



Need-to-knows for  
meeting today's  
connectivity demands

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## Great experiences require great technology

More people and more devices are connecting to enterprise networks than ever before. In fact, the number of connected IoT devices now significantly exceeds the number of users, with the number of connected IoT devices estimated to reach 39 billion by 2030.<sup>1</sup> When organizations have a network that can reliably support this scale, they can deliver exceptional connected and immersive experiences.

Consider a large outdoor stadium in the United States that connects more than 80,000 fans simultaneously. The network enables ticketless entry, mobile food ordering, real time statistics streaming, and video calls during the event. Experiences like these depend on networks that can deliver consistent, high performance connectivity across dense environments.

But the challenge for many organizations today is: how can networks securely and reliably support increasingly distributed users, devices, and applications while still leaving room for emerging technologies, like AI?

Meeting today's connectivity demands requires adopting modern wired and wireless technologies, from **Wi-Fi 7** and **private 5G** to **high reliability, low-latency switching architecture**. More importantly, it's enabling these technologies with intelligent, **AI-native network management** that can optimize performance automatically.

Here are a couple of important need-to-knows around each to keep in mind.

<sup>1</sup> [State of IoT 2025](#), IoT Analytics

# 1. The 6 GHz Wi-Fi 7 wave is growing

Wireless connectivity has become the primary way users and devices access enterprise networks. As more devices connect and new applications emerge, Wi-Fi networks are increasingly experiencing congestion that can impact performance and user experience.

The opening of the 6 GHz spectrum provides a new, cleaner band for wireless communication, helping relieve congestion in traditional bands. At the same time, Wi-Fi 7 introduces important new capabilities that further increase performance, efficiency, and reliability.

## Wi-Fi 7 key features

### **More data and more simultaneous transmissions:**

320 MHz channels double the bandwidth available in Wi-Fi 6E, enabling faster data transmission and improved performance for high demand applications.

### **Improved load balancing and throughput:**

Multilink operations (MLO) allow devices to connect across multiple frequency bands simultaneously. This capability can increase reliability and reduce latency by transmitting redundant data streams across several links.

### **Higher peak data rates:**

4K QAM enables more efficient data encoding, allowing more information to be transmitted in each signal and improving overall network speed and capacity.



## What you need to know about Wi-Fi 7

### 1. It is ideal for high bandwidth, low latency environments

Emerging applications are increasingly immersive and data intensive. Wi-Fi 7 is particularly valuable for environments that require consistent performance and ultra-low latency connectivity. Organizations benefit from Wi-Fi 7 when they need to:

- **Run bandwidth intensive applications** such as ultra-high definition video conferencing, AI workloads, cloud computing, or large data transfers without disruption
- **Ensure reliable connectivity** for mission critical applications including real time collaboration tools and healthcare systems such as electronic health records
- **Connect large numbers of users** across open office environments or high density public venues
- **Support growing numbers** of IoT devices, sensors, and smart building systems without compromising the performance of other applications

### 2. Upgrading now prepares you for the growing wave of Wi-Fi 7 devices

Wi-Fi 7 adoption is accelerating rapidly. The Wi-Fi Alliance estimates that nearly 260 million Wi-Fi 7 devices shipped in 2024,<sup>2</sup> including smartphones and laptops from major manufacturers. Organizations that upgrade their networks early will be better prepared to support this growing device ecosystem.

### 3. Switch infrastructure must evolve as well

Wi-Fi access points maintain backward compatibility, allowing older devices to connect even as newer standards are introduced. However, unleashing the full potential of Wi-Fi 7 often requires upgrading switching infrastructure to support higher throughput and multigigabit speeds.

Although widespread demand for five or ten gigabit speeds is still emerging, modern switching infrastructure ensures networks are prepared for increasing traffic volumes and emerging use cases such as AI inference at the edge.



<sup>2</sup> [Value of Wi-Fi](#), Wi-Fi Alliance

## 2. There is a new dawn of wireless coverage with private 5G

For many years, deploying a private 5G network was complex and difficult for most organizations. Implementing a solution often required coordinating multiple vendors for radios, spectrum, software, and integration services. This complexity slowed adoption and made ongoing management difficult for IT teams.

Today, several developments are making private 5G significantly more accessible. The introduction of shared spectrum options such as CBRS in the United States, combined with integrated end to end solutions, has simplified both deployment and management. As a result, private 5G is becoming an important complement to Wi-Fi for organizations that require wider coverage, reliable mobility, and predictable performance.

### Two key advancements improving private 5G adoption

- 1. Regulatory advances** now allow enterprises to access shared spectrum models without relying exclusively on telecommunications providers.
- 2. Integrated private 5G platforms** include built-in automation that simplifies deployment and ongoing operations.

### What you need to know about private 5G

#### 1. It offers more mobility and wider area coverage than Wi-Fi

| Organizational need                         | How private 5G helps                                                                                                                        |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Wider coverage areas</b>                 | Private 5G base stations operate at higher power levels than typical Wi-Fi access points, enabling larger coverage areas with fewer radios. |
| <b>Predictable quality of service</b>       | Private 5G networks can guarantee bandwidth, latency, and prioritization for specific applications and devices.                             |
| <b>High speed mobility</b>                  | Devices remain connected to the same radio for longer periods, reducing handoffs and minimizing latency or connection drops.                |
| <b>Support for mission critical traffic</b> | Private 5G provides more predictable performance in congested or interference prone environments.                                           |

#### 2. It doesn't replace Wi-Fi

Private 5G should not be viewed as a replacement for Wi-Fi. Instead, the two technologies complement each other by addressing different connectivity needs. Wi-Fi typically supports indoor connectivity and user driven applications, while private 5G can extend connectivity to wide outdoor areas, industrial sites, and mobility focused use cases. The future of enterprise connectivity will likely involve a combination of wireless technologies, including Wi-Fi, private 5G, Bluetooth, Zigbee, and LoRa.

#### 3. Why precision timing matters

Private 5G networks require precise synchronization to ensure that data is delivered accurately across distributed systems. Precision Time Protocol technology synchronizes clocks across the network with extremely high accuracy, ensuring that time sensitive applications such as factory automation or robotics operate correctly. Organizations should consider switching infrastructure that includes built-in timing capabilities, including grandmaster functionality, to ensure resilient and highly synchronized network performance.

#### 4. Many industries require both Wi-Fi and private 5G

No matter the industry vertical, the enterprise network is often called upon to meet various needs at the same time. Here's how Wi-Fi working together with private 5G can deliver:

- **Entertainment venues:** Private 5G supports operational systems such as mobile ticket scanning, while Wi-Fi delivers immersive digital experiences for guests.
- **Manufacturing:** Wi-Fi provides connectivity for office environments, while private 5G supports factory equipment that requires strong signals and reliable mobility.
- **Transportation:** Wi-Fi connects passengers while private 5G supports operational systems such as real time baggage tracking across large facilities.



### 3. For the best experiences, wireless and wired infrastructure should be AI-native

Modern technologies such as Wi-Fi 7 and precision-timed switching promise exceptional performance. However, delivering consistently great user experiences requires more than fast infrastructure. It requires a network that can intelligently monitor conditions, learn from data, and act automatically.

AI-native networks embed intelligence directly into the platform so the network can continuously analyze performance, correlate events across domains, and resolve issues automatically. This enables networks to shift from reactive troubleshooting to proactive operations.

The goal is not simply network uptime. It's delivering consistent, high-quality user and device experiences across increasingly complex environments.

#### What you need to know about AI-native networks

##### 1. They help simplify operations and accelerate deployment

| How an AI-native network boosts efficiency |                                                                                                                                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Optimizes performance                      | Continuously analyzes network conditions, traffic patterns, and user behavior to automatically tune performance.                                |
| Prevents issues before they occur          | Predictive analytics identify potential bottlenecks or disruptions early so the network can take corrective action automatically.               |
| Reduces operational overhead               | Automated workflows simplify configuration, troubleshooting, and lifecycle management across wireless and wired environments.                   |
| Accelerates deployment                     | Capabilities such as zero touch provisioning allow new access points and switches to be deployed quickly without complex on-site configuration. |

By shifting more operational responsibility to the platform, IT teams can spend less time troubleshooting and more time focusing on strategic initiatives.



## 2. True AI enables self-driving network operations

AI-native networks go beyond dashboards and alerts. They enable self-driving capabilities that allow the network to identify issues, determine root cause, and take corrective action automatically.

This closed loop automation enables networks to:

- **Identify root cause faster:** Correlate events across wireless, wired, and application layers to determine the true source of issues.
- **Automatically remediate problems:** Apply fixes or optimizations without requiring manual intervention.
- **Continuously learn and improve:** Machine learning models analyze telemetry and outcomes over time to improve accuracy and effectiveness.

## 3. Look for AI-native architecture, not AI washing

As AI becomes more central to network operations, it is important to distinguish between true AI-native platforms and solutions that simply add AI features on top of legacy architectures.

Some vendors promote AI capabilities that are limited to dashboards, basic anomaly detection, or recommendations that still require manual action. This approach is often referred to as AI washing.

When evaluating AI-driven network solutions, consider asking:

- Is AI embedded directly into the networking control plane architecture?
- Is the platform truly cloud-native and microservices-based?
- What telemetry is continuously streamed across wireless and switching infrastructure?
- Can the system automatically identify root cause and remediate issues?
- Do the AI models continuously learn and improve over time?

True AI-native networks use continuous telemetry, automated correlation, and self-driving operations to configure, optimize, and heal the network with minimal human intervention.



4. Data and telemetry are essential for effective AI

AI is only as effective as the data that powers it. High-quality telemetry from access points, switches, and connected devices enables machine learning models to understand network conditions and respond accordingly.

The AI engine within HPE’s network management solutions analyzes telemetry from millions of devices and billions of endpoints to deliver insights and automated actions across wireless, wired, and WAN environments.

When evaluating AI-driven networking platforms, consider the scale and quality of the telemetry that informs the AI models. Rich data enables more accurate insights, stronger automation, and better outcomes.

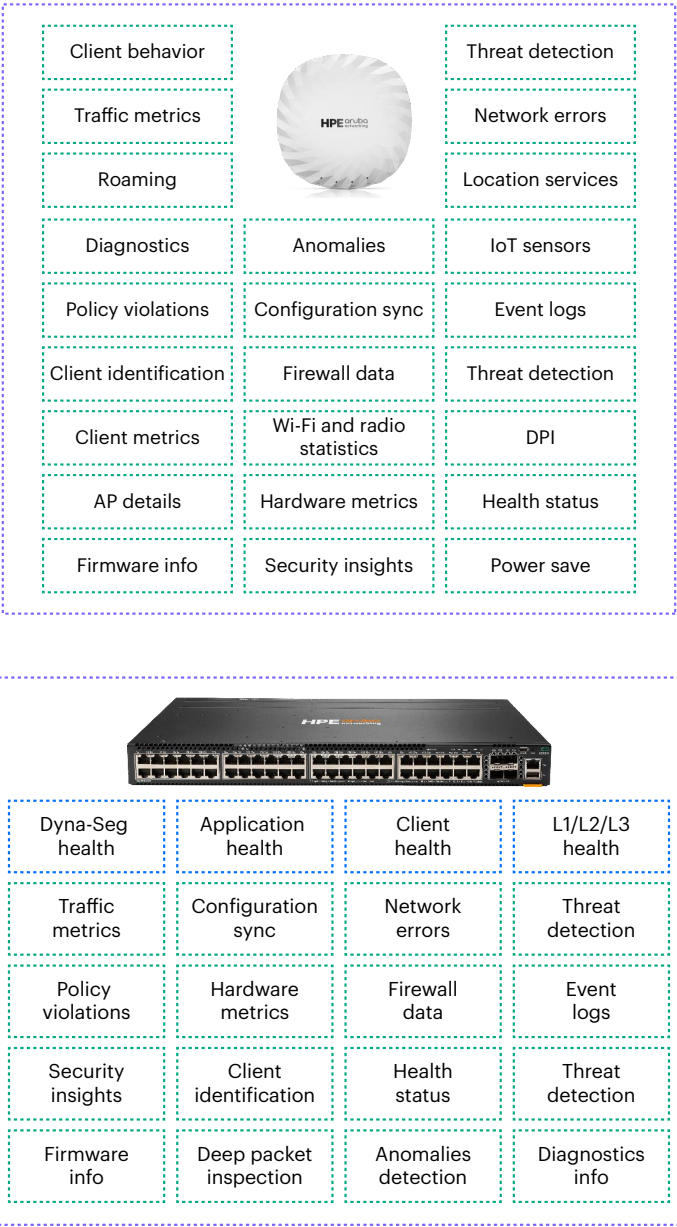


Figure 1. Telemetry delivered to HPE Aruba Networking Central by our access points and switches

# 4. A flexible network foundation is essential

As technology evolves, network requirements will continue to change. Organizations must build infrastructure that supports both current demands and future innovation. This requires a network architecture that can adapt quickly to new applications, devices, and operating conditions.

## How HPE supports network adaptability

| Stay ahead with cloud-native network management                                                                                                | Deploy new devices faster                                                                                                                                                                                                 | Maintain flexibility with open integrations                                                                                                                  | Deploy your way                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Because HPE's platforms are cloud native, they continuously deliver updates and new capabilities through a modular microservices architecture. | HPE provides one of the industry's broadest AI-native networking portfolios, including access points, switches, SD WAN, and private 5G solutions. Centralized workflows simplify device deployment across multiple sites. | Open APIs and third-party integrations allow organizations to integrate with existing tools while maintaining visibility into devices from multiple vendors. | Organizations can deploy through several models: cloud delivered SaaS, virtual private cloud, on-premises deployment, and network as a service (NaaS). |



## Meet today's connectivity demands

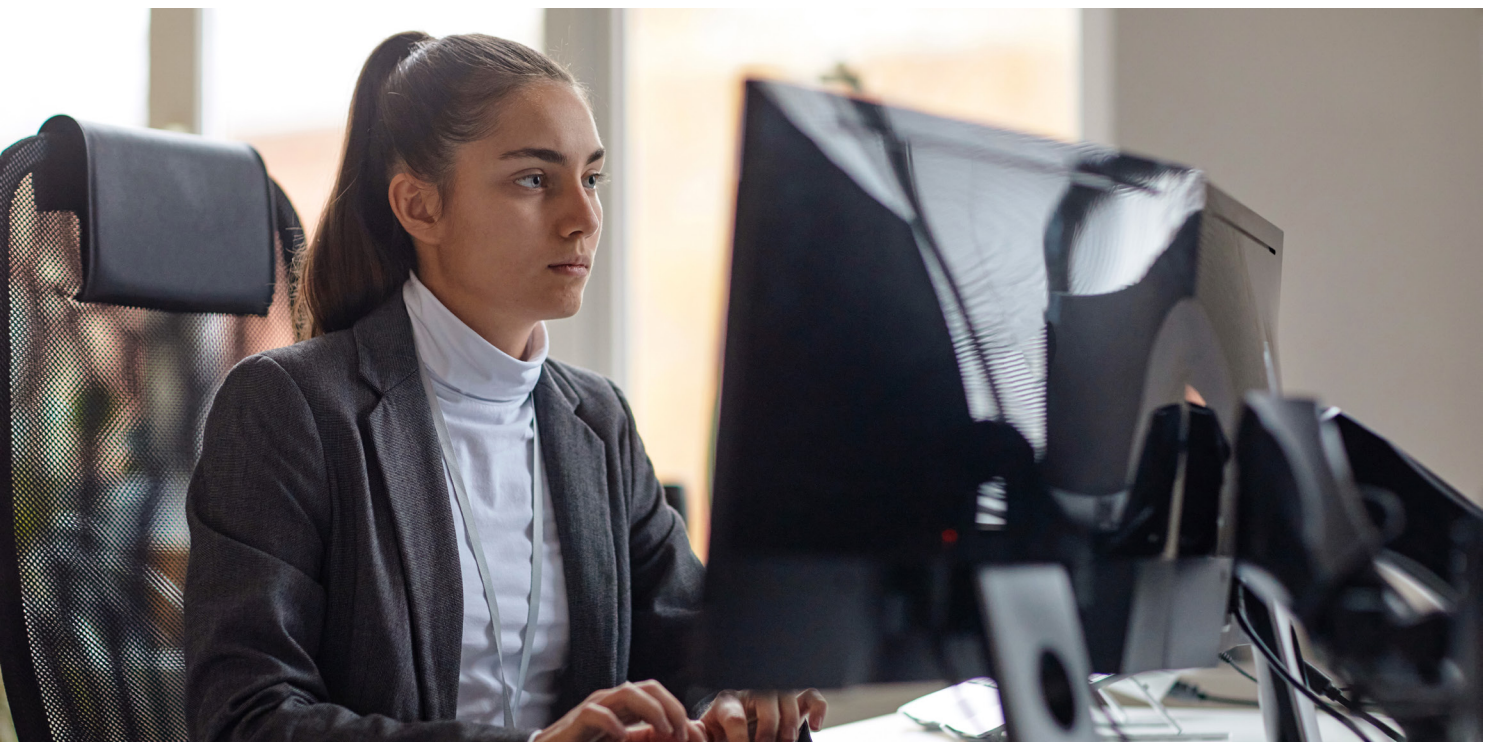
Modern enterprises require networks that can support growing numbers of users, devices, applications, and AI-driven workloads. By combining modern infrastructure, AI-native management, and a flexible networking foundation, organizations can build networks that deliver reliable performance today while adapting to the needs of tomorrow.

HPE provides the technologies and expertise needed to help organizations deploy, manage, and optimize modern networking environments.

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