CISCO
The bridge to possible

Supercharge & Drive Network Automation
In your Next-Gen Network with AIOps, Visibility and Event Correlation

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Agenda

- Introduction

- Functional architecture

- Overview of AIOps

- Full-stack observability (FSO)

- How FSO supports functional architecture

- Next Steps

Some definitions...

AIOps (Artificial intelligence for IT operations)

AIOps combines big data and machine learning to automate IT operations processes, including event correlation, anomaly detection, and causality determination.

*Gartner.com Definition

FSO (Full-stack observability)

A modern approach to gleaning insight into the performance of complex environments, applying analytics on deep and broad pools of telemetry data (metrics, events, logs, and traces) collected from an array of sources (applications, networks, internet, compute infrastructure, cloud services, Kubernetes, service mesh, microservices, etc.). Full-stack observability allows for easy visualization and troubleshooting of the entire software stack in one connected experience, including application performance monitoring, infrastructure monitoring, serverless monitoring, digital experience monitoring, and logs in context.

**Gartner Definition used in FSO Market Research Study conducted for Cisco March 2022

FSO (Full-stack observability)

Full-stack observability provides technologists with unified, real-time visibility into IT availability and performance up and down the stack for compute, storage, network, and public internet, from the customer-facing application all the way into the back-end. It enables IT operations, development, and networking teams to quickly and easily identify anomalies, understand root causes through dependency analysis, and fix issues before they affect end users and the business. And when this IT performance data is connected to business outcomes, technologists can rank issues based on their potential impact to the organization and prioritize actions accordingly.

***AppDynamics "Journey to Observability" Study March 2022

The journey to observability research

51%
Growing complexity of IT structure

45%
Increasing customer and end user expectations for exceptional digital experiences

41%
Increased concern about a major outage or service disruption affecting applications and digital services

Drivers for FSO (Full-stack observability)

50%
Improved IT productivity / less time spent 'fire-fighting'

46%
Reduced IT operational costs due to ability to quickly isolate and tackle performance issues anywhere in the IT stack

45%
Better able to prioritize IT innovation or activity based on where the biggest business impacts will be

Benefits of improved visibility across IT stack

39%
Implementation challenges

37%
Integration issues and concerns

34%
Concerns about increasing complexity as the organization scales

Biggest challenges moving to FSO

55%
Compute and storage infrastructure (traditional or cloud)
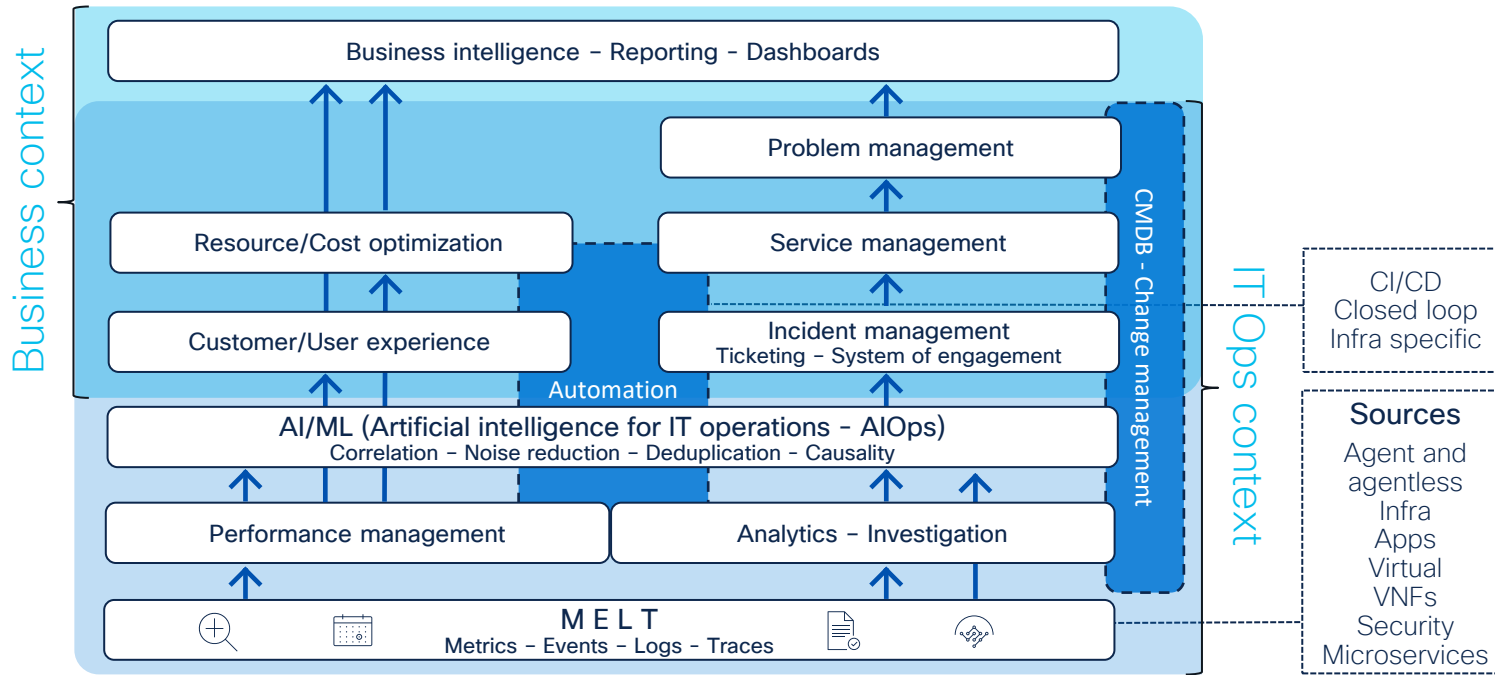
54%
Network infrastructure (traditional, cloud, or WAN)

49%
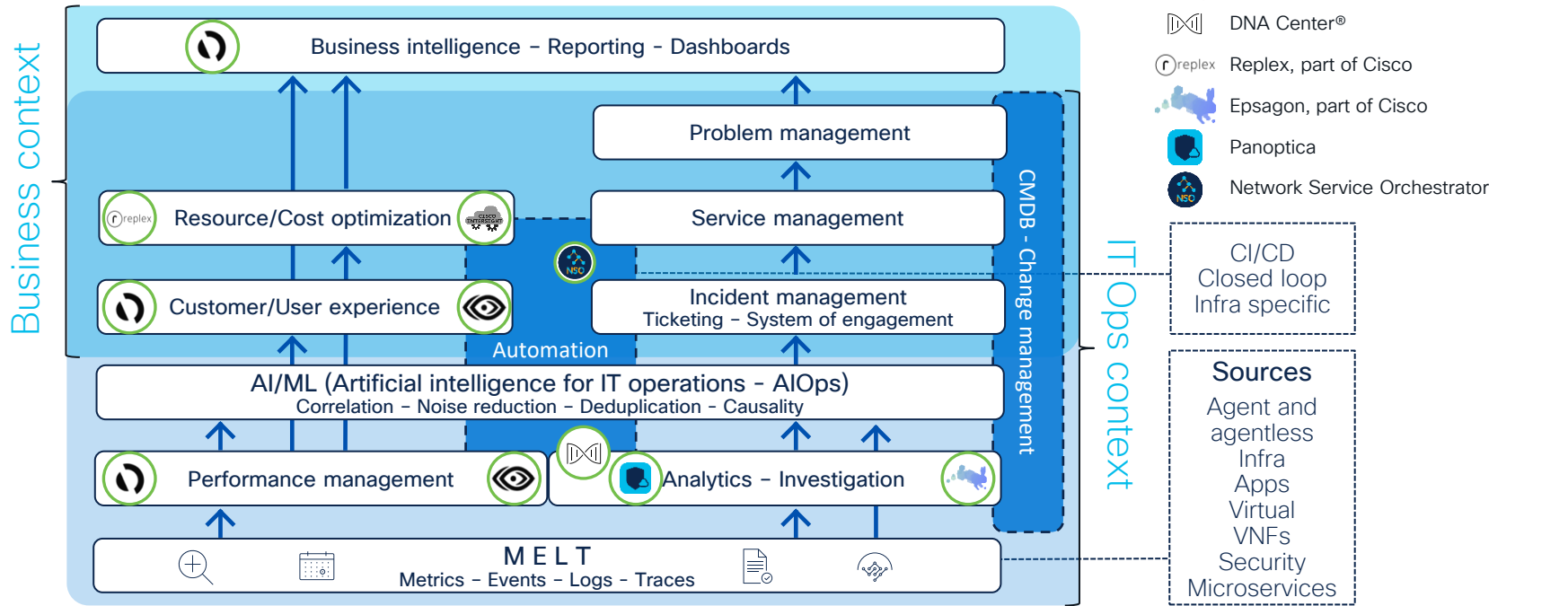Internal operational applications
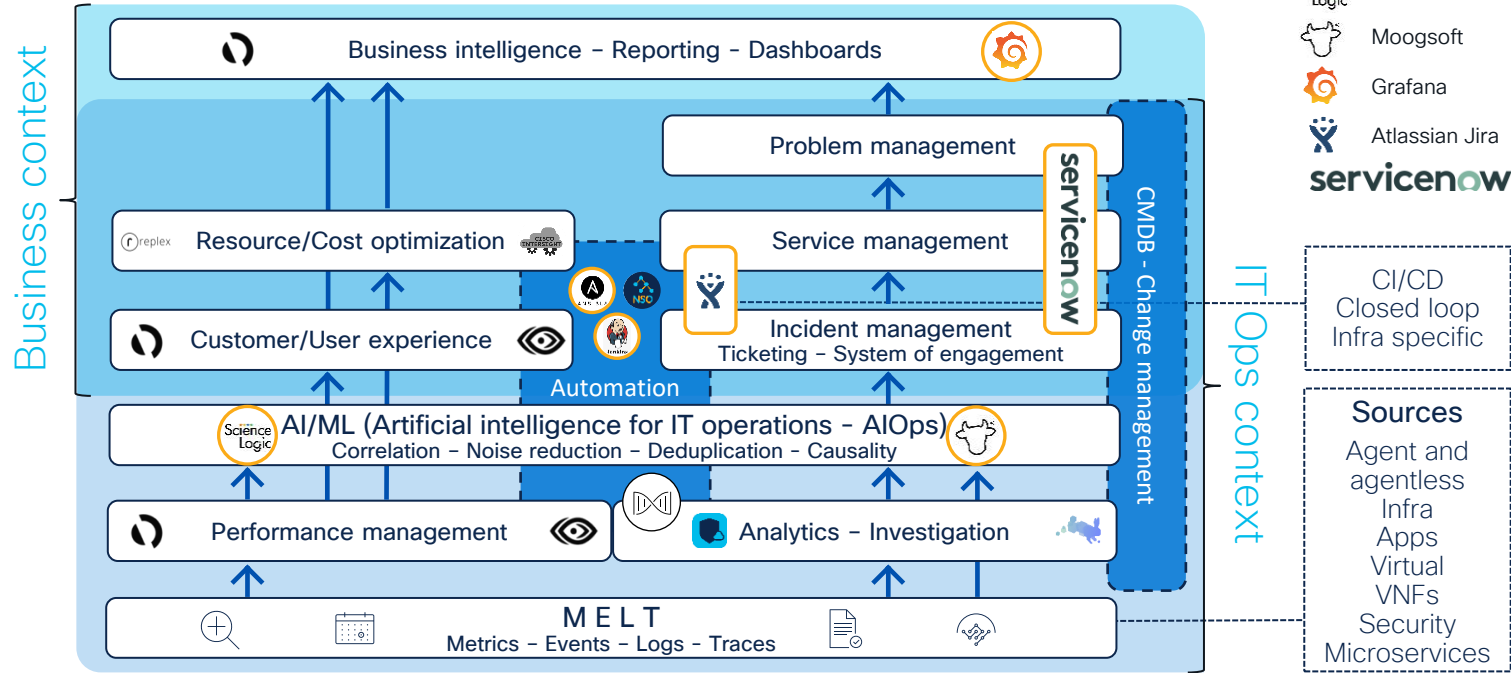
Focus areas for increased visibility
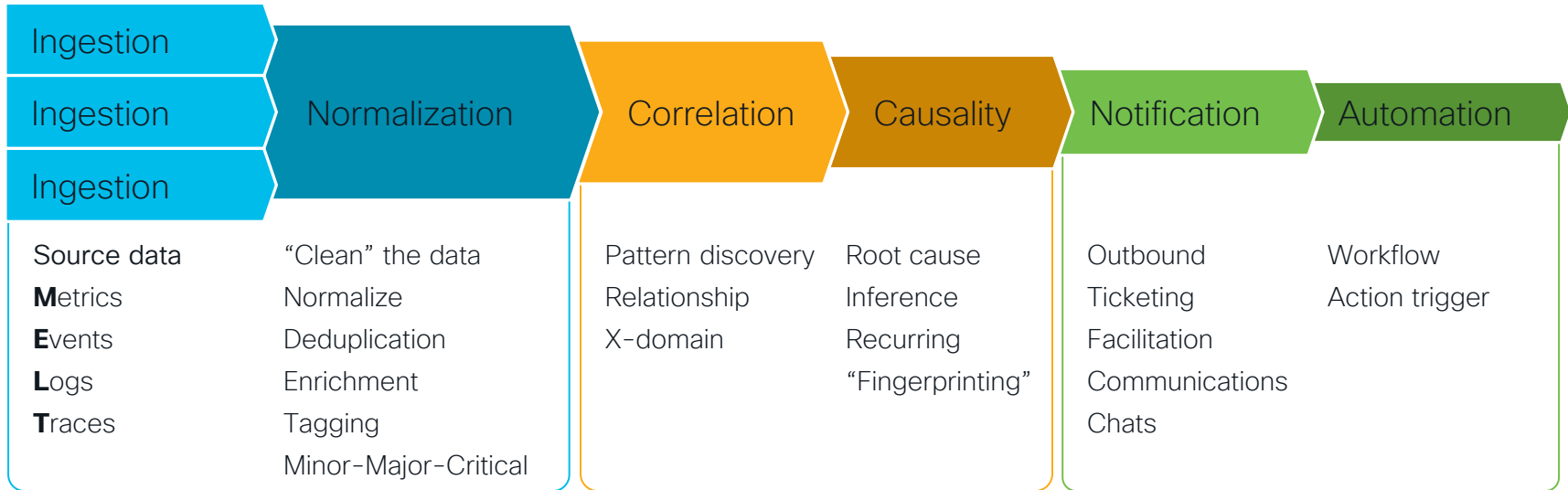
Functional architecture

Functional architecture

Functional architecture

Business context

- Business intelligence – Reporting - Dashboards
- Resource/Cost optimization
- Customer/User experience
- Problem management
- Service management
- Incident management
  Ticketing – System of engagement
- Automation
- AI/ML (Artificial intelligence for IT operations - AIOps)
  Correlation – Noise reduction – Deduplication - Causality
- Performance management
- Analytics – Investigation
- M E L T
  Metrics – Events – Logs - Traces

CMDB - Change management

IT Ops context

Partners
- Ansible
- Jenkins
- Science Logic
- Moogsoft
- Grafana
- Atlassian Jira
- servicenow

CI/CD
Closed loop
Infra specific

Sources
Agent and
agentless
Infra
Apps
Virtual
VNFs
Security
Microservices

Overview of AIOps
Key elements

Ingestion	Normalization	Correlation	Causality	Notification	Automation
Source data	"Clean" the data	Pattern discovery	Root cause	Outbound	Workflow
Metrics	Normalize	Relationship	Inference	Ticketing	Action trigger
Events	Deduplication	X-domain	Recurring	Facilitation	
Logs	Enrichment		"Fingerprinting"	Communications	
Traces	Tagging			Chats	
	Minor-Major-Critical				

Consider domain-centric vs. domain-agnostic when evaluating platforms – Not all elements may be available

Full-stack observability

with business context

Prioritize issues with business context »»

Full-stack
Visibility
Observable and optimizable
technology stack

Application performance	Application services and development	Network and internet
Data center infrastructure and clouds		Security (Dev and runtime)
Business outcomes and transactions		End user experiences
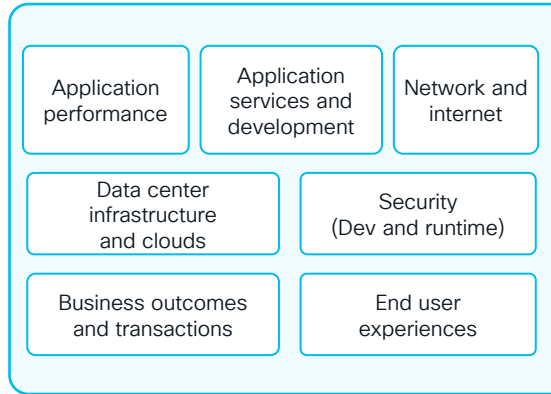
MELT and
open telemetry

Full-stack
Insights
Application and business
insights across stack

- End-to-end correlation and dependencies
- Shared common context of performance issues
- Prioritize issues with business and experience impact
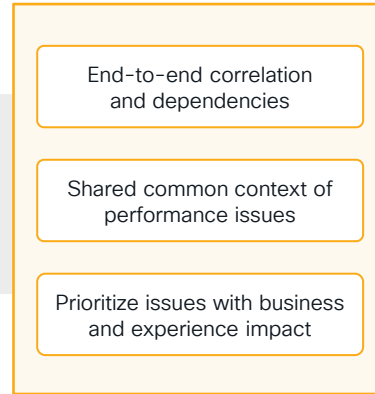
Transactions,
incidents, KPIs

Full-stack
Actions
Prioritized remediations and
optimizations across stack

- Application to infrastructure performance
- Cost and workload optimizations
- Application security detection and policy enforcement
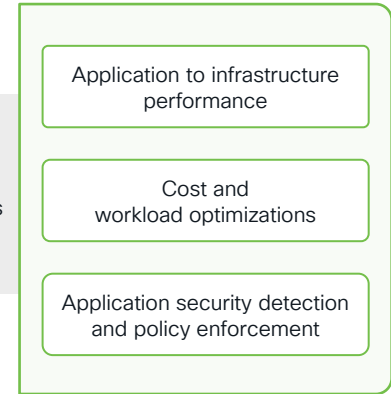
«« Full-stack actions for the business

Partner alignment to full-stack observability use cases

Hybrid application monitoring

Modern (cloud-native) application monitoring

Customer digital experience monitoring

Application dependency monitoring

Hybrid cost optimization

Application resource optimization

Application security

Scenario:
"Acme Markets"

Acme Markets is a countrywide grocery chain transforming its business in how it interacts, sells and delivers products and services to its customers.

New products and services added include a "RoadRunner" application that allows customers to order items for in-store pickup or home delivery. In addition, Acme Markets has begun looking at cashier-less, in-store shopping leveraging the latest in IoT technologies.

While Acme Markets' leadership is pleased with the progress of their digital transformation, they are finding it brings a new set of operational challenges. The CIO has identified observability and AIOps as a solution.
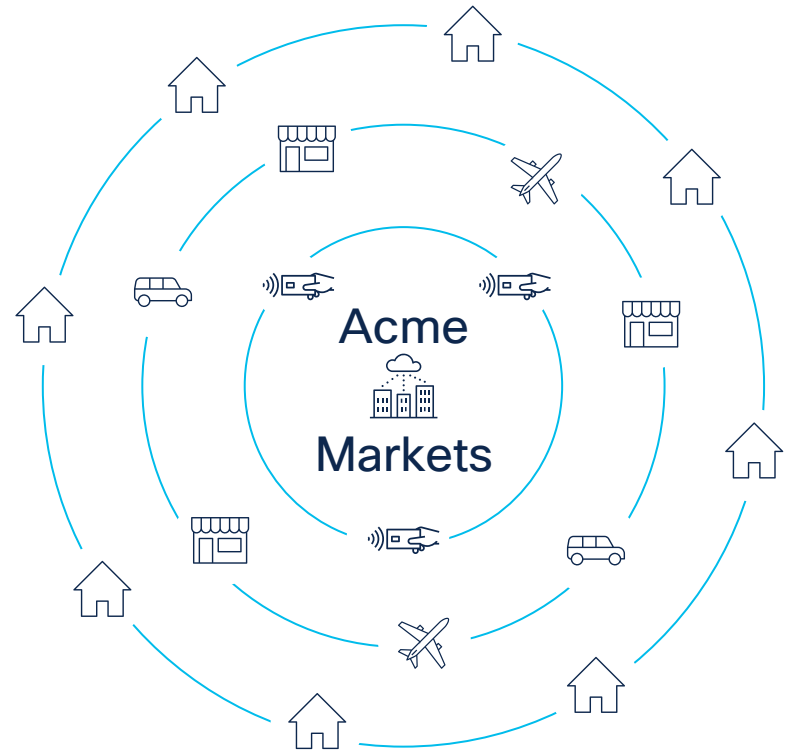
Acme Markets

Acme Markets' digital transformation journey

Acme Markets' transformation started with updated POS solution, in-store security/environmental controls, and courtesy Wi-Fi.

Their stores, headquarters, and distribution warehouses are connected by an SD-WAN solution that provides security and redundant connectivity.

Acme Markets hired a leading developer, "Bugs AppCo," to create the personal shopping app RoadRunner.

Acme Markets
A day in the IT Ops life

Payment gateway issues

Workload management

Redundant SD-WAN issues

"RoadRunner" retail application performance issues

Database issues at warehouse

DevOps team testing new release

Security breach from hacker Wiley Coyote

Payment gateway issues

0814h

Acme's MSP receives an alert that was generated from the ThousandEyes® agent located at "Payment GW Services" indicating a potential issue with processing time sensitive credit and debit card payments.

Metrics data is correlated into a single incident with other observability metrics. A new ticket is created and assigned to operator for action. Causality points toward issues with payment gateway provider.

The network operations center (NOC) operator reviews all the relevant information, sees the performance issues, and redirects traffic to an alternate payment gateway.

Private

M E L T

Incident record   CMDB
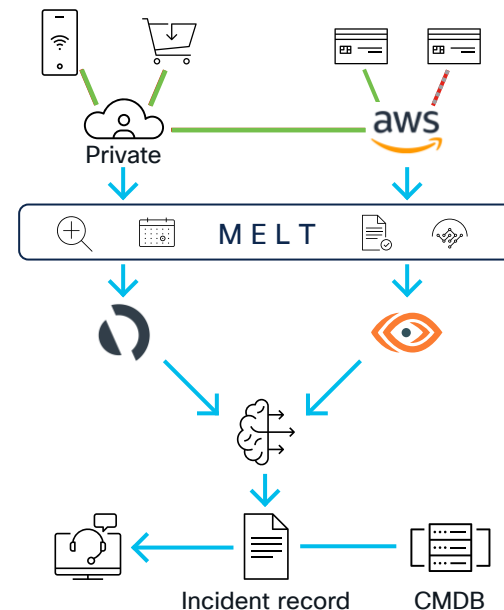
A day in the IT Ops life
# Workload management

1003h

Holiday sales result in a rapid increase in orders, both online and in-store. Demand has the potential to significantly degrade customer experience and could lead to loss of revenue.

Real user monitoring along with application performance metrics creates a ticket with causality pointing to lack of processing resources to support the POS application.

The network operations center (NOC) operator reviews all the relevant information, confirms lack of resources, and initiates automation script for Workload Optimizer to increase applicable resources to handle the increased order volume.

Private

aws

M E L T

Incident record   CMDB
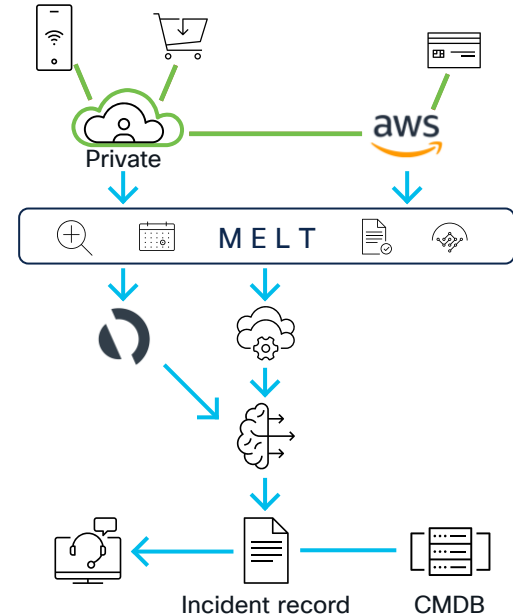
A day in the IT Ops life
# SD-WAN issue

1123h

Some of Acme Markets' stores and warehouses are experiencing random performance and overall application availability, affecting orders and customer in-store experience.

Metrics data is correlated across user monitoring, element monitoring, and network latency. Causality determined localized issues with a regional carrier.

The network operations center (NOC) operator reviews all the relevant information. ThousandEyes® clearly shows a carrier's POP is derogated and suggests an alternate route. After traffic is re-routed, normal operations resume.

SD-WAN SD-WAN

aws

Private

MELT

Incident record   CMDB
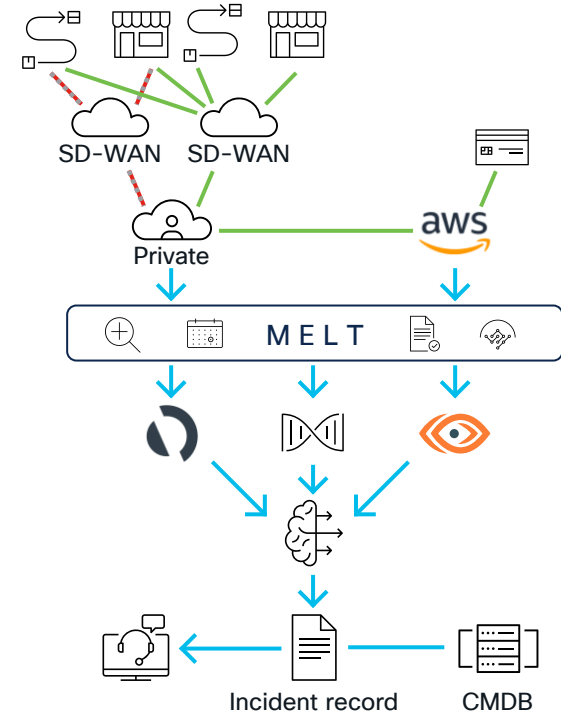
A day in the IT Ops life
# Retail app performance issues

1337h

After the DevOps team deployed a new feature to the RoadRunner App, customers are having a poor experience.

Metrics data is correlated across user monitoring, element monitoring, and network latency. Causality determined a bug in the RoadRunner App specific to the user interface with Apple devices.

The network operations center (NOC) operator reviews all the relevant information and engages the DevOps team, who review the code and push an immediate fix.

Private

aws

MELT

Dev-Ops

Incident record   CMDB
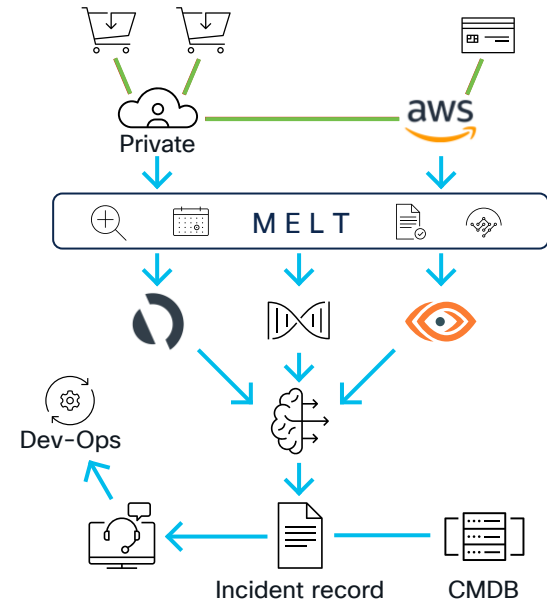
Database inventory issues

1352h

Staff at all of Acme Markets' warehouses are unable to complete orders because the inventory system is unavailable. Just-in-time deliveries are at risk to the retail stores and customers.

Metrics data is correlated across user monitoring, element monitoring, and network latency. **Causality determined the database cluster caching issues in the public cloud instance.**
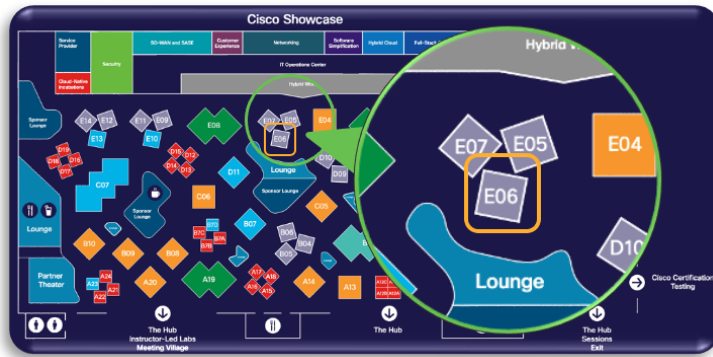
The network operations center (NOC) operator reviews all the relevant information, sees that this incident matches a known problem, and executes a script to clear cache and restore normal operations.

Private

aws

MELT

ANSIBLE

Incident record

CMDB
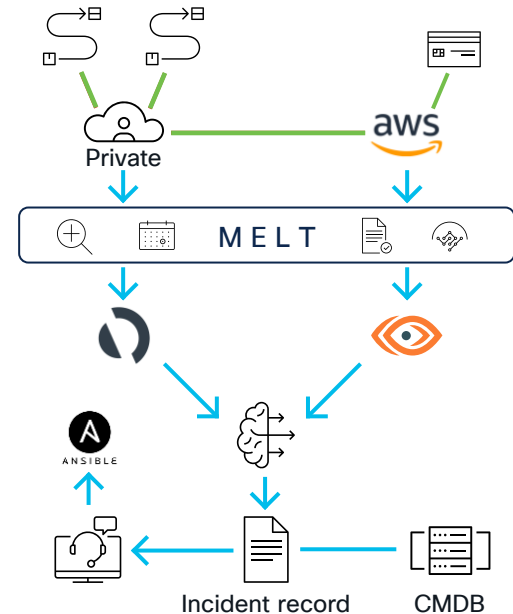
Next steps

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Successful Managed Campus in the New Hybrid World	The Journey into the Next Artificial Intelligence for IT Operations (AIOps)	**Making Hybrid Work...Work:** Learn How Managed Services Make it Easier to Optimize the Hybrid Work Environment
Thur. 9th Feb 14:15 – 15:15	**Thur. 9th Feb 16:00 – 16:30**	**Fri 10th Feb 11:00 – 12:00**
Cisco Sovereign Cloud	Elevate your Managed Services Practices with the Fast and Furious Velocity Managed Services Offers from Cisco (For SPs)	How to Supercharge your Next-Gen Network with AIOps and Managed Services

Next Steps

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14:15-15:15**

Cisco Sovereign Cloud

**Thur. 9th Feb
16:00-16:30**

Elevate your Managed Services Practices with the Fast and Furious Velocity Managed Services Offers from Cisco (For SP's)

**Fri 10th Feb
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