

# JUNIPER NETWORKS AND AEROHIVE NETWORKS: CLOUD- ENABLED SOLUTIONS FOR THE ENTERPRISE

*Cloud-managed wired and wireless solutions for today's multicloud enterprise*

## Challenge

Enterprises are increasingly challenged to deliver a high-quality user experience for applications and network resources—especially for distributed remote locations with little or no IT expertise, making management difficult.

## Solution

Juniper and Aerohive deliver a simple, easy-to-manage cloud-based wired and wireless network infrastructure. Aerohive provides simplified cloud management for its high-capacity 802.11ac-based WLAN access points, as well as cloud-managed NAC, while Juniper offers high-performance cloud managed campus and branch switching, routing, and security.

## Benefits

- Offers flexible on-premises and cloud-managed deployment options to get remote locations operating in minutes
- Provides highly scalable, self-healing networks that adapt to failures in real time
- Realizes the full potential of mobility, providing insight into application and network usage
- Provides complete security for all wireless and wired devices, including IoT
- Simplifies wired and wireless device deployment with ZTP, reducing reliance on skilled resources.

*The increasing consumption of cloud applications, along with the proliferation of Internet of Things (IoT) and mobile-first access in the workplace, are driving tremendous change in wireless and wired network infrastructure for today's distributed enterprise. A scalable, high-performance wireless and wired architecture that's easy to manage is critical to support an ever growing, diverse set of devices and provide the onramp to multicloud. Organizations also need to provide secure and effective strategies for corporate, guest, BYOD, and IoT device access.*

## The Challenge

It is predicted that tens of billions of devices will be connected to the Internet by 2020. The vast majority of these devices will use some form of wireless access. When planning for wireless networks, enterprises today not only have to accommodate user operated devices (including corporate, BYOD, and guests), but also connected systems and sensors (IoT devices) that may not rely on human interaction.

Enterprises must devote significant resources to planning, deploying, and managing large wireless networks with a wired infrastructure that can accommodate growth. To address these issues, organizations are increasingly adopting cloud-managed networks at the access edge to provide more deployment flexibility, implement secure network access, and simplify management.

## Business Intelligence

The explosion of IoT sensors and devices gives businesses new data that they can use to provide better customer experiences. For example, in retail, this business intelligence can enable accurate analytics on customer patterns in stores, interactive displays, timely mobile point of sale (POS), automated vending, inventory tracking, and highly personalized customer service. To meet these changing business needs, network managers must deliver innovative wired and wireless solutions that can provide simple, secure, and scalable access accompanied by comprehensive data and analytics.

## Operational Complexity

Additionally, the majority of today's enterprise networks are manual systems comprised of layers of switches and VLANs, with multiple management points requiring different tools, all adding to operational complexity. Multiple layers and flavors of security solutions, ranging from network access control (NAC) devices to firewalls, further contribute to this complexity. Because these product layers must

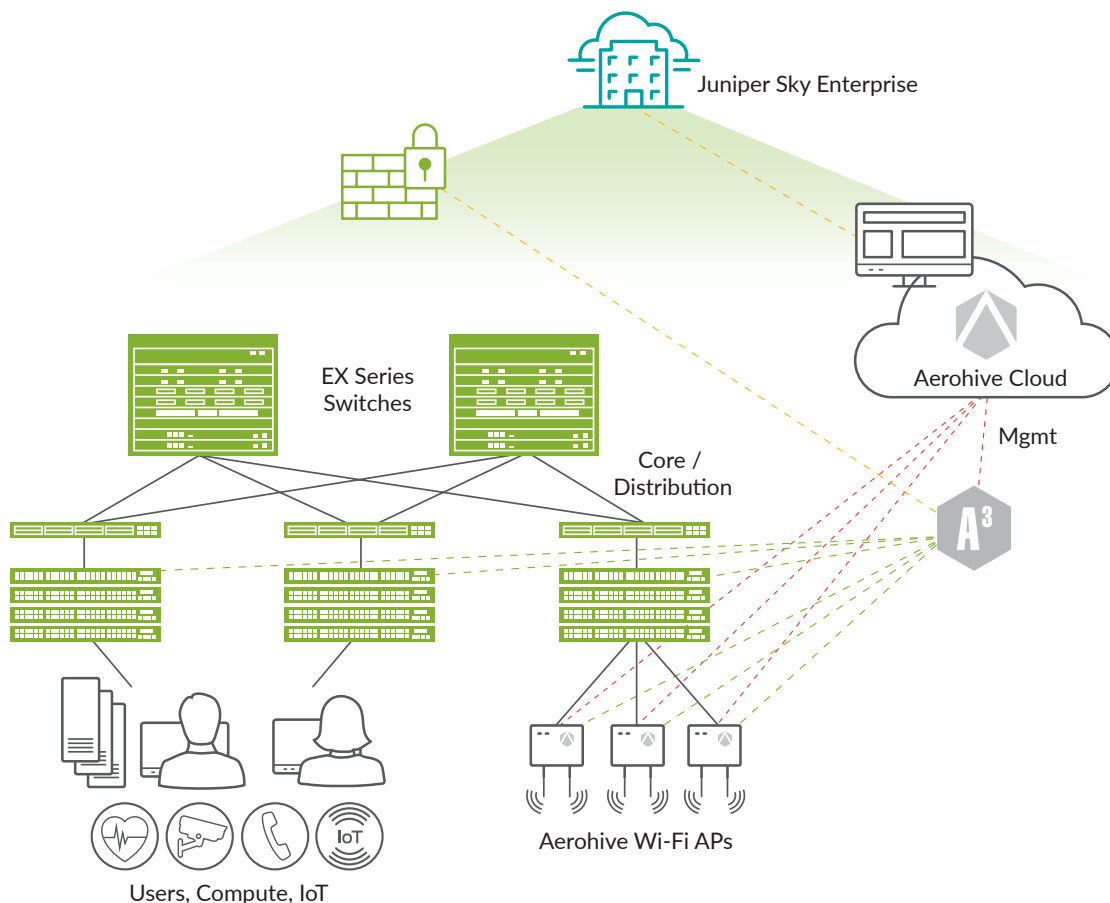


Figure 1: The Juniper Networks-Aerohive Networks cloud-managed solution.

be administered manually, the potential for configuration errors that disrupt services or open security gaps increases, making it riskier and more challenging than ever to operate and manage the distributed enterprise.

Today's Wi-Fi network must have the flexibility and performance to accommodate an explosion of connected devices without affecting the experiences of other users on the network. The onboarding process must be secure yet transparent to the user, and must take place without IT touching the device. Network managers must be able to prioritize mission-sensitive traffic while offering alternatives to restrict or limit the use of apps that are not deemed critical to the business.

### Security

At the same time, the network must provide appropriate levels of security to ensure that users' sessions, data, and devices are safe, and it must ensure predictable access to data resources based on user identity, time of day, device type, location, or security posture. The network must have the intelligence to deliver these core requirements while maintaining a consistent and reliable connection as the mobile user moves around within the corporate network.

### Flexibility

In fact, users should be able to experience the same levels of performance, security, and reliable access to resources no matter where they connect—not just to the wireless network in the main office. Users must be able to work from anywhere, on any device, and an intelligent network should be able to deliver the same user experience to wired and wireless users alike, whether they are at corporate headquarters, in a branch or remote office, or at home—all with the appropriate levels of security to fit the scenario.

A wireless solution that scales across numerous distributed sites must also be easily managed, preferably offering a single pane of glass management interface, providing unified reports, logs, and tools that can quickly identify, track, and resolve issues on any network, in any location, from anywhere. And the management solution should be delivered in a way that best suits the needs of the customer, with both on-premises and cloud-based alternatives available.

## The Juniper Networks-Aerohive Networks Solution

Together, Juniper Networks and Aerohive Networks deliver an elastic, simplified architecture, best-in-class hardware, and the distributed intelligence needed to deliver the optimized performance, security, resiliency, and simplified management required by today's highly dense, heavily utilized networks.

Additionally, the Aerohive Cloud Services Platform has open APIs that enable the Juniper® Sky Enterprise management solution to provide visibility into Aerohive Access Points, creating a single pane of glass solution for managing both wired and wireless devices. This allows businesses to realize the full potential of mobility as a platform for gaining business insights, gathering analytics, and launching revenue-generating services.

Key highlights of the joint Juniper-Aerohive solution include:

- Private or public cloud-based or on-premises-based management
- End-to-end enterprise-grade security
- Unified wired and wireless management with Juniper Sky Enterprise
- Cloud-managed NAC with Aerohive A3
- Juniper multigigabit access switches and Power over Ethernet (PoE)

Aerohive's HiveManager is a network management system designed to reduce the operational complexity of sophisticated access networks. Available as both a cloud-based and on-premises solution, HiveManager combines streamlined configuration workflows, real-time client and event monitoring, simplified troubleshooting, versatile RF planner tools, and API integrations.

Featuring a powerful dashboard with contextual filters and a time-range slider, HiveManager provides both current and historical insights into applications, client count trends, device data usage statistics, and the ability to drill down into comprehensive network policy, single device, application, client, and user views. Task-based policy workflows streamline the configuration of mobility networks and devices, reducing the whole process to just 15 minutes from start to finish. A help desk-optimized troubleshooting interface enables historical and real-time troubleshooting, provides problem summaries and suggested remedies, reduces problem escalation, and provides a better service experience for end users.

The cloud-enabled version of HiveManager provides all the features and functionality of a behind-the-firewall network management system, but without the installation, operation, and maintenance tasks associated with a dedicated management server—and at dramatically lower costs. Customers wishing to

deploy within their own environment can use HiveManager as a fully unified, on-premises system for their own virtualized data center infrastructure.

In addition, HiveManager also provides visibility into A3 so customers can monitor A3 directly from HiveManager.

### Simplified Management

Juniper Sky Enterprise is a cloud-based service designed to abstract, simplify, and hide the complexity of managing branch and campus networks. Distributed enterprises have traditionally run management software on their own IT infrastructure, a process that required long planning cycles, careful pre-staging of devices, onsite IT staff at branch locations during deployment, and ongoing management—all of which contributed to prohibitively high installation and maintenance costs. With Juniper Sky Enterprise, customers no longer need to purchase, install, and maintain servers and management software in their own environment; instead, they can scale capacity up or down, based on prevailing business needs. Regularly updated with the latest secure software and features, Juniper Sky Enterprise allows networks to be managed centrally with minimal input. IT staff can now focus on core business activities, resulting in significant CapEx and OpEx savings.

Juniper Sky Enterprise also greatly simplifies network operations by automating time-consuming tasks such as pre-staging or device configurations. New devices are automatically and securely onboarded and constantly monitored, ensuring that the network is always operating at the highest level.

Action	Host Name	Model	Associated Device	Associated Site	Active Clients	Connected
View Details	AH-081440	AP-132	EX3300-C-13P		5	✓
View Clients	AH-081440	AP-132		OneConfig BYD	5	✓

Status	Health	Connection Type	Host Name	Connection Status	IP Address	MAC Address	OS Type	Usage	VLAN	SSID
WIRELESS	✓	WIRELESS	Chromebook	CONNECTED	192.168.1.18	8CA0F87D1FF	Generic Android	2.08 MB	1	GET-YOUR-OWN
WIRELESS	✓	WIRELESS		CONNECTED	192.168.1.7	80B84CE46C	Eye-Fi Wireless Memory Card	20 KB	1	GET-YOUR-OWN
WIRELESS	✓	WIRELESS	amazon-ebd14x6to	CONNECTED	192.168.1.27	FDA1B21047B	Generic Android	97 KB	1	GET-YOUR-OWN

Figure 2: Juniper Sky Enterprise provides management of Aerohive Access Points.

Along with simplified configurations and operating system management, Aerohive HiveManager enables centralized wireless planning, monitoring, troubleshooting, reporting, and analytics. By deploying Aerohive's high-capacity 802.11ac Wi-Fi access points with high-performance Juniper Networks

EX Series Ethernet Switches across the campus and branch, customers achieve a simple, scalable, and secure wired and wireless solution.

By using Aerohive's open API to integrate with HiveManager, Juniper Sky Enterprise enables the creation of a single portal that gives customers visibility into all of their wired and wireless devices.

Additionally, Juniper Networks SRX Series Services Gateways, EX Series Ethernet Switches, and Aerohive Access Points all support Zero Touch Provisioning (ZTP), enabling an entire branch wired/wireless infrastructure to be deployed without any onsite engineers. With the integration of Juniper Sky Enterprise and Aerohive HiveManager, administrators can deploy a branch office in minutes and monitor the entire wired, wireless, and security infrastructure—including Juniper firewalls and switches, as well as Aerohive APs and wired/wireless endpoints—from a single pane of glass.

### Security


The complete portfolio of scalable SRX Series Services Gateways provides a foundation for implementing a wide array of protections, including high-performance unified threat management (UTM) services, next-generation firewall services, and dynamic threat intelligence. SRX Series gateways also offer multiple deployment options, including chassis-based and virtual appliances with full feature capability. Additionally, when combined with Juniper's advanced threat defense solution, Juniper Sky Enterprise provides a foundational platform for open policy enforcement that makes deployment, configuration, and management intuitively simple while realizing significant

CapEx and OpEx savings. A branch office deployed with EX Series switches, SRX Series firewalls, and Aerohive Access Points provides an automated, open, and secure wired and wireless infrastructure. EX Series switches offer an extensive set of security features such as port security, 802.1X, and network segmentation to support different levels of security based on business needs. Advanced security and VPN features available on SRX Series firewalls ensure that consistent security levels are maintained across branch and campus networks.

Aerohive A3 is an enterprise-grade NAC solution that effectively secures all wired and wireless devices on the network, including corporate, guest, and BYOD clients as well as IoT devices, offering complete functionality for device onboarding, device visibility, profiling, and policy enforcement. It also supports a variety of authentication options, including full support for 802.1X certificate workflows with its built-in RADIUS server.

Granular, role-based network policies ensure that users can access the resources they need but not other, potentially sensitive information. Network access rights can be dynamically changed or revoked based on changes in user behavior, security posture, and other criteria. IoT devices are notoriously difficult to secure; A3 addresses this challenge with device profiling (a.k.a. fingerprinting) that automatically identifies IoT devices, onboarding them into dedicated VLANs with appropriately gated network policies tailored just for them.

A3 also integrates with complementary security solutions like firewalls, MDM/EMM, and IDS, leveraging them to extend and unify policy enforcement across the network to further bolster overall network security.



EX2300-C/ EX2300	EX2300 Multigigabit	EX3400	EX4300	EX4300 Multigigabit	EX4600	EX9200	EX9250
Access	Multigig Access	Access	Access and Aggregation	Multigig Access and Aggregation	Aggregation	Core and Aggregation	Compact Core and Aggregation
12-24-48 x GbE 2-4 x 10GbE SFP+		24-48 x 1GbE 4 x 10GbE SFP+ 2 x 40GbE QSFP+	24-48 x 1GbE 4 x 10GbE SFP+ 2 x 40GbE QSFP+		72 x 10GbE SFP+ 12 x 40GbE QSFP+	Up to 320 x 10GbE Up to 60 x 40GbE Up to 20 x 100GbE	Up to 144 x 10GbE Up to 36 x 40GbE Up to 24 x 100GbE
PoE / PoE+	PoE / PoE+	PoE / PoE+	PoE / PoE+	PoE / PoE+ / PoE++	N/A	N/A	N/A
Virtual Chassis Capable					Virtual Chassis and MC-LAG	MC-LAG	
Junos Fusion SD						Junos Fusion AD	

Figure 3: EX Series access, aggregation, and core switching portfolio.



Figure 4: Aerohive Access Point portfolio.

The cloud management options of local A3 instances offer customers unprecedented levels of deployment simplicity, flexibility, and scalability, while streamlined, UI-based workflows reduce the operational complexity and costs typically associated with competitive offerings.

### Switching

Juniper cloud-grade EX Series switches, designed for the converged enterprise branch, campus, and data center, as well as for service providers, address growing demands for high availability, unified communications, and virtualization.

Juniper's high-performance, scalable, fixed-configuration 1GbE and multigigabit platforms, including the EX Series EX2200, EX2300, EX3300, EX3400, and EX4300 Ethernet Switches, offer optimized network access, Media Access Control Security (MACsec), and power savings for access point deployment. Juniper's fixed-configuration 10GbE aggregation switching portfolio, including the EX4300 and EX4600, is ideal for high-density campus deployments. The modular EX9200 core switches are optimized for high-density, mission-critical applications (see Figure 3).

### Aerohive Access Points

Aerohive Access Points, powered by a unique distributed control Wi-Fi architecture, increase speed, scale, and availability for enterprise networks of any size. Built with the latest radio and software technologies, the Aerohive portfolio is designed for the most demanding network conditions and a wide range of deployment scenarios. State-aware protocols combined with granular user, device, and application awareness not only optimize client performance, they also shape network access prioritization and security based on administrator preference. Aerohive dramatically simplifies the experience of deploying and managing thousands of access points with simplified onboarding and provisioning tools.

### Summary—Aerohive and Juniper Cloud-Enabled Solutions for the Enterprise

Today's Wi-Fi network must be flexible and high-performance enough to accommodate a variety of devices without affecting the experience of other users, prioritizing mission-sensitive traffic while offering alternatives to restrict or limit usage of the network deemed unimportant to the organization.

At the same time, the network must provide appropriate levels of security to ensure that users' sessions and data are safe, and the network must ensure predictable access to data resources based on user identity, time of day, device type, or location. The network must have the intelligence to deliver these core requirements while maintaining a consistent and reliable connection as workers move around within the network. In addition, devices and resources on the network must be effectively secured at the access layer.

IT must meet these requirements without adding layers of complexity to the distributed network. The intelligence needed to maintain operations should be incorporated throughout the entire network, ensuring that the decision-making power controlling the security, identity, mobility, and quality of service for every user is available at all times, without compromise. Integrating Juniper's and Aerohive's solutions into a single, intuitive portal that provides a central view of all devices accomplishes this, ensuring control and efficiency of operations.

Working together, Aerohive and Juniper deliver an interoperable solution that realizes the full potential of mobility and supports large numbers of diverse mobile devices without compromising security and performance. This joint solution combines the flexibility and simplicity of cloud-managed wireless networks with a choice of deployment options: the security of cloud-managed NAC from Aerohive along with high-performance, cloud-based networking solutions from Juniper to address the needs of enterprises of any size.

## Next Steps

To learn more about this joint Aerohive-Juniper solution, please contact your Juniper Networks or Aerohive Networks representative, or visit [www.juniper.net](http://www.juniper.net) and [www.aerohive.com](http://www.aerohive.com).

## About Aerohive

Aerohive (NYSE: HIVE) has a proven history of innovation helping IT radically simplify wireless and wired access using cloud networking. Aerohive's Public Cloud, Private Cloud, or Portable Cloud Architecture is based on the latest cloud technology and offers unrivaled customer choice and flexibility in choosing a deployment option that meets their current and future needs. Aerohive was founded in 2006 and is headquartered in Milpitas, CA. For more information, please visit [www.aerohive.com](http://www.aerohive.com), call us at 408-510-6100, follow us on [Twitter @Aerohive](#), subscribe to our blog, or become a fan on our Facebook page.

## About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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