# Vom Troubleshooting zur Prävention:
# Wie autonome Netzwerke den Betrieb unterstützen

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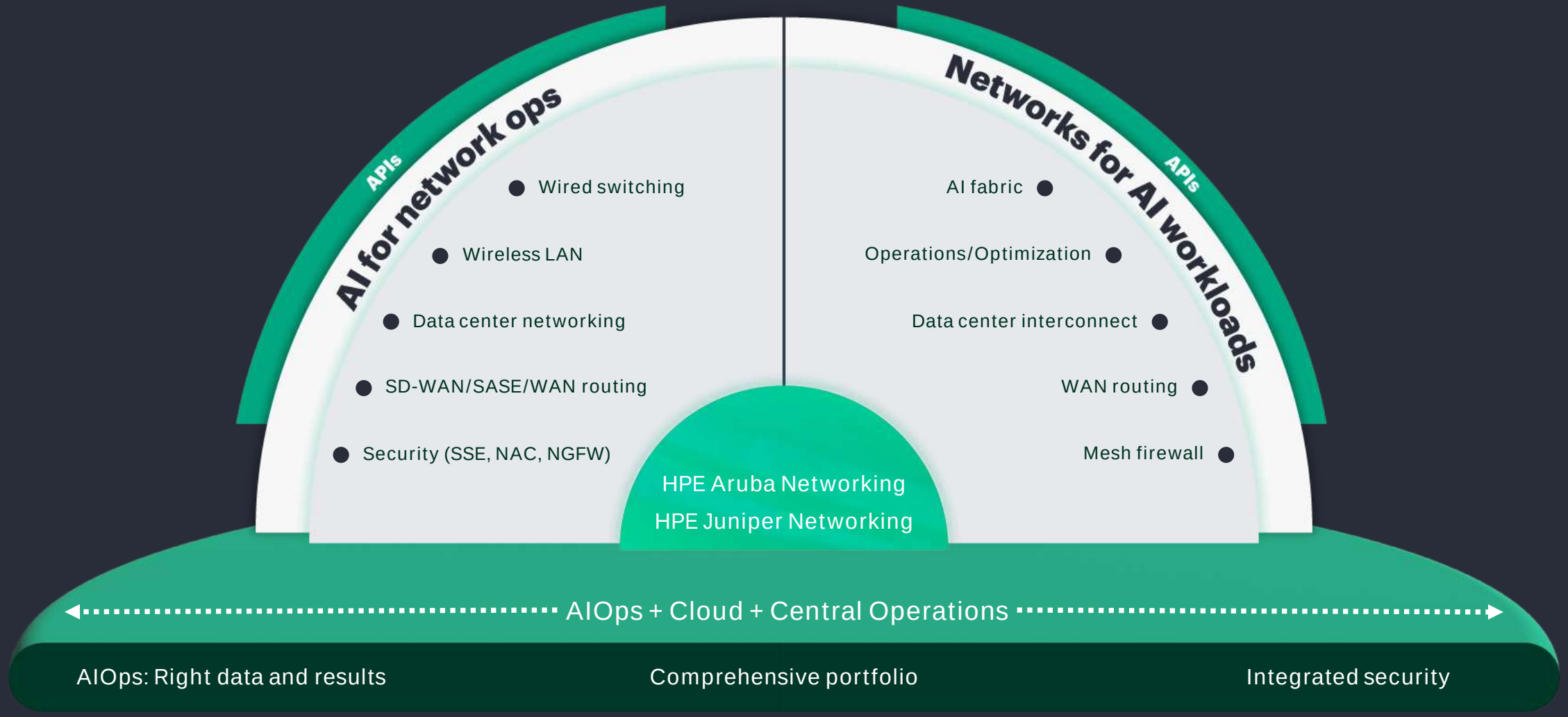
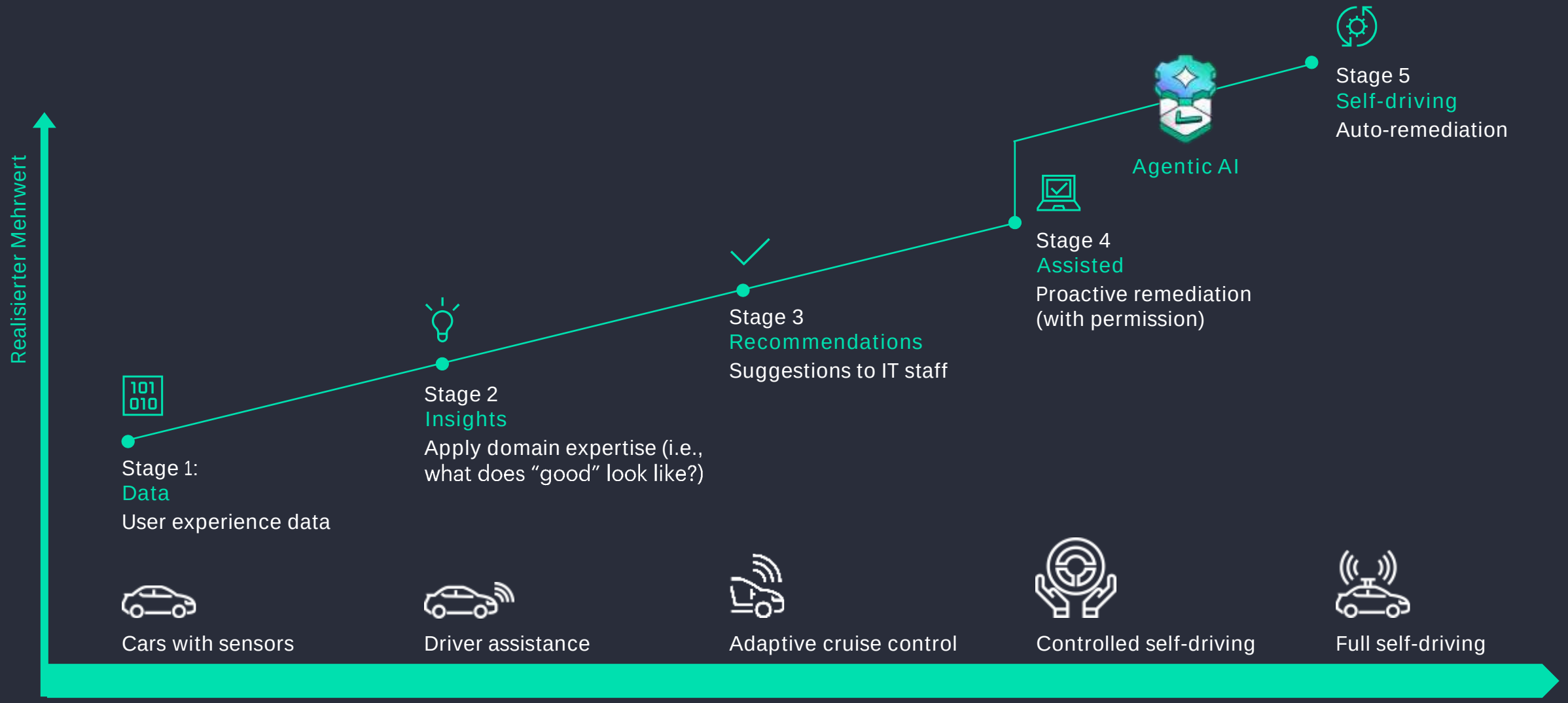
# 1 Minute Kurzvorstellung von HPE Networking: Das sichere, KI-native Netzwerk



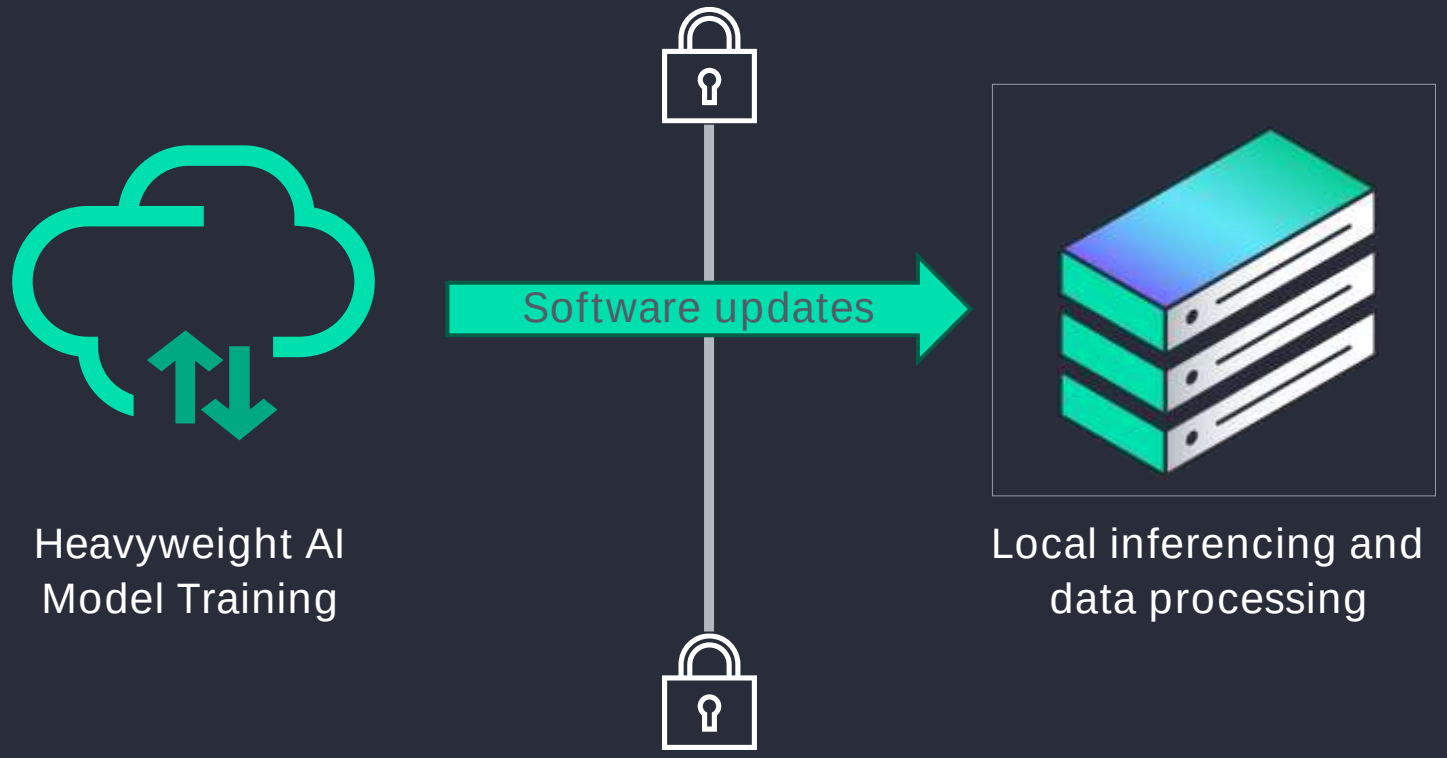
# Autonome Netzwerke?

# Wo sind Sie auf der Reise zum autonomen Netzwerk?



# 100% Air-Gapped HPE Aruba Networking Central on Premises

## KI mit lokalem Inferencing, ohne jegliche Cloud/Internet-Anbindung




Heavyweight AI Model Training

Local inferencing and data processing

**AI Search:** Delivers fast, NLP-powered access to product and documentation information using a lightweight, HPE-trained on-premises LLM

**Network Insights:** Large number of insights available on premises

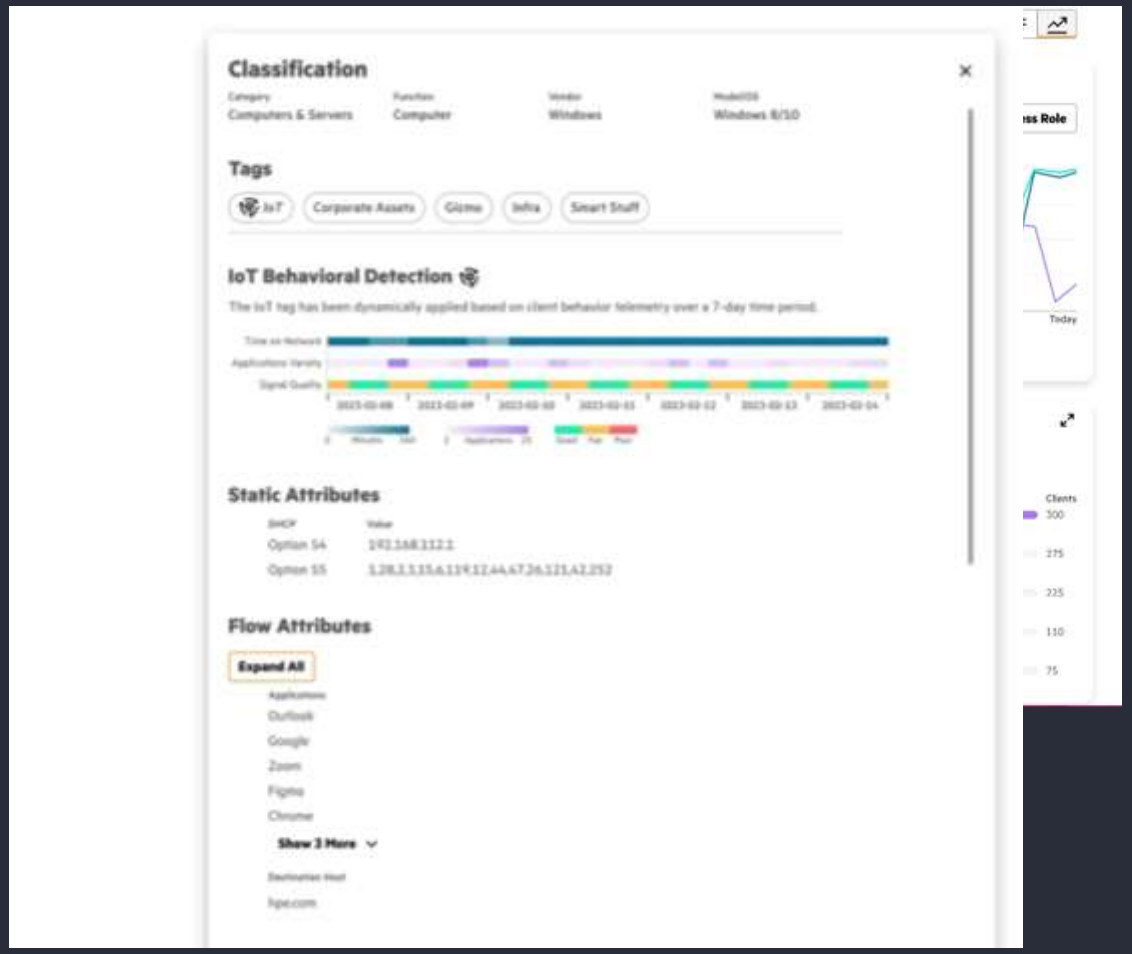
**AI Alerts:** Real-time anomaly detection, reducing alert fatigue

**Client Insights:** Know exactly what's on your network and how it's performing without any additional agents/collectors

**Your network and client data never leaves your premises**

# KI-basiertes Profiling der Endgeräte

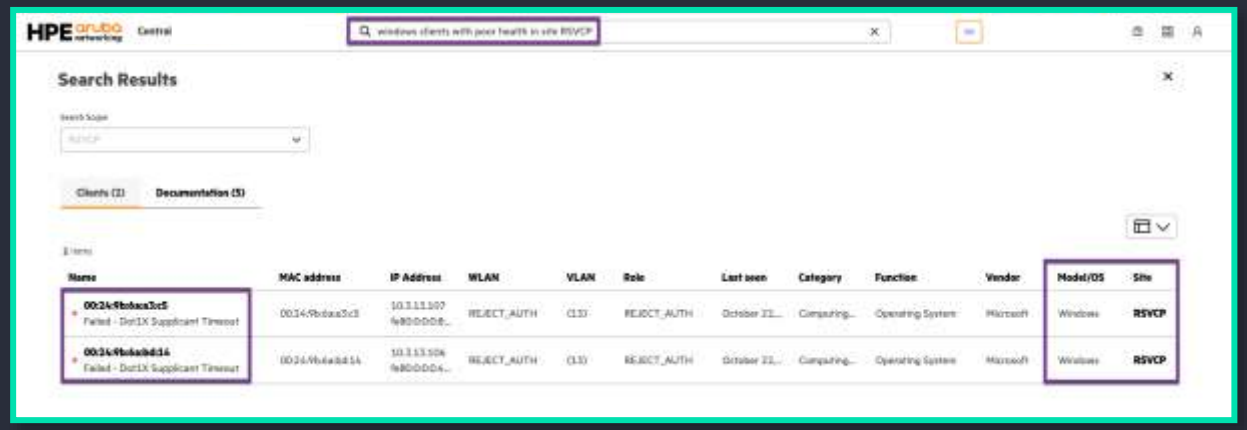
Enhance endpoint visibility for Zero Trust networking




- Only solution with AI-native IoT profiling and behavior analysis for segmentation accuracy
- Traffic flow visibility for high classification efficacy and enhanced protection
- Advanced filtering and custom group tagging aid in policy creation and enforcement

# AI Search

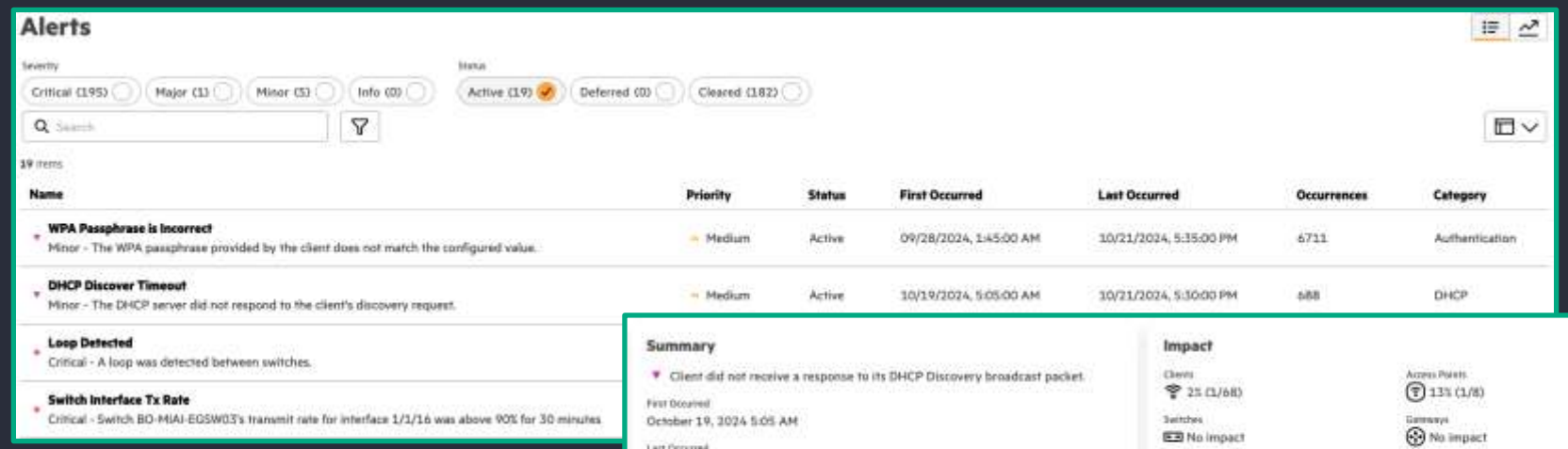
## Accurately identifying user intent with LLM



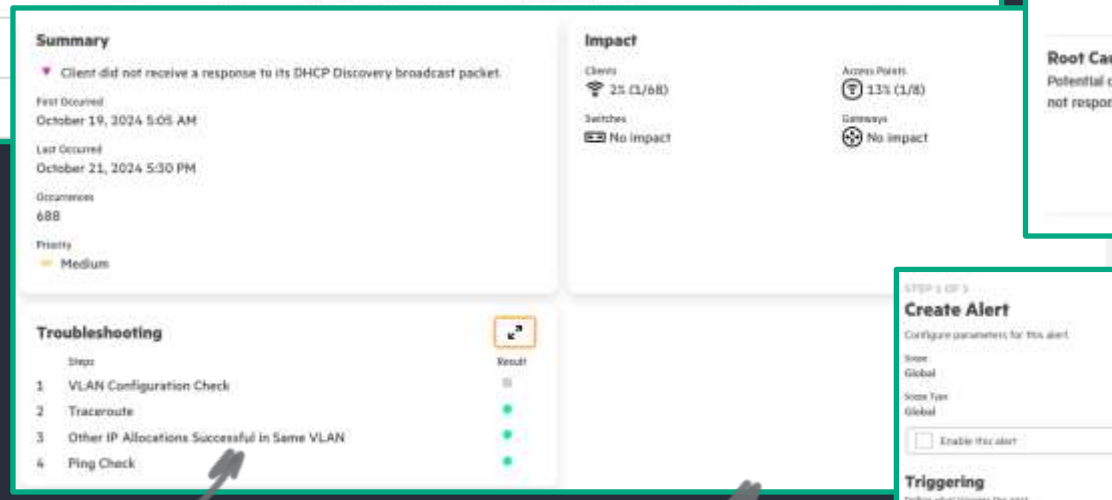


- One-click access to Topology, Alerts, Applications, Clients, and more.
- Search for Clients and Devices by IP, MAC address, Model, OS, and other criteria.
- Easily detect failed clients, malfunctioning devices, and applications experiencing issues, along with corresponding reason codes.
- Search the HPE Aruba Networking Knowledge Base and verify solutions using the Validated Solutions Guide.

# Alerts: KI-unterstütztes Troubleshooting

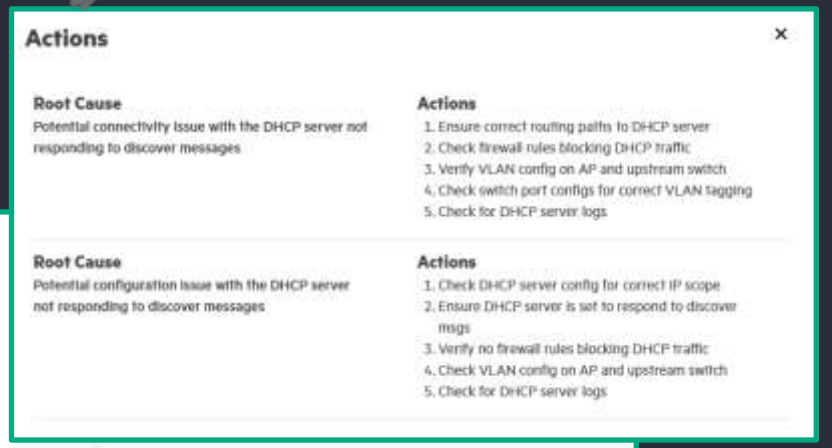



190+ alert types

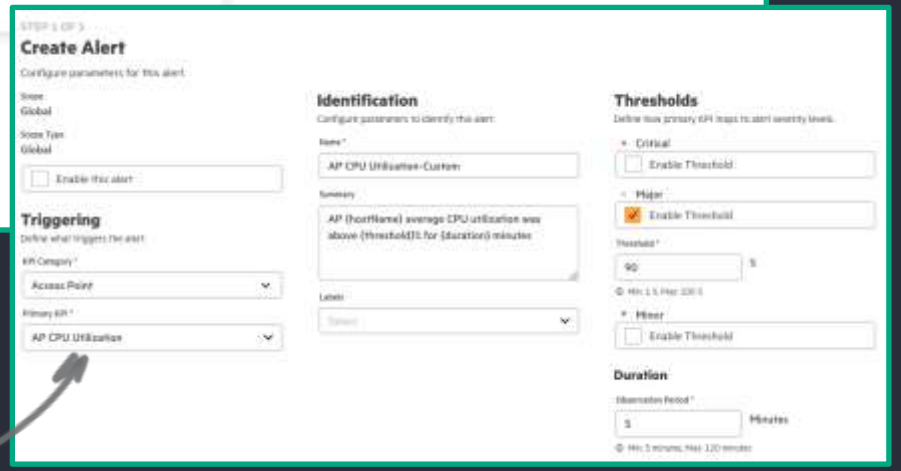



Automated troubleshooting steps

Root cause recommended action

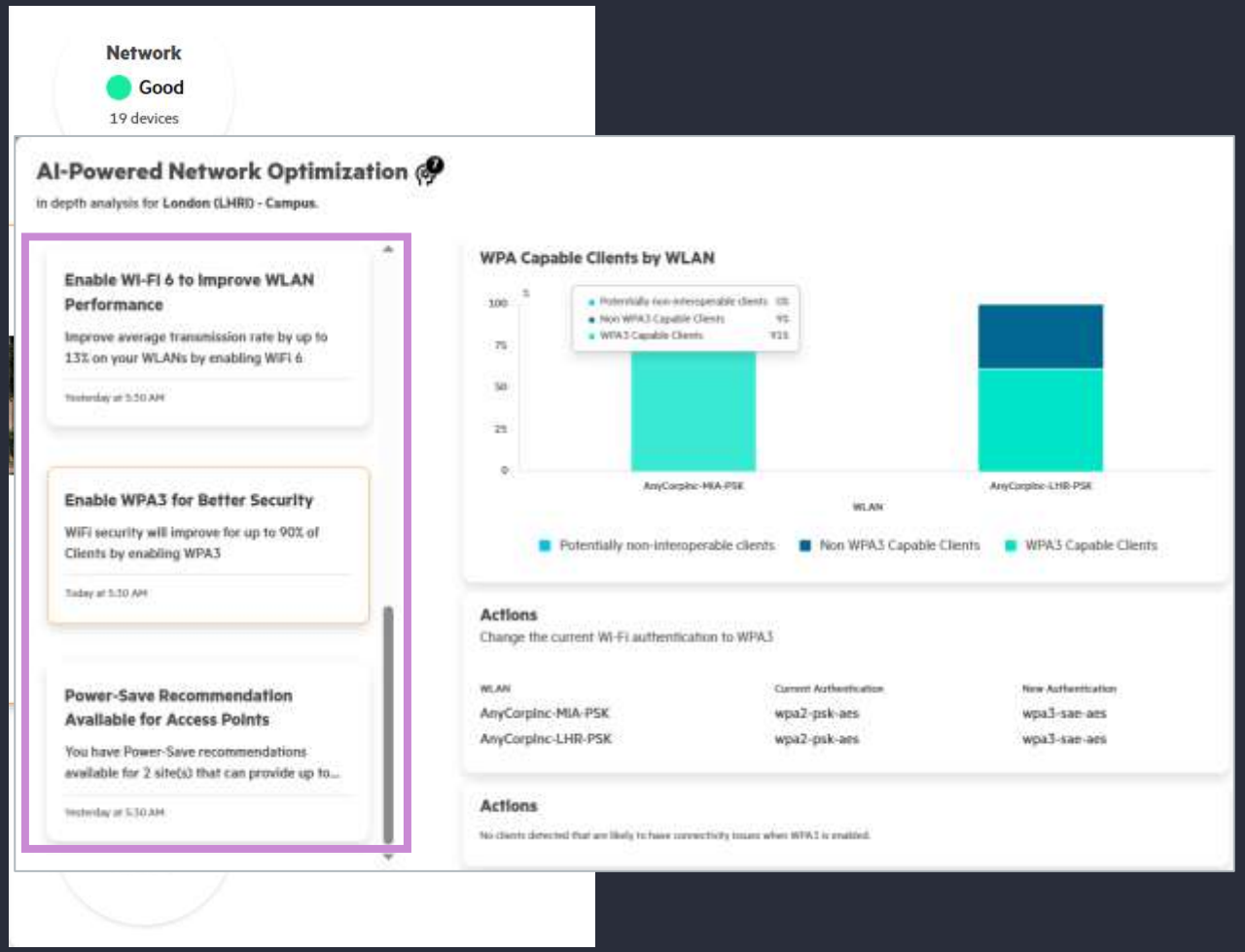



5-minutes to generate




Custom alerts on any KPI

# Proaktive Empfehlungen zur Optimierung des Netzwerks

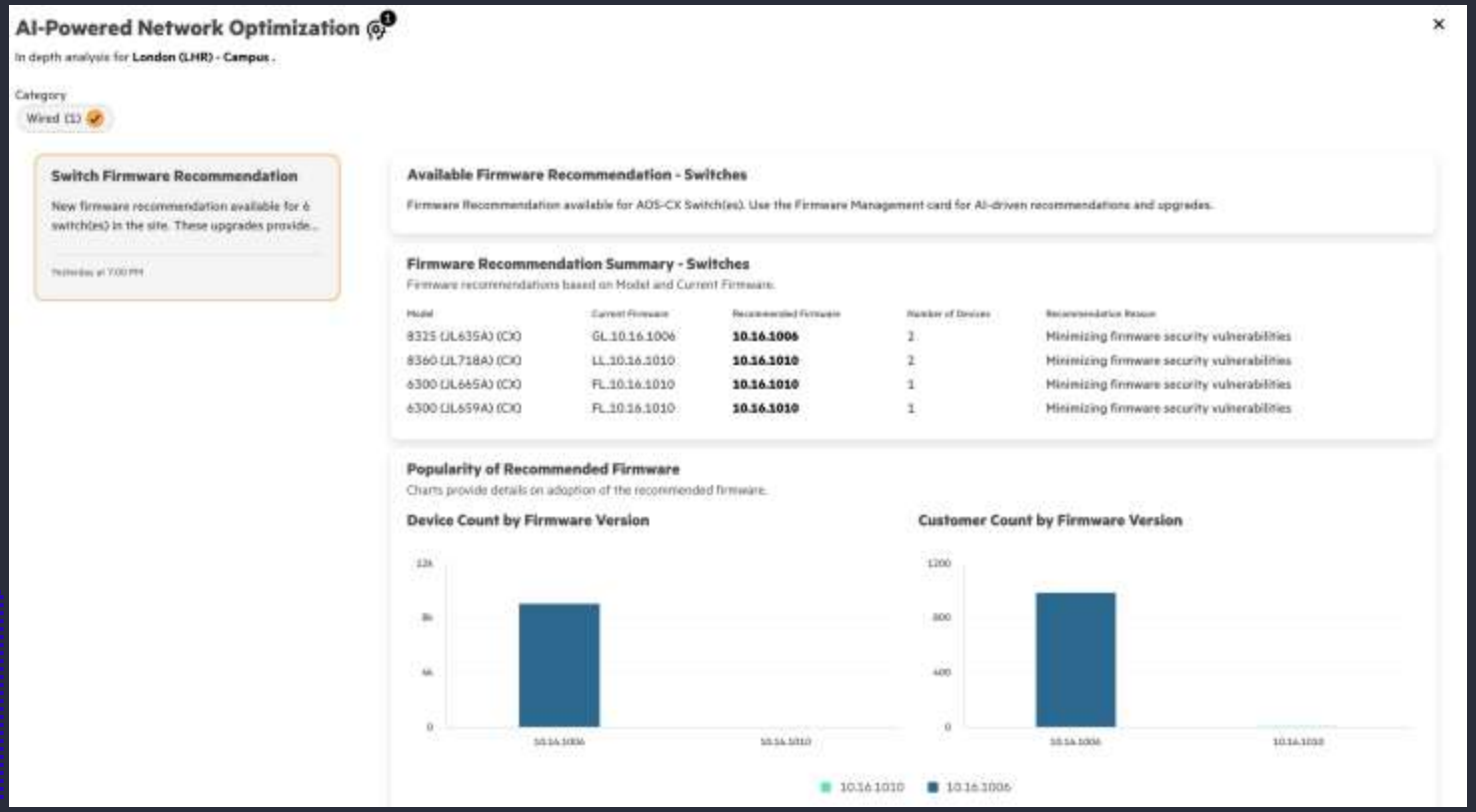



- Custom, actionable recommendations at a global/per-site basis
- AI/ML models trained and re-trained on data from anonymized peer groups with similar environments
- Examples:
  - Firmware recommendations
  - 802.11ax recommendations for Wi-Fi performance
  - AP power save recommendations to support sustainability efforts
  - WPA3 insights for improved security posture and more

# Firmware Recommender

Joey, Network admin

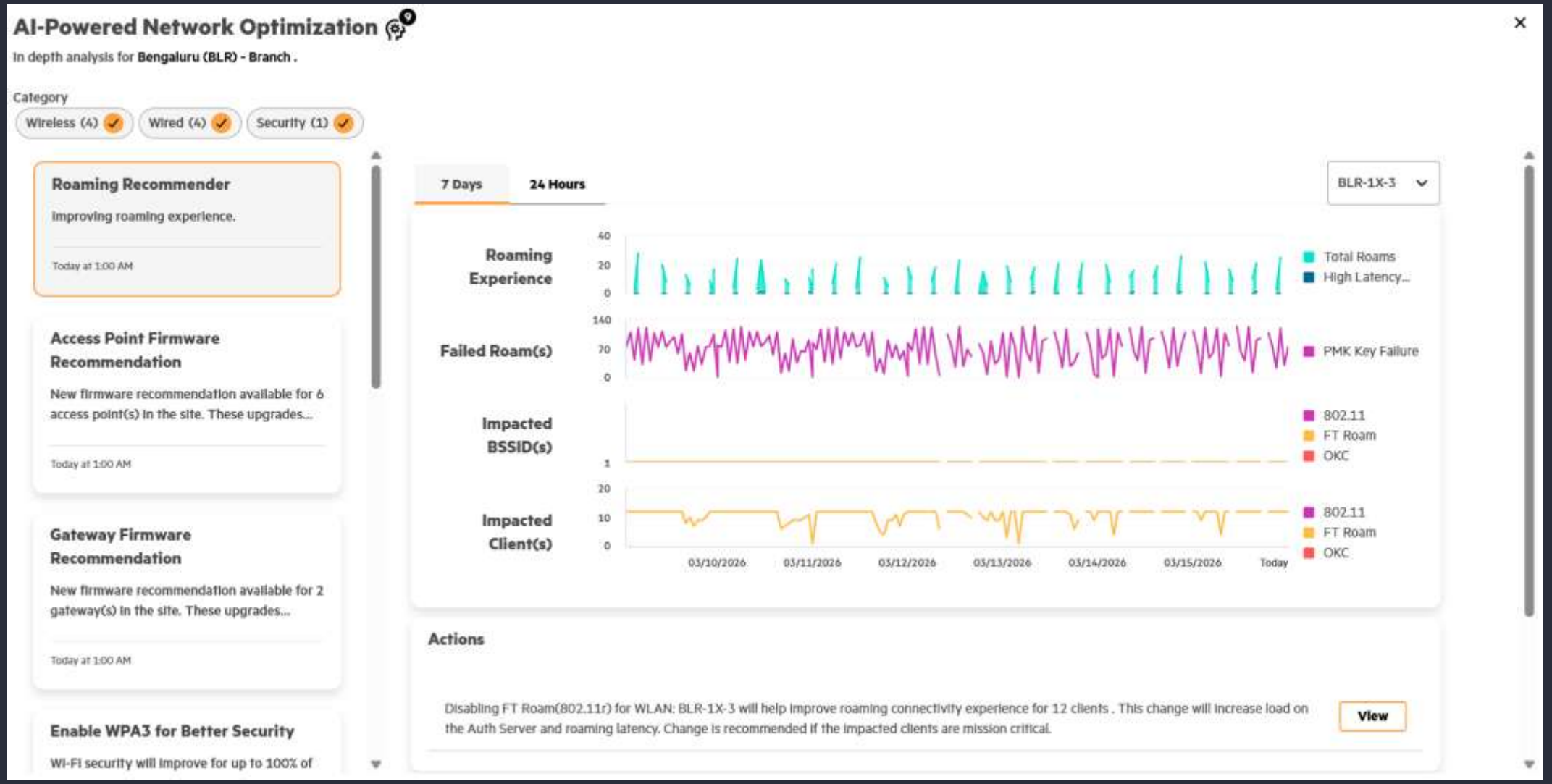
Manages a complex network and is cautious with upgrades. Relies on professional services for firmware assessment and recommendations



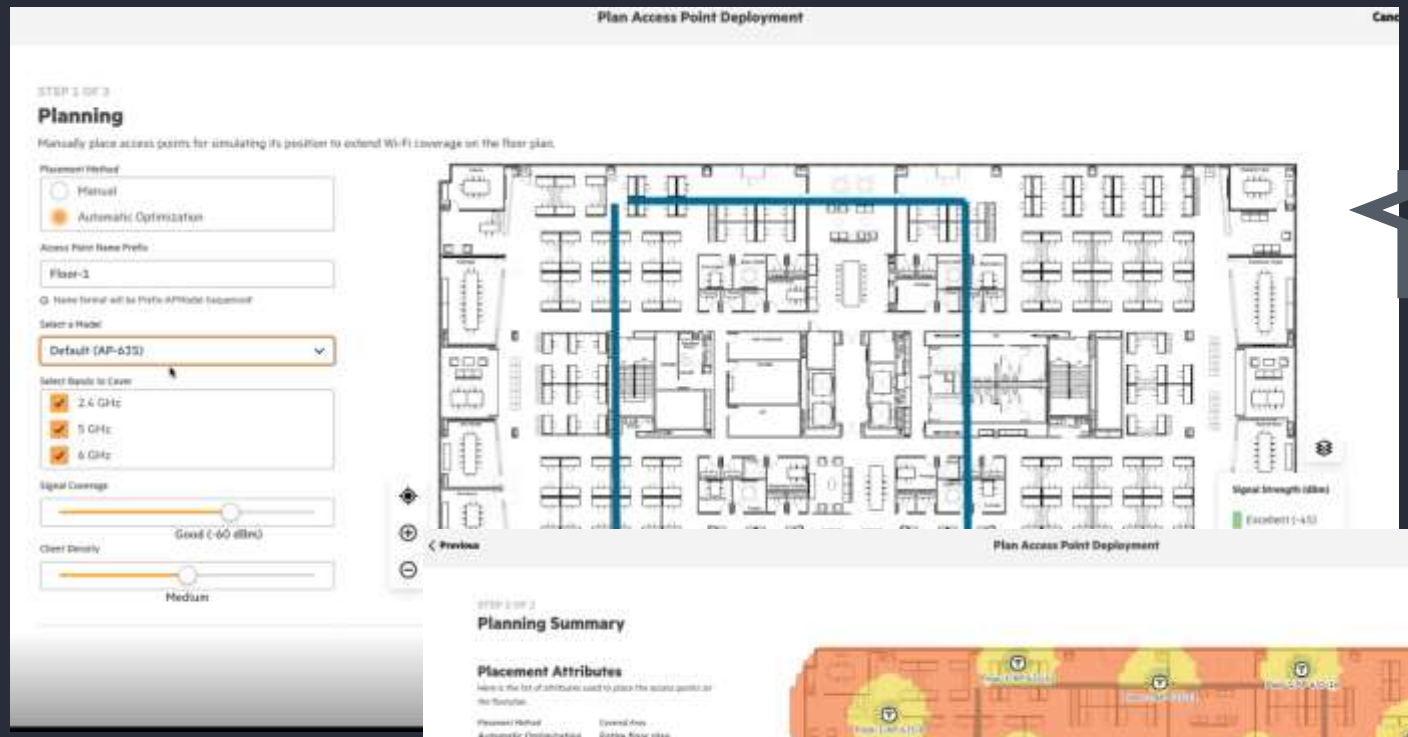

**Rely on HPE Aruba Networking's domain expertise**

AI-native firmware recommender uses ML models to recommend the best and most secure version of firmware for your network devices based on an extensive set of factors (compatibility, bugs, age, vulnerabilities, number of customers etc.)

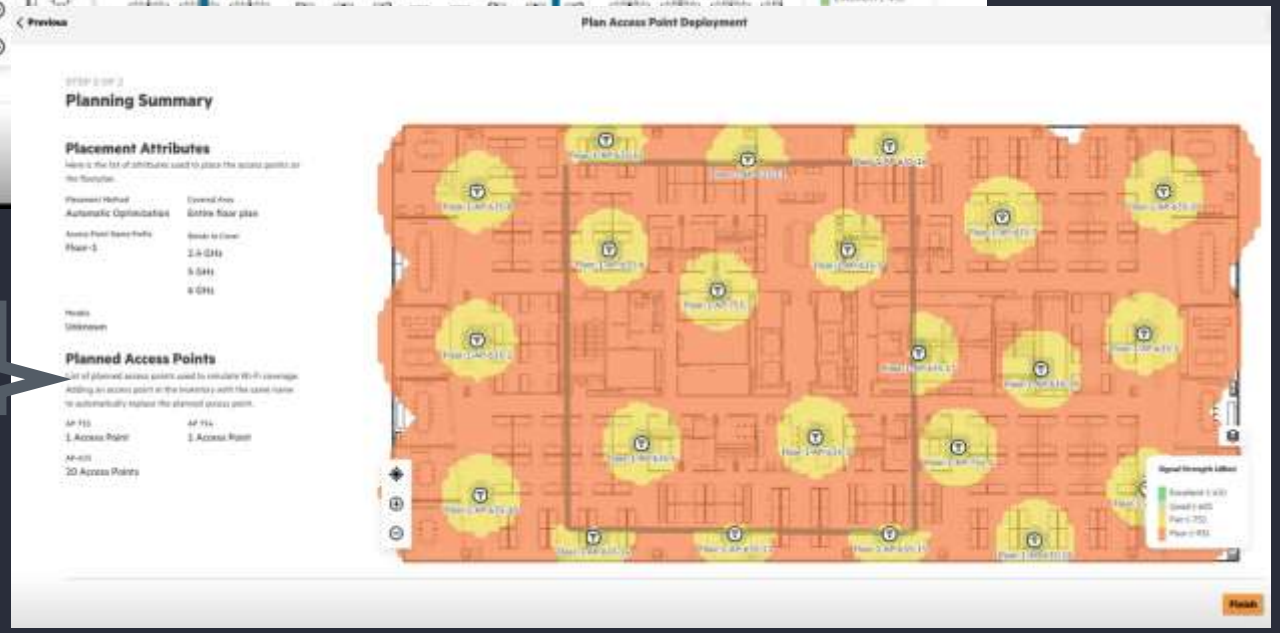
# Roaming Recommender



# Floor Plan Manager: Day-0 AP-Planung



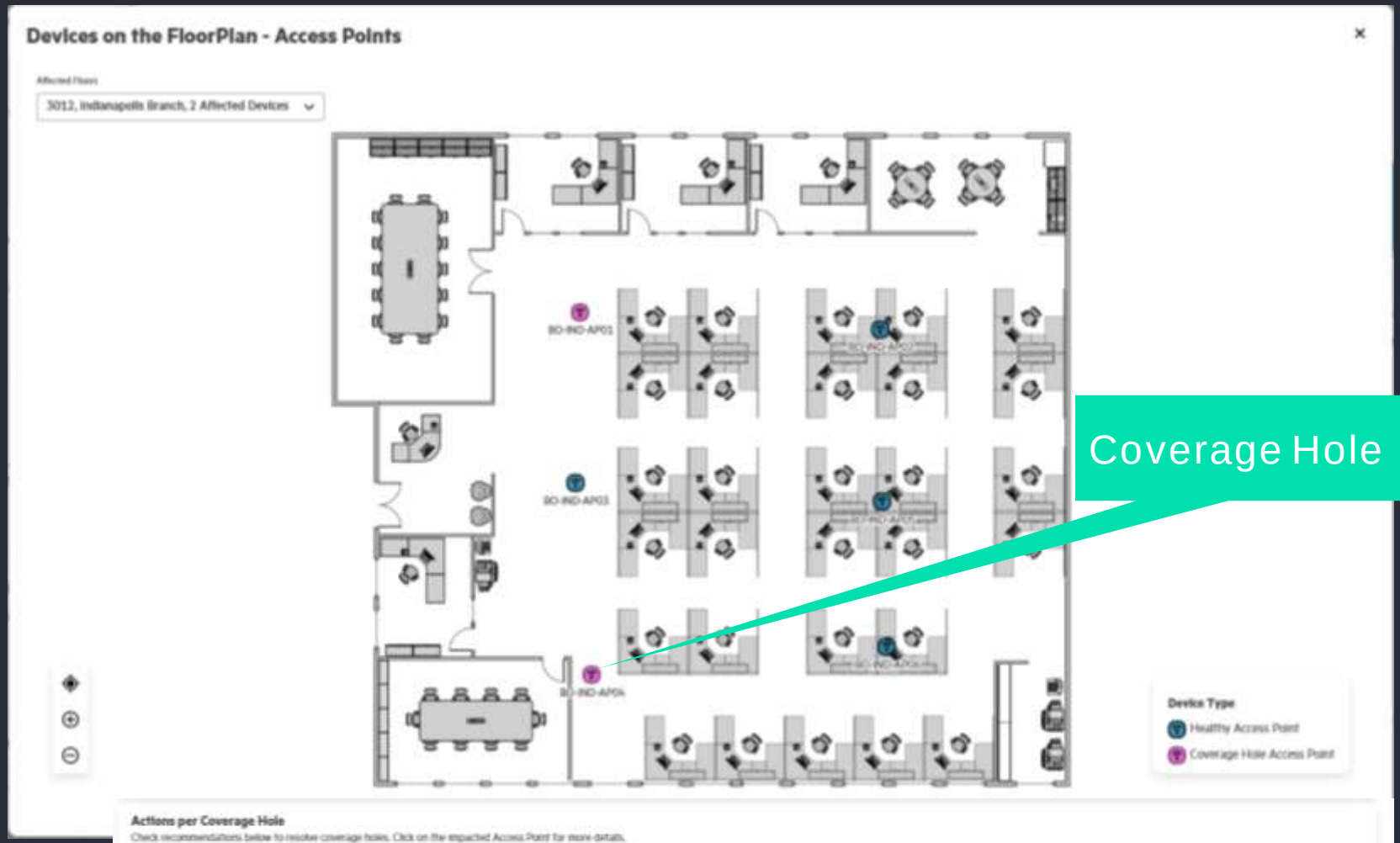

Challenge – Where should APs be placed?




Solution – Predictive AP placement guidance

- Challenge:
  - New deployments lack visibility into optimal AP placement.
  - Manual planning is time-intensive and error-prone.
- Solution:
  - Automated AP placement guidance based on RF heuristics and client density inputs
  - Planned vs. deployed views for validation.
  - Optimizes coverage and capacity before rollout.
- Results:
  - Faster Day-0 design with fewer manual adjustments.
  - Reduced site survey overhead.
  - Higher confidence in coverage and performance at launch.

# Coverage-Hole-Erkennung




Coverage Hole

## Feature Description

AI-powered detection of uplink/downlink coverage holes using client SNR telemetry

Floorplan-based visualization of impacted APs and client density

Action cards with root cause analysis and remediation steps (e.g., increase transmit power, add APs)

## Customer Benefits

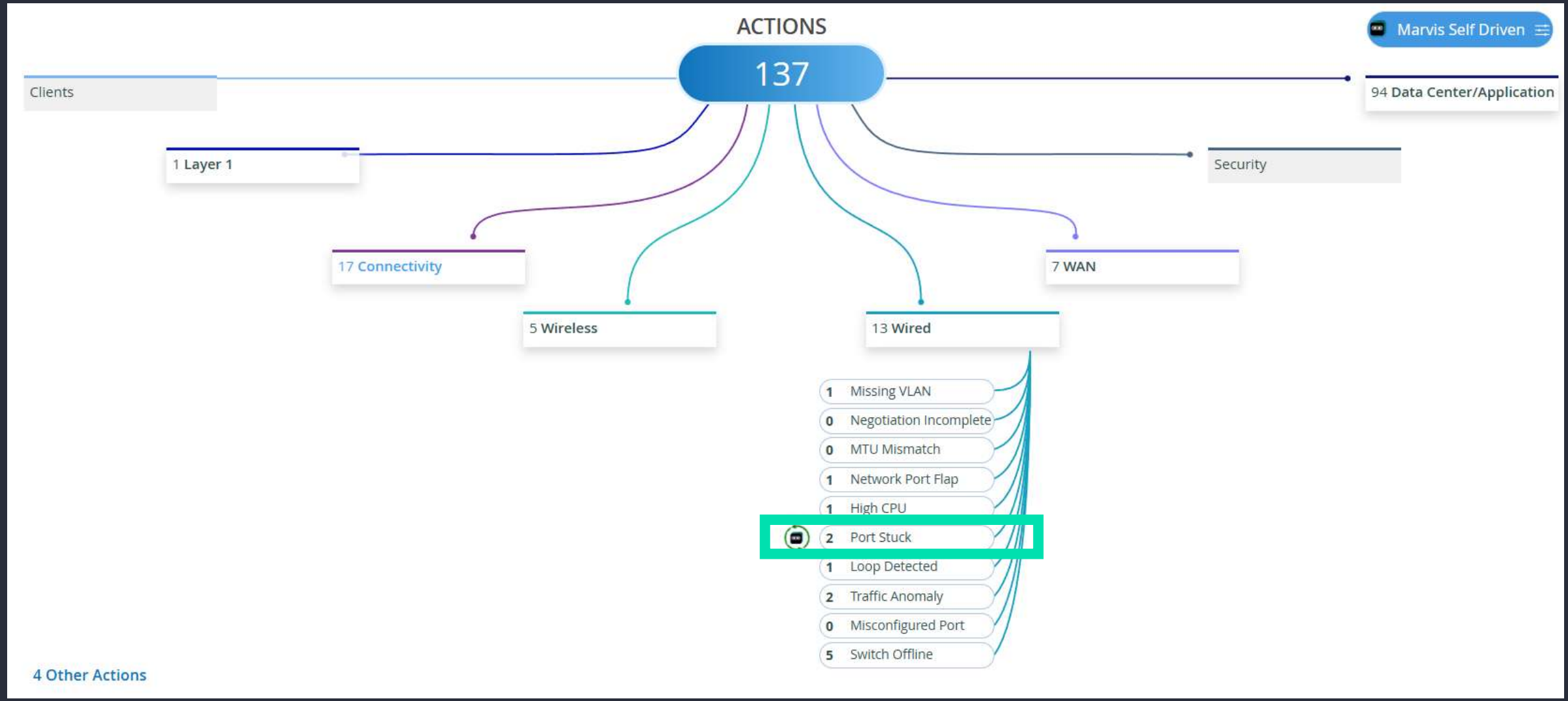
Improved RF coverage and client experience by resolving low-SNR zones

Reduced support tickets and faster resolution through automated recommendations

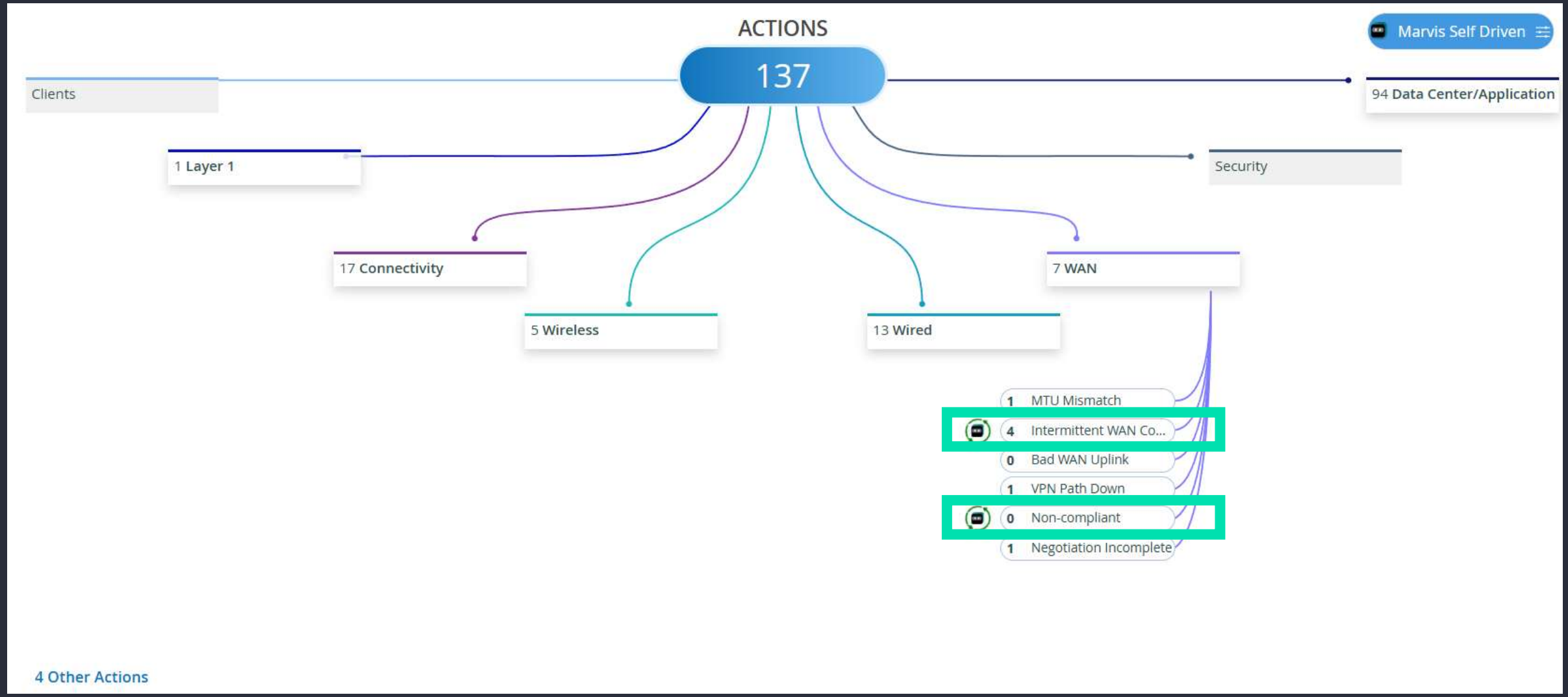
Enhanced visibility into spatial network health across 2.4GHz, 5GHz, and 6GHz bands

# Lassen wir Netzwerk-Probleme doch einfach von selbst lösen!

# Beispiel für Self-Driven Remediation (Wired)



# Beispiele für Self-Driven Remediation (WAN)



# Agentic AI

# Wie AI-Agenten im Netzwerk-Bereich unterstützen können

Network
Knowledge worker

**Task automation & Documentation**

- MOP generation
- Network audits
- Security posture analysis

**Network planning & testing**

- Digital twins
- Capacity planning
- Failure simulation

**Information distilling & Faster RCA**

- Event summarization
- Expert runbooks
- Multi-domain correlation

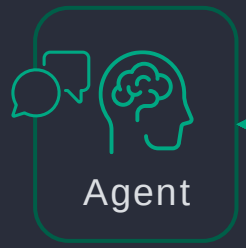
**Dynamic Network optimization**

- Failure impact analysis
- Path optimization
- BGP Hijack mitigation

# Bausteine von Agentic AI

## Anpassung des Systems an seine Umgebung

Data creates knowledge




Context creates meaning

**Fine-tuned LLMs**
(Model w/ context)

- Embed domain-specific knowledge directly into model weights

**Real-time streaming**
(More data)

- Continuous feed of current system state, sensor data, and metrics

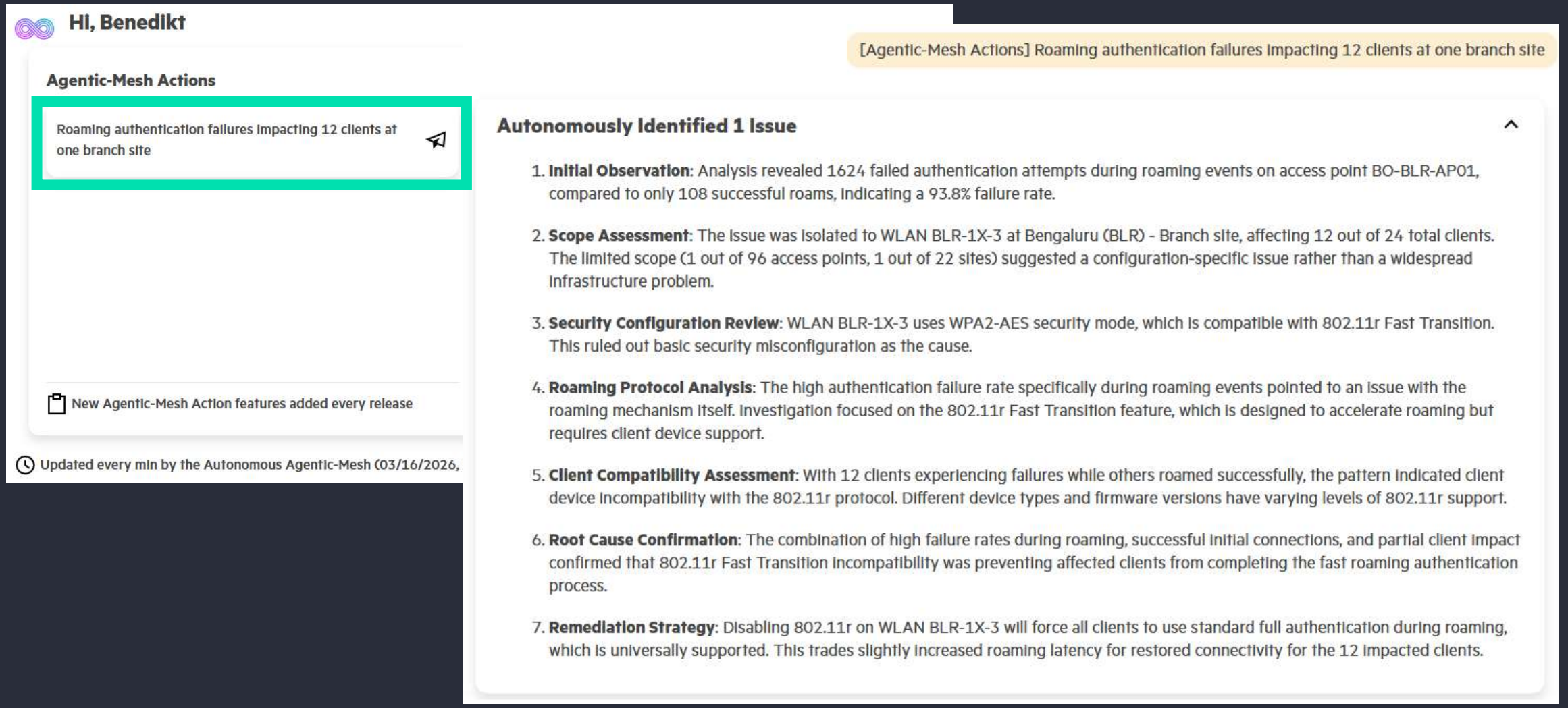
**Knowledge RAGs**
(Data + Context)

- Retrieve relevant information from indexed knowledge bases
- Give the agents more context (your secret sauce)

**Tools**
(Data + Actions)

- Connect agents to environment (systems, databases, services)

# Agentic Mesh in HPE Aruba Networking Central (1/2)



# Agentic Mesh in HPE Aruba Networking Central (2/2)

**Site-level Impact**: 12 clients at **Bengaluru (BLR) - Branch** site are experiencing roaming authentication failures with a 93.8% failure rate. Access point **BO-BLR-AP01** recorded 1624 failed authentication attempts during roaming events on WLAN **BLR-1X-3**.

***Root Cause***

802.11r Fast Transition roaming protocol incompatibility with specific client devices. The enabled FT feature on WLAN **BLR-1X-3** is preventing 12 clients from successfully authenticating during handoffs between access points.

***Remediation***

Disable 802.11r Fast Transition on WLAN **BLR-1X-3** to restore roaming functionality. Alternatively, create a separate WLAN without 802.11r for incompatible devices while maintaining the current WLAN for compatible clients.


Search

3 items

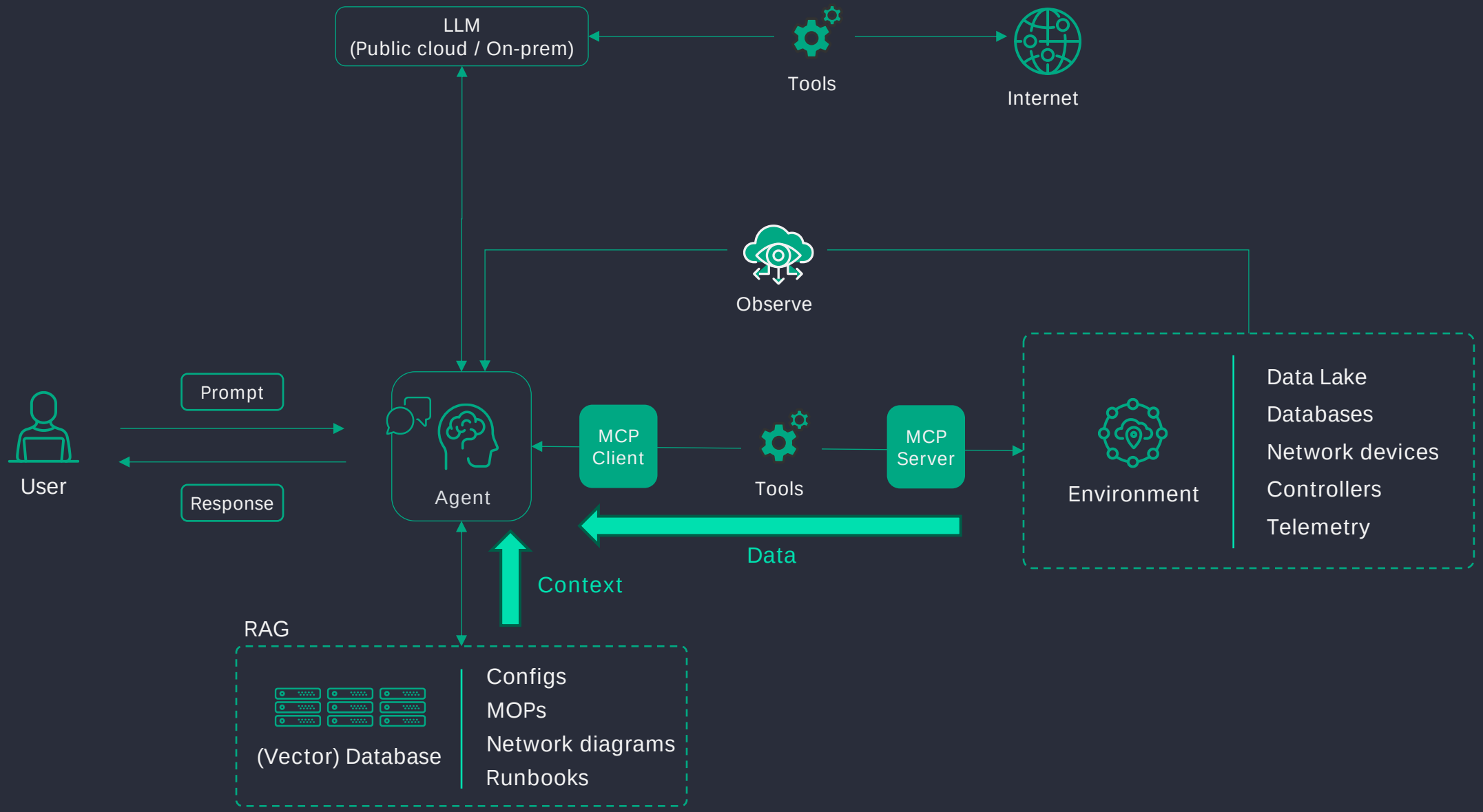
| FT (802.11r) Compatibility | Vendor | Year | Model | Impacted Clients | Total Clients |
|---|---|---|---|---|---|
| FT (802.11r) Capable | Zebra... | 2015 | Zebra-Mobile-... | 0 | 12 |
| FT (802.11r) Capable | Intel Corporate | 2016 | Windows... | 0 | 12 |
| FT (802.11r) Compatible | HUAWEI... | 2024 | Unclassified... | 0 | 5 |

Is this helpful?

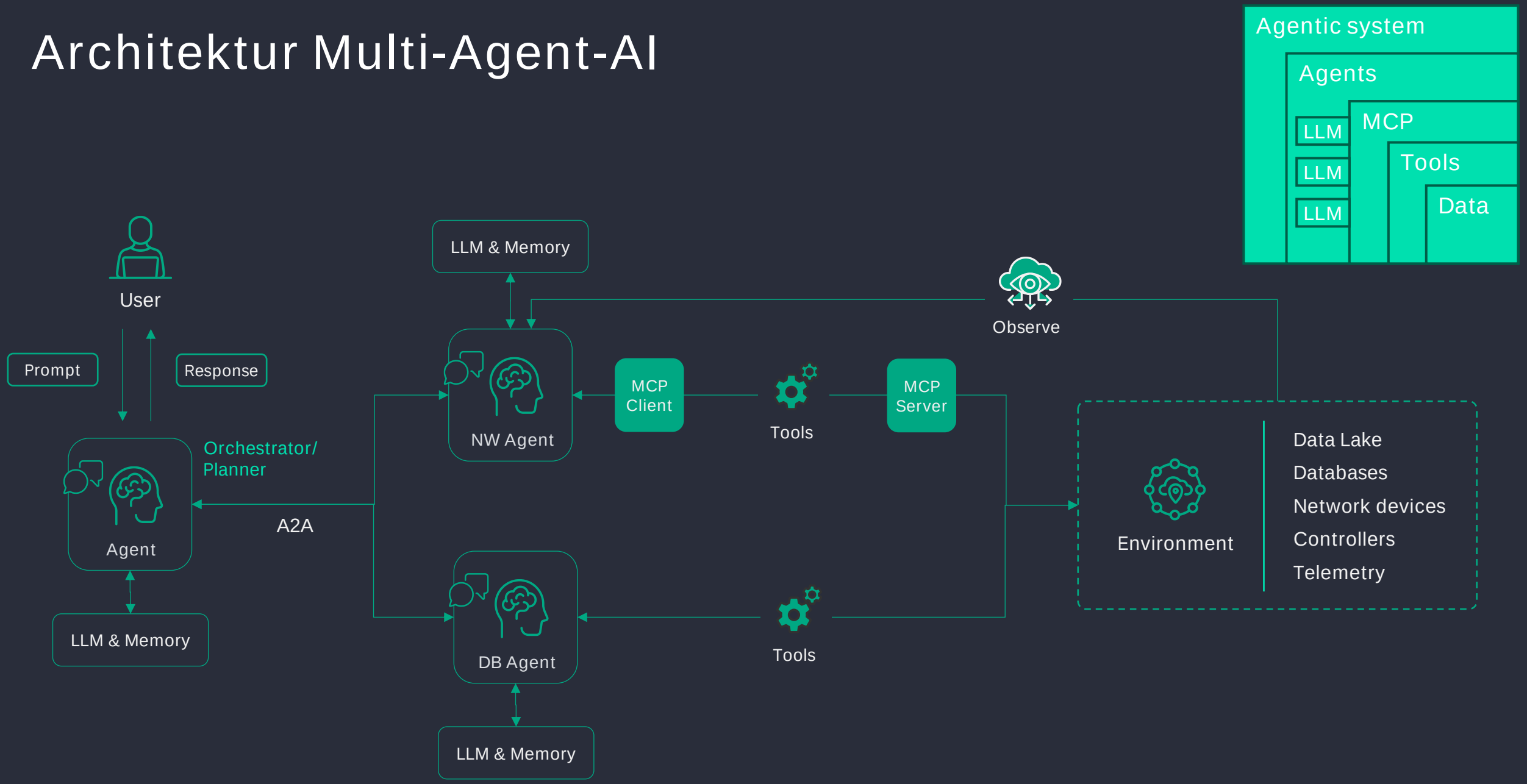
Enter a prompt here

# MCP-Server zur Anbindung an eigene KI-Agenten für umfassende Aufgaben

# Architektur Single-Agent-AI



# Architektur Multi-Agent-AI



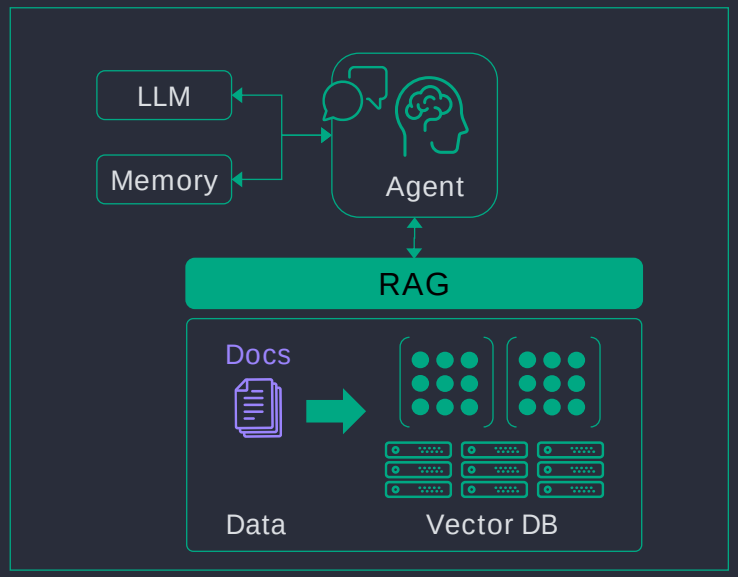
# Zusammenfassung von Agentic-AI-Architekturen

## Inference only

(no RAG, LLM fine-tuning or multi-agent)

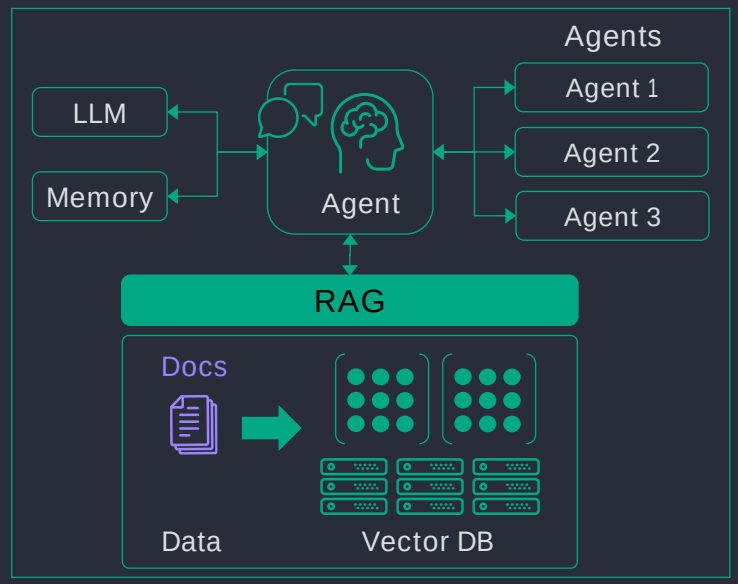

## Inference + RAG

(no LLM fine-tuning or multi-agent)




## Inference + RAG + Multi-agent

(no LLM fine-tuning)



# Klingt spannend? Na dann: nichts wie los!

Ihre Netzwerkumgebung (Router, Switches, Firewalls) von HPE Juniper Networking können Sie bereits heute mittels MCP-Server an Ihre eigenen AI Agents anbinden.

MCP Server Code auf Github (Open Source):

https://github.com/Juniper/junos-mcp-server

# Wichtige Aspekte für die Implementierung von Agentic AI

**Model selection**

- Choose wisely: LLM vs SLM (*Bigger is not always better!)*
- Find your sweet spot: Experiment with different models / different amounts of parameters
- Consider: Context window, Training data, Agentic capabilities, Open-source vs Open-weights vs Closed

**Agents**

- Be pedantic: Use Pydantic classes for data validation, parsing, and serialization
- Design your execution patterns: Sequential vs Parallel, Orchestrator & Planner agents, Observer & Critic agents
- Manage context windows: Provide only the required tools

**Agent-to-agent**

- Frameworks: Choose your favorite, connect them through A2A
- Design your callbacks: How and when agents handoff, How they use short-term and persistent memory
- Keep them in check: Prevent scope creep across agents (define the boundaries)

# Measuring Agents in Production

Research paper: https://arxiv.org/abs/2512.04123 (Dec 2025)

**95%** of agent deployments fail. > What separates successful deployments from failures?

| | | |
|---|---|---|
| What are the applications, users, and requirements of agents? | 73% | of successful deployments deploy agents primarily to increase efficiency and decrease time spent on manual tasks. |
| What models, architectures, and techniques are used to build deployed agents? | 70% | of successful deployments use off-the-shelf models without weight tuning |
| How are agents evaluated for deployment? | 74% | of successful deployments rely primarily on human-in-the-loop evaluation |
| What are the top challenges in building deployed agents? | 85% | of successful deployments don't see latency as a challenge (minutes is acceptable)<br>Reliability remains an unsolved challenge. |

# Agentic AI: Von der Planung bis zur Produktivschaltung

| *Model Architecture & Design* | *Infrastructure & Deployment* | *Data & Knowledge integration* | *Agent architecture* |
|---|---|---|---|
| Small vs Large Language Models | Deployment models: On-prem vs Cloud | Embedding model & Vector DB selection | Agent framework selection |
| Commercial vs Open-source LLMs | MCP engineering (client, server & host) | Building & fine-tuning RAG | Agent discovery |
| Context engineering & Runbooks | CI/CD pipelines | Multi-modal input processing | Agent hierarchy & Multi-agent interactions |
| LLM Benchmarking: Performance, cost, latency | Third-party integrations | Data lake integrations | Agent guardrails & safety policies |
| LLM routing & optimization | User experience: UI, APIs, SDKs | Data quality & pre-processing | Agent benchmarking |

Security, Compliance, Data Privacy, Human-In-The-Loop, Observability & Monitoring, Scale & Performance

# Fragen und Diskussion