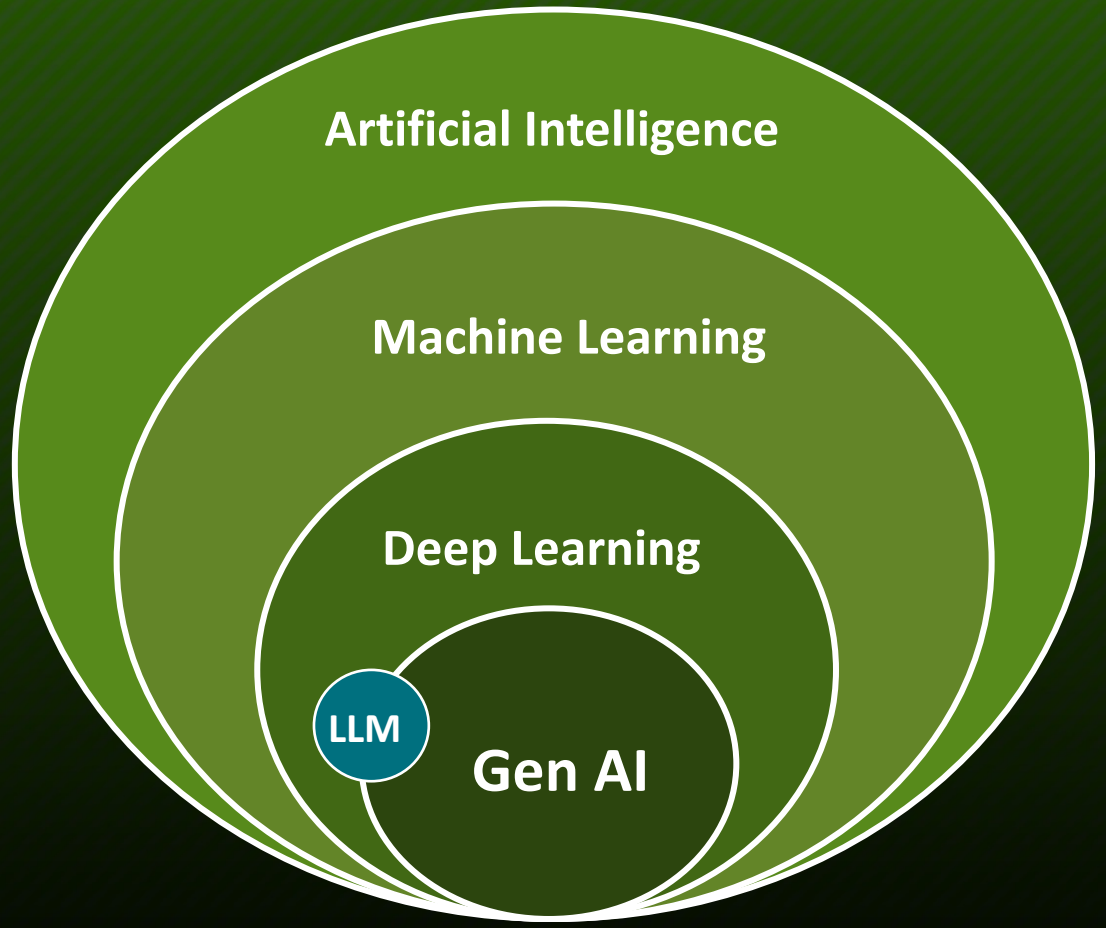
AIOps For Networking

Improving Users and Operations Experience With **AIOps**

Hitesh Mali
Architect
hmali@juniper.net
HPE – Juniper

THE AI LANDSCAPE



Artificial Intelligence: Systems that can perform tasks typically requiring human intelligence

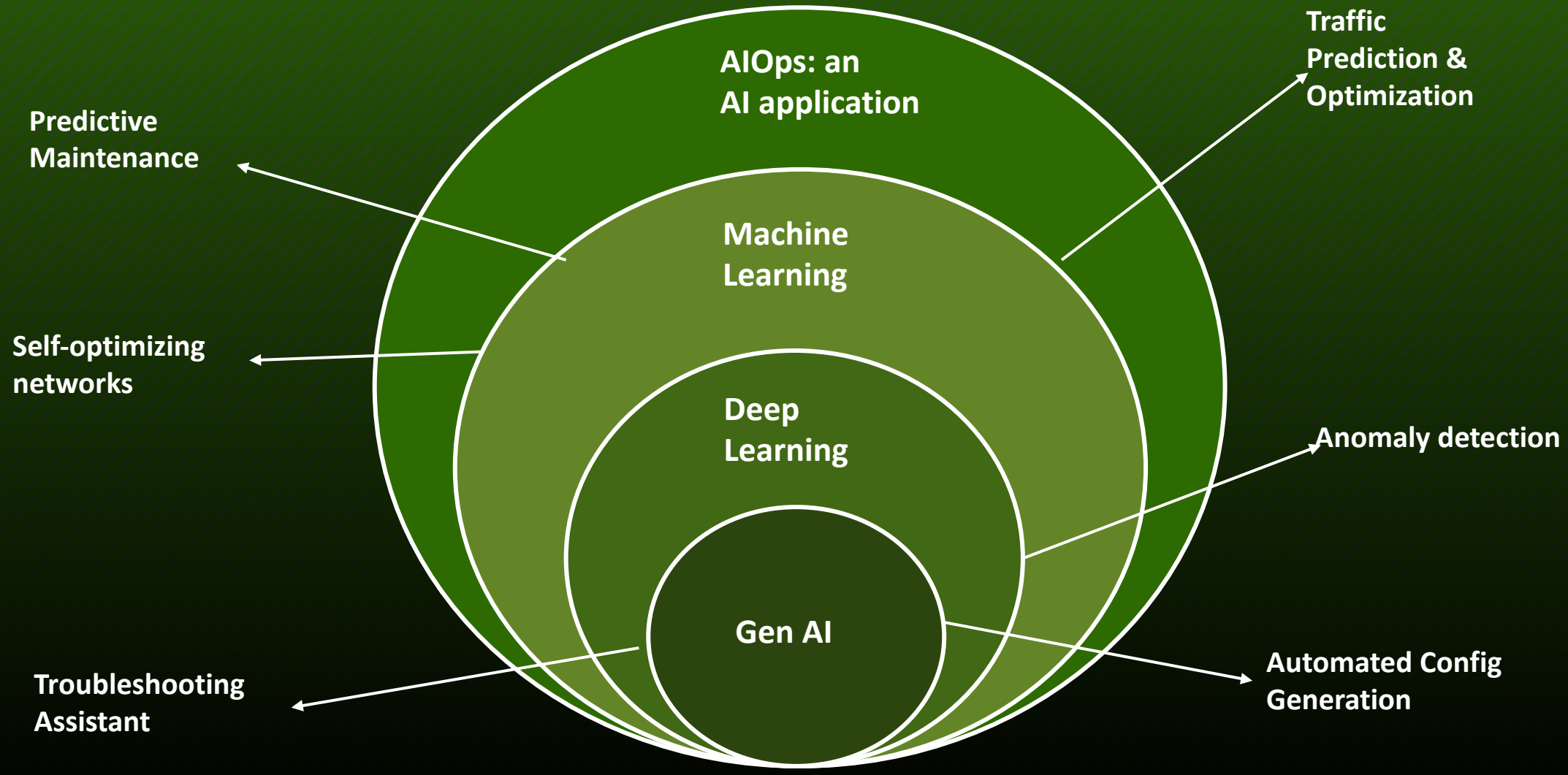
Machine Learning (ML): Systems that automatically learn from data and improve their performance on tasks without being directly programmed.

Deep Learning (DL): A kind of machine learning that uses many layers of neural networks to learn from data.

GenAI: AI application that uses deep learning and transformer-based architectures to generate new content.

What is AIOps?

The application of artificial intelligence to IT operations for Proactive fault identification and resolution



Brief History Of AIOps

2016–2017

Term coined by Gartner. Early focus: AI/ML for IT operations.

2017–2019

Early adoption: event correlation, log analysis, anomaly detection.

2020–2022

Expansion: automation, cloud-native, closed-loop remediation.

2023+

GenAI + LLMs enable natural language queries, playbooks, and autonomous ops

Benefits AIOps

Faster Time to Resolution

Automates tasks and accelerates resolution.

Proactive Insights

Anticipates and prevents service disruptions.

Improved Network Performance

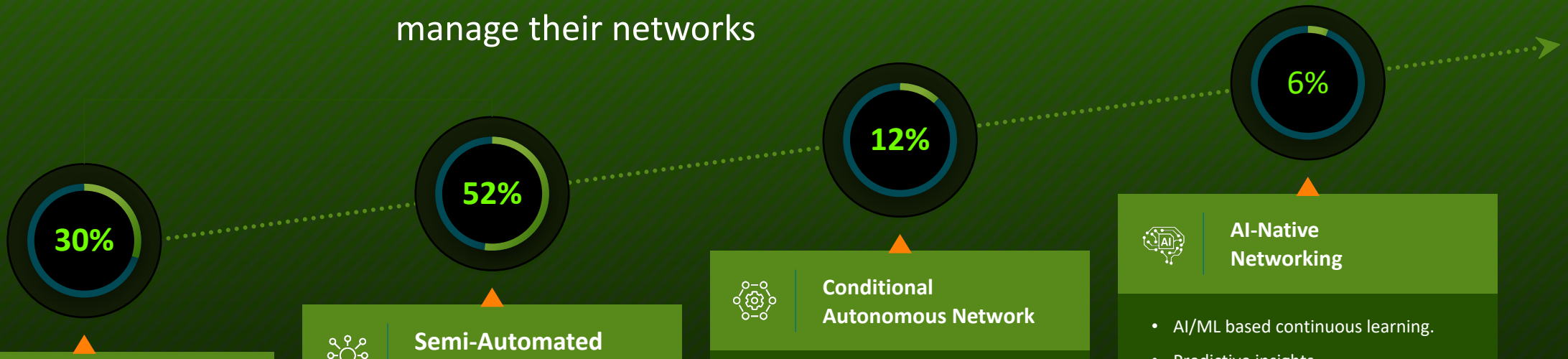
Faster response, Fewer outages, and seamless services.

Cost Reduction

Optimizes resources and reduces downtime

State of AIOps in Service Providers Today

82% of Service Providers rely on manual or semi-automated operations to manage their networks



Manual Ops

- CLI-based device configuration.
- Legacy OSS/NMS.

Time spend on customers sites and in war rooms.

Semi-Automated Network Management

- Automated daily repetitive tasks, events.
- Hardcoded service provisioning.
- Automated stitching of small set of configs.
- ML enabled anomalies detection such as bad cable detection.

Time refocused on critical issues; accelerated time to market.

Conditional Autonomous Network

- Day 0 – 2 Automation
- E2E active assurance.
- Intent-based service orchestration.
- Root-Cause Analysis.
- Virtual Network Assistant (chatbot) for recommended actions.

Critical issues identified and resolved prior to customers noticing them.

AI-Native Networking

- AI/ML based continuous learning.
- Predictive insights.
- Closed-loop remediation (AI/ML driving autonomous actions).
- Hybrid automation delivery model (cloud and/or on prem).

Critical issues identified and resolved autonomously. Guaranteed experience.

HEAVY READING

Current level of automation - Survey of 217 automation leaders

JUNIPER NETWORKS

AIOps vs. Traditional Automation

From reactive firefighting to proactive, self-healing networks

There is DHCP server failure.

Users can’t connect to the network.

Without AIOps

- User reports an incident
- Operators check multiple tools
- Troubleshoot the problem
- Manual troubleshooting & correlation
- Root cause analysis after impact
- Fix applied

Challenges

- Too much data, too many tools
- Slow mean time to detect/resolve (MTTD/MTTR)
- Reactive, inconsistent outcome

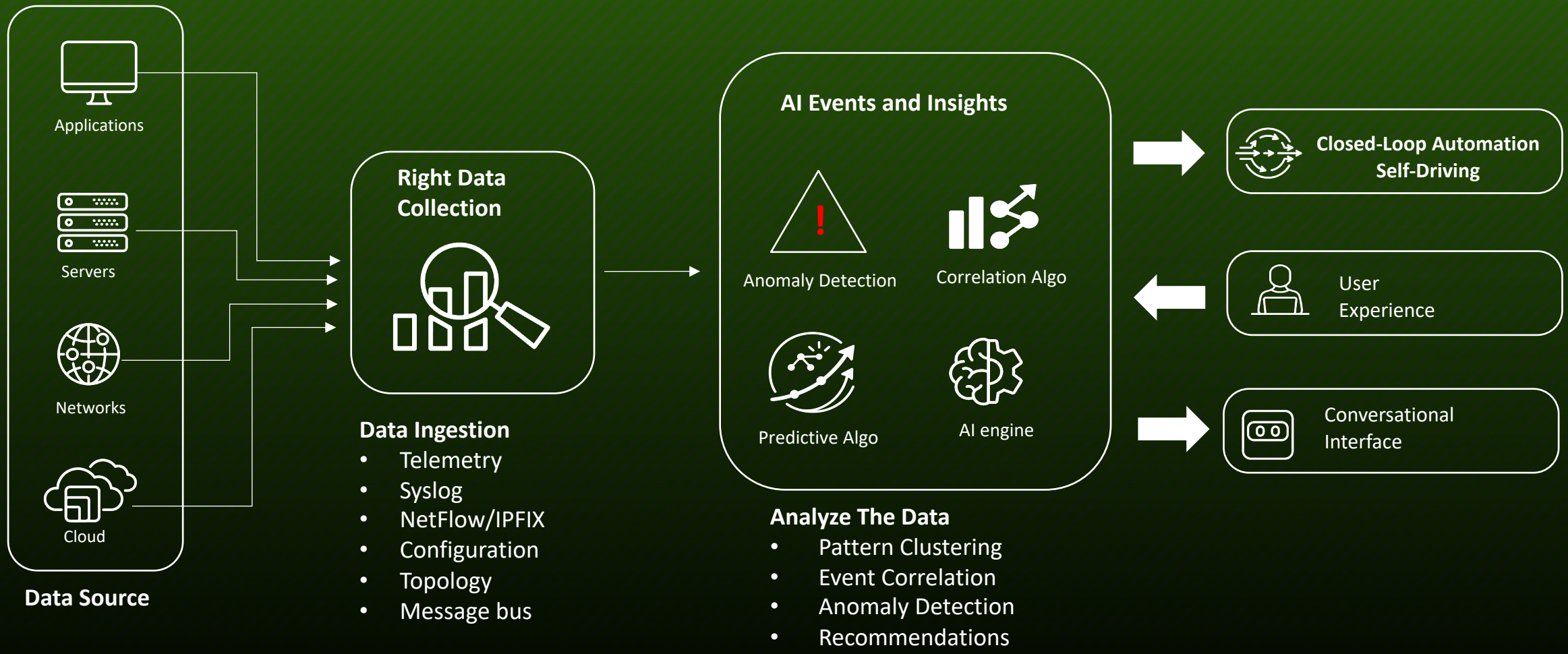
With AIOps

- Proactive monitoring & anomaly detection
- Correlates signals → identifies root cause
- Verifies impact & recommends action
- Auto-remediation
- Post-fix validation & notification

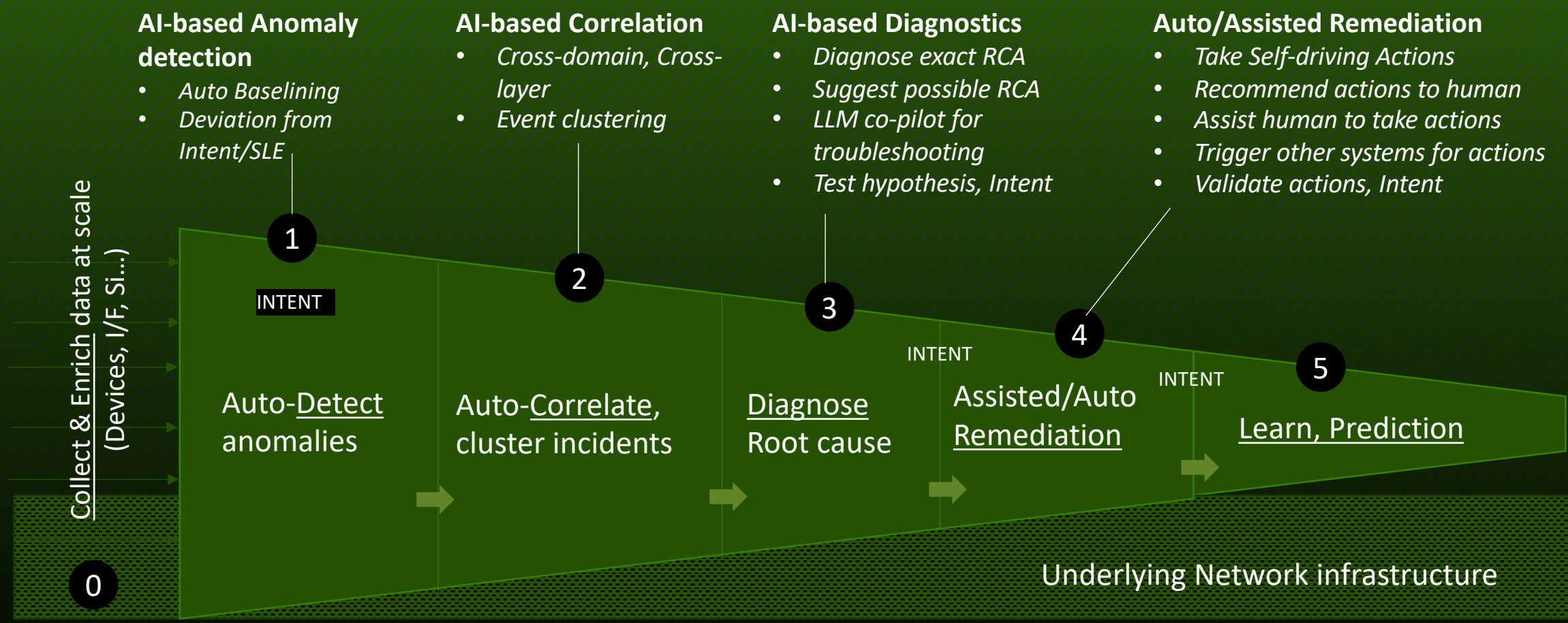
Self-driving operations → better user experience, lower MTTR

AIOps High Level Architecture

From raw telemetry to closed-loop, self-healing operations

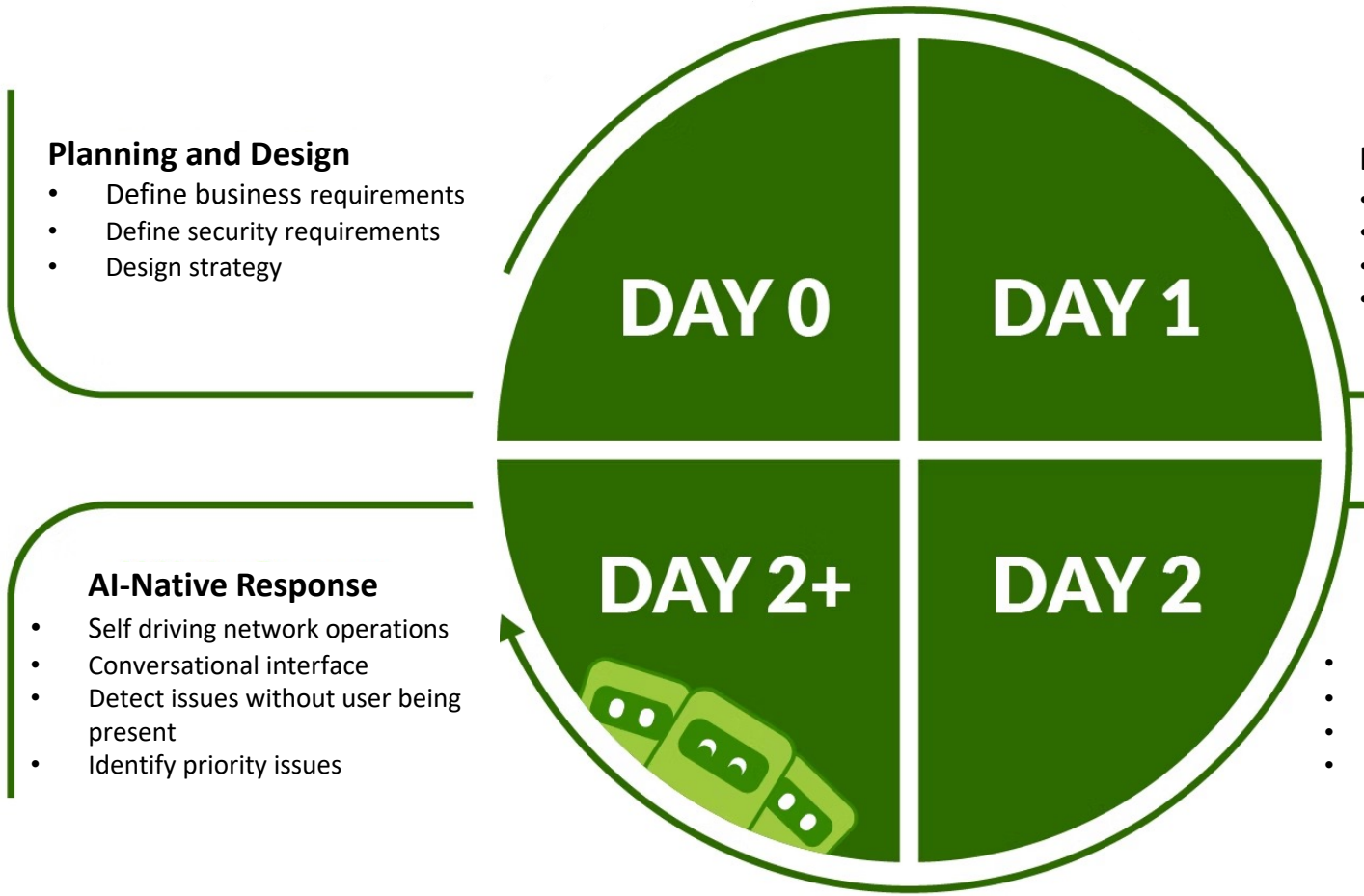


AIOps Operational Framework (closed loop)



MTTD ↓ • MTTR ↓ • False positives ↓ • Change success ↑ • User experience ↑

AIOps Deployment Stages



Planning and Design

- Define business requirements
- Define security requirements
- Design strategy

Implementation

- Cloud-native dashboard
- Zero touch provisioning
- APIs ecosystem
- Config templates

AI-Native Response

- Self driving network operations
- Conversational interface
- Detect issues without user being present
- Identify priority issues

AI-Native user experience insight

- Service Level Expectations
- Root cause identifications
- Proactive anomaly detection
- Event correlation

Evolution of AIOps

Early AIOps

Detect, Predict, and Correlate

Lacked : Context, intent and adaptability

AI chatbots

Virtual Network Assistant (chatbot) for recommended actions.

Lacked : Memory, reasoning and autonomy

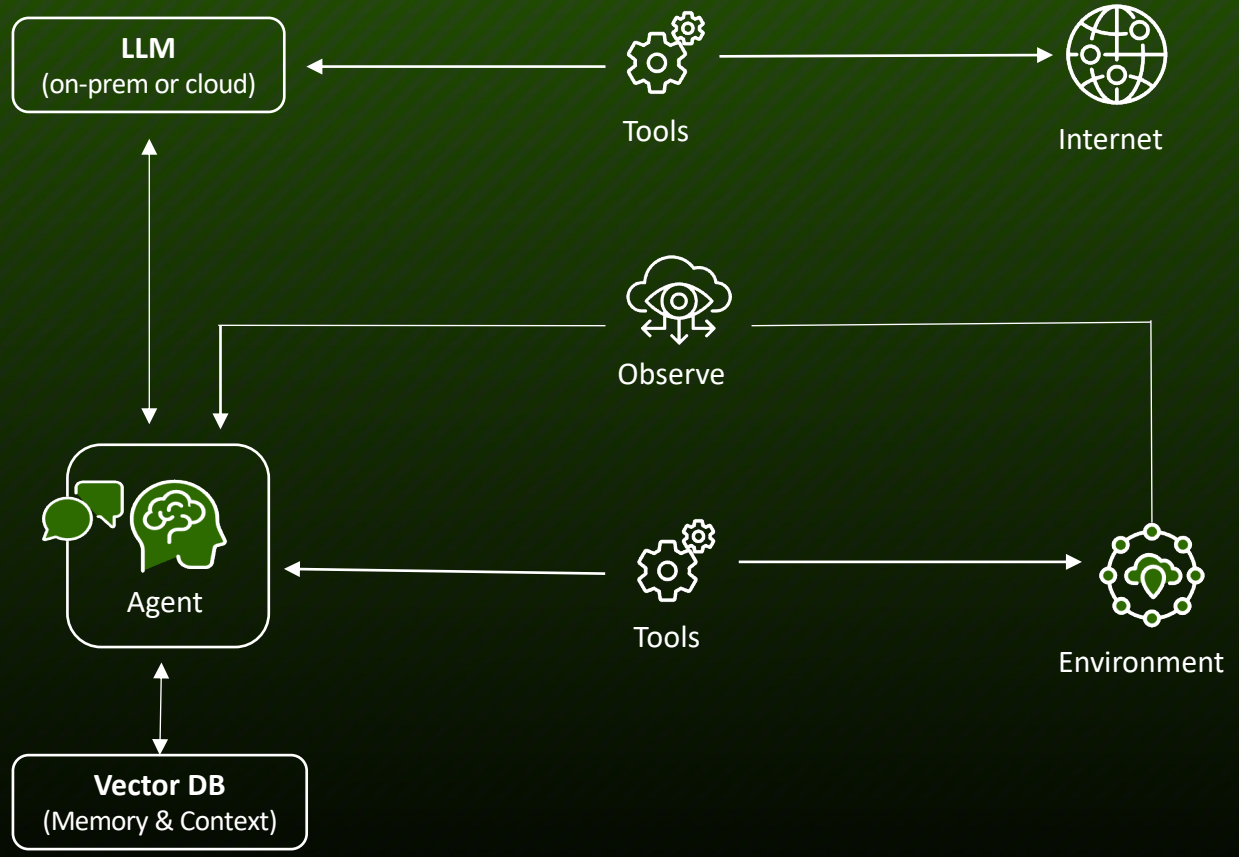
Agentic AIOps

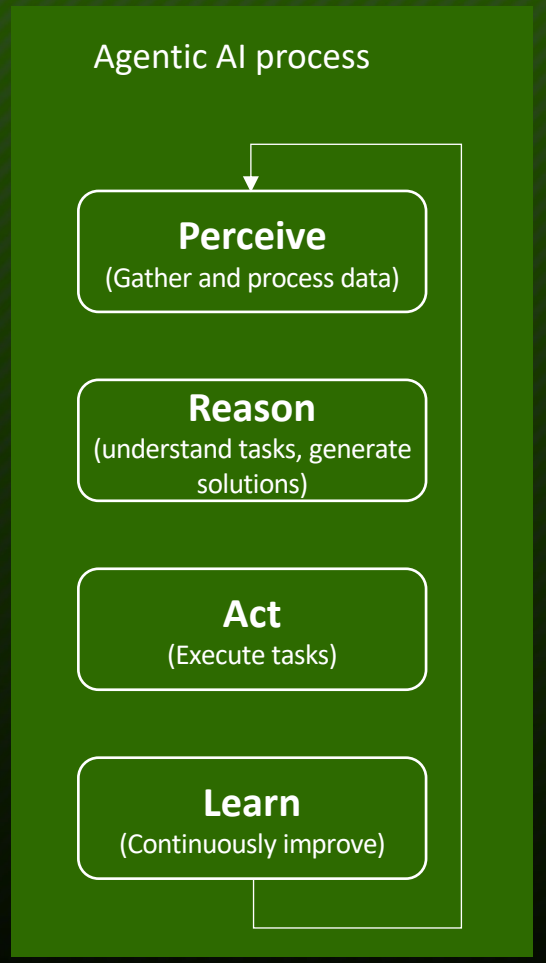
- Autonomous agents that reasons, adapt and act
- Conversational interface for answering questions

Agentic AI

Beyond traditional AI:

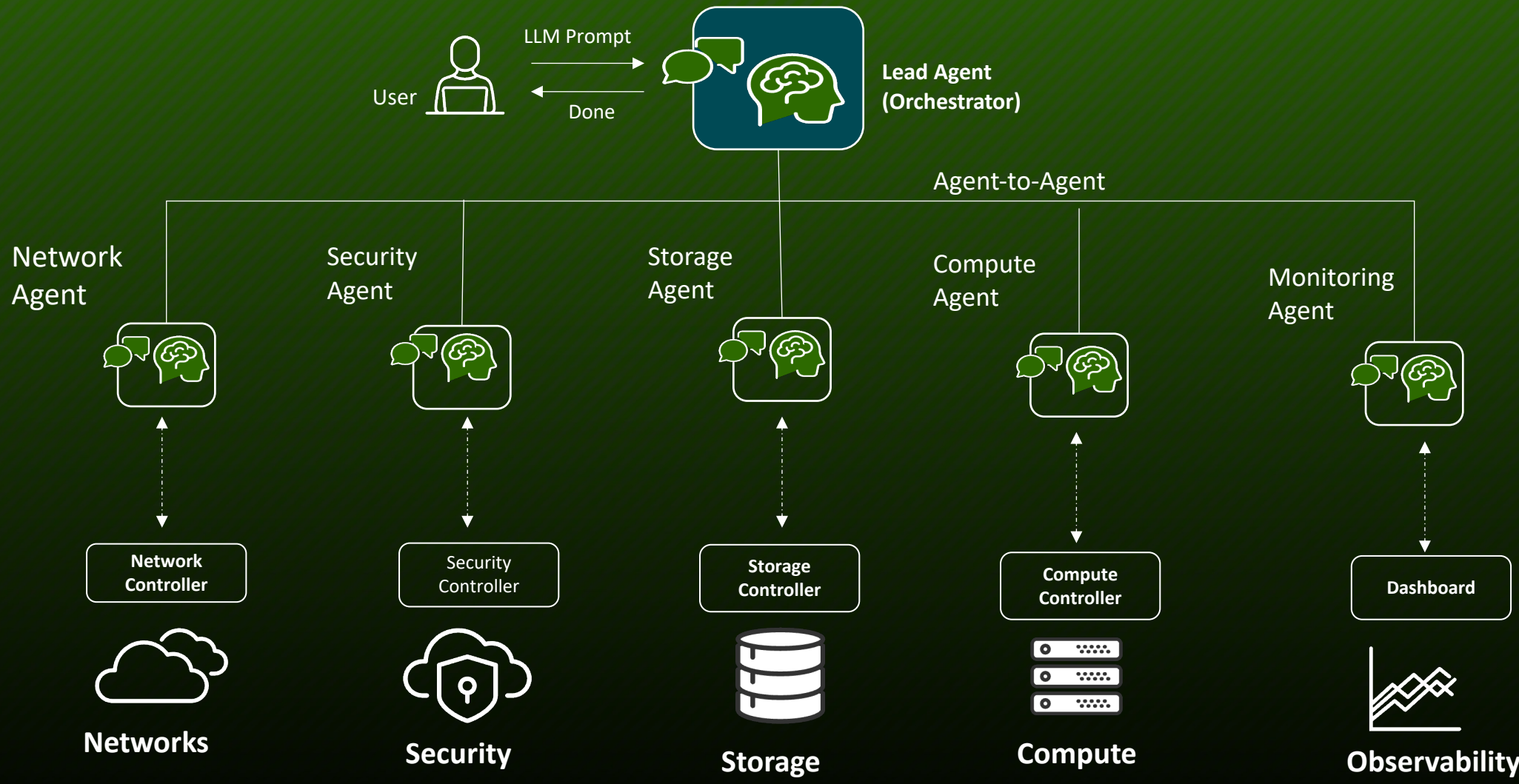
- Agentic AI doesn't just respond—it plans, executes, and adapts to achieve complex objectives.
- Decompose complex goals into actionable steps.
- Maintain context across multiple interactions, and iteratively refine its approach based on results.





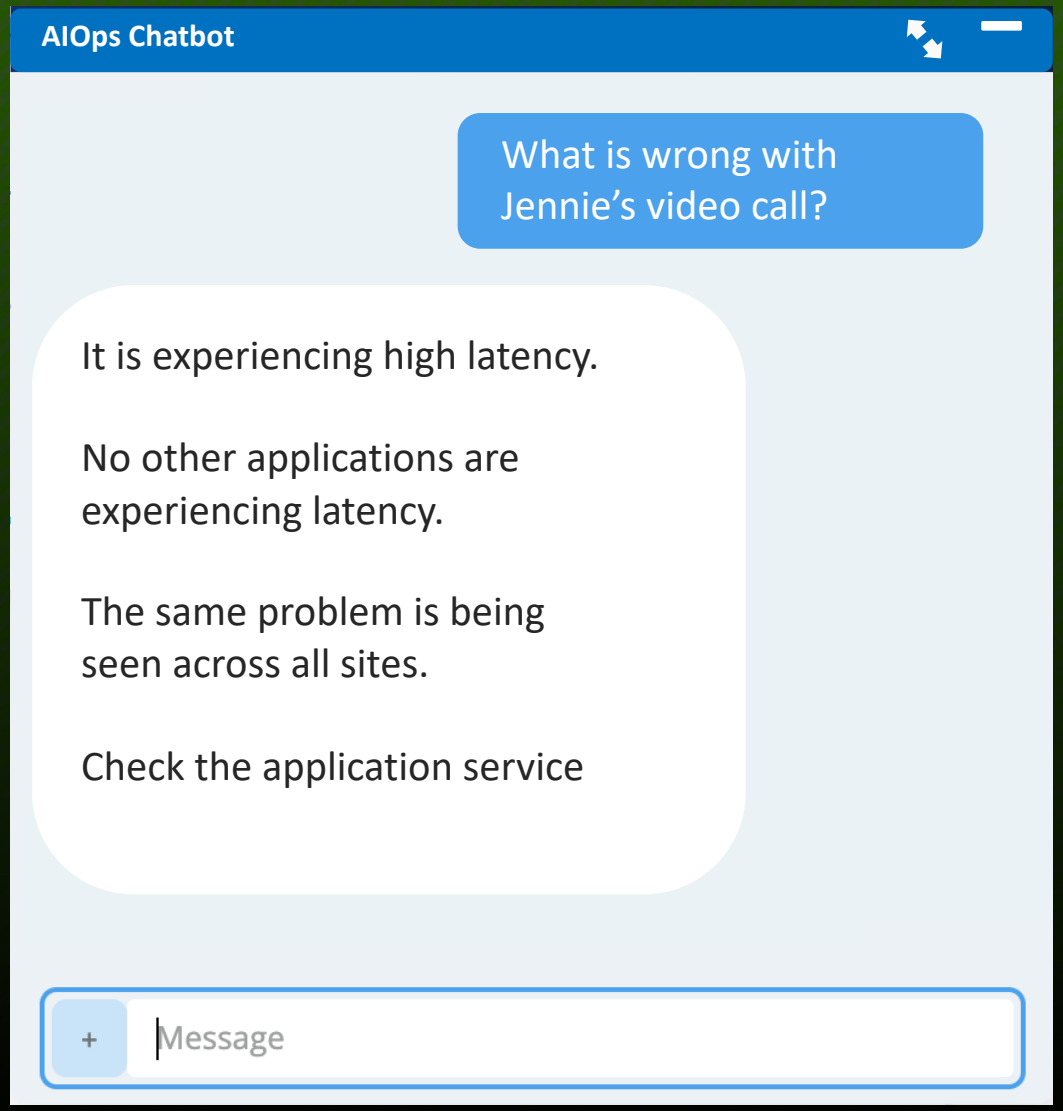
Agentic AIOps

Autonomous agents that **Reason, Adapt & Act**



Juniper Networks

AIOps Chatbot Assistant



AIOps works—but many teams don’t see the benefits yet

These roadblocks slow adoption and impact

 Poor quality of data	Noisy or incomplete telemetry yields unreliable outcomes and mistrust in the system.
 Siloed teams & tools	Fragmented data across domains means AI can’t connect the dots end-to-end.
 No integration with legacy technologies	Many networks weren’t built for AI; without modernization, AI stays isolated and underused.
 Lack of automation	If AI can detect issues but can’t act on them, you remain reactive.
 Infrastructure performance limitations	AI requires real-time data and responsiveness. If your infrastructure can’t keep up, AI can’t deliver.

Key takeaways

5 Priorities for Driving AIOps Success

Define a Clear AI Vision

Align AI strategy with business goals, outcomes, and transformation priorities

Start with Quick Wins

Focus on one high-impact domain/use case to demonstrate measurable value

Build the Right Talent Mix

Invest in a lean but skilled data + domain team – partner if needed

Pay attention to your data

Ensure telemetry, quality - AI is only as good as the data

Lead with Responsible AI Governance

Put Responsible AI guardrails in place

Thank you

Juniper Networks | Driven by Experience™