JUNIPER AP45 ACCESS POINT SERIES

Product Overview

The AP45 is a tri-band device with a dedicated fourth radio and a dynamic, 16-element vBLE antenna array. It enables the industry's most accurate, scalable location services, including user engagement, asset visibility, and contact tracing, with no need for battery-powered BLE beacons or manual calibration.

Juniper AI-Driven Network

The Juniper AP45 brings the performance and vBLE technology of the Juniper AP43 to the 6GHz band for enterprises needing increased channel widths and capacity. Juniper AI solutions for Wi-Fi 6E optimize operator and user experiences with secure, near-real-time client-to-cloud automation, insight, and actions.

Juniper brings true innovation to the wireless space with the world's first tri-band AI-driven wireless LAN (WLAN).

The Juniper AI-Driven Enterprise makes Wi-Fi predictable, reliable, and measurable, offering unprecedented visibility into the user experience through the use of unique service-level expectation (SLE) metrics. Proactive, AI-driven automation and self-healing replace time-consuming manual tasks, lowering Wi-Fi operational costs and saving substantial time and money. Juniper also brings enterprise-grade Wi-Fi and Bluetooth Low Energy (LE) together so businesses can increase the value of their wireless networks through personalized location services, such as wayfinding, proximity notifications, and asset location. With Juniper's patented virtual BLE (vBLE) technology, no battery beacons or manual calibration are required. All operations are managed using the open and programmable microservices-based Juniper Mist™ cloud architecture. The system delivers maximum network scalability and performance while also bringing DevOps agility to WLANs and location services.

The Juniper Mist Cloud Architecture

Our cloud-native, AI-driven microservices architecture delivers unparalleled agility, scale, and resiliency to your network. It lowers OpEx and delivers unprecedented insights into network performance, behaviors, traffic patterns, and potential trouble spots by using data science to analyze large amounts of rich metadata collected by Juniper Access Points.

Juniper Access Point Family

The Juniper enterprise-grade access point family consists of:

- AP45 Series and AP34, which support Wi-Fi 6E, 802.11ax (Wi-Fi 6), and Bluetooth LE
- AP43, AP12, AP32, AP33, and AP63 Series, which support 802.11ax (Wi-Fi 6) and Bluetooth LE

These access points are all managed by the real-time microservices based in Juniper Mist cloud.

The table below compares the supported major functions of the Juniper Wi-Fi 6E and Wi-Fi 6 access points to help in selecting the most appropriate model(s).

	AP45	AP34	AP43	AP63	AP33	AP32	AP12
Deployment	Indoor	Indoor	Indoor	Outdoor	Indoor	Indoor	Indoor Wall Plate/Desk Mount
Wi-Fi Standard	Wi-Fi 6E 802.11ax (Wi-Fi 6) 4x4 : 4SS	Wi-Fi 6E 802.11ax (Wi-Fi 6) 2x2 : 2SS	802.11ax (Wi-Fi 6) 4x4 : 4SS	802.11ax (Wi-Fi 6) 4x4 : 4SS	802.11ax (Wi-Fi 6) 5GHz: 4x4 : 4SS 2.4GHz: 2x2 :2SS	802.11ax (Wi-Fi 6) 5GHz: 4x4 : 4SS 2.4GHz: 2x2 : 2SS	802.11ax (Wi-Fi 6) 2x2 : 2SS
Wi-Fi Radios	Dedicated fourth radio	Dedicated fourth radio	Dedicated third radio	Dedicated third radio	Dedicated third radio	Dedicated third radio	Dedicated third radio
Antenna Options	Internal/External	Internal	Internal/External	Internal/External	Internal	Internal/External	Internal
Virtual BLE	✓	—	✓	✓	✓	—	—
IoT Interface	—	—	✓	—	—	—	—
IoT Sensors	Temperature, Accelerometer	Temperature	Humidity, Pressure, Temperature	—	—	—	—
Warranty	Limited Lifetime	Limited Lifetime	Limited Lifetime	One Year	Limited Lifetime	Limited Lifetime	Limited Lifetime
Frequencies Supported	2.4GHz 5GHz 6GHz	2.4GHz 5GHz 6GHz	2.4GHz 5GHz	2.4GHz 5GHz	2.4GHz 5GHz	2.4GHz 5GHz	2.4GHz 5GHz

Services Available for the Juniper AP45

Wi-Fi Cloud Services

Juniper Mist Wi-Fi Assurance

For IT and NOC Teams
- Predictable and Measurable Wi-Fi
- Service-Level Expectations (SLEs) Support
- WxLAN Policy Fabric for Role-Based Access
- Customizable Guest Wi-Fi Portal
- Radio Resource Management (RRM) Driven by AI

Marvis Virtual Assistant

For IT Helpdesk Teams
- AI-Powered Virtual Network Assistant
- Natural Language Processing Interface
- Anomaly Detection
- Client SLE Visibility and Enforcement
- Data Science-Driven Root-Cause Analysis

Bluetooth Cloud Services

Juniper Mist Mobile Engagement

For Digital Experience Teams
- Accurate (1-3m) Turn-by-Turn Navigation
- Sensor Fusion with Dead Reckoning
- Unsupervised Machine Learning
- Virtual Beacons with Custom Notifications
- Mobile SDK for iOS and Android

Juniper Mist Asset Visibility

For Process and Resource Improvement Teams
- Identification of Assets by Name and Location Visibility
- Zonal/Room Accuracy for Third-Party Tags
- Historical Analytics for Asset Tags
- Telemetry for Asset Tags (temperature, motion, and other data)
- APIs for Viewing Assets and Analytics

Analytics Cloud Services

Juniper Mist Premium Analytics

For Network Teams
- Baseline Analytics Features Come Included with Wi-Fi Assurance, Mobile Engagement, and Asset Visibility Subscriptions
- End-to-End Network Visibility
- Orchestrated Networking and Application Performance Queries
- Simplified Network Transparency

For Business Teams
- Baseline Analytics Features Come Included with Wi-Fi Assurance, Mobile Engagement, and Asset Visibility Subscriptions
- Customer Segmentation and Reporting Based on Visitor Telemetry
- Customized* Dwell and Third-Party Reporting for Traffic and Trend Analysis
- Correlation of Customer-Guest Traffic and Trend Analysis
- Correlated Customer-Guest Traffic and Trend Analysis

Access Point Features

High Performance Wi-Fi

The AP45 Series is comprised of tri-band, quad-radio 4x4 802.11ax with maximum data rates of 4800 Mbps in the 6GHz band, 2400 Mbps in the 5GHz band, and 1148 Mbps in the 2.4GHz band. The fourth radio functions as a network, location, and security sensor, a synthetic test client radio, as well as a spectrum monitor. With 802.11ax Orthogonal Frequency Division Multiple Access (OFDMA), Multi-User Multiple Input Multiple Output (MU-MIMO), and BSS Coloring technologies, the AP45 Series offers performance at unprecedented levels to support new bandwidth-hungry applications and soaring device densities.

AI for AX

With the features 802.11ax (Wi-Fi 6E) offers to boost performance and efficiency, configuring and operating an access point has grown far more complex. Juniper automates and optimizes these features with AI for AX capabilities to optimize BSS Coloring, improve data transmission scheduling within OFDMA and MU-MIMO, and assign clients to the best radio to boost the overall performance of the network.

Greater Spectral Efficiency

OFDMA improves spectral efficiency so that an increasing density of devices can be supported on the network. Density has become an issue with the rapid growth of IoT devices, which often utilize smaller data packets than mobile devices and hence increase the burden and contention on the network. Additionally, BSS Coloring improves the coexistence of overlapping BSSs and allows spatial reuse within a given channel by reducing packet collisions.

Automatic RF Optimization

With the increasing complexity that the addition of 6GHz spectrum to the 2.4GHz and 5GHz spectrum brings, reliable RF optimization is even more critical than in the past. Radio Resource Management automates dynamic channel and power assignment, taking Wi-Fi and external sources of interference into account with a dedicated sensor radio. The AI engine continuously monitors coverage and capacity SLE metrics to learn and optimize the RF environment. A learning algorithm uses hysteresis on a 24-hour window to conduct a sitewide rebalancing for optimal channel and power assignment.

Unprecedented Insight and Action

A dedicated, dual-band third radio collects data for Juniper's patent- pending Proactive Analytics and Correlation Engine (PACE), which uses machine learning to analyze user experiences, correlate problems, and automatically detect their root causes. These metrics are used to monitor SLEs and provide proactive recommendations to ensure problems don't occur (or are fixed as quickly as possible when they do). This radio also functions as a synthetic test client to proactively detect and mitigate network anomalies.

Improved IoT Battery Efficiency

By incorporating the 802.11ax target wake time (TWT) capability and Bluetooth 5.1, AP45 access points help extend the battery life of IoT devices, particularly as additional ones join the network.

Dynamic Debugging

Constantly monitor services running on the AP45 and send alerts whenever a service behaves abnormally. Dynamic debugging relieves IT of having to worry about an AP going offline or any services running on it becoming unavailable.

Dynamic Packet Capture

The Juniper Mist platform automatically captures packets and streams them to the cloud when major issues are detected. This saves IT time and effort and eliminates the need for truck rolls with sniffers to reproduce and capture data for troubleshooting.

Marvis Virtual Conversational Assistant

Marvis is a natural language processing (NLP)-based assistant with a Conversational Interface to understand user intent and goals, simplifying troubleshooting and the collection of network insights. It uses AI and data science to proactively identify issues, determine the root causes and scope of impact, and gain insights into your network and user experiences. It eliminates the need to manually hunt through endless dashboards and CLI commands.

Effortless, Cloud-Based Setup and Updates

The AP45 automatically connects to the Juniper Mist cloud, downloads its configuration, and joins the appropriate network. Firmware updates are retrieved and installed automatically, ensuring that the network is always up to date with new features, bug fixes, and security updates.

*Juniper Mist Premium Analytics service subscription is needed

Premium Analytics

Our Wireless Assurance, User Engagement, and Asset Visibility services include a base analytics capability for analyzing up to 30 days of data, which enables you to simplify the process of extracting network insights across your enterprise. If you require dynamic insights like motion paths* and other third-party* data and would like the option of customized reports, the Juniper Mist Premium Analytics service is available as an additional subscription.
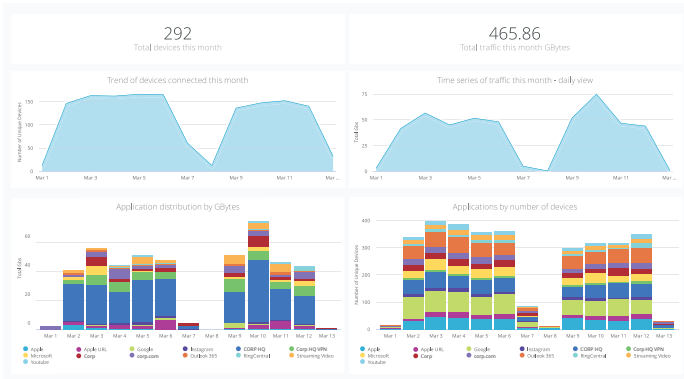

High-Accuracy Indoor Location

The AP45 has a 16-element virtual Bluetooth LE (vBLE) antenna array controlled from the Juniper Mist cloud. Passive antennas enhance the power of a single transmitter and produce directional beams (or can be combined to act as an omnidirectional radio) to accurately detect distance and location with 1-3 meter meter accuracy. With Juniper's patented vBLE technology, you can deploy an unlimited number of virtual beacons in your physical environment with no need to install battery-powered physical BLE beacons. Support for Bluetooth 5.1 boosts IoT device range and battery life.
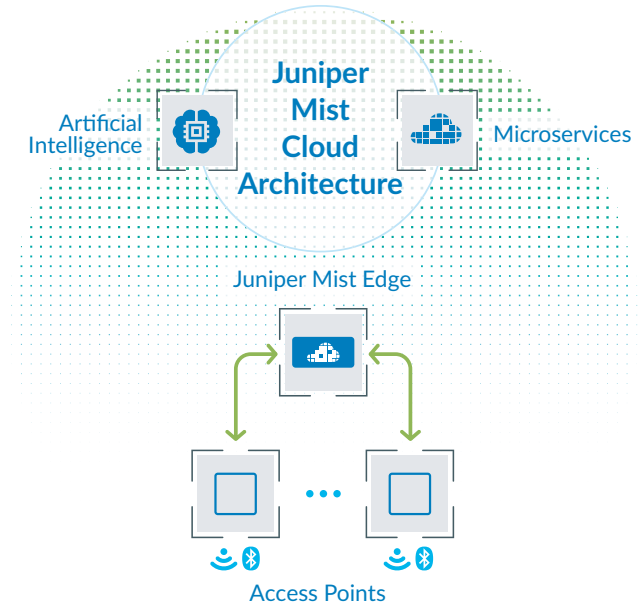
Juniper Mist Edge

Juniper Mist Edge is an on-premises appliance that runs a tunnel termination service. Juniper APs offer a flexible data plane. Traffic can be broken out locally, or tunneled to Juniper Mist Edge. There are many use cases the Juniper Mist Edge solves, including seamless mobility in large campus environments, tunneling of guest traffic to a DMZ, IoT segmentation, and teleworker. Learn more about Juniper Mist Edge.
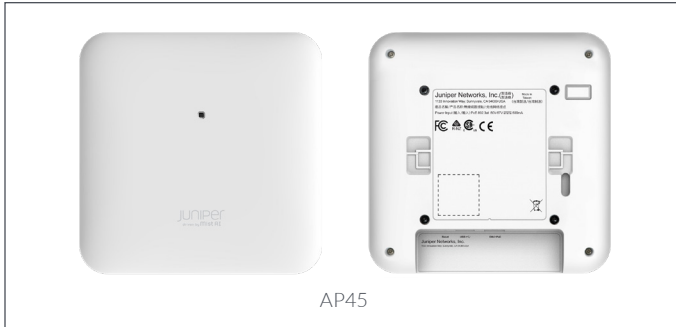
AP45

Specifications

Wi-Fi Standard	802.11ax (Wi-Fi 6), including support for OFDMA, 1024-QAM, MU-MIMO, Target Wake Time (TWT), Spatial Frequency Reuse (BSS Coloring). Backwards compatibility with 802.11a/b/g/n/ac
Combined Highest Supported Data Rates	Tri-Band: 8.3 Gbps Dual 5GHz (internal antenna model): +6 GHz 9.6Gbps
2.4 GHz	4x4 : 4 802.11ax up to 1,148 Mbps data rate
5 GHz	4x4 : 4 802.11ax up to 2,400 Mbps data rate
6GHz	4x4 : 4 802.11ax up to 4,800 Mbps data rate
MIMO Operation	Four spatial stream SU-MIMO for up to 4,800 Mbps wireless data rate to individual 4x4 HE160 Four spatial stream MU-MIMO for up to 4,800 Mbps wireless data rate to up to four MU-MIMO capable client devices simultaneously
Dedicated Fourth Radio	2.4GHz, 5GHz, and 6GHz tri-band WIDS/WIPS, spectrum analysis, synthetic client and location analytics radio
Internal Antennas (AP45)	Four 2.4GHz omnidirectional antennas with 4 dBi peak gain Four 5GHz omnidirectional antennas with 6 dBi peak gain Four 6GHz omnidirectional antennas with 6 dBi peak gain* *Subject to change
Bluetooth 5.1	vBLE 16-element Directional Antenna Array + Omni Bluetooth Antenna
Beam Forming	Transmit Beamforming and Maximal Ratio Combining
Power Options	802.3at PoE, 802.3bt PoE
Dimensions	230mm x 230mm x 50mm
Shipping Box	289mm x 268mm x 191mm
Weight	AP45 is 2.01kg, AP45E is 1.97kg
Operating Temperature	Internal antenna: 0° to 40° C External antenna: -20° to 50° C
Operating Humidity	10% to 90% maximum relative humidity, non-condensing
Operating Altitude	3,048m (10,000 ft)
Trusted Platform Module (TPM)	Includes a TPM for infrastructure security

Ordering Information

US/FCC Domain	AP45-US (Internal Antenna) AP45E-US (External Antenna)
Rest of the World	AP45-WW (Internal Antenna) AP45E-WW (External Antenna)

I/O and Indicators

IoT Sensors	Temperature, Accelerometer
USB	USB 2.0 support interface, 900 mA output
Eth0	100/1000/2500/5000Base-T (802.3bz); RJ45; PoE PD
Eth1	10/100/1000Base-T; RJ45; optional PoE 15.4W PSE mode (requires 802.3bt on Eth0)
External Antennas (AP45E)	Two pluggable antenna connectors; 2.4/5 (4 pin), 6+Scan (6 pin)
Reset	Reset to the factory default settings
Indicators	One multicolor status LED
Traffic Forwarding Options	Eth0, Eth1, Juniper Mist Edge

Mounting Brackets

APBR-U*	Universal bracket
APBR-ADP-M16	16mm threaded rod (M16-2)
APBR-ADP-T58	3⁄8" Threaded Rod
APBR-ADP-CR9	9⁄16" T-Rail, Channel Rail
APBR-ADP-RT15	15⁄16" T-Rail
APBR-ADP-WS15	1-1/2" T-Rail
APBR-ADP-T12	1/2" threaded rod

*The AP package includes one Universal Bracket. APBR-U is available separately as an accessory.

Patented VBLE Technology

In addition to the industry-leading Wi-Fi technology at the heart of the AP45 access point, our second-generation, patented, and dynamic, 16-element virtual Bluetooth LE (vBLE) antenna array combines with machine learning to eliminate the need for battery-powered beacons. This maximizes scalability and optimizes your deployment investment in location-based services.

vBLE enables businesses to provide rich location-based experiences that are engaging, accurate, real-time, and scalable.

Bluetooth Antenna Array

About Juniper Networks

At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.

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