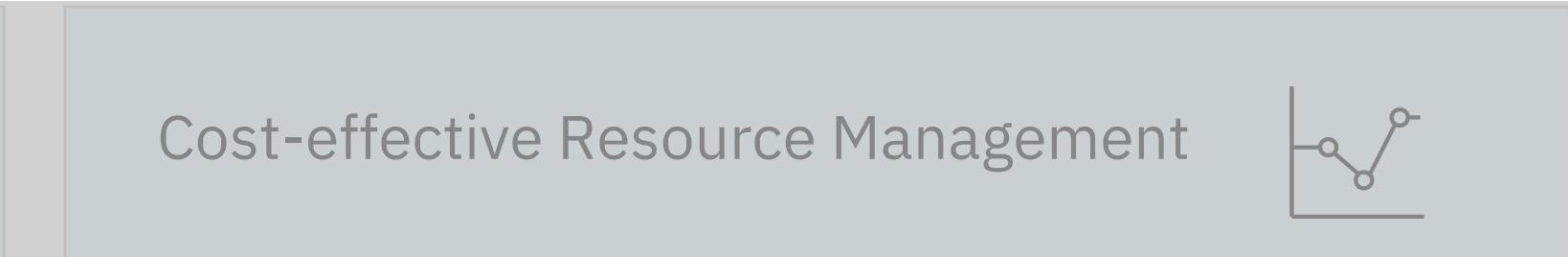
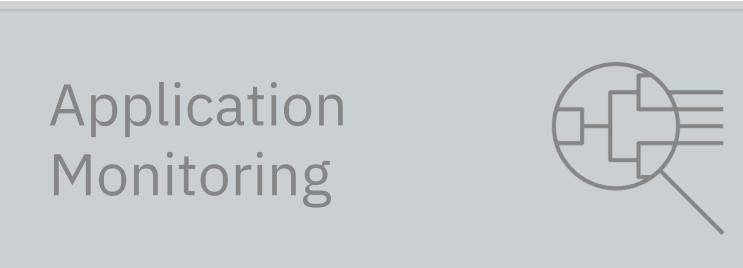


Integrated AI-powered IT Operations



IT Automation with IBM

The most complete and integrated set of modular automation technologies



Enterprise Observability

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

Automated Operations

Dynamically and continuously assure cost effective application performance and resource utilization

Incident Management

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

Integrated AI-powered IT Operations



Platforms

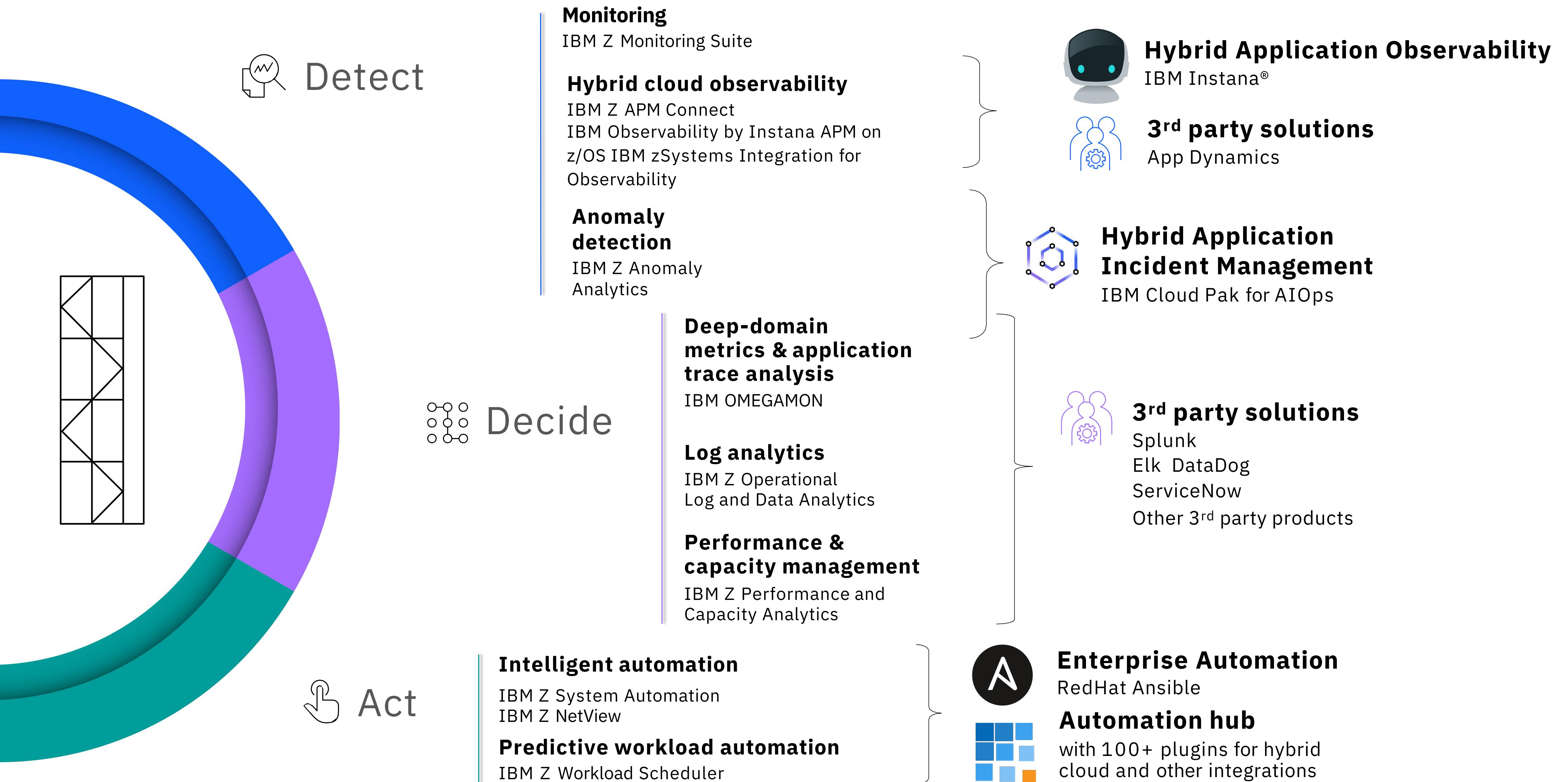


Hybrid Multicloud Networks



Data & Operations

Better together – Hybrid Cloud Integrations

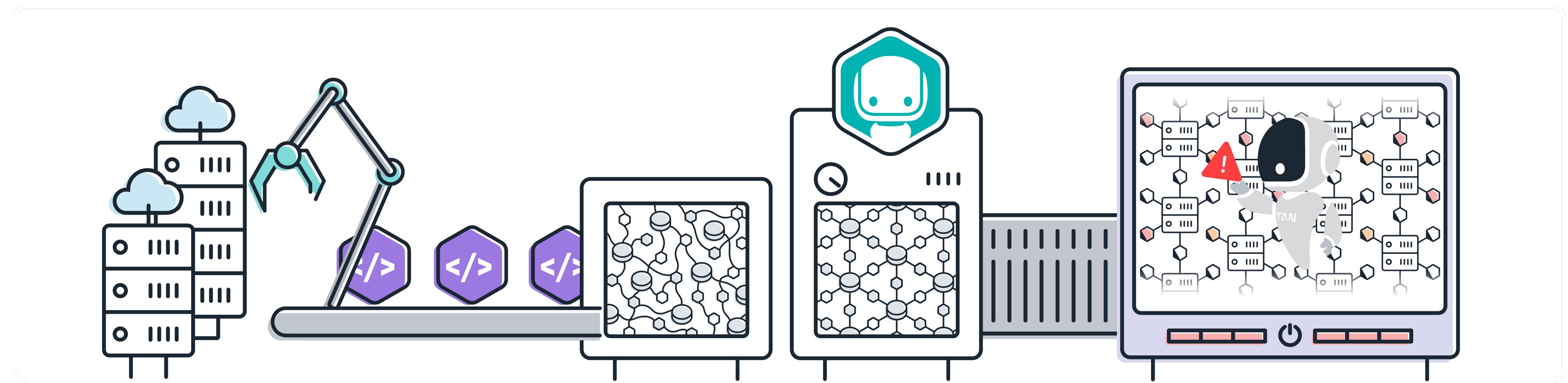


IBM Observability by Instana

IBM Observability by Instana®

Modern applications require modern solutions.

Track **every** interdependency
from code to end user.



Automate full-
stack visibility.

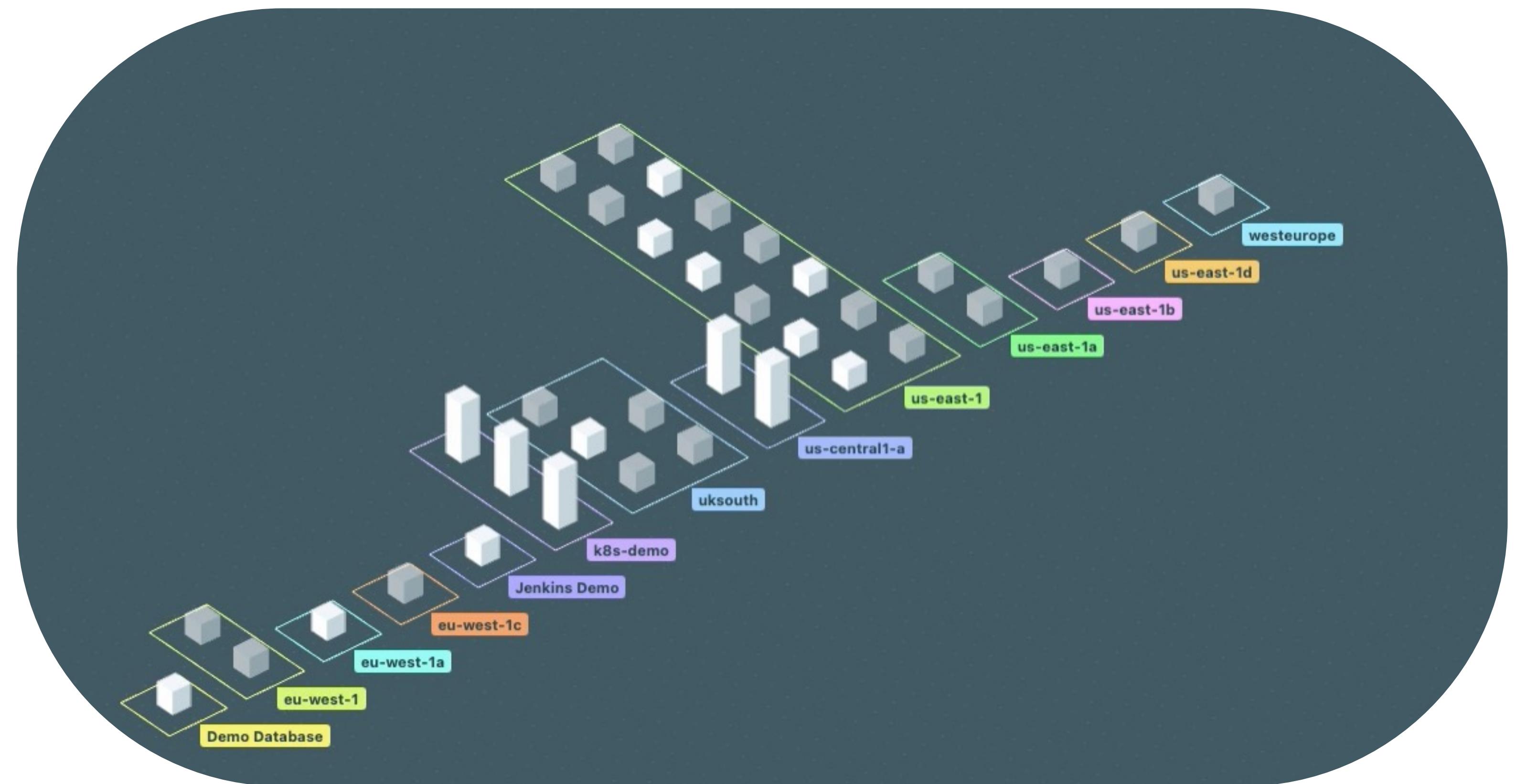
Collect accurate
data in **context**.

Take **intelligent**
action.

Automate full-stack visibility

Automated, full-stack application visibility across the entire monitoring lifecycle - including real-time change detection, mapping, tracing and profiling.

- Self-monitoring, auto-updating single agent
- Automatic & continuous discovery, deployment, configuration and dependency mapping
- Zero-configuration dashboards, alerting, troubleshooting & remediation
- Always-on, automated health monitoring – tracing, logging and profiling



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.

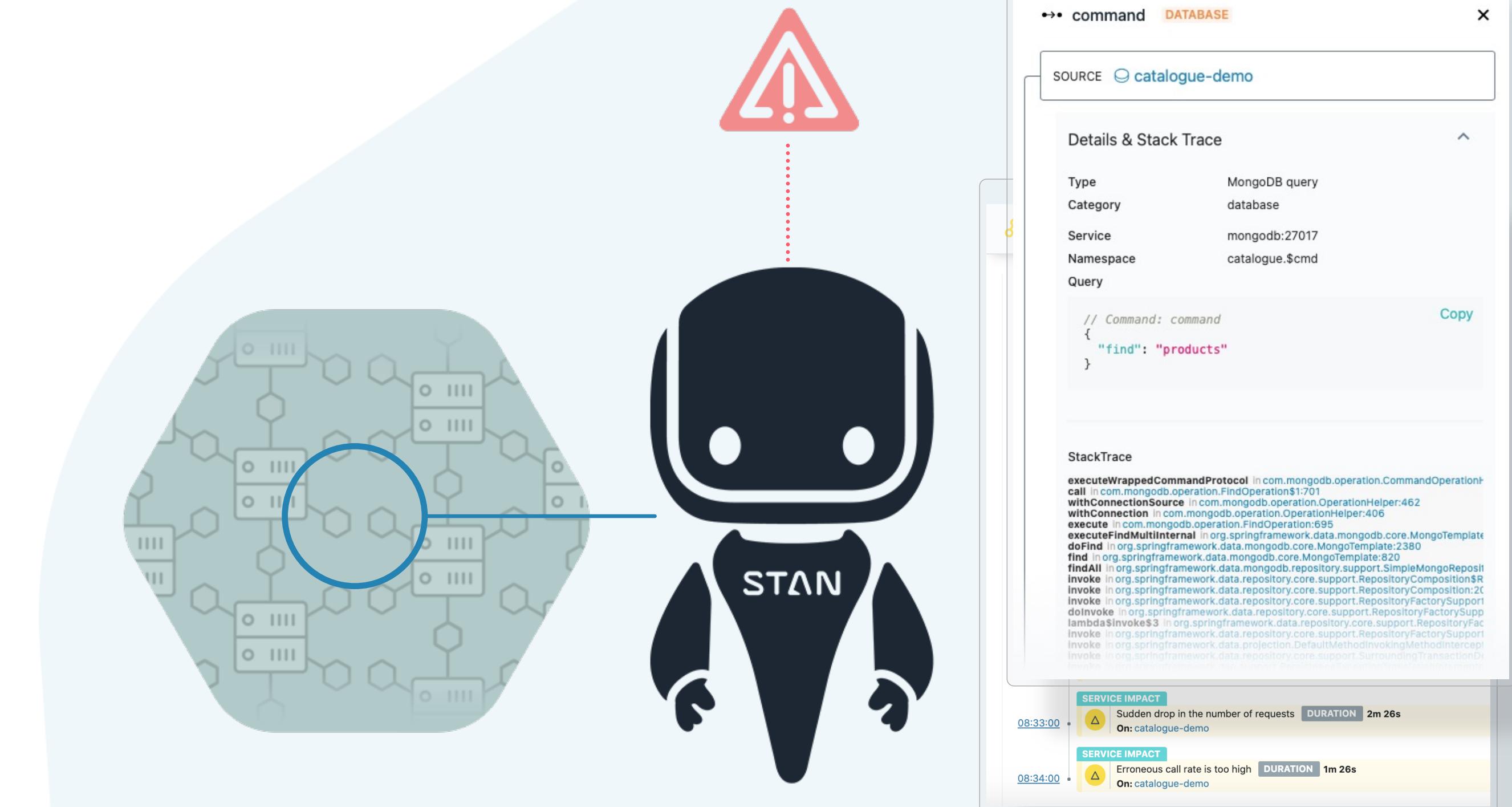
- Dynamic graph
- Automatic Anomaly Detection
- Application Perspectives
- Open Source & Logging Integrations



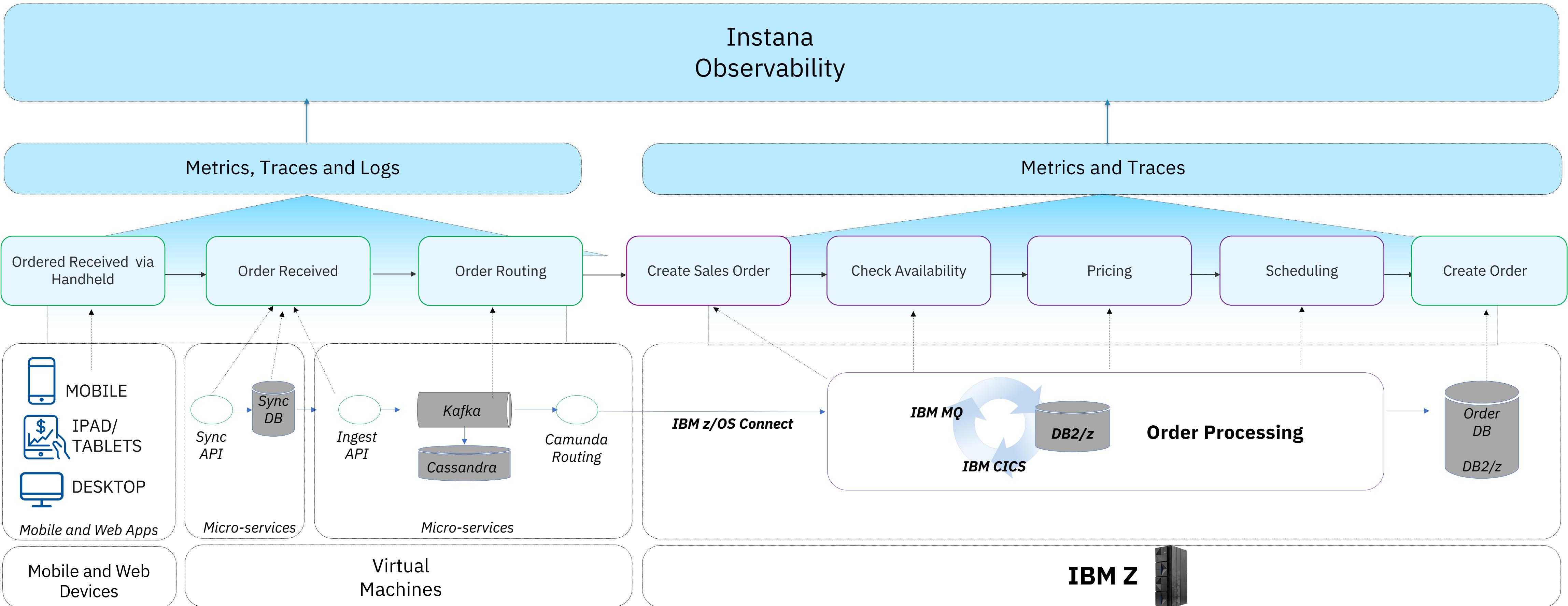
Intelligent action

Resolve issues faster with an understanding of contributing factors. Analyze every user request from any perspective to quickly resolve bottlenecks and optimize performance.

- Root Cause Analysis with Correlated Alerting & Incident Reporting
- Guided Troubleshooting
- Immediate Feedback of Pipeline & Canaries
- Unbounded Analytics



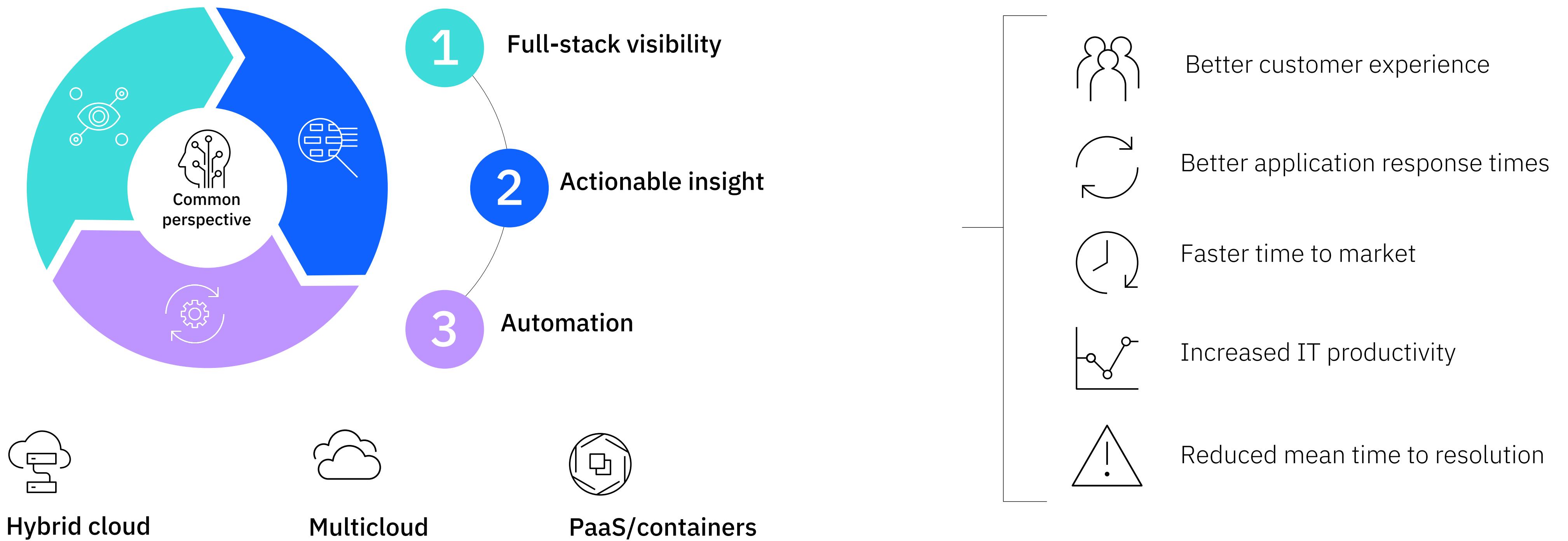
Instana can observe the **entire Hybrid Application Landscape**



IBM Turbonomic Application Resource Management

IBM Turbonomic® Application Resource Management

Continuous application performance while safely reducing cloud costs



IBM Turbonomic

Software (not people) continuously makes complex resourcing decisions to ensure all applications get exactly what they need to perform.

Public cloud optimization

- VM rightsizing
- Storage volume configuration
- Database configuration
- Maximize RI coverage
- Optimize RI purchasing

[Learn more](#)

Kubernetes optimization

- Container rightsizing
- Pod moves
- Cluster scaling
- SLO-driven scaling
- Container platform planning



Data center optimization

- Continuous compute placement
- VM rightsizing
- continuous storage placement
- Superclusters
- Initial placement

[Learn more](#)

Sustainable IT

- Container rightsizing
- Pod moves
- Cluster scaling
- SLO-driven scaling
- Container platform planning



What actions can Turbonomic recommend and automate?

1. Vertically scale workloads
(uses more historical data than other autoscalers like OCP VPA)
2. Horizontally scale workloads (to meet SLO)
3. Provision or suspend cluster nodes
(recommend only on s390x)
4. Move pods to different nodes
(unique to Turbonomic)

1

Modify CPU requests and limits, equivalent to:
`oc set resources deployment foo \ --limits=cpu=200m, memory=512Mi \ --requests=cpu=100m, memory=256Mi`

2

Increase or decrease number of pods, equivalent to:
`oc scale deployment foo \ --current-replicas=1 \ --replicas=2`

3

Cannot *automatically* scale nodes on s390x – however you can manually scale when *recommended*

4

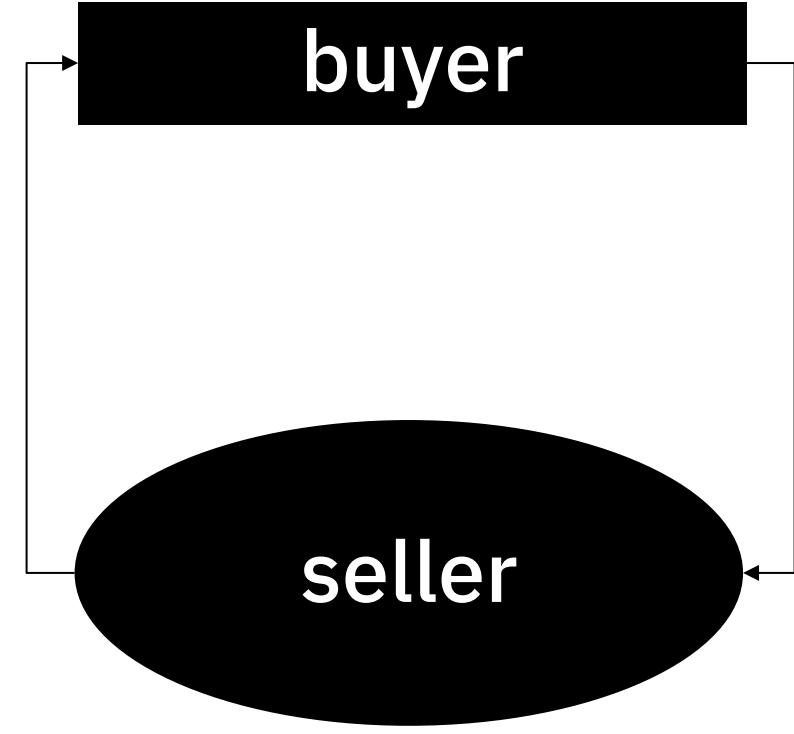
Spin up new pod on target node -> ensure it is up and running and passes health checks -> delete original pod

[More details](#)

IBM Turbonomic automates resource decision-making

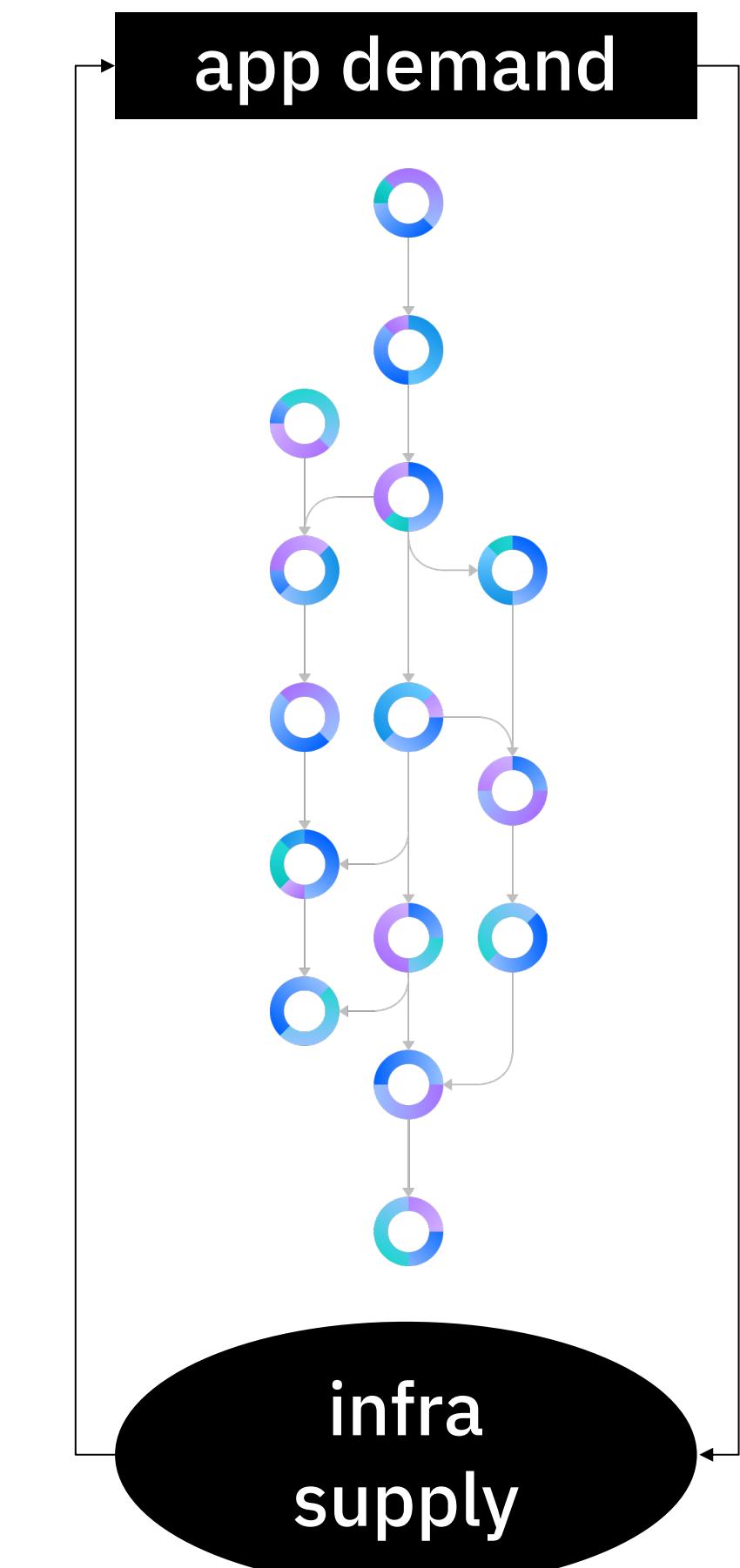
1. Abstraction

Entities in the environment are abstracted as buyers or sellers of application resources (compute, storage, network).



2. Analytics

Environment / the application stack is modeled as a market and the principles of supply, demand, and price are applied to match app demand to infrastructure supply.



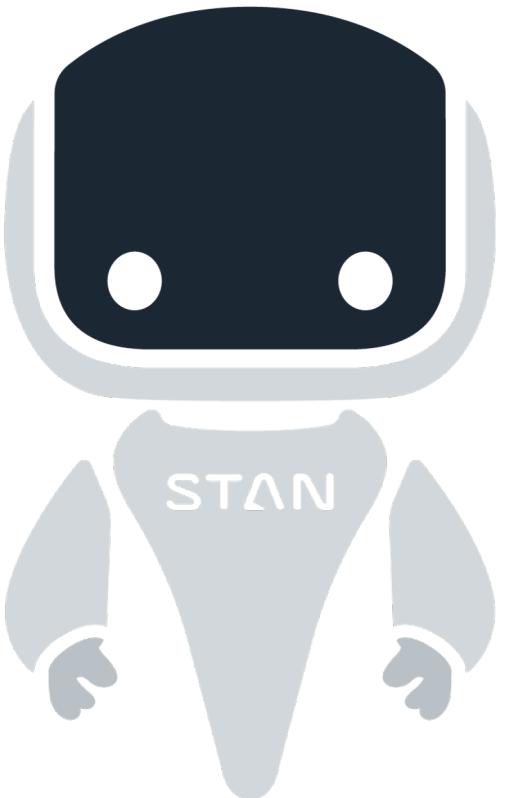
3. Automation

App-first, full-stack approach ensures actions are safe to automate. Clients operationalize automation by integrating actions into pipelines, processes, and workflows

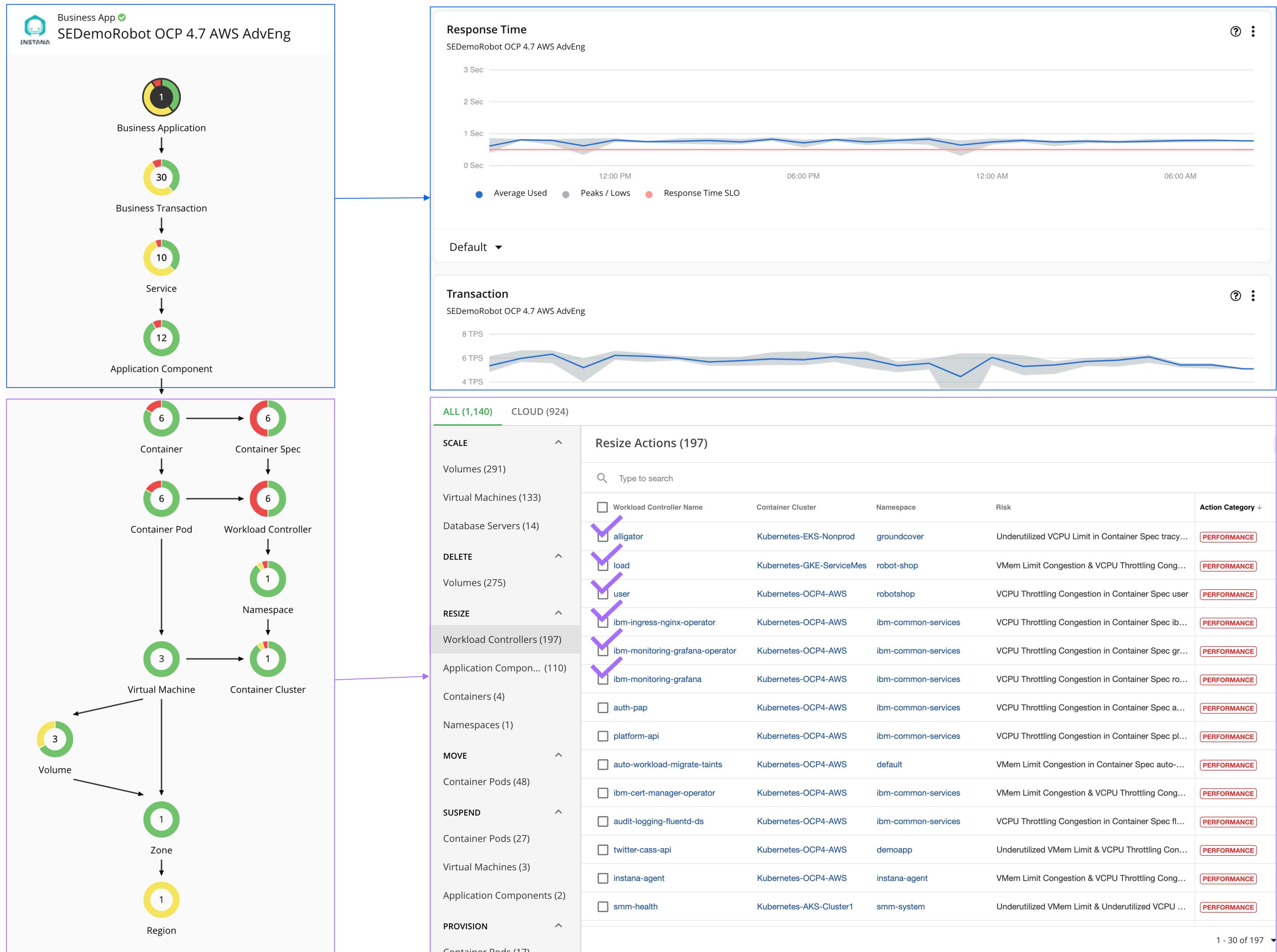
IBM Instana + IBM Turbonomic

Powerful alone,
better together

Only **Instana** provides
real-time observability
data with 1 second
metric granularity



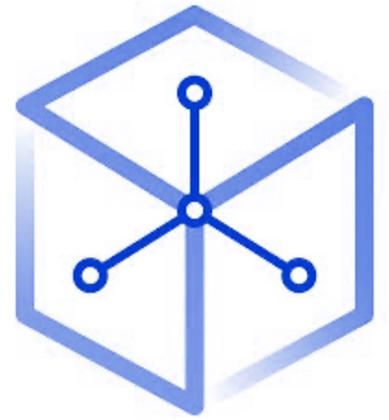
Only **Turbonomic**
provides cost
optimization you can
operationalize and
automate.



IBM Cloud Pak for AIOps

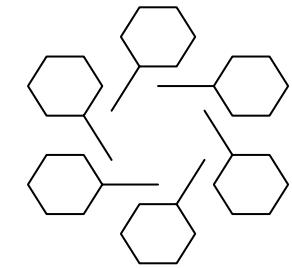
IBM Cloud Pak for AIOps

Proactive problem determination, remediation and avoidance



Proactive incident resolution using AI to eliminate unnecessary down time

Cross Domain Data Ingestion

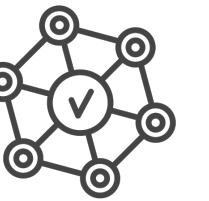


Events, metrics, alerts, topology, CMDB

Tickets, defects, CI/CD events

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

Event Correlation

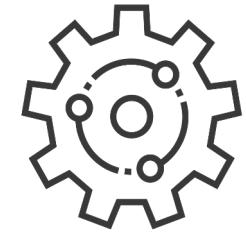


Correlate across all relevant data sources

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

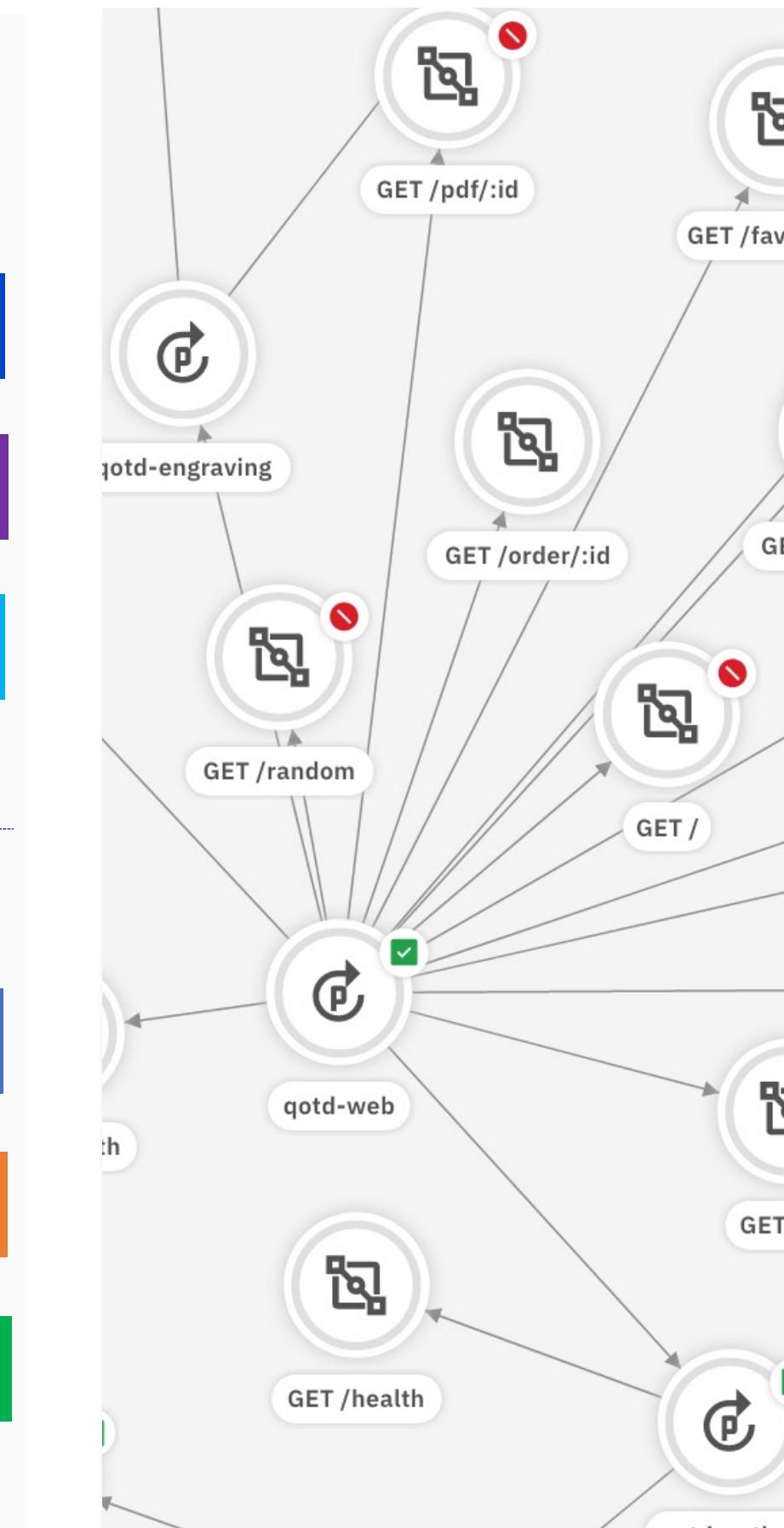
Metrics

Topology / Changes



Informed, Actionable Insights

Acclimate & Enrich Data



Augment Ops

Take Actions

Trustworthy Analysis

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%



The Goal

First

Occurrence

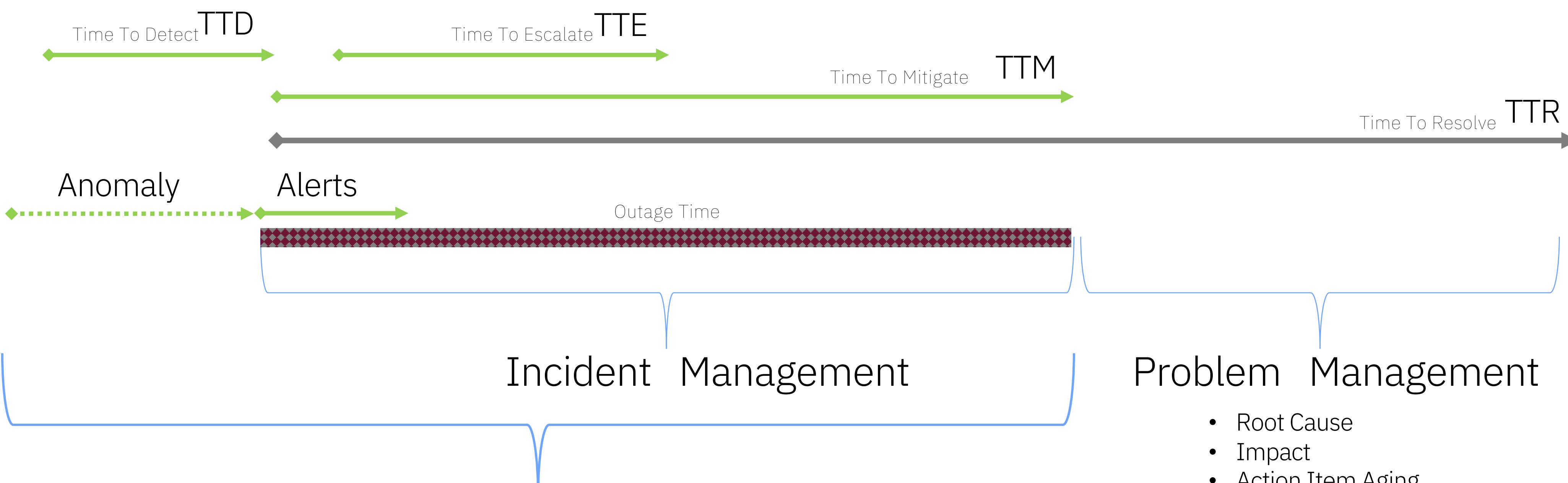
Detection

Escalation

Mitigation

Resolve

- Assess the abnormal
- Confirm the problem
- Assign Correct Resource
- Immediate impact mitigated
- Return to normal operation
- Permanent solution deployed
- No chance of re-occurrence



AIOps

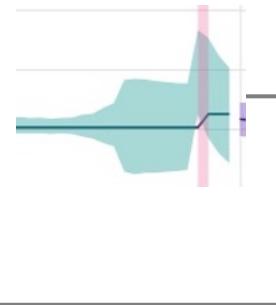
- Root Cause
- Impact
- Action Item Aging

IBM



Comprehensive AIOps approach to Real Business Outcomes

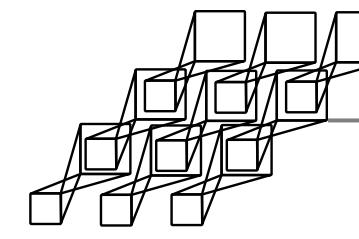
Analytics look to understand “normal”.
When they’re not, ...



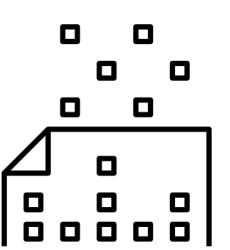
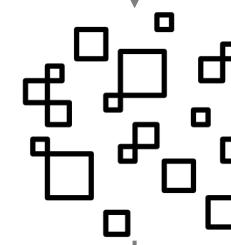
The engine generates Anomalies....



Faults & Events from the entire environment.....



Are de-duplicated and correlated into Alerts

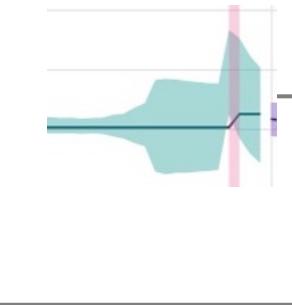


...and are run through analytics to correlate & enrich to understand what is wrong...



Comprehensive AIOps approach to Real Business Outcomes

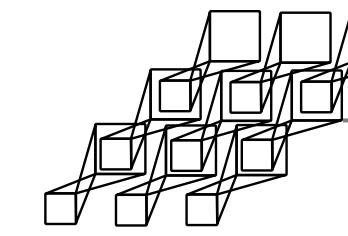
Analytics look to understand “normal”.
When they’re not, ...



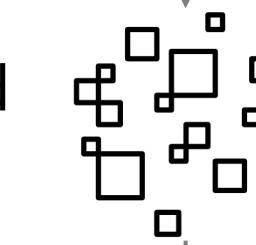
The engine generates Anomalies....



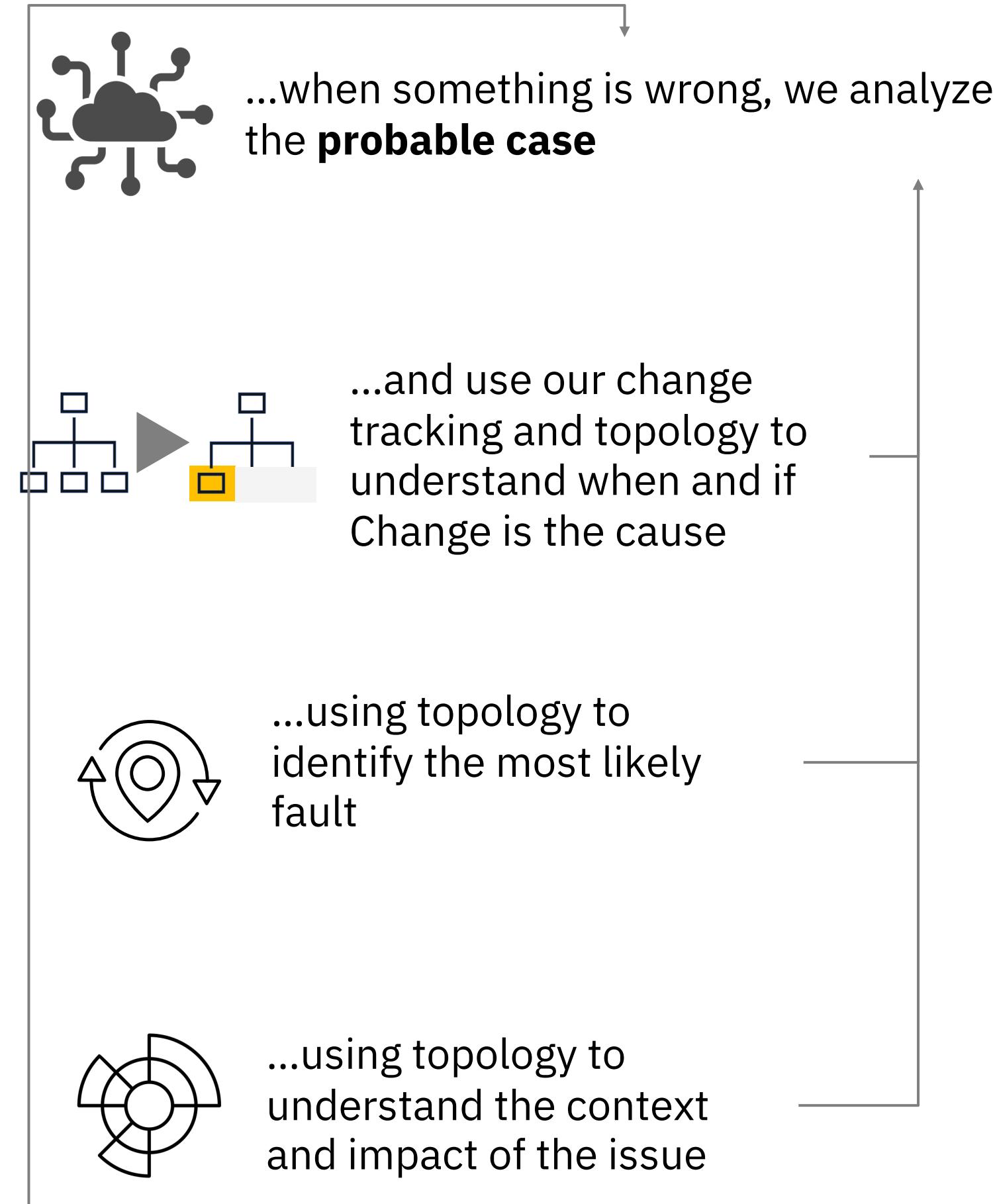
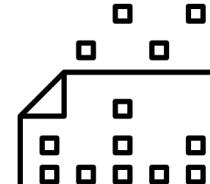
Faults & Events from the entire environment.....



Are de-duplicated and correlated into Alerts

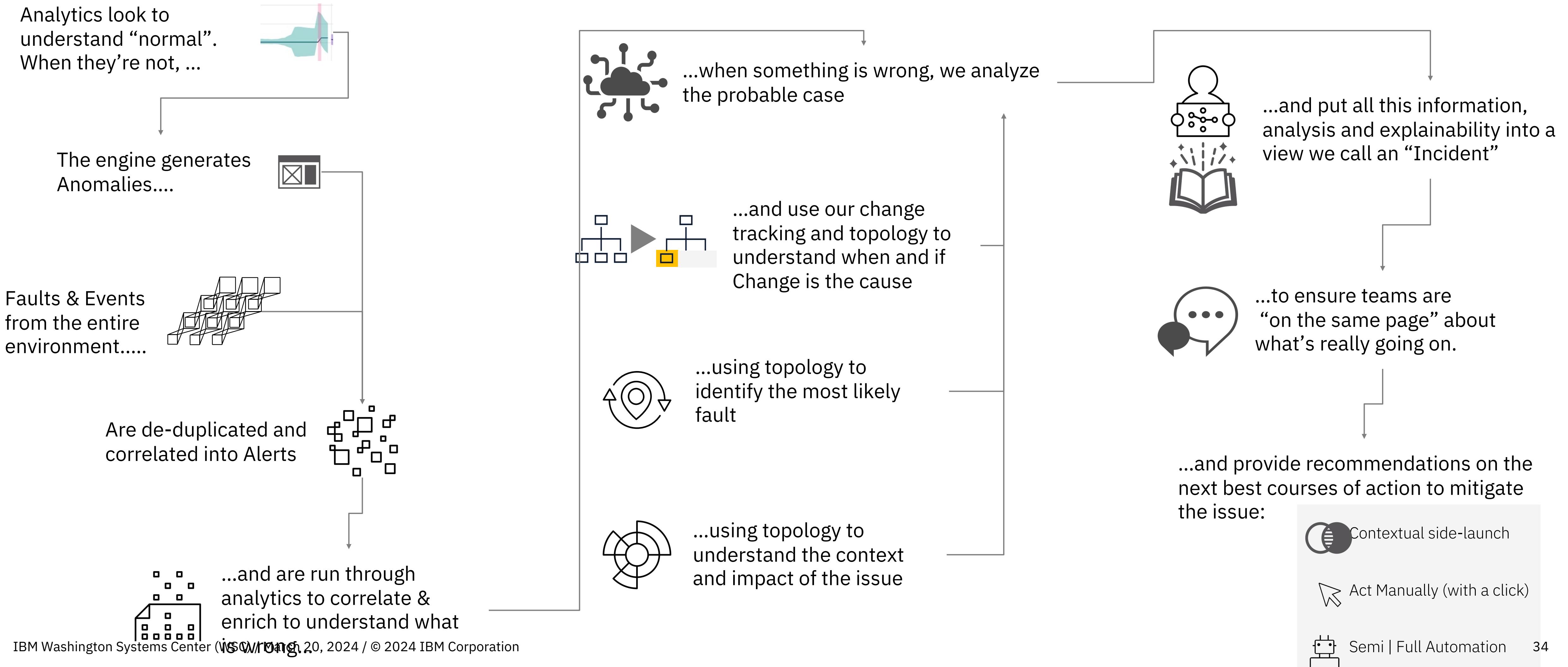


...and are run through analytics to correlate & enrich to understand what is wrong





Comprehensive AIOps approach to Real Business Outcomes



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. 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 'Overview' being the active tab. A header bar displays 'Stories and alerts' (with a count of 6), 'Change story settings', and filter buttons for 'Priority 1', 'Assigned', and 'Related stories (3)'.

The main content area is divided into several sections:

- Probable cause alerts:** Three alerts are listed: 'Response time high for ts-ticketinfo-service', 'Log Anomaly - HTTP Response Anomaly (503)', and 'MemoryUtilization is Higher than expected'. Each alert has a 'Runbooks' section with a 'Run' button.
 - Alert topology:** A diagram showing the relationships between resources like 'Pod 1: Fuel tracker' and 'Distribution dashboard'.
- Recommended runbooks:** A list of runbooks for the selected alert, including 'Migrate virtual machine to new tier' (Status: Ready to run, Success rate: 81%, Avg. rating: ★★★★☆) and 'Noticing 500 internal server error and out-of-memory error' (Status: Failed, Success rate: 81%, Avg. rating: ★★★★☆).
- Similar past resolution tickets:** Two similar incident tickets are shown, both titled 'Noticing 500 internal server error and out-of-memory error'. The first ticket has a description: 'The Service team rolled back the deployment update to restore service.' and was last updated on 4 Mar 2020. The second ticket has a long, detailed description and was also last updated on 4 Mar 2020.
- Topology churn:** A chart showing the number of relationships and property changes over time, with a specific point highlighted on 11/03/2020 at 11:08:38 AM with 56 property changes.
- Status severity breakdown:** A bar chart showing the distribution of status severities over different time intervals (e.g., 24 hours, 12 hours, 6 hours, etc.).

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.

Environment and Tooling Data Connectors

IBM Cloud Pak | Automation

Data and tool connections

Connect to your tools to provide data that will help gather insights for your environment.

Learn more ▾

Manage connections

Schedule connections

Search

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

All connections

Category	Tool	Description	Status	Actions
Logs	Alcatel-Lucent 1300 XMC	Events	Green	View Details
Logs	Alcatel-Lucent 5529 OAD V6	Events	Green	View Details
Logs	Alcatel-Lucent 5620 Logfile	Events	Green	View Details
Logs	Alcatel-Lucent 5620 SAM 3GPP v8	Events	Green	View Details
Logs	Alcatel-Lucent 5620 SAM v13 JMS	Events	Green	View Details
Logs	Alcatel-Lucent SESS	Events	Green	View Details
Logs	Alcatel-Lucent 9333 WNNMS	Events	Green	View Details
Events	Alcatel-Lucent ITM-NM/DHS	Events	Green	View Details
Events	Alcatel-Lucent ITM-SC	Events	Green	View Details
Events	Alcatel-Lucent OHC-R	Events	Green	View Details
Events	Alcatel-Lucent OS-OS	Events	Green	View Details
Metrics	Ansible Automation Controller	Metrics	Red	View Details
Events	Apache Pulsar	Events	Green	View Details
Metrics	AppDynamics	Metrics	Green	View Details
Events	AWS CloudWatch	Metrics	Green	View Details
Events	BMC Patrol	Events	Green	View Details
Events	BMC Patrol V9	Events	Green	View Details
Events	CA Spectrum V9.4 (CORBA)	Events	Green	View Details
Events	CA Spectrum V9.4 (CORBA)	Events	Green	View Details
Events	Ciena Blue Planet	Events	Green	View Details
Topology	Cisco APIC	Events	Green	View Details
Logs	Converge TRILOGUE INfinity	Events	Green	View Details
Logs	Custom	Logs	Green	View Details
Logs	Daniel PointMaster	Events	Green	View Details
Metrics	Dynatrace	Metrics	Green	View Details
Logs	ECI eNM	Events	Green	View Details
Logs	ELK	Logs	Green	View Details
Events	Email	Events	Green	View Details
Logs	FIFO	Events	Green	View Details
Logs	Genband IEMS	Events	Green	View Details
Logs	Generic 3GPP	Events	Green	View Details
Logs	Generic Log File Java	Events	Green	View Details
Logs	Generic Multi-Technology Operations Systems Interface (MTOSI)	Events	Green	View Details
Logs	Generic TMF814	Events	Green	View Details
Logs	Glenayre VMS	Events	Green	View Details
Logs	HPE Operations Manager	Events	Green	View Details
HTTP	HTTP Server Error Log	Events	Green	View Details
Logs	Huawei M2000 MML	Events	Green	View Details
Logs	Huawei U2000	Events	Green	View Details
Logs	Huawei U2000 (CORBA)	Events	Green	View Details
Logs	Huawei U2000 3GPP (CORBA)	Events	Green	View Details
Logs	IBM Cloud Platform Common Services Monitoring	Events	Green	View Details
Logs	IBM Tivoli Common Event Infrastructure (CEI)	Events	Green	View Details
Logs	IBM Tivoli EIF	Events	Green	View Details
Logs	IBM Tivoli NetView	Events	Green	View Details
Logs	IBM Turbonomic	Events	Green	View Details
Logs	IBM WebSphere MQ	Events	Green	View Details
Logs	iDirect Pulse	Events	Green	View Details
Logs	Java Socket	Events	Green	View Details
Logs	JDBC	Events	Green	View Details
Logs	Juniper Contrail	Events	Green	View Details
Logs	Juniper Contrail Alerts	Logs Events	Green	View Details
Logs	Kafka	Logs Events	Green	View Details
Logs	Kodiak EMS (CORBA)	Events	Green	View Details
Logs	Kubernetes	Topology	Green	View Details
Logs	Microfocus (HP) Network Node Manager I (NNM)	Events	Green	View Details
Logs	Microsoft Azure	Events	Green	View Details
Logs	Microsoft EWS	Events	Green	View Details
Logs	Microsoft SCOM 2012	Events	Green	View Details
Logs	Microsoft SCOM 2016	Events	Green	View Details
Logs	Microsoft Teams	ChatOps	Green	View Details
Logs	Microsoft Windows Event Log	Events	Green	View Details
Logs	Motorola OHC-R GSP9 (CORBA)	Events	Green	View Details
Logs	Netcool	Events	Green	View Details
Metrics	New Relic	Metrics	Green	View Details
Logs	Nokia Network Functions Manager for Packet	Events	Green	View Details
Logs	Nokia Network Services Platform	Events	Green	View Details
Logs	Nokia-Siemens ENSD (Server)	Events	Green	View Details
Logs	Nokia-Siemens EWSD (UNIX)	Events	Green	View Details
Logs	Nokia-Siemens Switch/Radio/vantage Commander (CORBA/3GPP V6.3)	Events	Green	View Details
Logs	Nokia-Siemens TNMS-SNMP Interface	Events	Green	View Details
Logs	Nortel DMS	Events	Green	View Details
Logs	Nortel EIF	Events	Green	View Details
Logs	Nortel Magellan NMS	Events	Green	View Details
Logs	Nortel Meridian	Events	Green	View Details
Logs	Nortel Preside EA1	Events	Green	View Details
Logs	PagerDuty	Events	Green	View Details
Logs	POS Snyder	Events	Green	View Details
Logs	Ping	Events	Green	View Details
Logs	Samsung Base Station Manager (BSM)	Events	Green	View Details
Logs	ServiceNow	Tickets Topology	Green	View Details
Logs	Simnet	Events	Green	View Details
Logs	Sitescope	Events	Green	View Details
Logs	Splunk	Metrics Log	Green	View Details
Logs	SSH	Metrics	Green	View Details
Logs	Standard Input	Events	Green	View Details
Logs	Syslog	Events	Green	View Details
Logs	Systodg	Events	Green	View Details
Logs	Tandem	Events	Green	View Details
Logs	Tandem SCP	Events	Green	View Details
Logs	Tandem U32	Events	Green	View Details
Logs	Wireless (CORBA)	Events	Green	View Details

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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

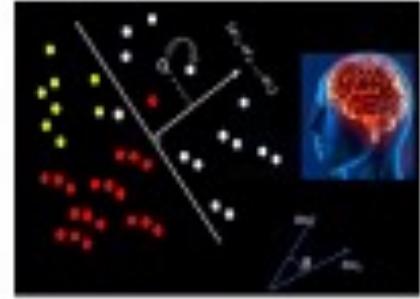
Leverage your existing Netcool Probes

Easy configuration and management



AI Analytics in Cloud Pak for AIOps

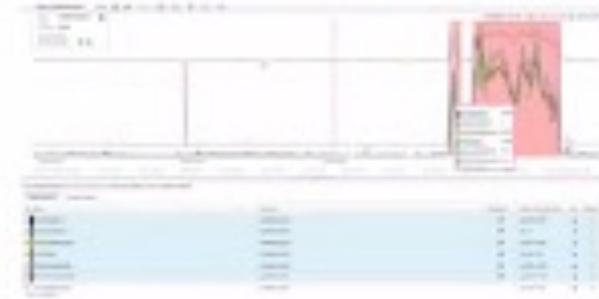
Log Anomaly Detection



Detect anomalies from log messages

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

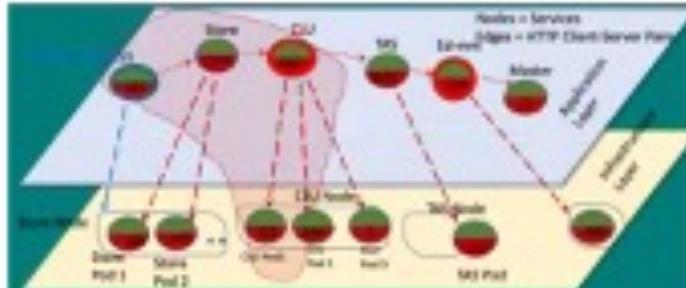
Metric Anomaly Detection



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

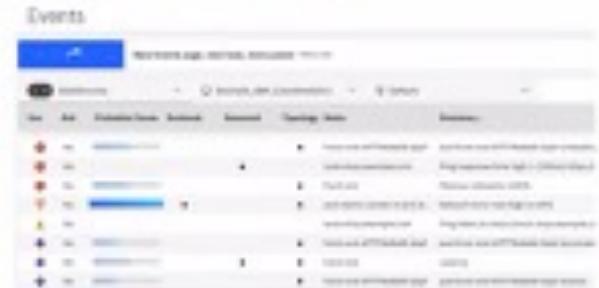
Fault Localization & Blast radius



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.

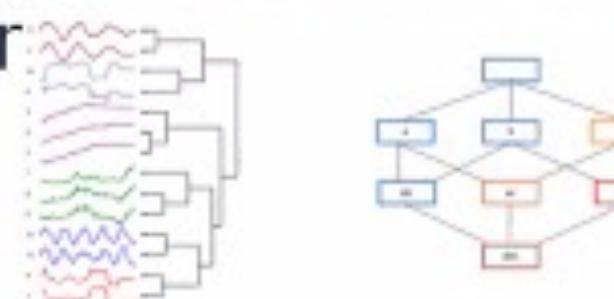
Probable Cause



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

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

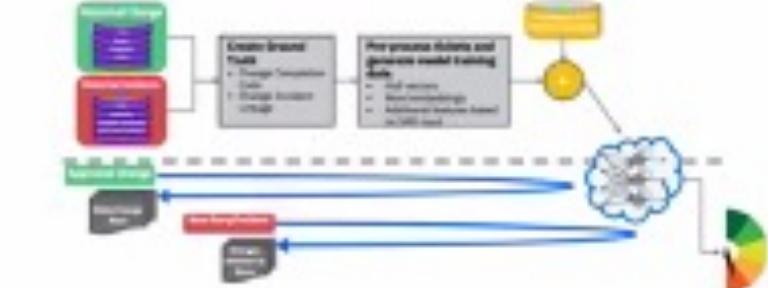
Incident Similarity



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

Probable cause
Analyzes across domain and application boundaries to determine the likelihood of an alert being the cause of an incident.

Events, topology Enabled

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.

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

Models

9 Resources

Resources with models
Resources without models

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Ansible Automation Platform & Cloud Pak for AIOps

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



The screenshot shows the Ansible Automation Platform interface. At the top, it displays '3691 HOSTS', '83 FAILED HOSTS', and '3 INVENTORIES'. Below this is a 'JOB STATUS' chart showing the number of jobs over time from 16:00 to 2:5. The chart shows a fluctuating trend with peaks around 280 and 300 jobs. Under 'RECENTLY USED TEMPLATES', there is a table with columns 'NAME', 'ACTIVITY', and 'ACTIONS'. The templates listed are 'Deployment pipeline', 'Rollback deployment', 'Deploy to development', 'Test application', and 'Deploy database'. Each template has a corresponding activity bar and a rocket ship icon in the 'ACTIONS' column.

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...

The screenshot shows the Cloud Pak for AIOps interface. The top navigation bar includes 'Cloud Pak for AIOps', 'IBM Automation', 'Automation policies / Policy templates /', and 'Assign a runbook to alerts'. The main area is divided into sections: 'Augment Ops' (with icons for contextual side-launch, manual actuation, automation, pipelines, explainability, and collaboration), 'Informed, Actionable Insights' (with icons for change tracking, event processing, fault localization, and probable cause analysis), and 'Probable cause alerts' (listing alerts for CPU usage and memory usage). A detailed alert for '/opt/ibm/java/jre/bin/java - Excessive CPU usage' is shown, with a complex diagram illustrating its cause-and-effect relationships across multiple nodes and processes.

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)

