END-TO-END ASSURANCE WITH AN AI-NATIVE CAMPUS AND BRANCH SOLUTION BRIEF

Deliver The Most Predictable, Reliable, And Measurable User Experiences With The Lowest Total Cost Of Ownership

Challenge
Distributed businesses need to:
*- **Enable** secure deployment and operation of branch networks*
*- **Manage** unexpected increases in applications, users, devices, cloud services*
*- **Minimize** operational burdens on limited IT staff*
*- **Understand** and optimize the user experience as a revenue-impacting priority*

Solution
Juniper AI-Native campus and branch solutions provide:
- The ability to measure end user experience vs. uptime
- A fully integrated wireless access, wired access, SD-WAN, indoor location, NAC, and firewalling portfolio
- Full-stack management through the industry's only microservices cloud built on a 100% open API architecture
- A unique virtual network assistant

Benefits
- Transformational scale and agility with fastest feature rollouts
- Increased efficiency and more sustainable and secure connections
- Simplified operations ensuring rapid MTTI/MTTR and lowest TCO/OPEX
- Up to a 90% reduction in network-related trouble tickets

Introduction

Connectivity is not the same as experiencing a great connection

In today's distributed environments, enterprise IT is under tremendous pressure to deliver seamless experiences to internal and external users alike. Business success increasingly depends on it, even as already overstretched teams must answer for the performance of an ever-growing number of users, devices, and applications across complex networks.

The long-time focus of network vendors on connectivity and uptime only complicates the challenges. And it contributes to poor network experiences that frustrate employees and cost enterprises millions in lost revenue. That's why it's time for a different approach that focuses on user experiences.

Shifting from simply measuring connectivity to optimizing experiences across connections changes everything by introducing an entirely new set of questions and expectations that are focused on ever-evolving business and user needs.

Only Juniper Networks takes an experience-first approach that addresses today's critical networking needs to make every connection count.

You've come a long way in the cloud, but AI-Native Networking is a game changer

Amid these challenges, you've likely made some effective strategic decisions, starting with leveraging the cloud. Do any of these steps sound familiar?

- Migrating to Microsoft 365 and other SaaS-based applications
- Making the leap to an SD-WAN architecture to help lower management burdens and reduce reliance on costly private circuits
- Adding next-gen firewalls either on-prem or in the cloud in an attempt to keep the perimeter secure
- Integrating AI into some facets of the business

These kinds of steps typically lead to worthwhile performance improvements, but what if you could transform your network to:

- Speed up deployments by as much as 8x
- Reduce network-related trouble tickets by up to 90%
- Reduce branch site visits by 85% or more

The Challenge

Today's enterprise networks must support multiple data centers and a myriad of campus, branch, and edge locations with an array of hybrid, private, and public cloud solutions. Network reliability, security, and scalability have become strategically critical. Yet complexity contributes to significant management challenges, and network complexity only continues to grow. Just consider that 73% of respondents to an Enterprise Strategy Group survey said their network had grown more complex over the past two years.

The Solution

AI-Native Campus and Branch Solutions transform distributed networking in support of exceptional experiences for users and IT alike.

By leveraging the cloud and AIOps, AI-Native Campus and Branch Solutions provide state-of-the-art automation, with continuous insights and recommended actions across all network domains (Figure 1).

The capabilities not only support in-house implementations, they can also deliver significant value to Managed Service Provider (MSP) implementations. AI-Native capabilities identify problems that operators—whether in-house or third-party—may not even know exist, leading to faster issue identification and resolution—and lower costs. And they are available as a fully-managed service, an in-house approach, or a hybrid approach.

Industry's only AI-Native and Cloud-Native Campus and Branch Solution

Deliver the most predictable, reliable, and measurable user experiences with the lowest total cost of ownership
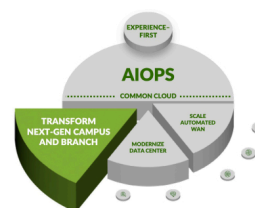
Wireless Access

Seamless and secure mobile connections

- Reliable student/shopper/ patient/ employee connectivity
- Expand and refresh Wi-Fi with agility
- Identify and secure mobile devices with NAC

Wired Access

Reliable & secure connections for business

- Reliable connectivity for IoT, access points, and wired devices
- Connect and protect IoT and users with microsegmentation
- Identify and secure devices with NAC

Indoor Location Services

Deliver insight-based personalized user experiences

- Student/shopper/patient/ employee engagement
- Indoor GPS and asset location
- Location-based analytics

Secure Branch Access

Secure, reliable, and seamless connectivity for global branch offices

- Secure SD-WAN/SASE
- Distributed enterprise
- Optimize WAN for cloud apps

Figure 1: AI-Native Campus and Branch solutions

Employing a unique approach

Juniper is the only vendor with a fully integrated AI-Native Networking Platform and portfolio of AI-Native Campus and Branch solutions. The unique combination of wireless access, wired access, SD-WAN, indoor location services, NAC, and firewalling under a common Mist AI engine and microservices cloud infrastructure underpins rapid deployments and streamlined management. The integrated approach not only helps significantly reduce TCO and OPEX, it enables measurable end-to-end assurance. (Figure 2).

Delivering better user experiences

AI-Native Campus and Branch solutions measure user experience by reporting on characteristics such as application response time to and from the cloud. When users and devices connect to a wireless network, the Juniper Mist Cloud correlates events in the wireless, wired, and WAN domains to ensure Service Level Expectation (SLE)

are being met. This comprehensive approach provides assurance that all individuals and devices accessing the network have exceptional experiences.

Unleashing AIOps

Historically, network troubleshooting and optimization has been a reactive exercise. With Juniper, however, operators can proactively identify and address issues before users even know they exist. It's all thanks to the cloud-based Mist AI engine, which uses a combination of artificial intelligence, machine learning, and data science techniques to optimize user experiences and simplify operations.

Tapping cloud agility and scale

To deliver the best agility and scale—and fastest deployment times—Juniper relies on a microservices cloud underpinned by a 100%

open API architecture. Microservices make it possible to rapidly process and analyze the rich telemetry data essential to AI-driven automation, as well as support seamless feature rollouts with zero downtime. The cloud continually feeds user, device, network element, and application states to Mist.
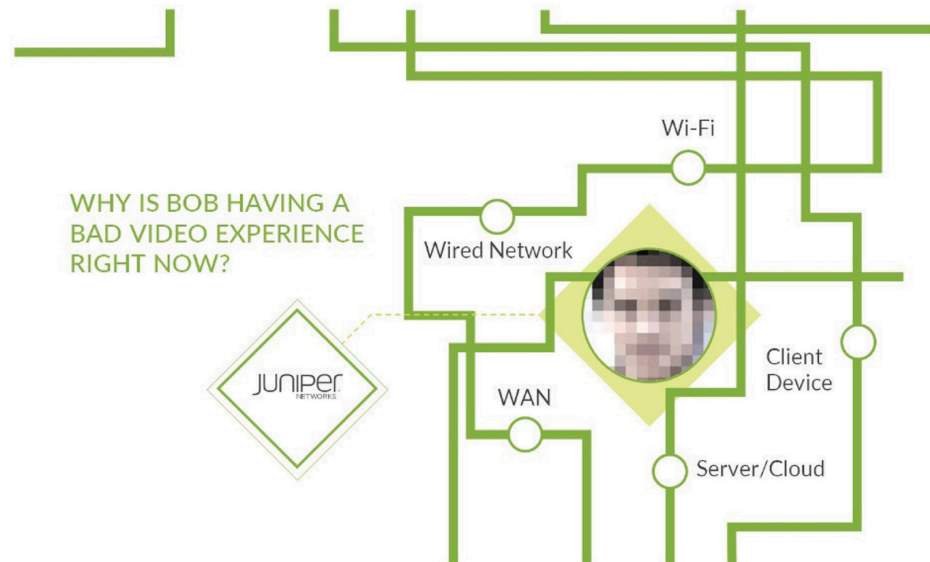

WHY IS BOB HAVING A BAD VIDEO EXPERIENCE RIGHT NOW?

Figure 2: Many domains can contribute to poor experience

AI-Native in action: The video call experience

To understand what AI-Native Campus and Branch solutions can do, consider a user's dropped video call that that could be related to events in multiple domains. (Figure 3). Possible culprits include:

- Difficulty connecting to the Wi-Fi Access Point
- A bad Ethernet cable on the router further upstream
- Low performance on a virtual machine from the video application server that is housed in a cloud data center
- A problem with the user's PC, or internet connection, or a node in the enterprise WAN

With end-to-end event correlation, anomaly detection, and self-driving capabilities tied to service levels, administrators can easily isolate the domain and the failing component. In many cases, a virtual network assistant can either direct the administrator to the problem or perform the repair itself, saving the IT team significant time.

Juniper further assures video experiences by [incorporating Zoom experience information into Marvis, the first AI-Native virtual network assistant](), and providing insights into performance and potential issues via a natural language user interface.

For a real-world example of optimized user experience and cross-domain problem resolution, see the [Dartmouth case study]().

Juniper Mist Cloud Services

The Juniper Mist AI platform enables predictable, reliable, and measurable networking with industry-leading [AIOps]()—that rely on more than nine years of reinforced learnings—and unprecedented visibility into user and device experiences. It starts with analyzing large amounts of rich metadata collected from [Juniper high-performance Access Points](), Juniper [EX Series Switches](), and Juniper [Session Smart Routers]() and [SRX branch firewalls]() to provide actionable insights from across wireless, wired, and WAN domains.

To assure the best user experiences, the [Juniper Mist AI Cloud]() offers customizable service levels for clients, applications, and networks, and makes proactive recommendations that enable IT teams to move quickly and decisively on any issues that arise.

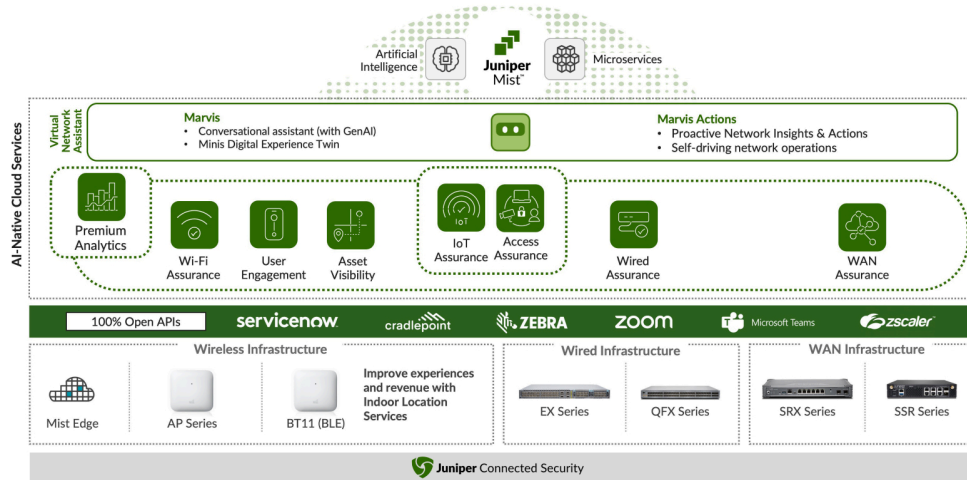## A closer look at the AI-Native Campus and Branch Solutions portfolio

Figure 3: The AI-Native Campus and Branch Solutions portfolio by domain and function.

Here's a high-level look at key attributes, features, and components of the AI-Native Campus and Branch Solutions portfolio.

Microservices Architecture

The Juniper Mist microservices architecture is built on a distributed set of independently deployable and manageable modules that run various application services. The approach allows for the elastic scaling of services up or down as needed across the extended enterprise and eliminates the need for costly and complex monolithic hardware. It seamlessly delivers enhancements and bug fixes without the need for downtime or impact on users. And the platform is inherently resilient: A failure in one service does not impact others.

Marvis VNA

The Marvis Virtual Network Assistant (VNA) is a groundbreaking support tool with a conversational AI interface (with ChatGPT support). Users can rely on Marvis to understand and quickly remediate issues impacting devices and users anywhere in the network. Marvis Minis, the industry's first AI-Native Digital Experience Twin, works with Mist AI to proactively simulate user activity to instantly validate network configurations and detect problems before they happen. Marvis can also identify and resolve the root cause of many network issues across WLAN, LAN, WAN, and security domains through proactive actions.

Juniper Mist Wireless Assurance

In the wireless domain, Mist Wireless (Wi-Fi) Assurance uses machine learning to make Wi-Fi predictable, reliable, and measurable and ensure optimal user experiences. It starts with collecting data through Juniper Access Points. Mist AI then employs machine learning to correlate events with root causes and solutions and provide in-depth service-level visibility and actionable insights.
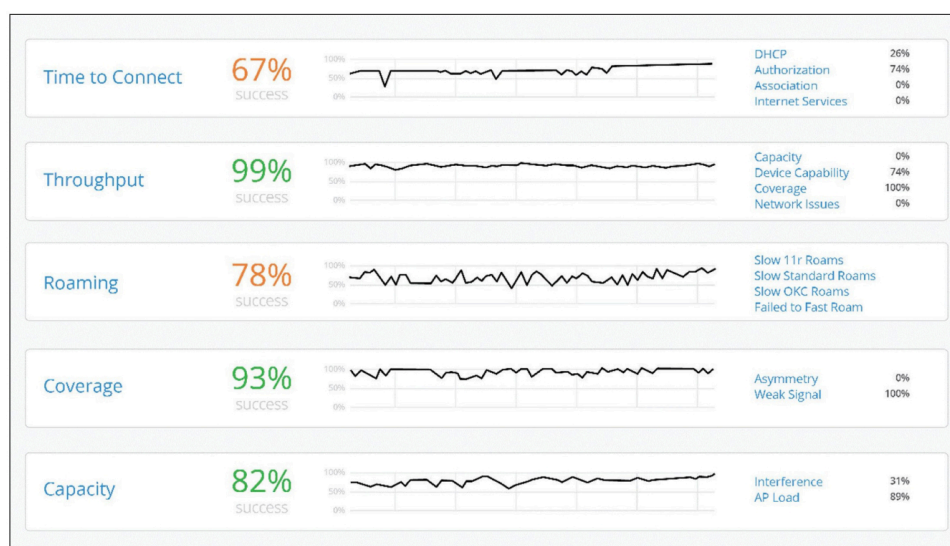
Figure 4: Actionable analytics from Mist Wi-Fi Assurance. Administrators can set up and track key wireless criteria (pre- and post-connection metrics), such as time to connect, capacity, coverage, and throughput.

Juniper Mist Premium Analytics and Access Assurance

Juniper Mist Premium Analytics is a cloud-based subscription service that provides end-to-end network observability and business intelligence to IT networking and line-of-business users. It offers long-term data storage for full-stack network and location insights. Easy-to-use dashboards give networking teams client-to-cloud visibility, enabling them to quickly identify and address issues, plan their IT infrastructure, and manage resources.

Juniper's Mist Access Assurance combines full network access control (NAC) and policy enforcement to simplify network operations. For IoT and BYOD, Juniper Mist IoT Assurance provides a full suite of access control functionality using multiple and private pre-shared keys (MPSK and PPSK).

For more information, see the Wi-Fi Assurance page and the Wi-Fi Assurance Overview.

Wired Assurance

Juniper Mist Wired Assurance is a cloud service that brings automated operations to campus fabrics, delivering unparalleled user and IT experiences for campus switching through simpler operations, shorter mean time to repair (MTTR), and better visibility into connected devices.

Juniper EX and Juniper QFX Series Ethernet Switches provide rich telemetry through the Junos® operating system, which enables insights into what the switch is experiencing and how it is doing. In addition to providing metrics about switch health and performance of connected devices (Figure 6), Wired Assurance:

- Enables single-click activation and auto provisioning of EX switches
- Brings cloud management and Mist AI to the campus fabric
- Supports wired service-level expectations (SLES) and third-party integrations

For more information, see the Wired Assurance page and the Wired Assurance data sheet.
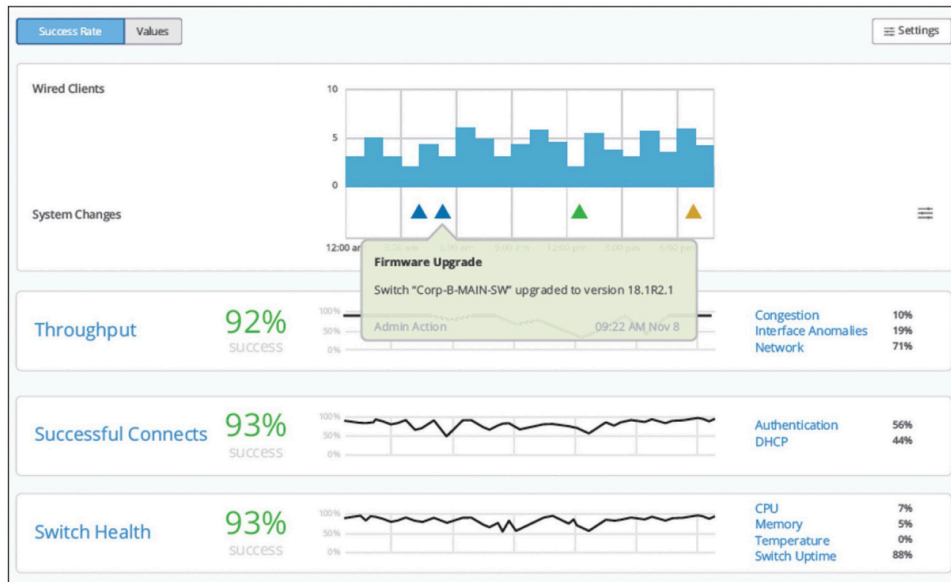
Figure 5: Wired Assurance service-level expectation

WAN Assurance

[Juniper Mist WAN Assurance](#) is a cloud service that can add AI-Native automation and insights, along with SLEs, to [Juniper AI-Driven SD-WAN](#) deployments.

Powered by Mist AI and the Marvis Virtual Network Assistant, WAN Assurance supports zero-touch provisioning (ZTP) for plug-and-play installation at remote sites with minimal or no IT expertise required. It also provides AIOps capabilities to help understand and optimize user experiences across the SD-WAN (Figure 7).

The analytics in WAN Assurance are provided by the tunnel-free SD-WAN, which offers a flexible, application-aware network fabric that meets stringent enterprise performance, security, and availability requirements.

Juniper SD-WAN relies on Session Smart Routers to securely connect all branch offices to data centers, local clouds, public clouds, or cloud services (Figure 8).
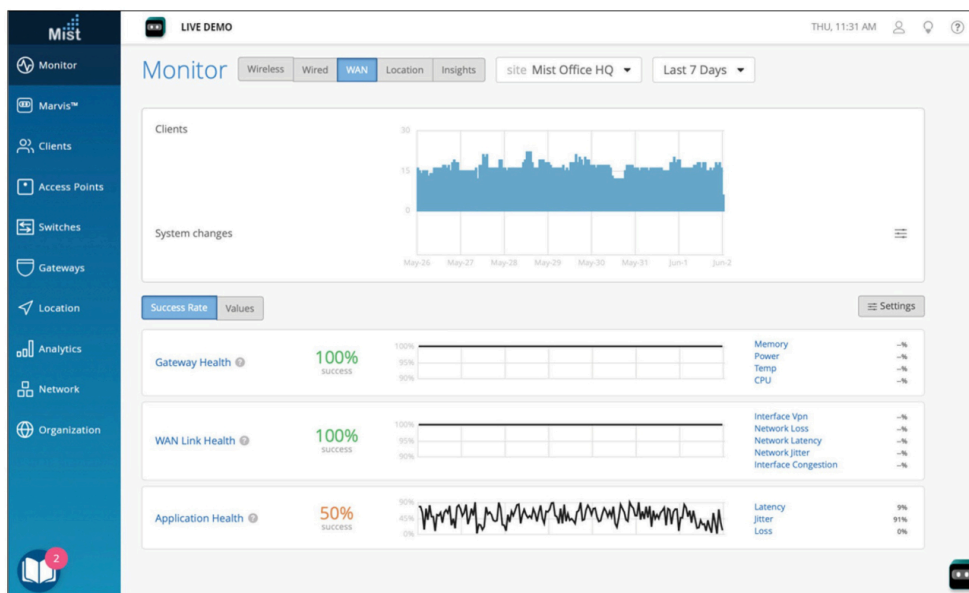

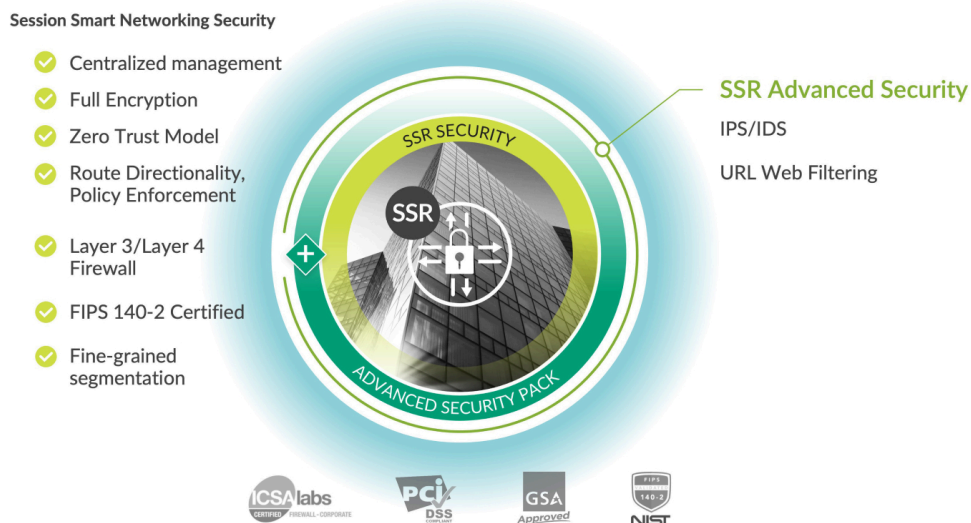*Figure 6: WAN Assurance supports SLEs*

Figure 7: Secure SD-WAN with Zero Trust

Juniper SD-WAN not only uses a deny-by-default approach to session access to enable Zero Trust security, it also uses a host of security features to provide industry-leading protections (Figure 9).

The Session Smart Routers in Juniper SD-WAN provide a tunnel-free, low overhead architecture that collects session and application data. Based on customer results, the combined features and capabilities in Juniper SD-WAN can reduce bandwidth consumption by up to 50% compared to alternative networking platforms.

The largest scale deployment of SSR routers is 10,000+ sites in an SD-WAN installation.

Read the Juniper SD-WAN solution brief to learn more.

AI-Native Campus and Branch Solutions as a Managed Service

Customers have relied on Juniper AI-Native Campus and Branch technology for years. For enterprises looking to onboard it, however, there are big questions around the best approach. With Juniper solutions, Managed Service Provider (MSP) offerings are often a great fit because our strong partnerships provide a host of delivery options that help ensure success.

An evolving market landscape

With many IT teams understaffed and looking for resources, it is natural that many customers will desire outside resources. The near-term future for cloud-managed Wi-Fi will see a growth of 21% over the next couple of years.[1]

Table 1: Service option considerations

	DIY	Fully managed	Co-managed
Definitions	Customer manages solution from installation to administration.	MSP manages solution and customer is completely hands off.	Solution designed and managed by both the customer and the MSP.
Pros	Customer has autonomy and control over all aspects of the solution and can build in-house IT skill sets.	Time and cost savings as IT resources are supplied as needed. Greater assurance of necessary knowledge and experience. Integration with other network and cloud services. Ensured stability of the solution.	Potentially provides greater flexibility. Customer may have limited time to deploy or maintain a new WAN, or they may benefit from an accelerated deployment and a co-managed solution. MSP can handle connectivity while customer controls policies.
Cons	Unexpected costs and lack of in-house expertise. Difficulty in cloud integration.	Customer may lose control over aspects of the solution. They may have configuration needs not supported by the MSP.	May incur overhead aligning business and technical goals between customer and MSP.

By working with an MSP that partners with Juniper, customers can simplify their IT support through:

- A broad end-to-end portfolio in wireless, wired, and SD-WAN networking and indoor location services
- Optimized operations with integrated AIOps for faster root cause analysis, event correlations, self-correcting actions, and fewer truck rolls

- A conversational interface that uses natural language processing and understanding (NLP, NLU), along with generative AI, so teams can interact with the network to understand what's happening and get specific answers
- Comprehensive visibility and control with customizable service levels

Juniper is deeply invested in the success of service provider channels and has Tier 1 references in many vertical industries. When choosing a Juniper partner, customers can rest assured that they will have access to our extensive range of resources.

Conclusion: Transforming the economics of networking

The networking industry has long focused on uptime rather than the quality of user and operator experiences. Given the strategic importance of networks to organizations, along with budgetary realities, that must change.

Juniper is leading the way by relying on an experience-first approach to develop technology across the full stack of wired, wireless, and WAN. Today, AI-Native Campus and Branch solutions, whether deployed in-house or managed by an MSP, simplify secure service delivery while guaranteeing optimal user experiences.

It all started with asking the right questions about our customers' most urgent networking needs and using the answers to inform our approach to AI and product development. Unlike traditional vendors who are scrambling to bolt on AI in response to market expectations, we've built upon reinforced AI learnings for more than nine years.

Today, the combination of our proven AIOps capabilities and microservices architecture transforms networking economics for enterprises and service providers alike, providing the only end-to-end assurance across the full stack. And the potential benefits are transformative:

- Up to **60%** reduction in TCO (ACG Research)
- Up to **87%** OPEX savings (ACG Research)
- **$500k (USD)** savings per year in staff time (London Borough of Brent)

[1]Source: ACG Research, Financial Benefits of Juniper Networks Wired, Wireless, and SD-WAN driven by Mist AI in Managed Network Services, July 2022

Go deeper with third-party insights

Juniper has been named a Leader in the 2024 Gartner® Magic Quadrant™ for Wired and Wireless LAN Access Infrastructure for the fourth time in a row. And for the third time in row, Gartner has positioned Juniper as furthest in Completeness of Vision and highest in Ability to Execute. We are also the only vendor positioned as a Leader in both the 2024 Magic Quadrant for Enterprise Wired and Wireless Infrastructure and the 2024 Gartner Magic Quadrant for Indoor Location Services, where we've also been recognized as a Leader for three consecutive years.

Next Steps

For more information and assistance in starting or continuing your AI-Native Campus and Branch journey, contact your Juniper account representative or inquire about a Juniper AI-Native Campus and Branch managed service offering through your trusted provider. In many cases, this can reduce time and costs as IT resources are supplied on demand. You can also work with your representative to set up a reference call with an existing customer.

Juniper provides a Weekly Mist AI Demo, allowing you to see the AI-Native Campus and Branch in action.

Finally, you can see firsthand how to perform many of these tasks by accessing the product tour and following the tutorials.

Related Resources

The following resources provide additional perspectives and details on the AI-driven enterprise:

Web Pages

- AI-driven SD-WAN
- Mist Wi-Fi Assurance
- Mist Wired Assurance
- Session Smart Router
- Mist AI and Cloud
- Marvis Virtual Network Assistant

Analyst Reports

- Gartner Magic Quadrant for Wired and Wireless Networking 2024

Solution Briefs and White Papers

- Enabling the AI Driven Enterprise
- AI-Native Campus and Branch Solutions for MSPs
- Building a Secure AI-Driven SD-Branch
- Ensure Performance and Efficiency with AI-Native SD-WAN Solution Brief
- The AI-Driven Campus Architecture

Datasheets

- Marvis Virtual Network Assistant
- Mist Wi-Fi Assurance
- Mist Wired Assurance
- Mist WAN Assurance

Case Studies

- [Dartmouth College](#)
- [City of Parkland](#)
- [The Gap](#)

About Juniper Networks

Juniper Networks believes that connectivity is not the same as experiencing a great connection. Juniper's AI-Native Networking Platform is built from the ground up across the AIOps layer and our systems to fully harness the power of AI. From real-time fault isolation to proactive anomaly detection and self-driving corrective actions, it provides campus, branch, data center, and WAN operations with next-level predictability, reliability, and security. Additional information can be found at Juniper Networks (www.juniper.net) or connect with Juniper on X (Twitter), LinkedIn, and Facebook.

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