JUNIPER NETWORKS® | Driven by Experience™   eGuide

Experience-First Networking

Maximize user and IT experiences with secure client-to-cloud automation, insight, and AI-driven actions.

Have you ever heard someone say **"The Wi-Fi sucks,"** but all your dashboards and event logs say the network is working just fine?

Have you received a complaint that **"The internet isn't working,"** but there are no records of a WAN service issue in your area?

Or has the comment **"My application is slow"** left you scrambling to determine if there really is a network or security problem… or is it just the user's perception?

All too often, there is a disconnect between network performance and user experience, which gets worse as the number of users, devices, and applications grow in a given environment. But **"up"** and **"available"** are not the same as **"good,"** and just passing traffic is no longer an acceptable measurement of a successful IT infrastructure.

Experience-First Networking.

Juniper knows that **experience** is the first and most important requirement for networking in the cloud era.

This is why we are focused on putting our users – the network architects, builders, and operators – at the center of all that we do, so that to their users – the salesperson giving a demo over video call, the associate using a point-of-sale scanner in a store, the students watching Netflix in their dorm rooms, and the developer coding the next billion-dollar app – are as happy and productive as possible.

This requires a relentless focus on experience, from when customers first engage with us to how they deploy and manage our solutions on a day-to-day basis (including upgrades, troubleshooting, and feature rollouts).

Maybe a short-handed enterprise IT team has to deploy and troubleshoot a software upgrade in 1,000 retail stores. Or a network security manager has to protect application servers from new ransomware without inadvertently impacting the application services. Or a cloud architect working for a hot digital consumer company needs to quickly deploy and tune new services as their growth continues to accelerate.

By making applications and data the network's priority, we enable our users to build agile networks, leverage CI/CD and DevOps approaches, and lead the digital transformation that they're all driving.

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The Right Architecture for Client-to-Cloud Experiences

There are four fundamental pillars that are key to Juniper's experience-first enterprise platform:

1 Assured end user experiences.

While other solutions provide visibility to the site or application, Juniper provides visibility all the way down to the individual client, application, and session to optimize individual user experiences. In addition, only Juniper has a common schema for applying customizable service levels from client-to-cloud (i.e. across the LAN/WLAN/WAN) as well as closed loop assurance in the data center and WAN.

Juniper lets you set and measure key metrics and proactively assure optimal user experiences on an ongoing basis.

2 Proactive automation.

Automation is key to lowering ongoing operational costs and maximizing IT efficiencies. Juniper leads the industry in open programmability and defined intent-based networking to provide control, observability and root cause identification.
And we don't stop there. We are a leader in AIOps, which extends AI-driven insight for real-time actions, such as Self-Driving Network™ operations.

In addition, AI is used for network support, enabling problems to be addressed proactively and with minimal disruption to IT personnel.

3 Cloud-now and cloud-ready.

Juniper is leading networking in the cloud era – from cloud-native workloads and managing devices across multiple cloud instances, to cloud-hosted operations for troubleshooting, feature delivery, trending analysis, reporting, and more.

4 Connected security with real-time threat awareness.

By making the network threat-aware, our customers are able to detect and stop advanced threats in a much shorter timeframe, which keep their network pipes free and clear for business-critical traffic. Once a threat is detected, intelligence and protections are distributed to other enforcement points across their network, whether it's a router, a switch, a Wi-Fi access point, or a firewall.

This is where Juniper stands out, with our unique connected security approach delivering proven protection where it is needed most (e.g. 100% effectiveness score with zero false positives on the latest ICSA certification test), consistent security policies that can be created once and easily applied to any application traffic flow in both public and private cloud environments, and sophisticated policy and segmentation based on current risk profiles.

None of this can happen in a vacuum. For automation, insight, and AI-driven actions to deliver maximum results from the client all the way through the cloud (or several clouds), they must be coordinated. More specifically, correlation is required across the WLAN, LAN, WAN, Data Center, and security domains to deliver cohesive operations and experiences.

**Let us put this into perspective with an example we all can relate to.**

Yesterday, Bob's video call dropped. Why? Was it his Wi-Fi? A bad ethernet cable on his router? The application server in the cloud/data center? A new security policy? Malware on his computer? Or his internet/WAN connection?

With end-to-end service levels, event correlation, anomaly detection, and self-driving functionality, you can easily discover the issue and fix it before Bob even knows there is a problem. Juniper picks up where other solutions stop. We know that even though the network is up, Bob's experience is not good. And we know these things proactively, often before a user complains or a ticket is opened.

That's experience-first networking.

What was wrong with Bob's video call yesterday?

Wi-Fi

Wired Network

Bob

WAN

Server/Cloud

Client Device
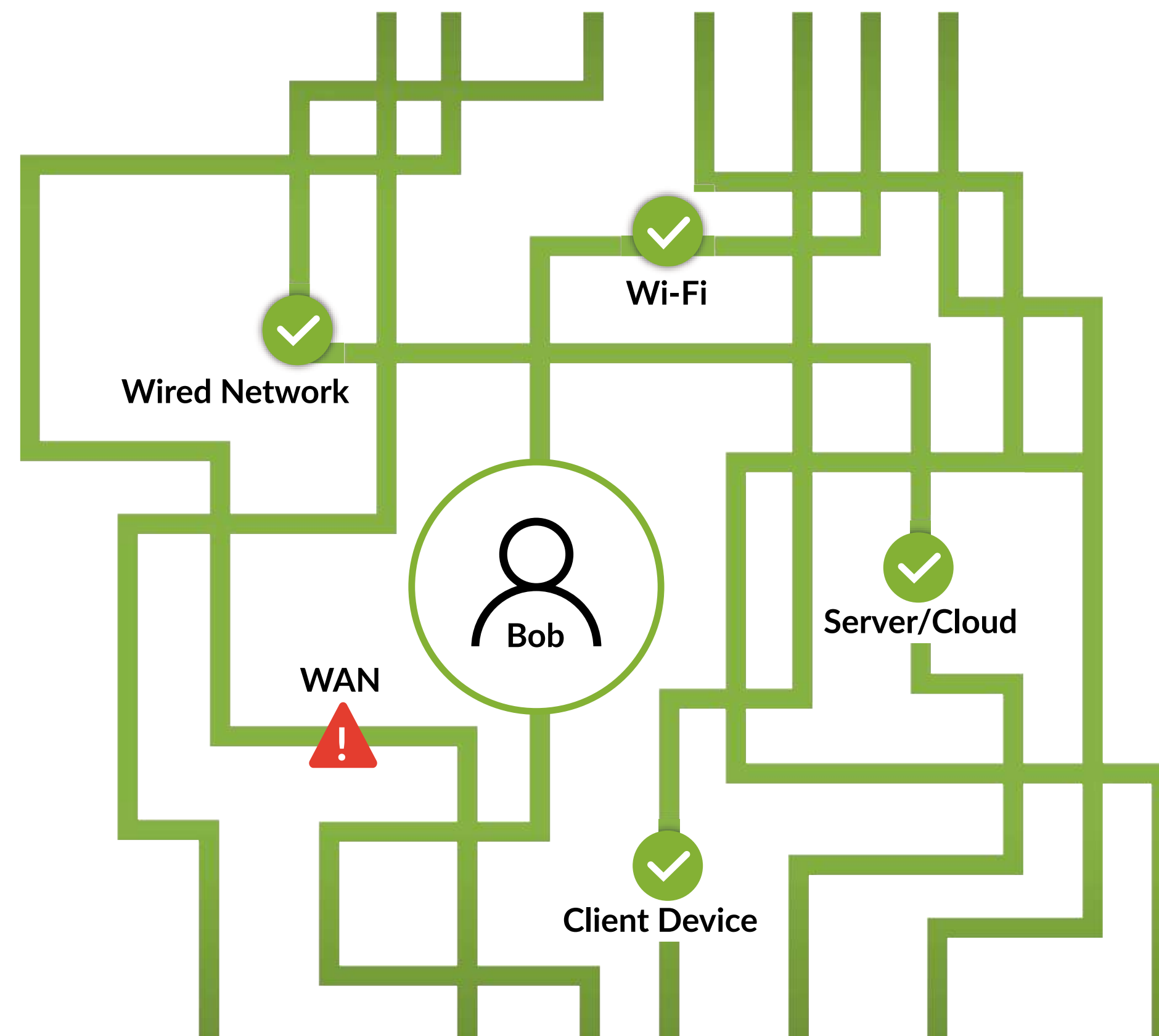
Streamline Operator Experiences

The delivery of experience extends beyond what is going on for the user. This assured user experience depends on the experience and means of the operations team. Better automation, insights and AI in operational toolsets helps them to more quickly and efficiently deliver new apps and services, assure the user experience and security, and make repairs and changes when needed.

Here's an example from the operator's point of view.

It's a refrain we've heard before — the application isn't functioning correctly, so it *must* be the network. The ability to quickly diagnose where the problem lies is key to getting the network fixed, or as is often the case, shortening the mean time to innocence.

Could the issue be caused by an external routing issue? Something internal to the network fabric? Security policy? Bandwidth or cabling? It can be a major headache to sort through all the possible areas of failure to find the root of the problem.

Having a single source of truth for your network allows network operators to specify exactly how they expect their network to operate and ensure that the network's function is continuously validated against that intent — if there is deviation, the system generates an anomaly. Further, the approach enables observability across teams, proactive discovery of potential issues and eases change management.

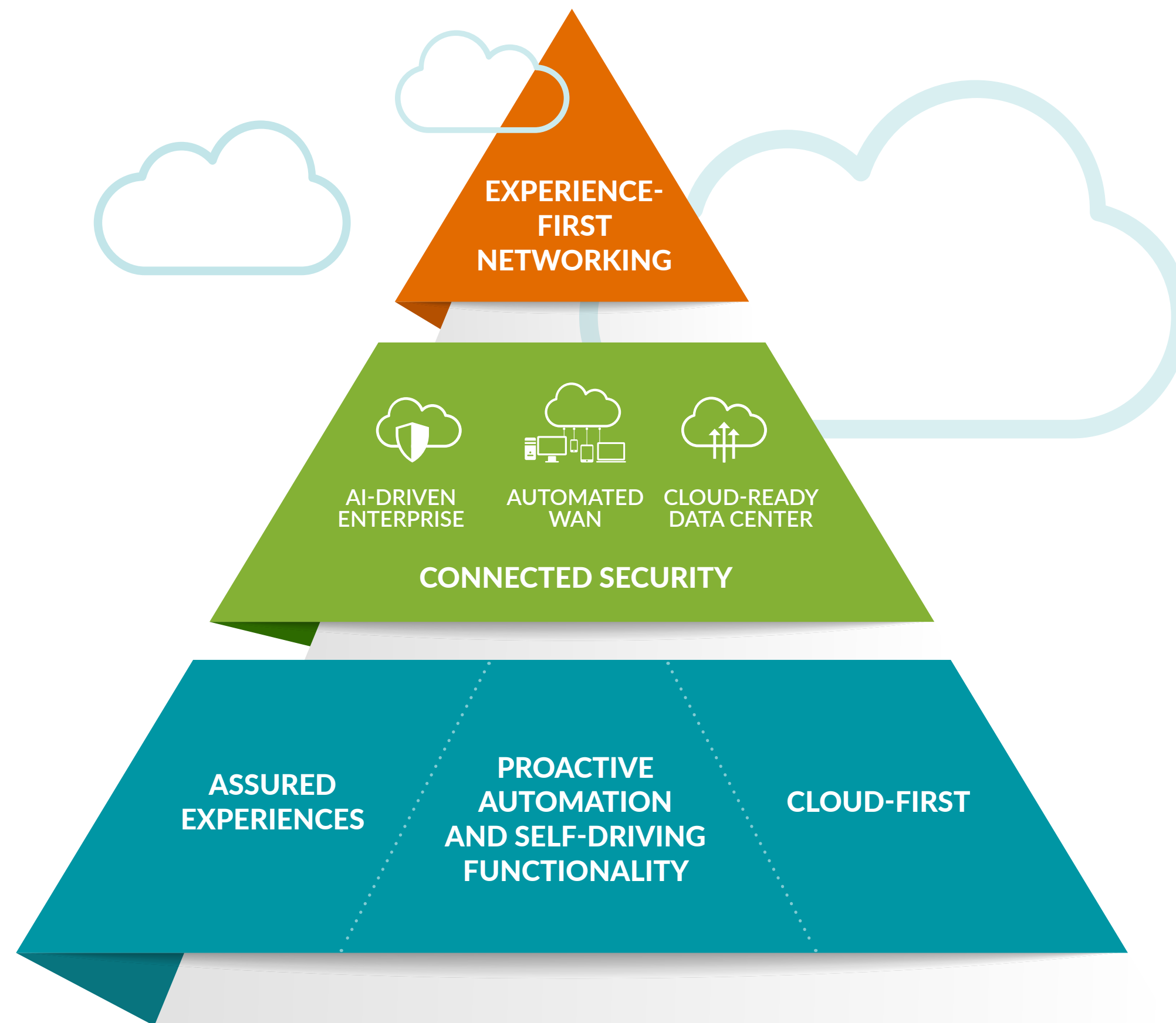**That's putting experience for the operations team first.**

BGP routing

Cabling

EVPN Fabric

Optics

Link Utilization
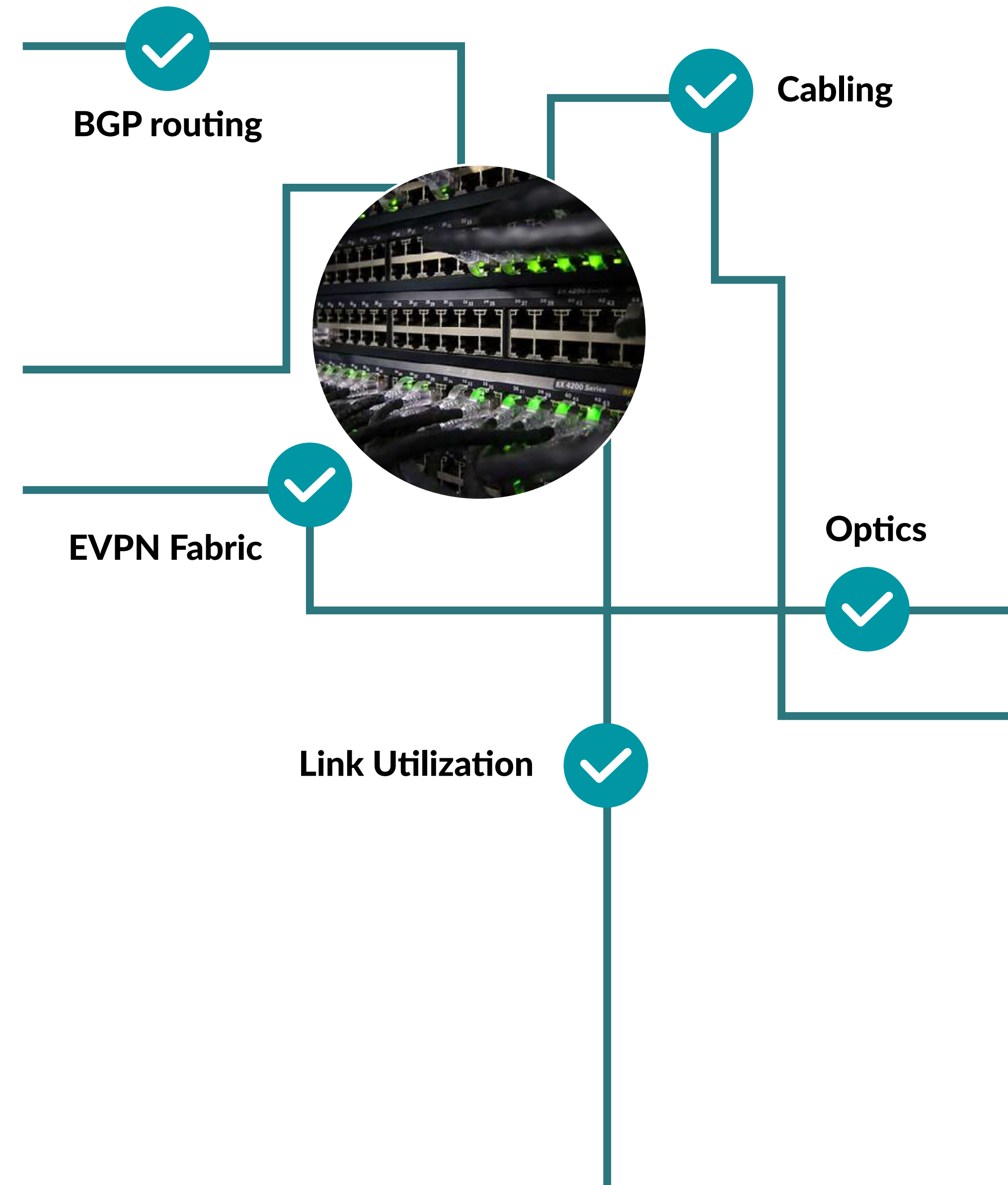
The Juniper Enterprise Portfolio: When Experience Matters
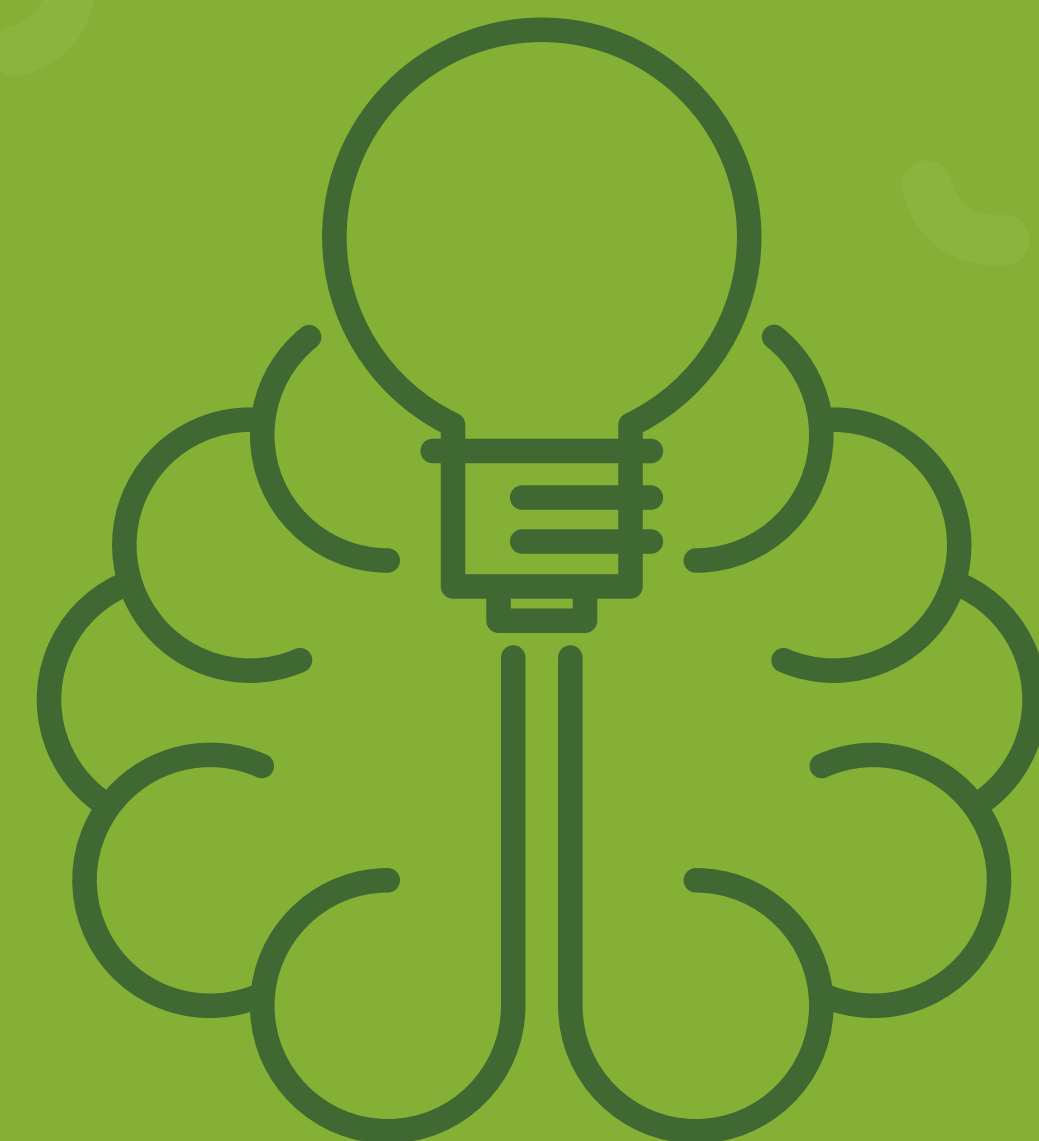
Juniper provides a complete client-to-cloud enterprise solution that encompasses three components to deliver the best IT and user experiences.

The Juniper experience-first solution has the following networking components, each equipped with security built in to make them threat-aware:

AI-Driven Enterprise

which includes wired and wireless access and SD-WAN 3.0, all driven by Mist AI.

Automated WAN Solutions

for linking different offices and data center facilities with reliable connectivity.

Cloud-Ready Data Center

for simplified underlay/overlay management with intent-based automation and assurance.

AI-Driven Enterprise: Wired/Wireless Access.

Wireless is more business critical than ever, but traditional WLAN solutions are over a decade old and lack the agility and elasticity to support the rapid growth in mobile devices, IoT, and applications.

Juniper changed the WLAN game with a revolutionary modern cloud-native platform that leverages Mist AI to:
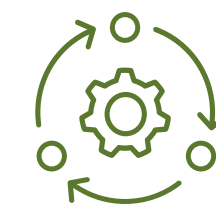
Lower IT costs

with AIOps, self-driving network functions and a conversational Virtual Network Assistant™: Marvis.

Assure better user experiences

with wireless service levels, proactive remediation, personalized location services, and security.

Bring agility to the network

through a microservices architecture that enables weekly updates to adapt to new devices and applications being deployed in our customers' networks.

By leveraging the years of learning that Marvis has performed in the wireless domain, Juniper has brought unprecedented insight and automation to wired access by bringing all these attributes to the EX switching platform.

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We believe the following are key differentiators of the Juniper solution for wired and wireless access driven by Mist AI:

Dynamic packet capture (without human interaction)

for easy and accurate data collection without truck rolls.

Automated event correlation

across the wired, wireless, WAN, and security domains for fast root cause identification and remediation.

Programmable workflows

for 100% API-driven network operations.

Virtual Bluetooth LE and integrated IoT

which bring the benefits of indoor location without extra hardware (e.g. no battery beacons) and software.

Risk profiling for wired/wireless.

Juniper wired/wireless customers can receive alerts of threats detected by Juniper SRX Series firewalls and ATP Cloud. This allows administrators to quickly assess security risks when users and devices connect to access networks, and take appropriate action if required, such as quarantining or enforcing policies.

2020 Gartner Magic Quadrant for Wired & Wireless LAN Access Infrastructure.

## (A Leader & Furthest in Execution)

Gartner Magic Quadrant for Wired and Wireless LAN Access Infrastructure, Bill Menezes, Christian Canales, Tim Zimmerman, Mike Toussaint, 4 November 2020.

This graphic was published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner document is available upon request from Juniper Networks.

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Public Cloud   SaaS   Enterprise Data Center

4G/LTE

Internet   MPLS
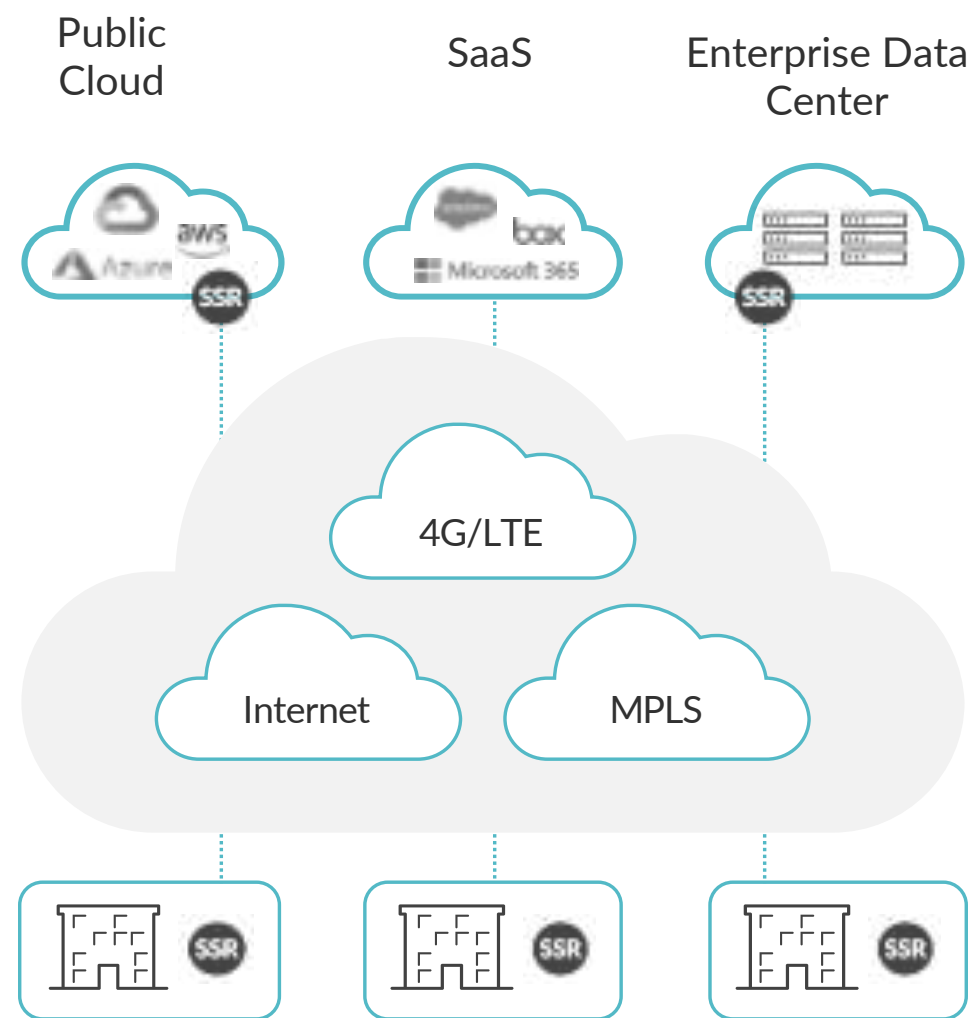
✓ **Optimized User Experience**
✓ **Application Awareness and Control**
✓ **Zero Trust Networking**
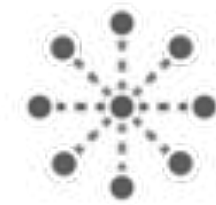
Session Aware

Tunnel Free

Experience-First

Client-to-Cloud

AI-Driven Enterprise: Session Smart™ SD-WAN.

By adding Mist AI to the leading WAN edge portfolio, Juniper charted a bold course for WAN transformation.

The static and network-centric approach to wide area networking is being replaced by a proactive AI-driven model with a keen focus on optimizing user experiences.

Session Smart is the third generation of SD-WAN (SD-WAN 3.0), delivering unique and groundbreaking technology that materially reduces WAN overhead, minimizes network latency, and replaces outdated and cumbersome network policies with flexible and real-time actions that are tied to real business and user needs.

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Key differentiators of the Juniper Session Smart™ SD-WAN solution:

Session awareness.

Unlike legacy competitive SD-WAN solutions, intelligent decisions are based on real-time sessions and agile business policies instead of static network policies determined on a per tunnel basis. Policies can be defined by the user or users without complicated routing instructions, and will follow individuals wherever they roam.

No overhead (bandwidth savings).

Because Session Smart SD-WAN is deployed without tunnels, approximately 30% of WAN overhead is reduced automatically, which substantially lowers bandwidth utilization expenses and minimizes cloud hosting costs. In some instances, Session Smart SD-WAN is 75% more cost effective than traditional SD-WAN solutions.

Experience-first.

Session Smart networking delivers superior performance for real-time traffic like voice over IP, 5G, and collaboration applications. For business critical collaboration applications, Zoom and Teams, session failover ensures that calls will stay active, even in the event of a link failure, by leveraging the backup link. This sets the Session Smart solution apart from the competition which requires 2-3 minutes to re-establish a tunnel, meaning that the call will be lost during the re-establishment time.

Zero trust and enhanced security.

Session Smart SD-WAN is zero trust by default, delivering session integrity and segmentation "out of the box". When the Session Smart SD-WAN solution is deployed in conjunction with SRX Series firewalls, customers get Zero Trust Security, including dynamic threat detection, Encrypted Traffic Insights, and threat protection validated by ICSA Labs and CyberRatings.org to be 99.7% effective against advanced threats.

AI-Driven Enterprise: Driven by Mist AI.

Juniper's wired, wireless, and SD-WAN solutions are all driven by Mist AI. **As a result, they all leverage best-in-class AIOps for client-to-cloud automation, insight, and assured actions that deliver the following unique attributes:**
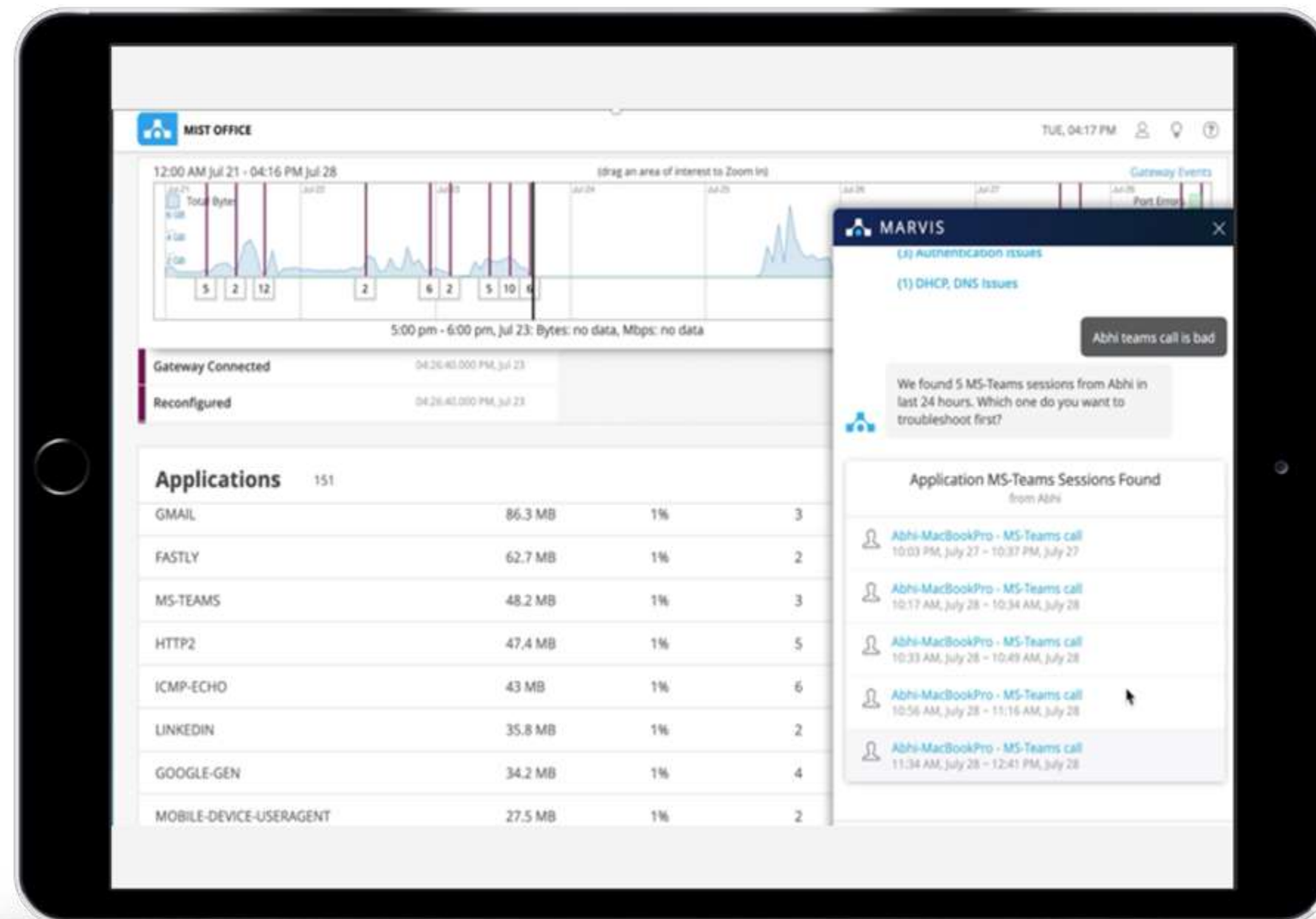
- **Set, monitor, and enforce service levels** across the LAN/ WLAN/WAN for optimal user experiences (by device, user, group, and location).

- **Proactive automation** through prescriptive recommendations, with closed-loop verification when actions are taken.

- **Anomaly detection** to quickly identify and fix new issues (before users know they exist).

- **AI-driven actions** through Self-Driving Network™ remediation, when possible, to fix problems proactively and avoid common issues assocated with human error.

- The only **AI-driven Virtual Network Assistant™ (Marvis)**, which uses natural language processing (NLP), natural language understanding (NLU), and a conversational interface for unsurpassed insight and automated help desk functions.

Automated WAN.

For many large organizations, their WAN is essential for linking their offices and data center facilities with reliable connectivity, and for employees to use mission-critical applications.
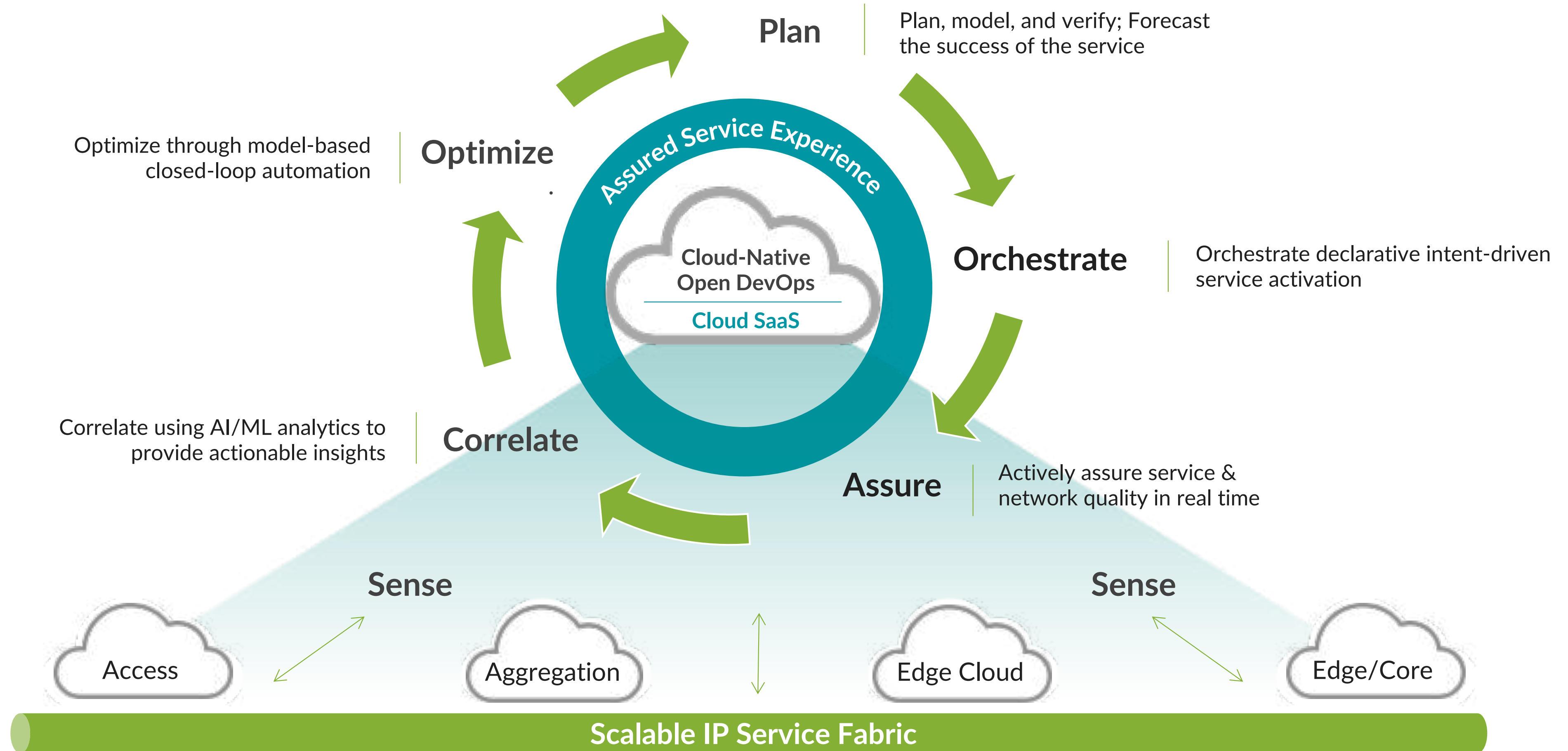
The enterprise WAN is critical in delivering the uptime, resiliency and agility required to ensure the organization can scale and adapt technology operations as its business changes.

Automation lays the foundation for a self-healing network, ultimately resulting in a superior user experience.

Key differentiators of the Juniper solution for automated WAN:

Agility for the unknown.
With the inherent programmability of the trio chipset, Juniper's automated WAN solution is like a Swiss Army Knife, giving you virtually endless use case versatility and flexible bandwidth on-demand.

Intent-driven automation.
Juniper Paragon Automation delivers closed-loop automation that translates business intent into service performance, assuring your customers receive a differentiated experience throughout their time with you.

Threat-aware by design.
Juniper MX series is the industry's first and only platform to deliver routing and advanced security services, all in one. DDoS protection, stateful firewall, CGNAT, URL filtering, and DNS sinkhole provide effective security without performance degradation.

Juniper Paragon Automation Powers the WAN.

Plan — Plan, model, and verify; Forecast the success of the service

Orchestrate — Orchestrate declarative intent-driven service activation

Assure — Actively assure service & network quality in real time

Correlate — Correlate using AI/ML analytics to provide actionable insights

Optimize — Optimize through model-based closed-loop automation

Assured Service Experience

Cloud-Native Open DevOps

Cloud SaaS

Sense

Sense

Access

Aggregation

Edge Cloud

Edge/Core

Scalable IP Service Fabric

Cloud-Ready Data Center.

Modern data center networking solutions need to provide the agility and flexibility associated with cloud-like infrastructure and cloud operational models. It's not about your network, it's about networking. It's the shift from merely moving packets to making it easier to manage and operate. It's about driving end user experience and operator experience through automation and assurance. And it's bringing to life the big idea of simplicity across the entire data center infrastructure.

Key differentiators of the Juniper solution for the automated data center:

One unified, multivendor solution for automation and assurance.

Juniper Apstra is the only closed-loop fabric management with a single source of truth extending from design (Day 0), through deployment (Day 1), to assured operations (Day 2+). Simply describe what is needed and the software sets up the network accordingly and assures continuous operation as intended, with built-in change control and proactive notifications of network issues.

A best-in-class portfolio of data center switching.

Juniper's QFX and PTX Series continue to lead the industry with best-in-class throughput and scalability, including 400G interfaces, the open programmability of the Junos OS, and the widest range of EVPN-VXLAN and IP fabric capabilities.

A best-in-class open-source SDN overlay.

Contrail Networking, for common control over networking and security across private and public clouds for Kubernetes, bare metal and virtual machine workloads, extending network automation into DevOps workflows.
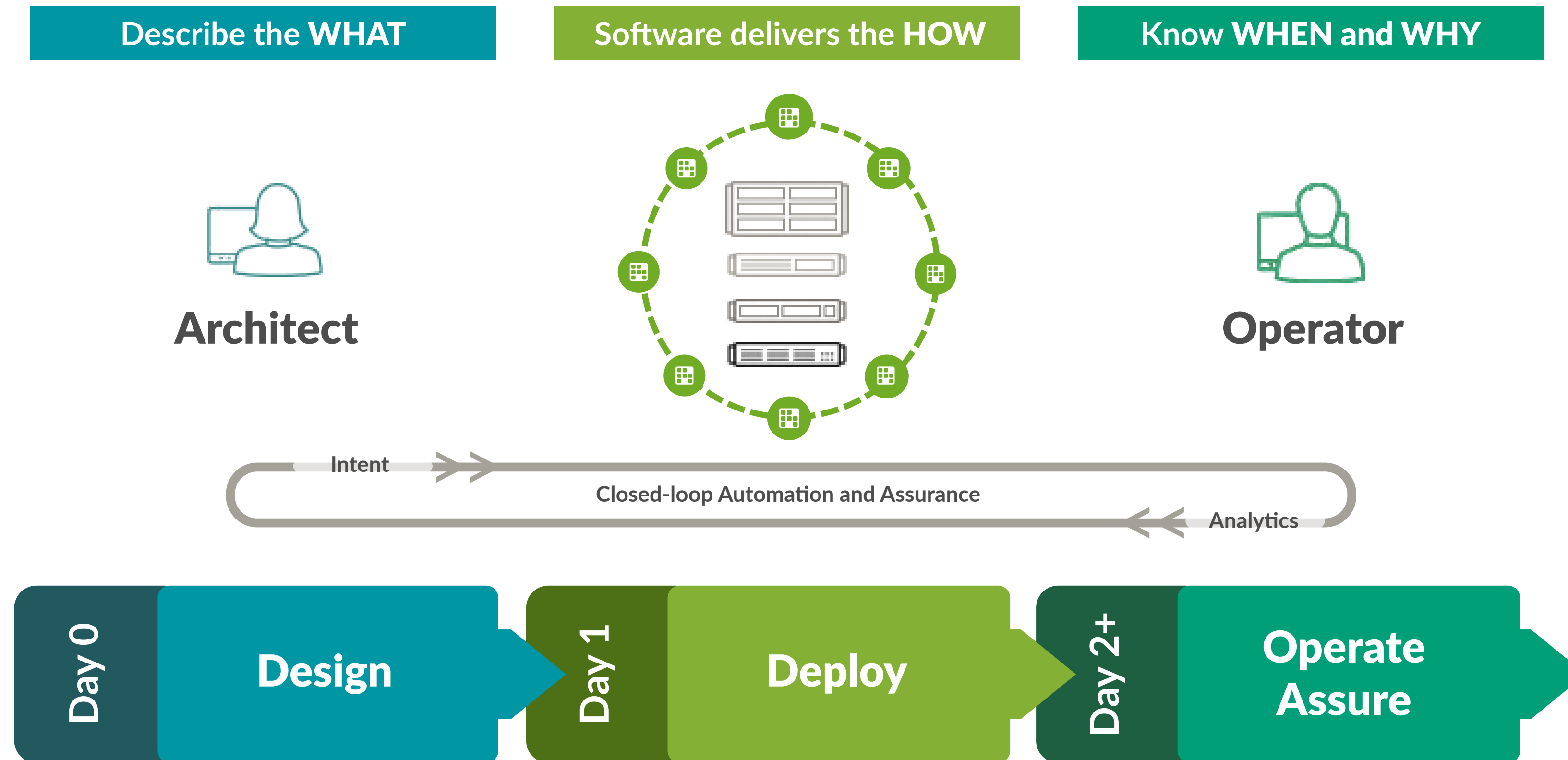
Zero trust data center.

Juniper provides segmentation, user and application-based traffic policies, and threat prevention services to enable a zero trust data center. Juniper SRX firewalls prevent unauthorized users and malware from accessing the data center at the edge, security subscriptions on vSRXs within the data center protect traffic inside using identity-based policies, and the cSRX provides containerized security that is used to protect individual applications and workloads.

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Reimagining Data Center Operations: One Unified Solution.

Describe the **WHAT**	Software delivers the **HOW**	Know **WHEN and WHY**

Architect

Operator

Intent →→

Closed-loop Automation and Assurance

← Analytics

Day 0	**Design**	Day 1	**Deploy**	Day 2+	**Operate Assure**

Global Services.

To help accelerate time-to-value and de-risk network investments, Juniper offers an evolving suite of lifecycle services that helps organizations align AI with people, process, and technology. Through insights, automation, and flexible services, Juniper provides assured assistance and advantage across the entire change management spectrum.

AI-Driven Customer Success

Accelerating time to value with AI-Driven network
insights, automation and flexible business models.

INSIGHTS

Relevant network
insights provide
recommendations that
add business value

AUTOMATION

Intelligent, personalized
service automation proactively
prevents business problems
and mitigates risk

FLEXIBILITY

Customizable services to
enhance your tech stack
and maximize ROI

Real Results
Real Experiences
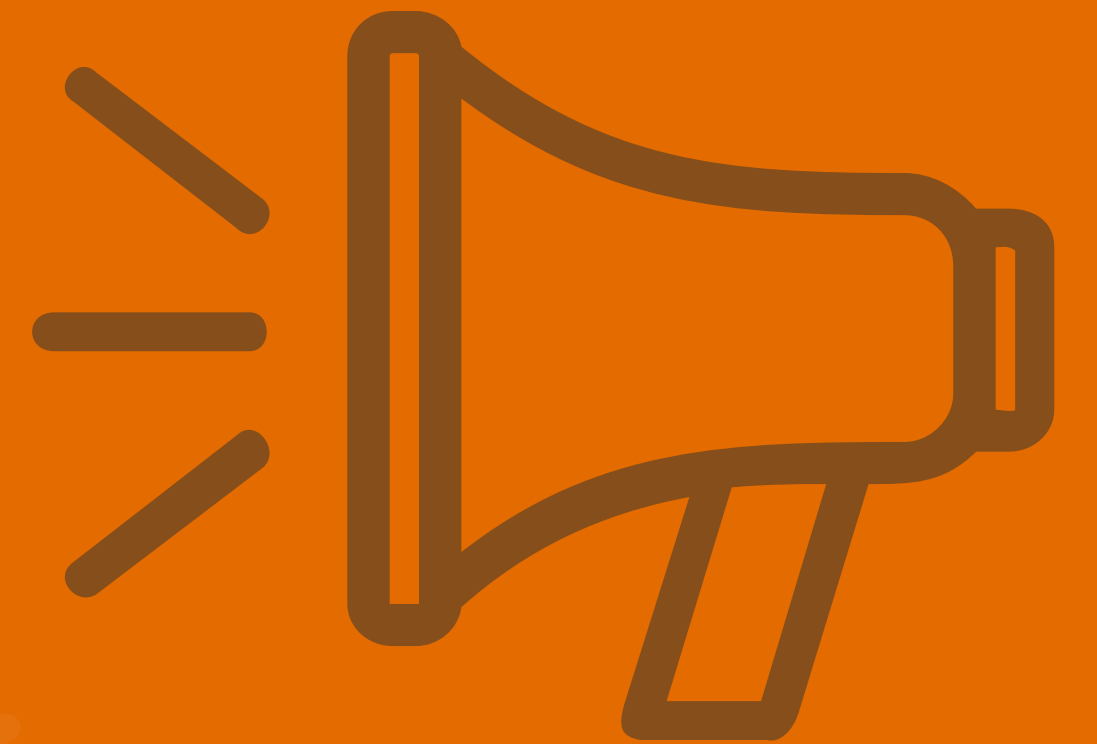
Real Results. Real Experiences.

Optimizing IT experiences saves time and money, while enabling IT departments to best align with key business objectives. For example, the following enterprise customers have all benefited from Juniper's experience first approach:

✓ ServiceNow maximized employee productivity by **eliminating over 90% of all user-generated Wi-Fi trouble tickets.**

✓ A major telco deployed Juniper across 2,400 retail locations to ensure customers could quickly and reliably transfer data between phones when making a new purchase. This was critical to **ensuring customer satisfaction in a highly competitive retail environment.**

✓ For a web services company, automation in the data center led to game changing agility–tasks taking two weeks in the past now only take two hours – **a 99% improvement.**

✓ The Orlando VA Medical Center combined Wi-Fi, virtual Bluetooth LE and IoT to **track assets, provide a better network experience for the Veteran and prevent dementia patients from leaving facilities unattended.**

✓ The City of Philadelphia implemented a threat-aware Juniper network to reduce risk, and empower both city workers and visitors with **superior smart city services.**

✓ Students at Dartmouth are getting **reliable wired/wireless connectivity everywhere on campus.**

✓ Fans all over the US can stream Pac-12 Networks soccer matches, football games, track meets, and more, with **high-quality video and no glitches.**

✓ A national healthcare system is **saving 30% of OpEx** by switching from MPLS to a centrally managed Juniper SD-WAN.

Juniper simplifies operations and puts a spotlight on users for the best end-to-end experiences – from client-to-cloud. That level of automation, insight and self-driving actions simply didn't exist before, and can only be achieved with Juniper.

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A new era of Experience-First Networking is upon us, led by Juniper.

Is your network ready?

Juniper | Driven by Experience™

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