

From chaos to autonomy: How agentic AI is reinventing network operations

Outpace complexity, prevent outages,
and accelerate the journey to self-driving
networks.

Reliable and secure connectivity isn't just a luxury: it's business-critical. But with limited resources, tight budgets, and demanding timelines, IT teams are struggling to manage ever-increasing network complexity on their own.

To address these challenges, they're turning to innovative AI-native and cloud-native networking solutions to help streamline operations, improve efficiency, and enable smarter, more scalable network management. If done correctly, IT shifts from observing and managing network devices to ensuring application and user experiences that directly impact the bottom line.

At the forefront of this transformation is the concept of the self-driving network: an AI-assisted network designed to optimize operations, autonomously heal itself, and shift IT from a reactive cost center to a proactive driver of business performance. Agentic AI plays a critical role in advancing this vision, moving networks from static connections to dynamic, business-enabling assets.

What is agentic AI?

Agentic AI is the next level of AI advancement. Using LLMs, machine learning (ML), generative AI, and open protocols, agentic AI introduces intelligent agents capable of reasoning, self-learning, and collaborating to solve complex problems. Each agent is a domain-specific expert, with specialization in areas such as switching or routing, that can solve complex problems, adapt dynamically, and autonomously mitigate issues without human intervention.

To coordinate their actions, the agents are organized in a graph-based structure that acts as a blueprint to map how they'll interact, plan, and execute tasks. Agentic AI breaks down multifaceted challenges into subtasks that are delegated to the most suitable agent or agents. The agentic system of LLMs and tools establish dynamic, agent-to-agent workflows to gather and synthesize relevant data to analyze, understand, and prevent or solve the problem, either autonomously or with human oversight.

It's redefining networking

Unlike traditional, reactive network operations that are fragmented and often let outage-causing issues slip through the cracks, agentic AI acts as a proactive unifier. By continuously evaluating network and application vital signs, such as error rate, response time, and network latency, and correlating them, agentic AI can diagnose issues early and accurately.

So, instead of relying on basic observability that only tells you about network conditions or what happened after a problem occurs, you get actionable application and user insights that identify what needs to be fixed and, when given permission, AI that can resolve the issue autonomously before users are ever impacted.

An agentic AI use case

Video quality suddenly degrades in a branch office. The issue goes unnoticed until a user opens a ticket. Campus, WAN, data center, and security teams start investigating the issue, but their investigations happen in isolation, and findings are manually correlated across disparate systems. The whole process is slow and labor-intensive, costing user experience.

In a self-driving network with agentic AI, intelligent agents are dynamically orchestrated into a workflow across an agentic mesh. Using Service Level Experience (SLE) data, for example from Zoom or Teams, they collaborate to pinpoint the underlying issue, such as a misconfigured WAN link, and take corrective action either with human approval or as an autonomous, self-driving action. What once required days or weeks is reduced to seconds or minutes. The result is minimal disruption, restored performance, and a more efficient and scalable operations team.

The benefits

Just like agentic AI itself, its benefits and use cases continue to grow with time. Right now, they include, but aren't limited to:

- **Speed:** Faster analysis and synthesis of massive volumes of data in real time and rapid resolution of complex problems minimizes networking delays and enhances responsiveness
- **Productivity:** Mundane and multi-step procedures are automated, streamlining operations and freeing IT teams to focus on business-critical initiatives and innovation instead
- **Extensibility:** As agentic AI evolves and adapts by integrating new agents with specialized capabilities—without disrupting existing workflows—it becomes easier for it to handle complex tasks across industries
- **Innovation:** AI-powered simulations and faster prototyping reveal promising models and breakthrough solutions across domains for end-to-end assurance
- **Security:** AI systems work 24/7 without growing tired or bored and can reduce human error, prevent data breaches, and enforce industry laws

Agentic AI's impact on the self-driving network

The journey to a self-driving network has five stages built on progressive levels of trust:

- 1. Data collection:** Gathering high-quality data from the network in real time to provide the necessary inputs for AI/ML algorithms
- 2. Insights:** The data is then processed by AI-powered analytics to generate insights that identify performance trends, potential disruptions, or inefficiencies in the network
- 3. Recommendations:** Based on these insights, the network generates recommendations for actions that will optimize performance or resolve issues
- 4. Assisted-driving:** The network begins to autonomously take corrective actions with IT oversight
- 5. Fully self-driving:** IT has enough trust in AI to let it take full control of making real-time adjustments and optimizations

Building trust is essential at every stage, with each successful step laying the groundwork for broader acceptance of AI-led autonomy. Transparency, explainability, and human-in-the-loop controls help teams stay informed and empowered throughout the process.

Much like the gradual evolution of self-driving cars—where drivers first adopted features like automatic braking and lane assist before embracing full autonomy—confidence in agentic AI grows through consistent, reliable outcomes that build trust one action at a time.



Not all models are the same

Agentic AI isn't a black box technology that instantly solves every problem. It depends on high-quality data and real-time, AI-native platforms and an open ecosystem that incorporate digital twinning, as well as purpose-trained LLMs capable of predicting user experiences, leveraging generative AI, and understanding natural language. Together, these elements enable seamless communication across intelligent AI agents, tools, multivendor networking domains, and external platforms, delivering consistent, end-to-end experiences.

Unlike legacy, vertically integrated networking platforms that must bolt agentic capabilities onto rigid, monolithic workflows, HPE's microservices-based architectures incorporate agentic services as a natural extension of our platform. As modular building blocks, they allow developers to integrate services through well-defined APIs, delivering distributed intelligence, modularity, and continuous adaptation.

HPE's data pool differs from other vendors' because we've been gathering it longer than anyone else. Since 2015, HPE has been collecting user and application data from billions of access points, routers, switches, firewalls, and client devices. This constant stream of telemetry data is what trains and powers our cross-domain agentic AI models, keeping them up to date and accurate.

Among that data is real-time specialized SLE telemetry. This fundamentally different approach to collecting data gives us insight into users' actual experience instead of relying solely on device health indicators or dashboards. SLE focuses on whether users can access and use their applications to reveal issues that may be hiding under the surface of other device-focused data, supporting the best user experience possible.

Unlike single-domain AI solutions that are limited in scope, HPE extends our agentic mesh across campus, branch, WAN, and data center domains. Cross-domain AI is built for complex hybrid environments, enabling seamless workflows, scalability, and resiliency for application or user affecting issues that could arise anywhere from client to cloud.



Charting the future of autonomous networking

As networks grow more complex, agentic AI becomes essential not just for managing them, but also for transforming how IT delivers value. By combining deep, real-time intelligence with powerful automation, it accelerates the shift from device-centric operations to high-impact, experience-centric outcomes. With the right data foundation, microservices architecture, and cross-domain design, organizations can build networks that continuously optimize themselves, adapt to new challenges, and free IT teams to focus on strategic initiatives.

This is the path toward a fully self-driving network: one that delivers seamless client-to-cloud experiences while elevating IT's role in driving business performance.

Learn more at

[HPE.com/networking](https://hpe.com/networking)

Visit [HPE.com](https://hpe.com)



[Chat now](#)

© Copyright 2026 Hewlett Packard Enterprise Development LP. The information contained herein is subject to change without notice. The only warranties Hewlett Packard Enterprise products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Hewlett Packard Enterprise shall not be liable for technical or editorial errors or omissions contained herein.

a00158163ENW

HEWLETT PACKARD ENTERPRISE

hpe.com

