CISCO Connect

Observe, Assure, Automate

Drive resiliency with AgenticOps for Critical Networks

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Sept 2026

Agenda

01 Network evolution and growing pains

02 Simplification and digital resilience – the key to future networking

03 Agile Services Networking – simplify, observe, assure, automate

04 Use cases

05 Call to action

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Network connectivity

The **objectives** have not changed...



Simplified and autonomous operations



Increased service resiliency



Lowest TCO and carbon footprint



New monetization opportunities



Unparallelled customer experience

... but the **architectural imperatives** and **ecosystem** have

The rise of AI

New players in the market

Highly sophisticated bad actors

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Growing network demands driven by AI

AI Network Traffic

is already reshaping infrastructure needs

- Inference traffic is small today, but it is growing exponentially
- Inference quality and resiliency become critical as traffic grows
- By 2035, AI becomes a material share of total network traffic

By 2031

AI traffic will

exceed

non-AI traffic[2]

By 2033

62%

of all network traffic will be AI traffic[2]

1-2 – Omdia: CSPs' infrastructure strategies for AI traffic and performance requirements
Openrouter.ai/rankings

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The new landscape for connectivity









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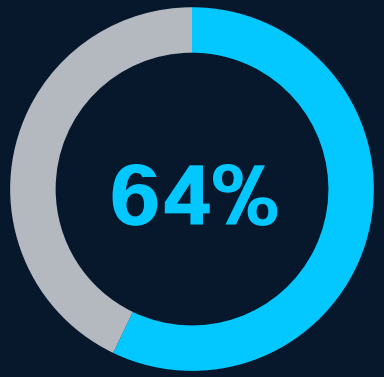
Unplanned downtime impacts critical networks

Unplanned downtime

$2.3 million per hour

The automotive manufacturing sector suffers the most impact from downtime[1]

Complexity



64% of enterprises use an average of 4 to 6 tools to try to resolve network issues[2]

Business impact

$400 billion

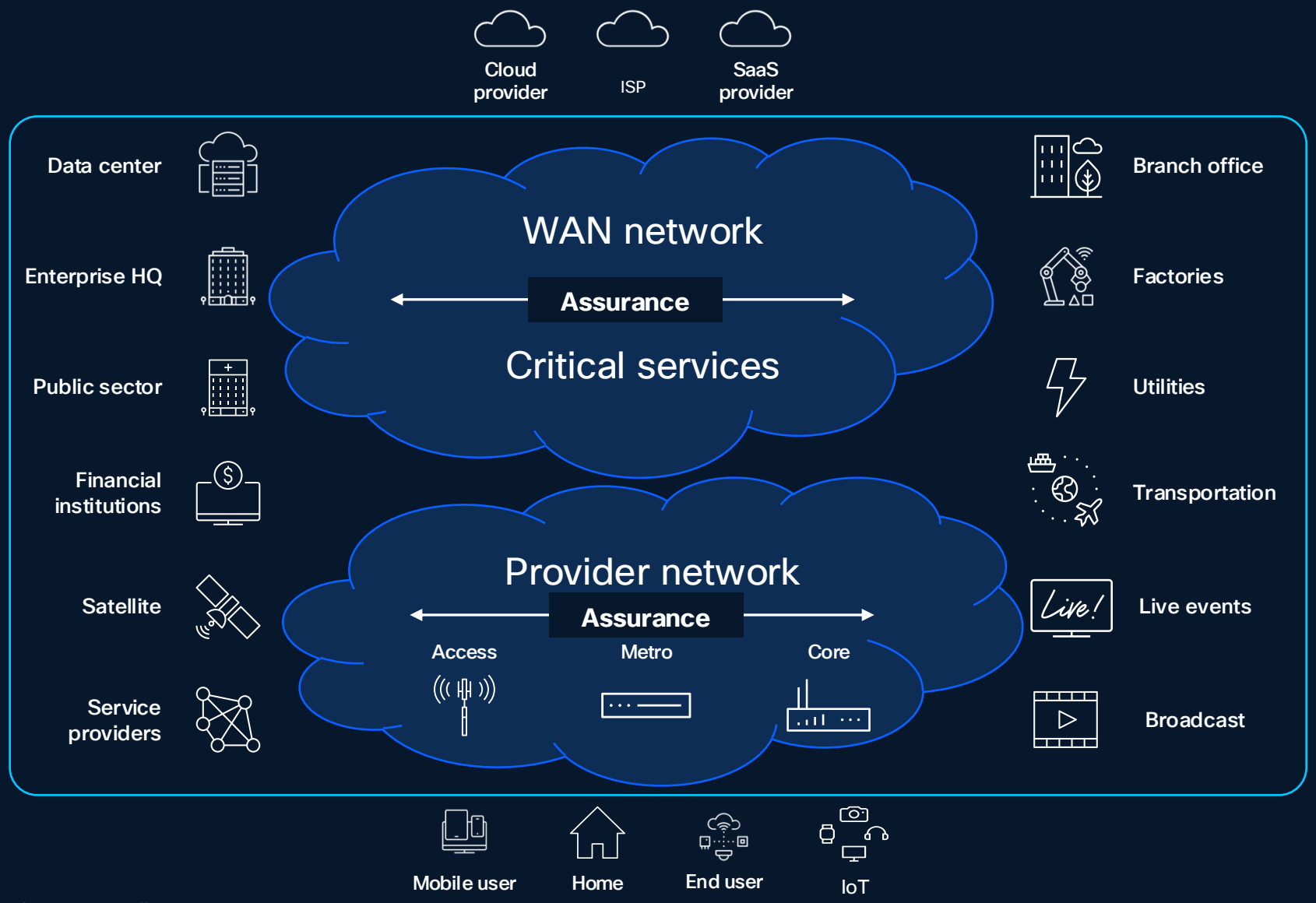
Annual cost of downtime for Global 2000 companies[3]

Lost productivity, higher costs, and negative user experiences

Sources:
1: Siemens; 2: EMA; 3: Splunk

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Critical networks need guaranteed packet delivery



Critical networks:

- Factories, utilities, transportation
- Public sector
- Financial institutions
- Data center interconnects
- Enterprise to branch offices

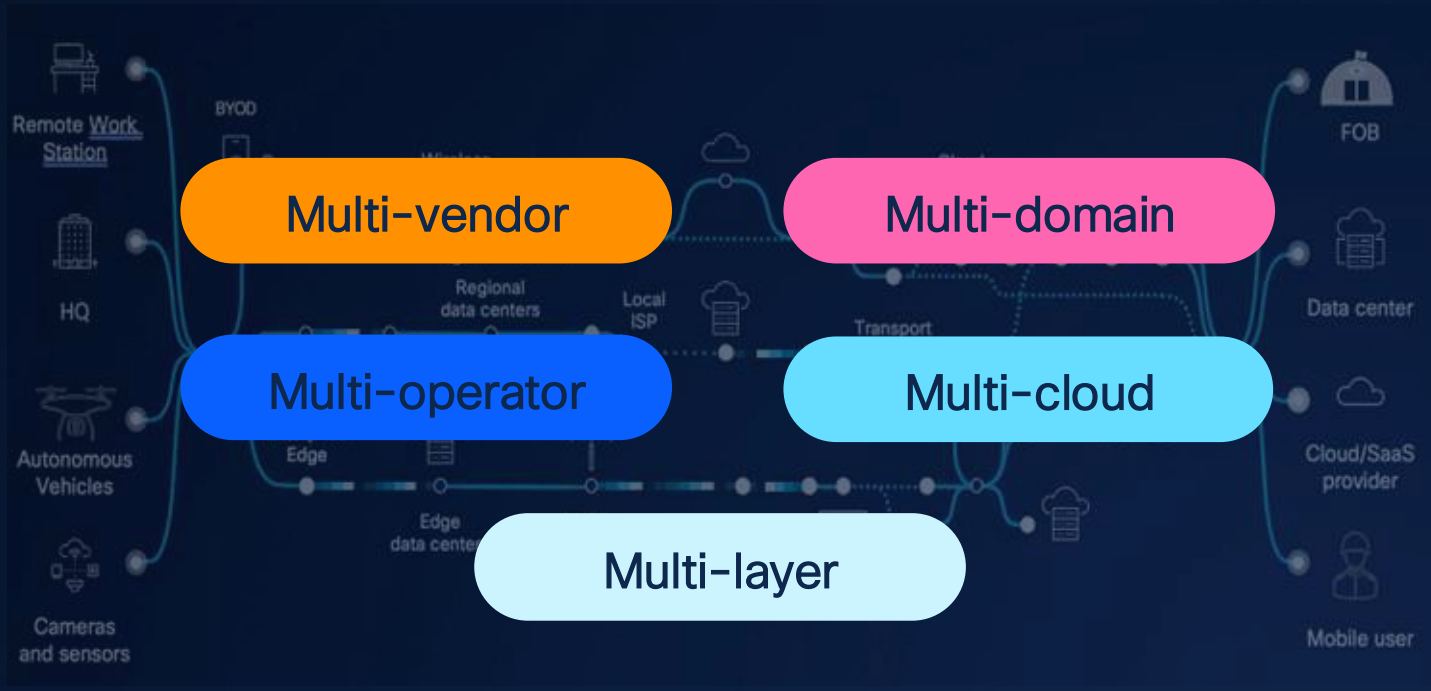
Service providers:

- Mobile/access to core
- B2B and wholesale
- Satellite
- Live events and broadcasts

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Complexity of the Wide Area Network is Increasing

- Higher demands on networks and services
- Complex & distributed network; fragmented tools
- Performance visibility silos
- Expensive site visits
- Lengthy resolution times



Multiple layers, vendors and domains
Silos of network & service data

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The BIG question

How do you keep the organization, services and connectivity stable and minimize impact in the face of any disruption, as network requirements evolve?

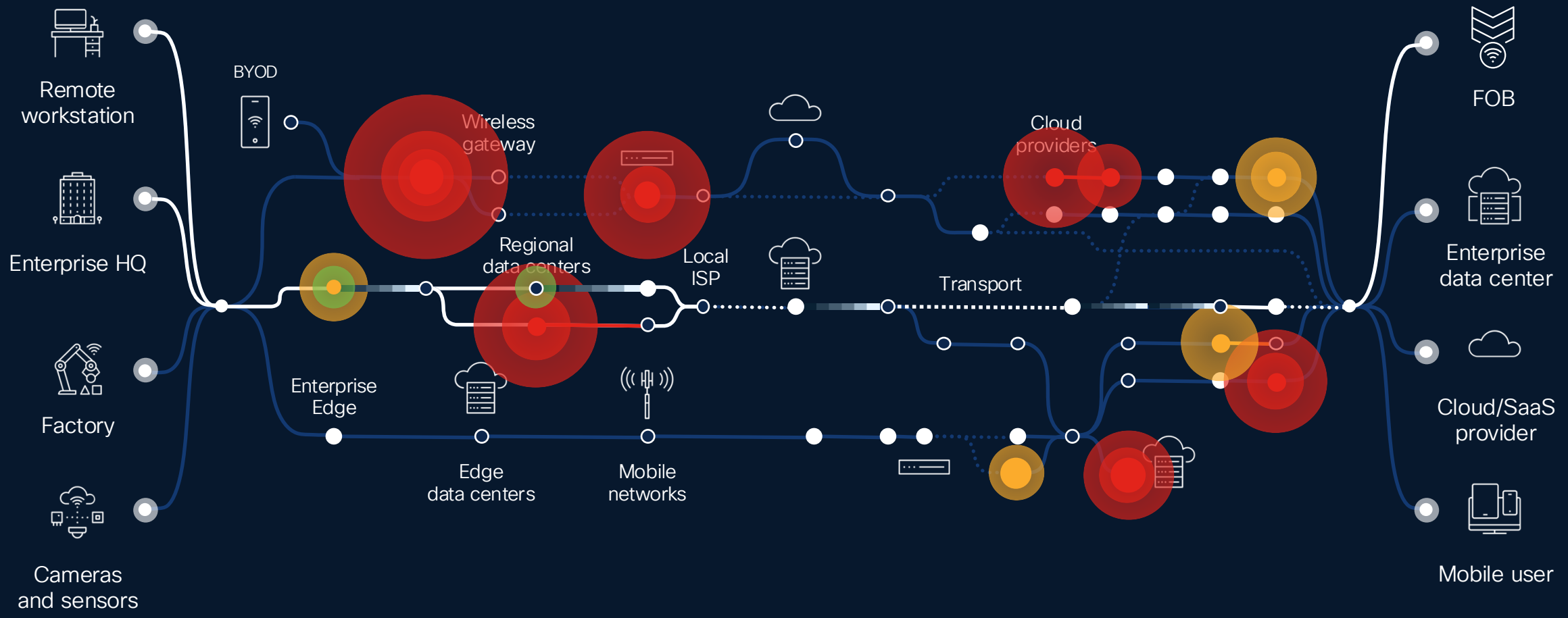


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What really impacts network service outcomes

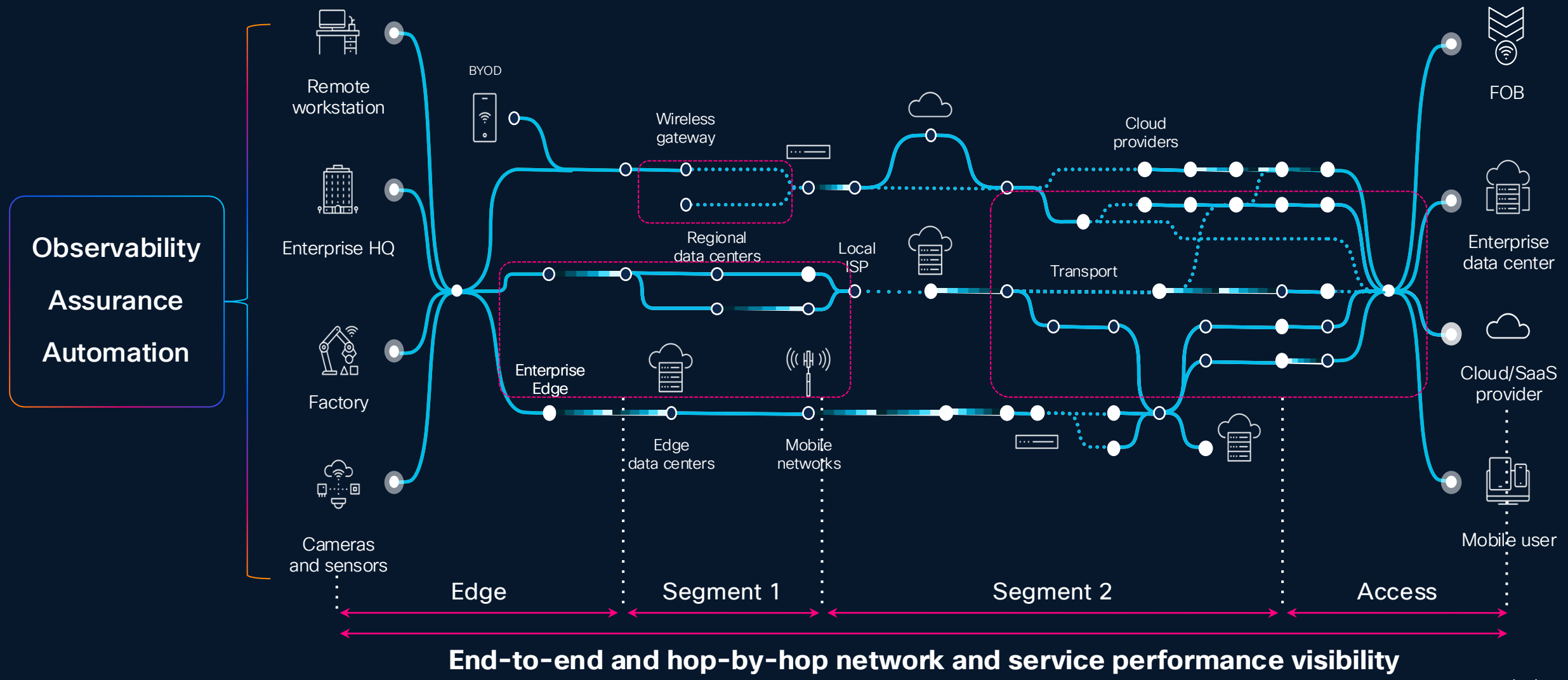
Transient network path performance on the packet delivery from point A to B

Everything in the network can impact the “quality” of delivery to the target



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The end goal: sustained and stable packet flow for critical services



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Pillars of Network Resilience & Architectural Simplification

Simplified and faster network deployment	Flexible service delivery closer to end-user demand	High performance, scalability and reliability	Unified cross-domain insights and streamlined operations	Seamless end-to-end service delivery
Unified silicon	Routing platforms	IP/optical convergence and pluggable optics	Observability, automation and assurance	Network programmability

Security everywhere

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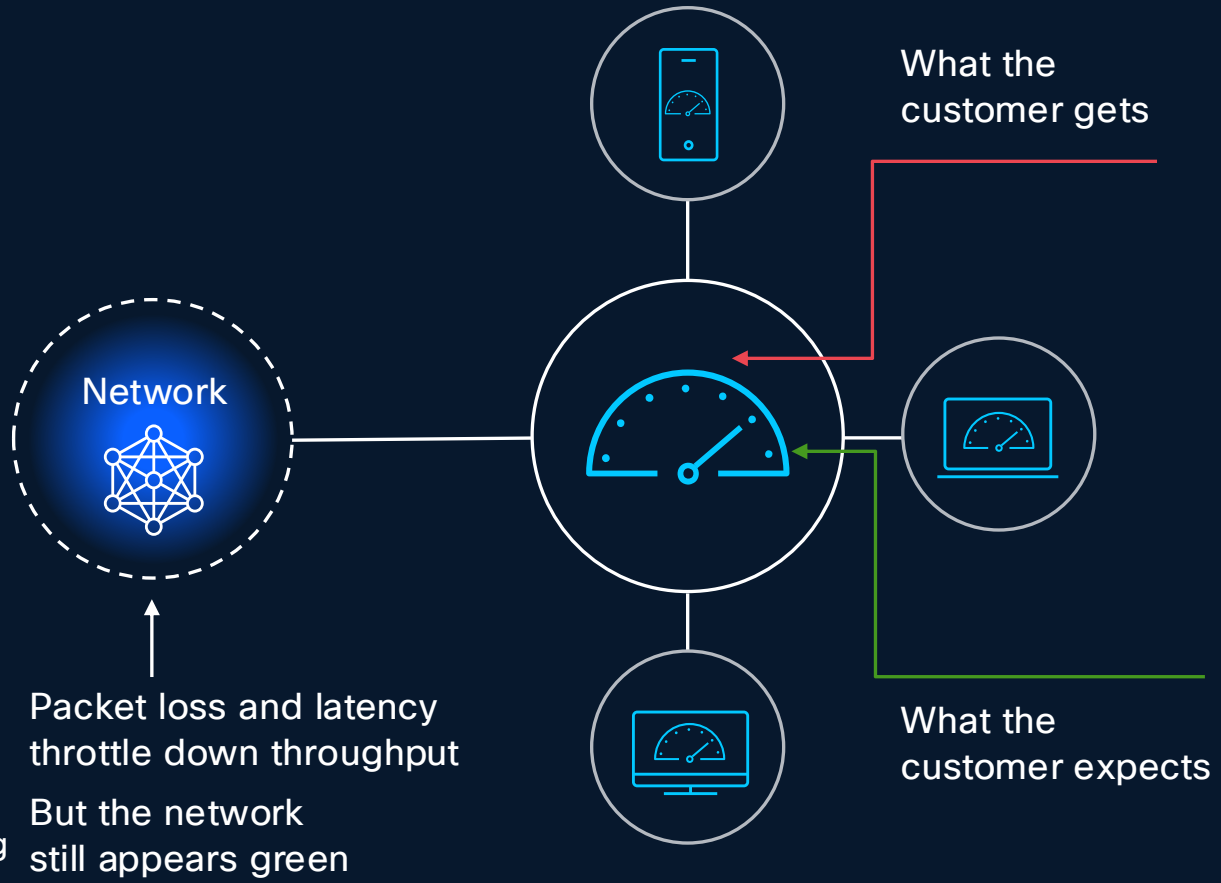
Impact of Network Anomalies

Without deep visibility into micro events:

- 0.53% packet loss leads to a 50% decrease in data throughput
- 5 ms delay leads to a 10% decrease in data throughput

Impact on AI Workloads up to

- 1% packet loss 95% idle GPU
  - 1% packet loss can contribute to a scenario where GPUs are idle up to 95% of the time due to waiting on delayed or retransmitted data in the network, severely impacting training performance in AI/ML workloads.



The quality of the network has a major influence on user quality of experience (QoE)

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Most tools are ineffective at detecting today's QoE issues

Without deep visibility into micro events:

- 0.53% packet loss leads to a 50% decrease in data throughput
- 5 ms delay leads to a 10% decrease in data throughput
- 10 ms jitter leads to a 10% decrease in data throughput

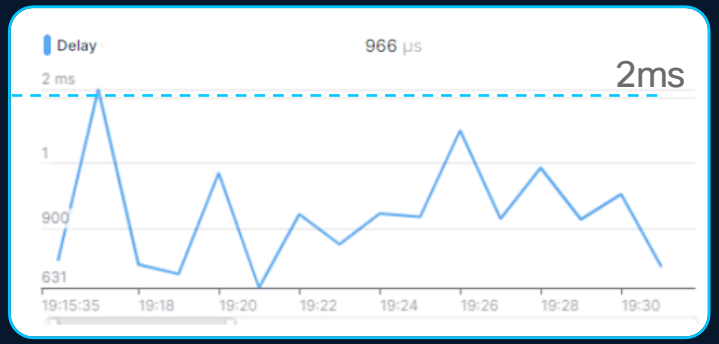
Reliable data = Efficient Outcomes

Reliable data = Efficient AgenticOps

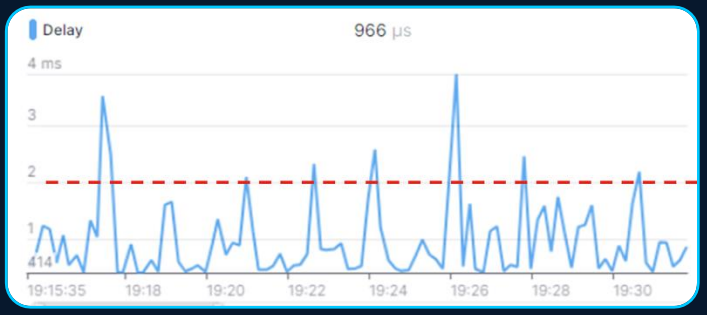
Low accuracy

High accuracy

Perception



Reality



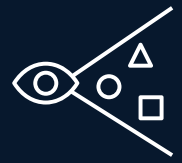
The quality of the network has a major influence on user Quality of Experience (QoE)

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Reliable Data = Efficient Outcomes

Accuracy and granularity





Low accuracy

Perception



Everything looks fine! Latency is below threshold



Choosing the right tool for the job

High accuracy

Reality



Customer is impacted! SLA is breached

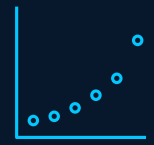
AI/Analytics is only as good as the input data

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Be Proactive, Not Reactive



Continuous measurement = Baseline



Enrich, correlate, predict

And if things go wrong



Fast troubleshooting



Proof of innocence

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Provider Connectivity Assurance Solution Overview

Actions

Insights

Visibility

Open automation and APIs

Open data and alerts

Network Automation

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SaaS

On-Prem

Air-Gapped

Management, automation, data collection and analytics



Metrics from other sources

Cisco, 3rd party

Native Synthetic Test Reflection

IPSLA

N

Hardware Sensor Layer

With embedded PM

Software Sensor Layer

Containerized and horizontally scalable

Granular and Proactive Visibility

Sub-second sampling

1-way metrics

50+ KPIs

µSec resolution

User Personas and Use Cases

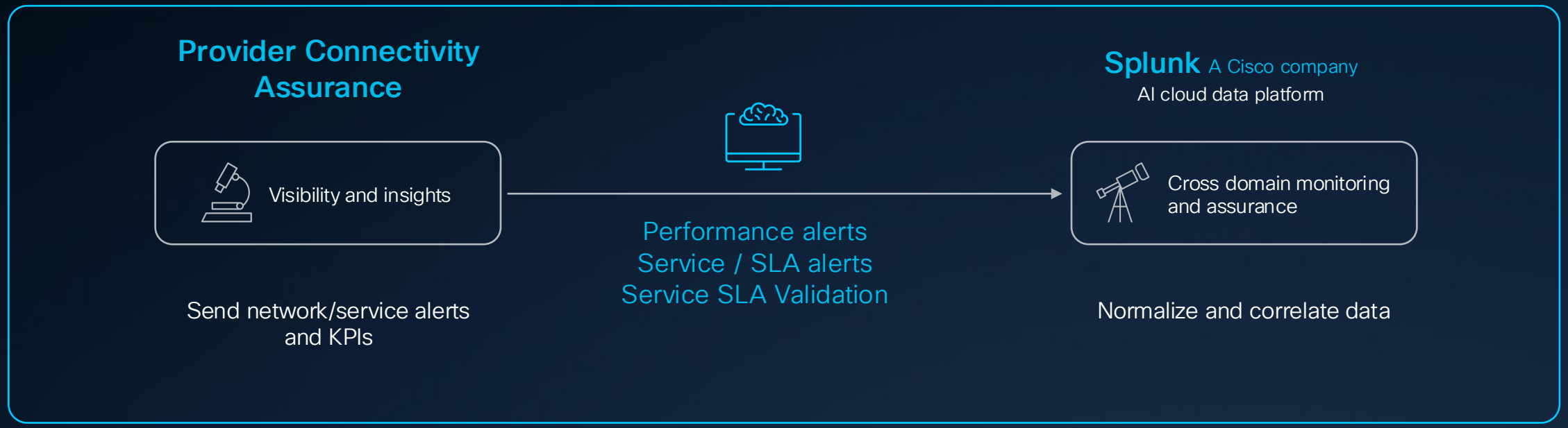
- End customers
- Service managers
- Engineering
- Operations
- Capacity planning
- IT and network

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Observe and Assure

- Simplify operations with a unified view of user experience
- Identify, prioritize and predict user-impacting events
- Drive automated decisions to accelerate resolution



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Outcome of Operational Simplification With Automation, Observability & Assurance

Pre-failure detection

Continuity of offered services, education, research contested environments C2 / ISR etc.

End-to-End validation of connections

Observability across diverse environments



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Autonomous networks – AI for operations

Automate network operations

AI-enabled operations across service and device lifecycle

AI-powered capacity planning and forecasting

Intent-based provisioning and health monitoring

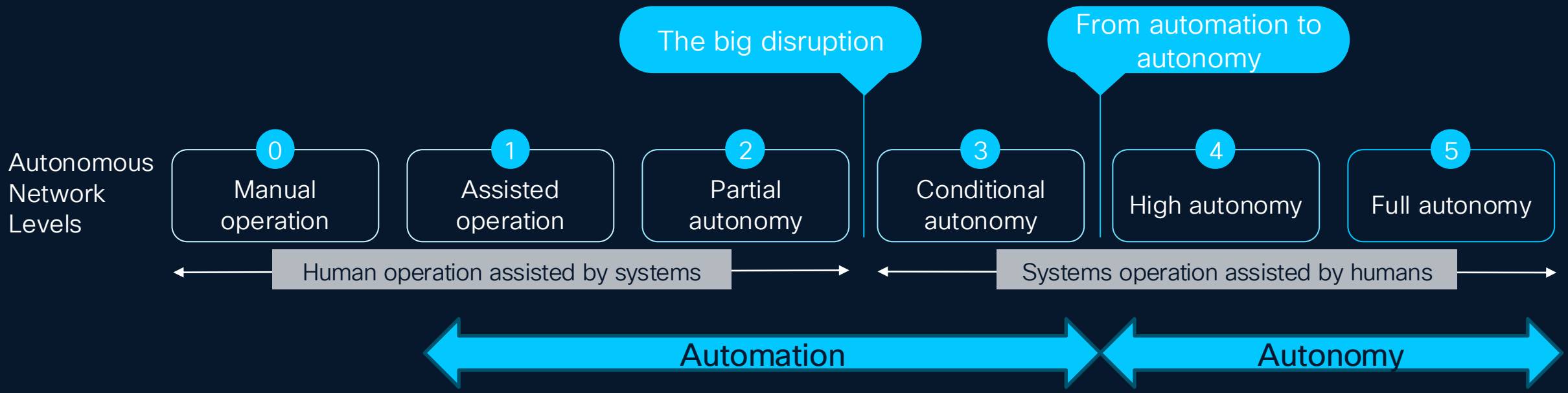
Multi-layer, multi-vendor management and operations

Closed loop automation



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The Journey to Autonomous Networking



84%

of companies are currently at initial levels of automation

61%

aiming to achieve Level 3 or above by 2028

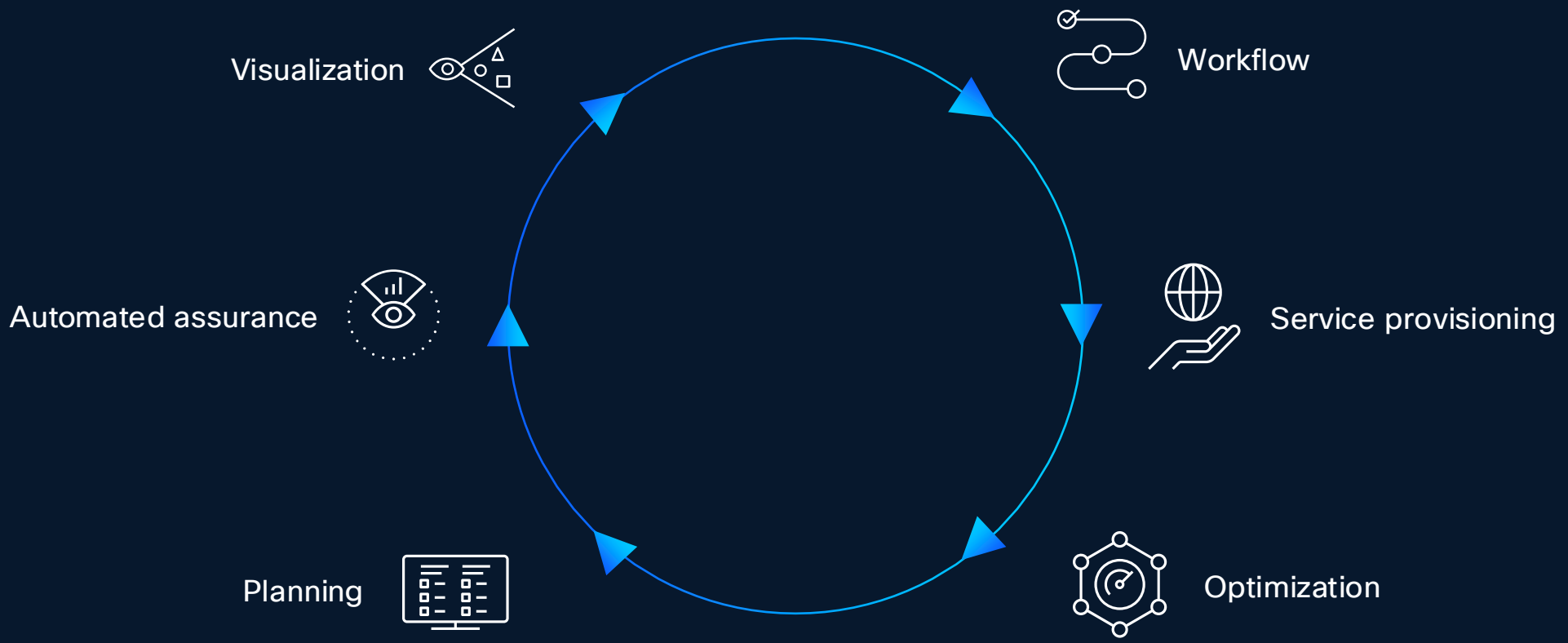
Source: Cap Gemini "Capgemini Research Institute, Autonomous Telco Networks Survey, December 2023 – January 2024

Source: https://inform.tmforum.org/research-and-analysis/reports/autonomous-networks-exploring-the-evolution-from-level-0-to-level-5

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Autonomous networks - AI for operations

Complete lifecycle of network operations

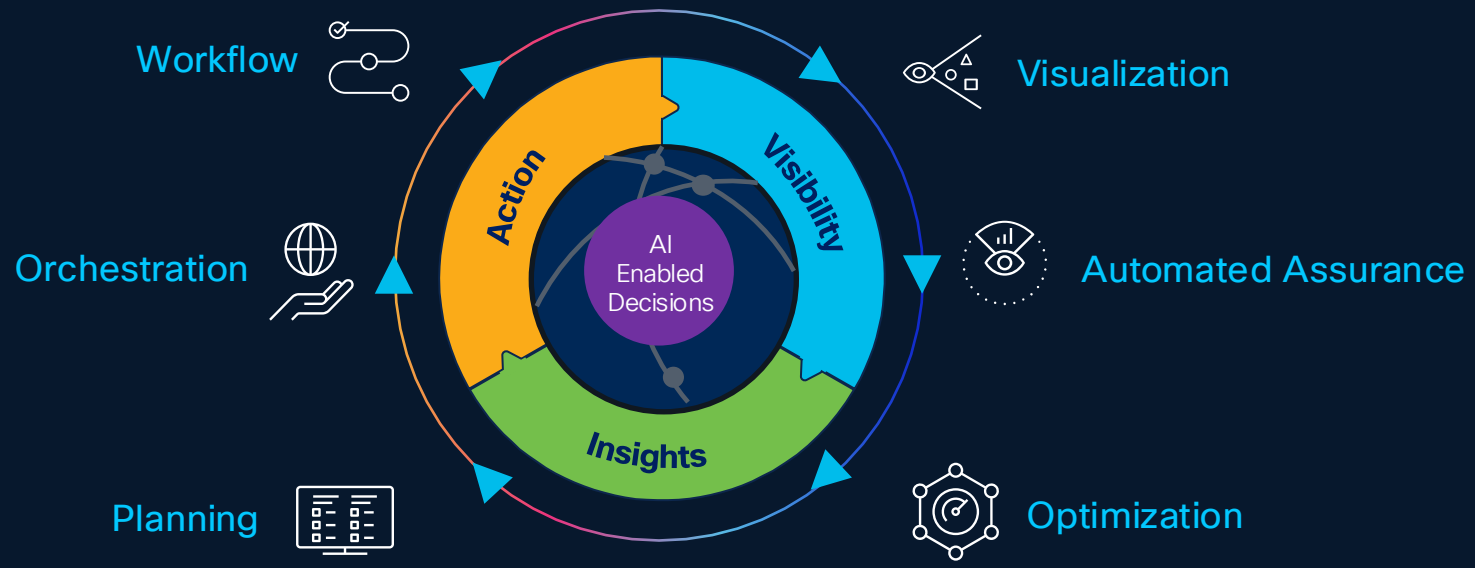


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Crosswork Automation & Assurance

AI-enabled, multi-vendor automation of the complete lifecycle of network operations

- Most Comprehensive Functions
- Intent-driven Automation
- Modular, Multi-vendor & Extensible
- Multi-agentic AI
- Low-code/ No-code Experience
- Scalable, Resilient & Secure
- Deep Visibility & Analytics



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Scaling Operations with Intelligence & AI



- Multi-agentic framework for AgenticOps and decision-making
- Delivered as features to existing Crosswork applications
- Future integration with Cisco AI Assistant and AI Canvas
- SDK for 3rd-party agent development

Today → **Goal**

Reactive

Minimize the impact of network incidents

- Time series anomaly detection
- Root cause analysis

Improve operational KPIs and reduce churn

Preventive

Reduce the occurrence of network incidents

- Risk factor identification
- Automated maintenance

Improve customer experience and optimize operations

Prescriptive

Automatically align network operations to policy/intent goals

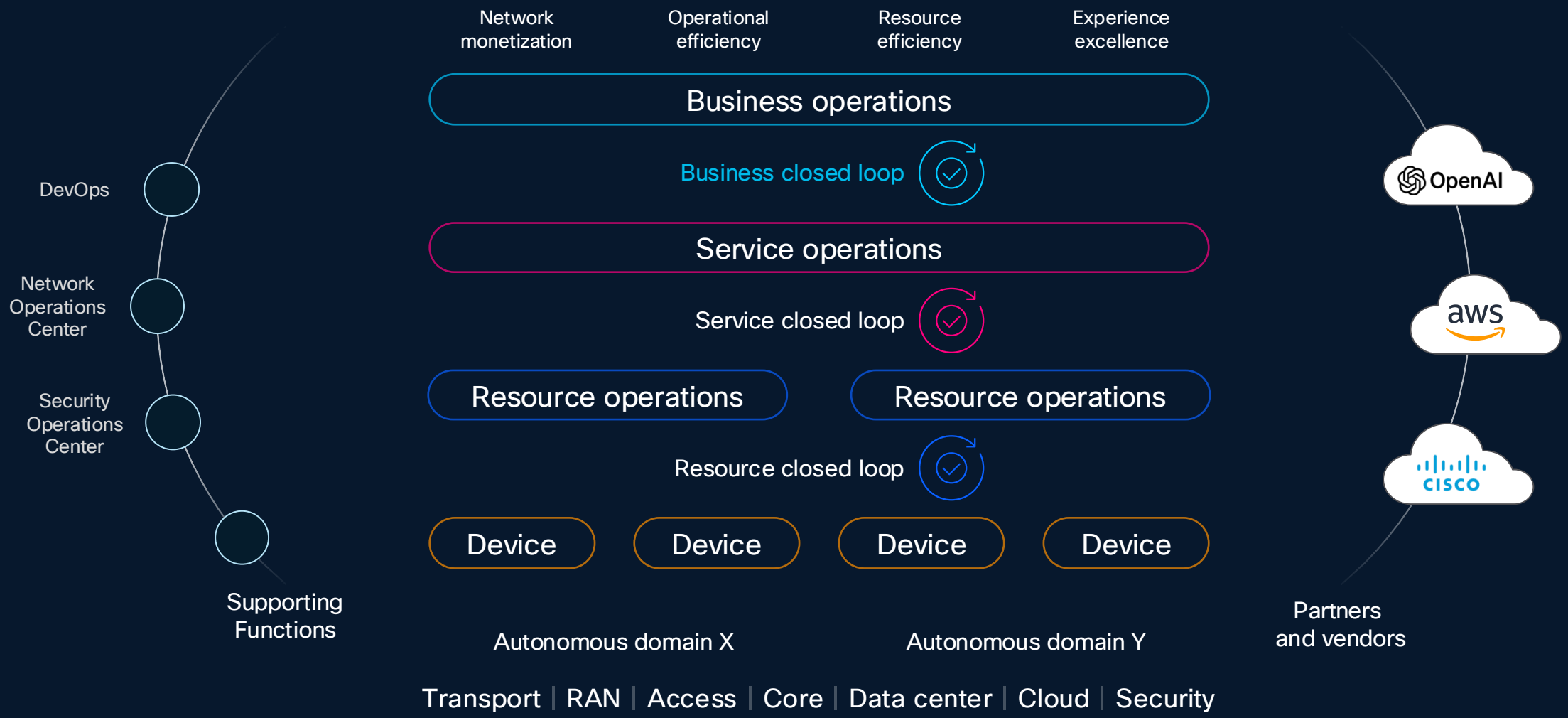
- Operational recommendations
- Co-pilot code and config generation

Simplify operation lifecycle and reduce time-to-value

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Autonomous networking requires a system view

Autonomy, abstraction, collaboration, closed loop

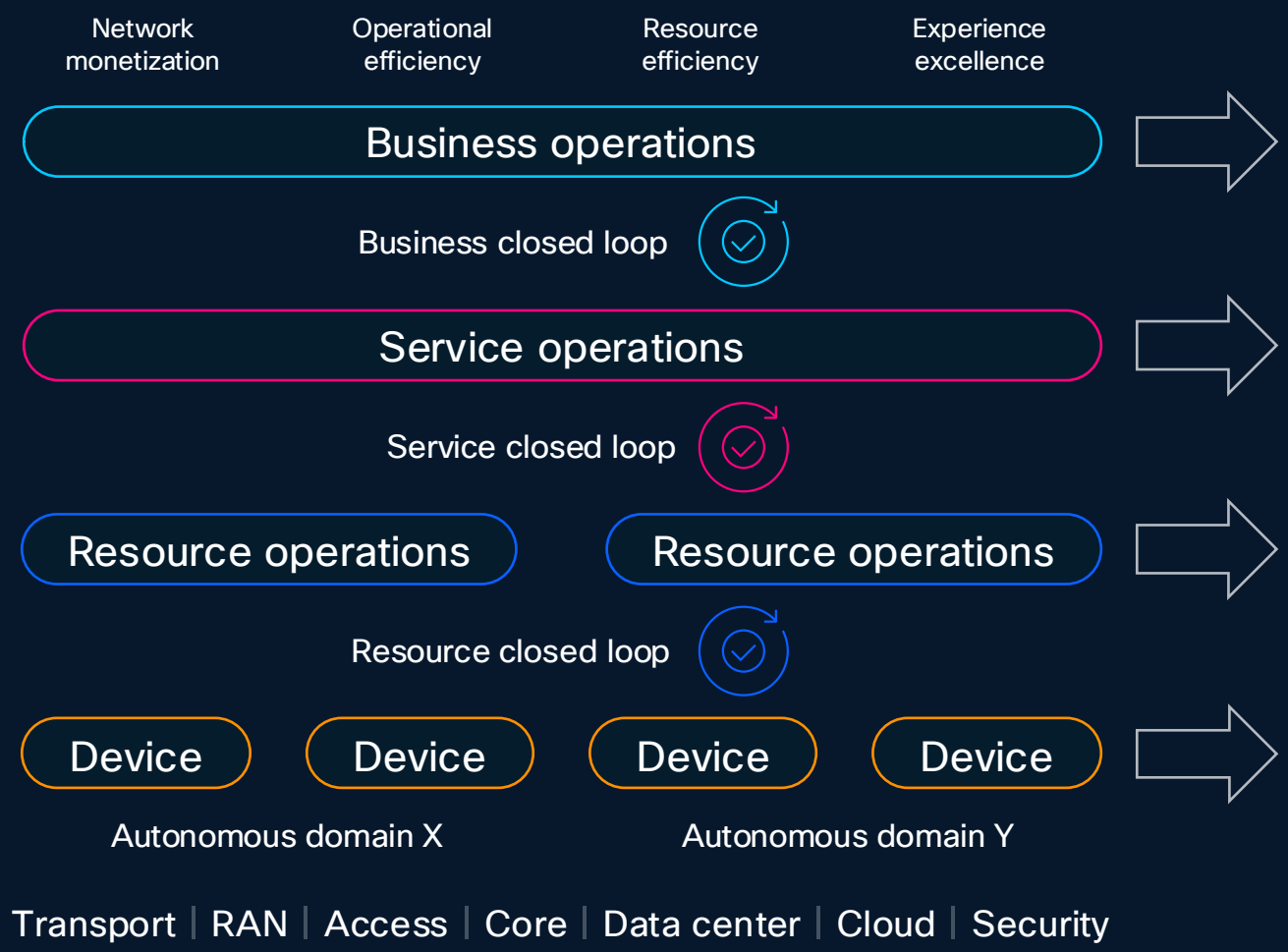


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"Autonomous Networks Business Requirements & Architecture", TM Forum

Autonomous networks – AI for operations

Multi-layer data intelligence – foundational for AgenticOps



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Ingested data:
- Order management
- Ticketing
- BSS

Use case:
- Churn analytics
- Campaign analytics
- Partner analytics

Ingested data:
- Service health
- Service E2E assurance
- Gaming experience

Use case
- Root cause analysis
- Service KPI monitoring and predictions
- Automation repair

Ingested data
- Network topology
- Network failures (routing events)

Use case
- Custom network maps
- BGP route reflector

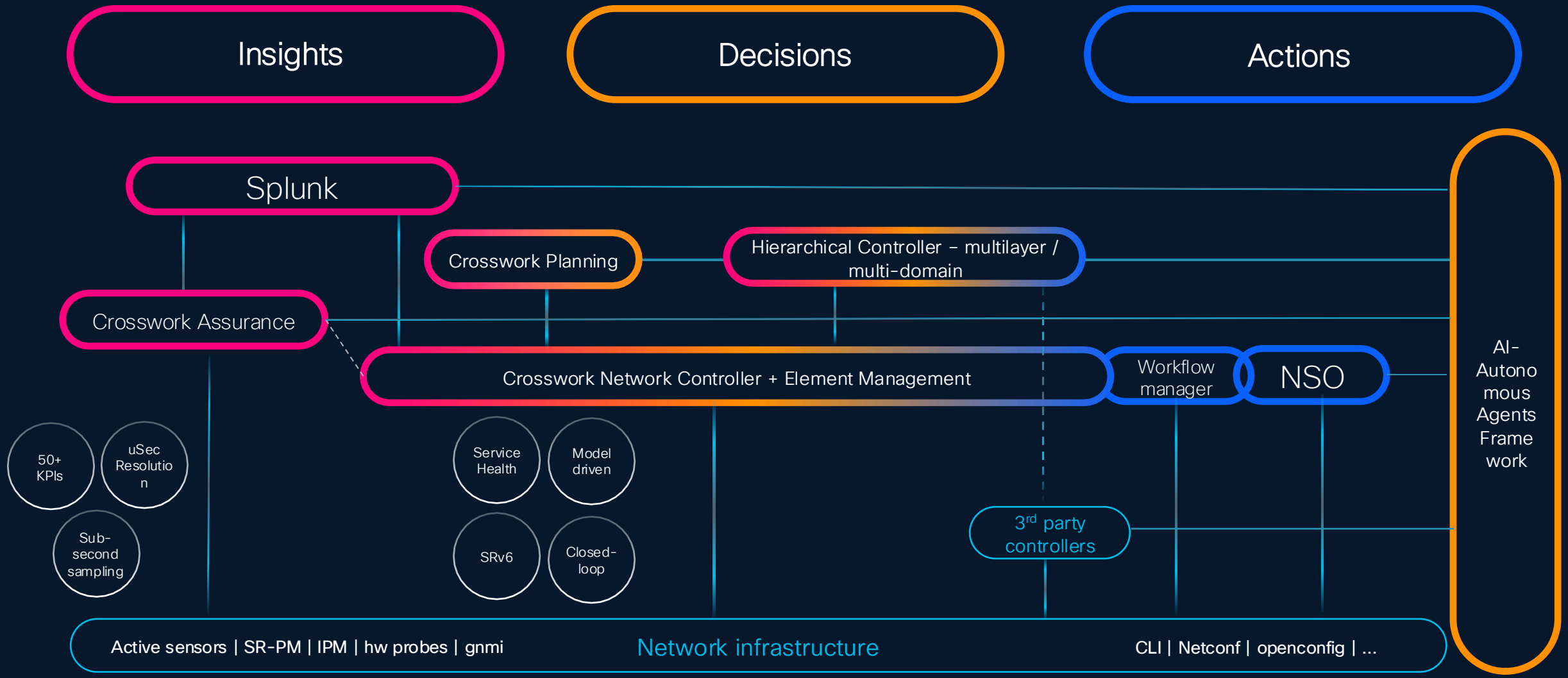
Ingested data
- Devices inventory
- Devices faults/events
- Devices telemetry
- Devices metadata

Use cases
- Custom device-level dashboards
- Device deep dive searches
- Adaptative threshold

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Source: "Autonomous Networks Business Requirements & Architecture", TM Forum

Towards autonomous operations



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A few use case examples

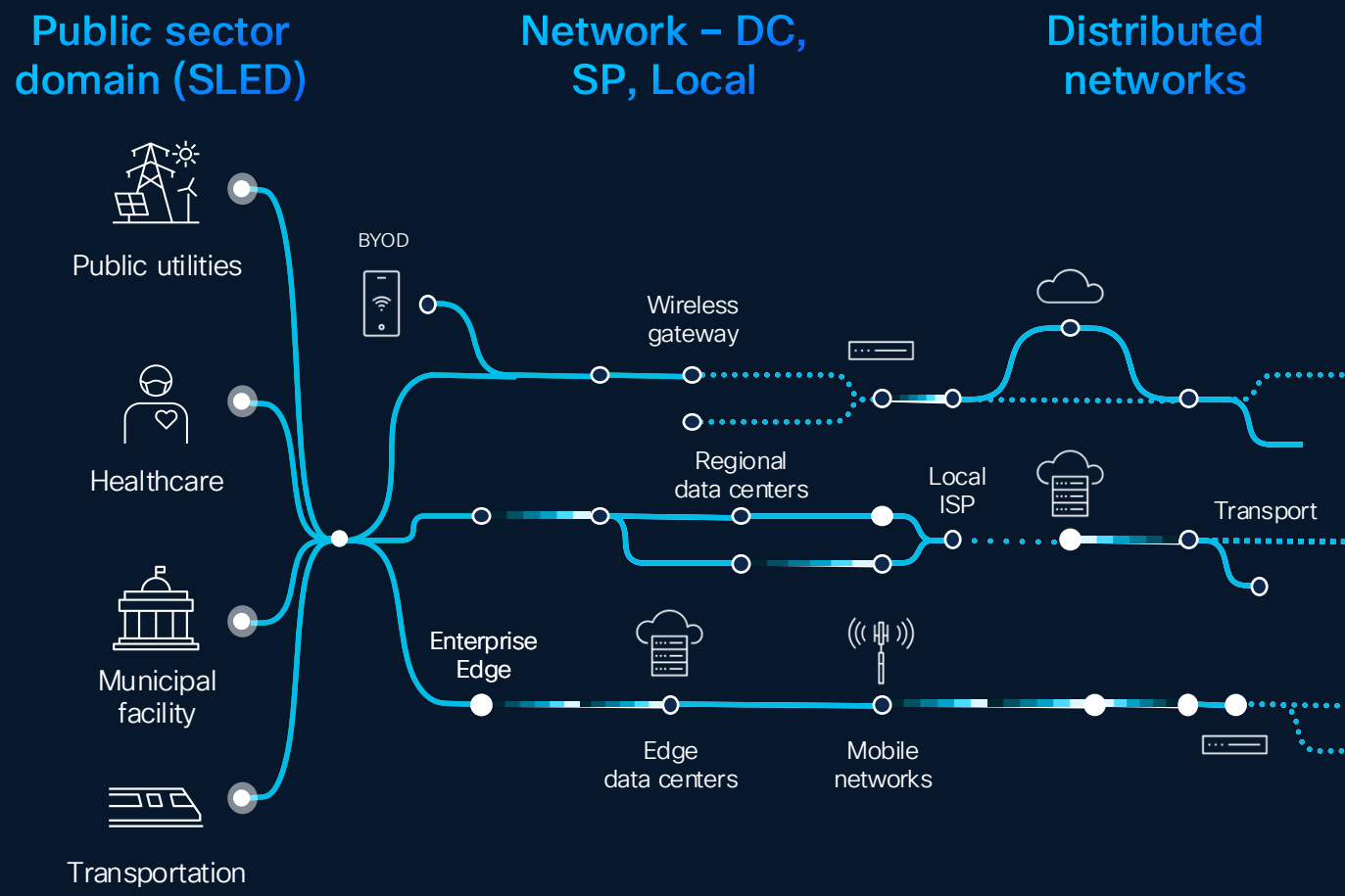
Unified observability for resilient public sector networks

Need

- End-to-end visibility across segmented domains (access, DC/SP, backbone, cloud, branch)
- Rapid fault isolation – underlay vs overlay vs application vs external
- Reduced operational complexity across distributed environments

Solution

- Transit and backbone assurance | Continuous validation of national/global connectivity
- Segmentation and secure control | Isolated domains with enforced inter-domain policies
- Automation and closed-loop operations | Automated detection, root-cause isolation, and corrective action across domains, SR/SRv6-PM, SRv6-IPM, HW/SW telemetry with service-aware insight, NSO, service and network health



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Optimized network service and connectivity flows

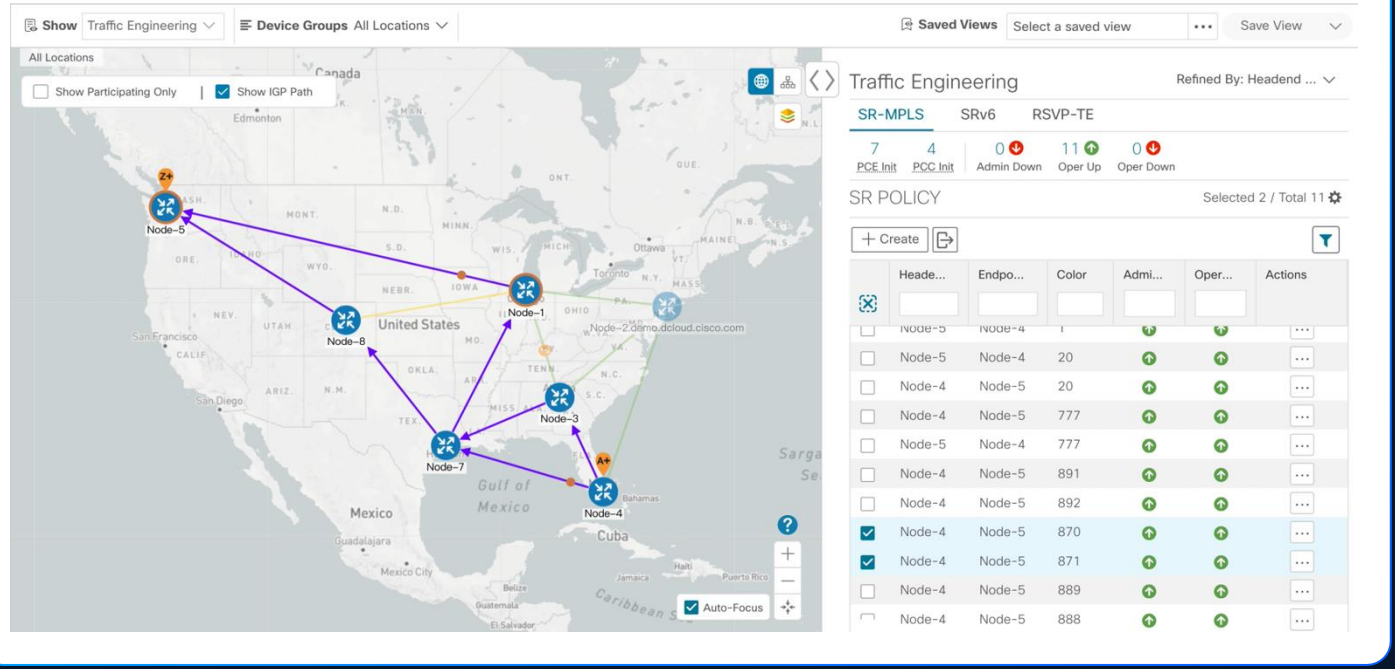
Need

- Manual re-optimization based on network changes is not scalable
- Jeopardizes target SLA/OLAs – especially in sensitive and critical traffic flows

Solution

Automation and closed-loop operations

- Define policy intent once
- Simplify operationalization by automatically detecting any topology changes
- Automate service path provisioning leveraging real-time re-computation of paths in violation of ‘optimization metrics’, i.e., intent



SR policy SLA

Objectives | Latency, IGP/TE metric minimization
Constraints | Affinities, disjoint paths, bandwidth
Outcome | Preserved service intent

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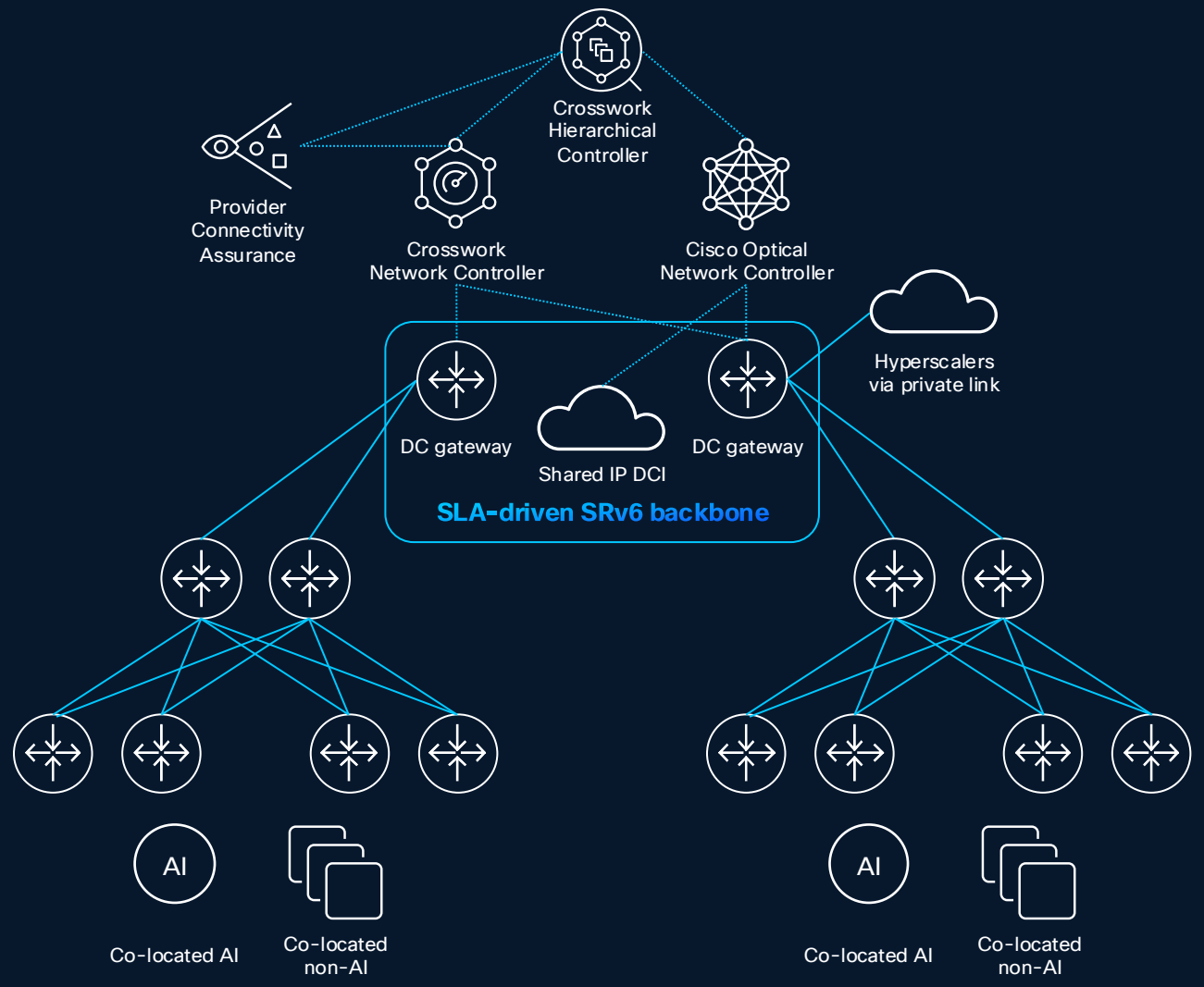
Scalable AI-ready data center and cloud connectivity

Need

- DC gateway with advanced routing for data center interconnect (DCI), WAN, cloud connectivity – any-to-any connectivity
- Shared IP DCI for AI and non-AI traffic
- Tiered IP services <100G

Solution

- Traffic differentiation and resiliency | Network slicing with flexible any-to-any connectivity, SR-TE, FlexAlgo, and SR programmability, visibility
- Security and sovereignty of data in-transit| Quantum-safe MACsec with SKIP, and SR-TE/FlexAlgo secure path enforcement
- Sustainability and space optimization | Routed Optical Networking
- Visibility and automated health | Provider Connectivity Assurance, SR/SRv6-PM, SRv6-IPM, HW/SW telemetry, service health and network health



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Precision monitoring in a smart connected factory of a European car manufacturer

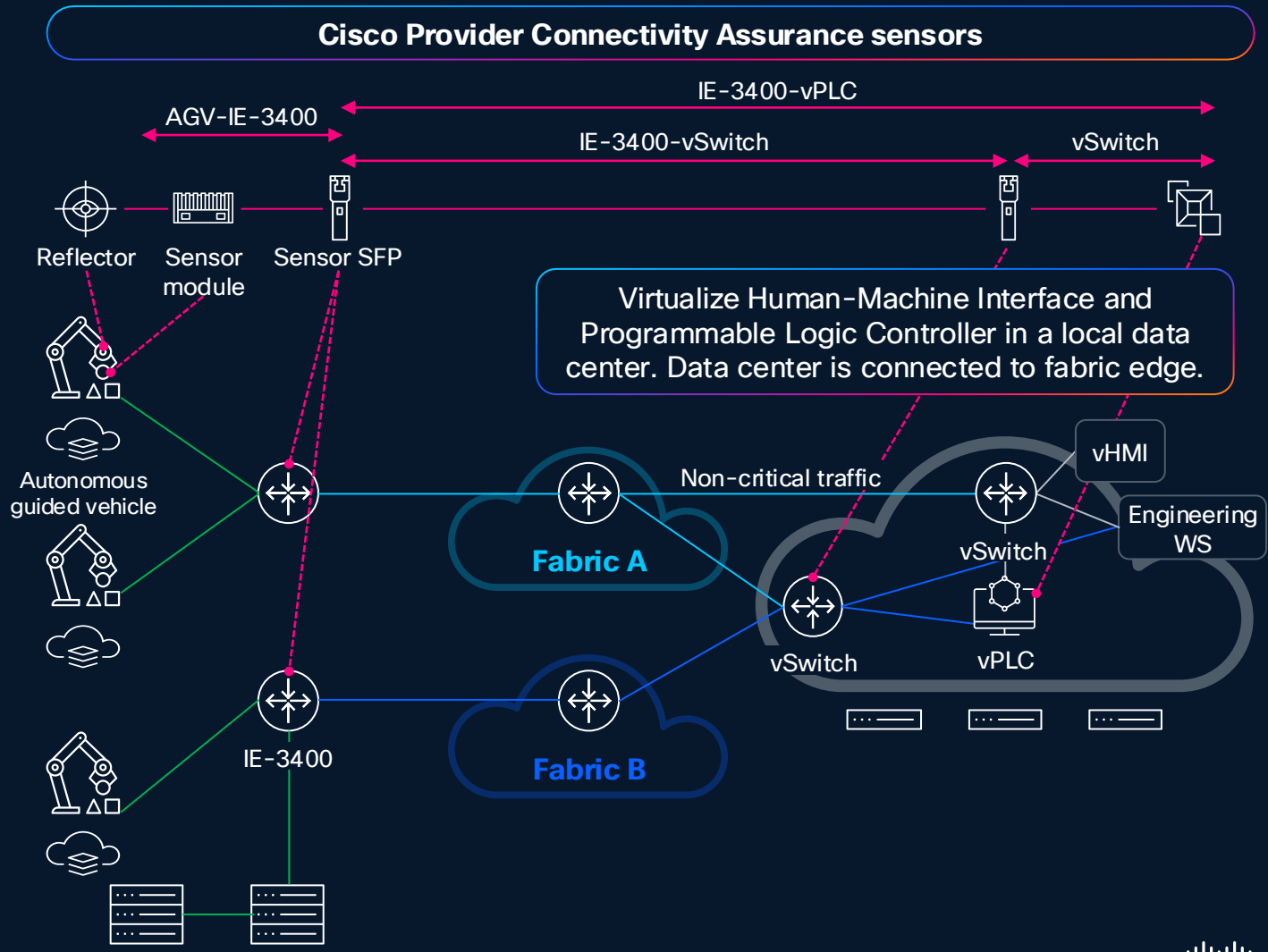
Need

- Proactive network monitoring to avoid unplanned downtime
- Understand normal network performance and when performance deviation occurs on both operational and backup networks with microsecond precision
- Proactively send insights to northbound systems for preventive remediation

Solution

Precision monitoring with Provider Connectivity Assurance sensors

- Microsecond precision across Fabric A (operational path) and Fabric B (redundancy path)
- Monitor maximum delay, packet loss, and delay variation between physical and virtual
- Monitor different classes of service



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Unlock business value for critical network users



Financial sector

Assure every transaction with predictive assurance and automation to help prevent user-impacting issues.



Government

Boost productivity and assure secure connectivity for Citizen Services. Meet SLAs and resolve issues early.



Defense

Secure and assure network services with air-gapped solutions. Meet SLAs. Detect and resolve issues before user impact.



Large-scale infrastructure (utilities, transport)

Prevent unplanned downtime and connectivity issues with proactive testing, real-time performance visibility, and automated remediation.

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...and build on these examples



Improving network reliability, scalability and disaster recovery



Eliminating costly downtime on the production network



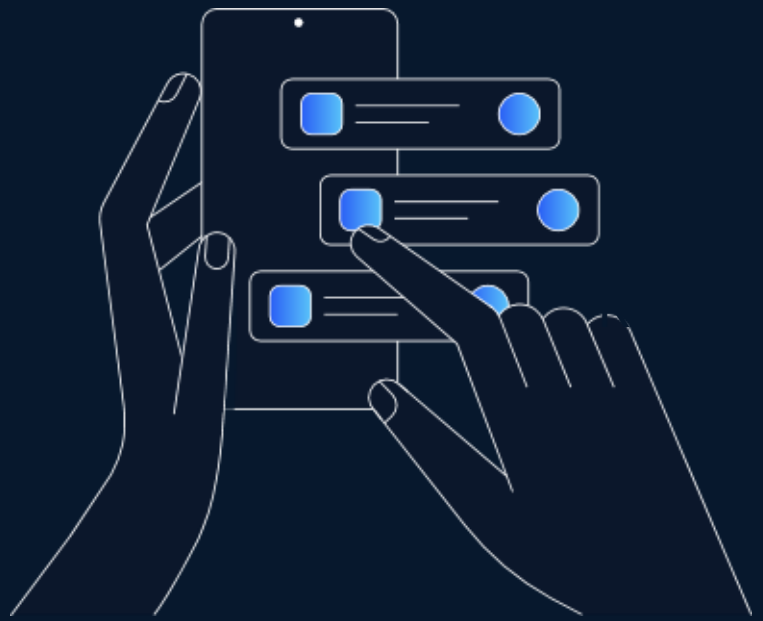
Meeting stringent SLAs with universities across Connecticut



Reducing risk in point of sale, inventory, and supply chain systems

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Next steps



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Explore use cases

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Thank you

