

# AP41 ACCESS POINT SERIES

## Highest-Performance Wi-Fi, Bluetooth® LE, and IoT

### JUNIPER AI-DRIVEN ENTERPRISE

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

Our AI-Driven network 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, Bluetooth® Low Energy (LE), and IoT 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.

The Juniper Mist platform is 100% programmable, supporting open APIs. It enables full automation and seamless integration with complementary LAN, WAN, security, user engagement, and asset location solutions. The architecture enables you to consume wireless and location services in both a scalable and cost-effective manner.



### JUNIPER ACCESS POINT FAMILY

The Juniper enterprise-grade access point family consists of:

- AP41, AP21, and AP61 Series, which support 802.11ac Wave 2, Bluetooth LE, and IoT
- AP12, AP32, AP33, AP43, and AP63 Series, which support 802.11ax (Wi-Fi 6), Bluetooth LE, and IoT
- BT11, which supports Bluetooth LE

These access points are all built on a real-time microservices platform and are managed by the Juniper Mist cloud.

	AP61	AP41	AP21	BT11
<b>Deployment</b>	Outdoor	Indoor	Indoor	Indoor
<b>Wi-Fi</b>	802.11ac Wave 2 4x4 : 4SS	802.11ac Wave 2 4x4 : 4SS	802.11ac Wave 2 2x2: 2SS	-
<b>Wi-Fi Tri Radio</b>	✓	✓	-	-
<b>IoT Interface</b>	-	✓	-	-
<b>Antenna Options</b>	Internal/ External	Internal/ External	Internal	Internal
<b>Virtual Bluetooth LE</b>	✓	✓	✓	✓

### SERVICES AVAILABLE FOR THE JUNIPER AP41

#### WI-FI CLOUD SERVICES

##### Juniper Mist Wi-Fi Assurance



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

##### Marvis Virtual Assistant



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

#### BLUETOOTH LE 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 & 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

\*Juniper Mist Premium Analytics service subscription is needed.

## ACCESS POINT FEATURES

### High-Performance Wi-Fi

The AP41 Series comprises tri-radio 4x4 access points with maximum data rates of 1,730 Mbps in the 5GHz band and 800 Mbps in the 2.4GHz band. The third radio functions as a network, location, and security sensor as well as a spectrum monitor.

The AP41 Series is available with internal and external antenna models.

### High-Accuracy Indoor Location

The AP41 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 to accurately detect distance and location with 1-3 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.



### Unprecedented Insight and Action

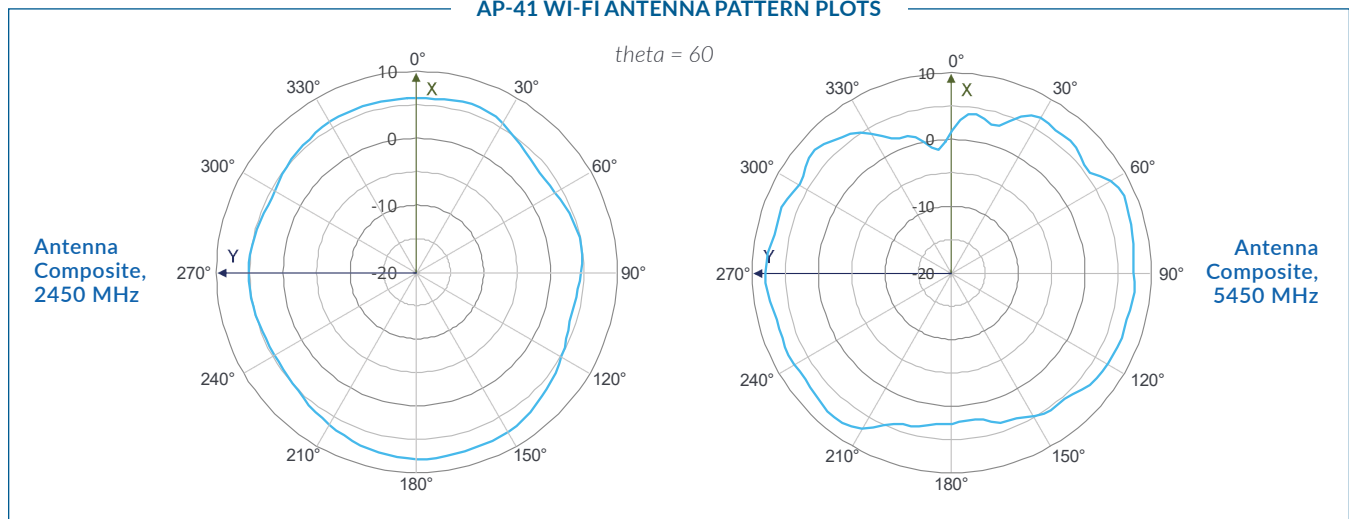
A dedicated dual-band radio collects data for Juniper's patent-pending Proactive Analytics and Correlation Engine (PACE), which relies on machine learning to analyze user experiences, correlate problems, and automatically detect their root cause. These metrics are used to monitor SLEs and provide proactive recommendations to ensure that problems don't occur or are fixed as quickly as possible if they do.

### 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.

Client Events 47 Total 31 Good 7 Neutral 9 Bad						
Association	Scanner 2	12:25:50.827 AM, Jun 30	AP	Main	Server IP Address	10.1.1
Fast BSS Assoc Failure	Scanner 2	12:25:48.458 AM, Jun 30	Reason	Falling DHCP DISCOVER from 54:54:25:10:10:02 on vlan 1 with MAC 1224:54:77:81	BSSID	54:54:25:10:10:02
IP Assigned	Scanner 2	12:25:47.335 AM, Jun 30		NO DHCP	SSID	Network 1
DNS OK	Scanner 2	12:25:45.023 AM, Jun 30		Request seen from client in response to the Offer on the Server	Subnet	10.1.1.1/16
Default Gateway ARP Success	Scanner 2	12:25:42.837 AM, Jun 30			Transaction ID	922349945
DHCP Stuck - Bind Failure	Scanner 2	12:25:39.747 AM, Jun 30				
Authorization	Scanner 2	12:25:39.207 AM, Jun 30	RSSI			-53
DNS OK	Scanner 2	12:25:38.104 AM, Jun 30	VLAN			1
Fast Roaming 802.11R	Scanner 2	12:25:37.099 AM, Jun 30	Failure Count			1
Reassociation	Scanner 2	12:25:36.098 AM, Jun 30				

### AP-41 WI-FI ANTENNA PATTERN PLOTS



\*Juniper Mist Premium Analytics service subscription is needed.

### Marvis Virtual Network Assistant

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

### Network and Business Insights

Wi-Fi Assurance includes a base analytics capability for analyzing up to 30 days of data, enabling you to simplify the process of extracting network insights from data and analytics across your enterprise. Review your network throughput peaks to properly align your support resources. To extend these capabilities to third-party\* network elements, consume up to one year\* of data, and gain the option to generate customized\* reports, the Juniper Mist Premium Analytics service is available as an additional subscription.

### Effortless, Cloud-Based Setup and Updates

The AP41 Series automatically connects to the Juniper Mist cloud, downloads its AP 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.

### Dynamic Debugging

Constantly monitor services running on the AP41 Series 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.

### Automatic RF Optimization

Juniper's Radio Resource Management (RRM) automates dynamic channel and power assignment, taking Wi-Fi and external sources of interference into account with its 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 site-wide rebalancing for optimal channel and power assignment.

SPECIFICATIONS	
Wi-Fi Standard	802.11ac Wave 2 (backwards compatibility with 802.11a/b/g/n)
Combined Highest Supported Data Rates	2.5 Gbps
2.4GHz	4x4:4 802.11b/g/n/ac up to 800 Mbps data rate 802.11ac for VHT capable clients
5GHz	4x4:4 802.11a/n/ac Wave 2 up to 1,700 Mbps data rate
MIMO Operation	Four spatial stream SU-MIMO for up to 1,733 Mbps wireless data rate to individual 4x4 VHT80 Four spatial stream MU-MIMO for up to 1,733 Mbps wireless data rate to up to three MU-MIMO-capable client devices simultaneously
Dedicated Third Radio	2.4GHz and 5GHz dual-band WIDS/WIPS, spectrum analysis & location analytics radio
Internal Antennas (AP41 only)	Four 2.4GHz omnidirectional antennas with 4 dBi peak gain Four 5GHz omnidirectional antennas with 6 dBi peak gain
Bluetooth	16 Directional Antennas + 1 Omni Antenna Bluetooth Array
Beam Forming	Transmit Beamforming and Maximal Ratio Combining
Power Options	802.3at PoE, 12V/3A DC power supply
Power Adapter	100-240VAC, 50-60 Hz, input. 12V/3A DC output.
Dimensions	215 x 215 x 52 mm (8.46 x 8.46 x 2.05 in)
Weight	1.6 kg (3.53 lbs) excluding mount and accessories
Shipping Box	Size (L x W x H): 285 x 268 x 86 mm (10.6 x 10.6 x 3.4 in) Weight: 2.18 kg (4.82 lbs) Boxes per carton: 8
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)
Electromagnetic Emissions	FCC Part 15 Class B
Reliability (MTBF)	AP41: 1,243,955 hours (142 yrs) @ 25C; 748,877 hours (85 yrs) @ 40C AP41E: 1,264,116 hours (144 yrs) @ 25C; 508,342 hours (58 yrs) @ 40C

I/O PORTS & ACCESSORIES	
Reset	Reset to the factory default settings
USB	USB 2.0 support interface
12VDC	Input for optional DC power supply
IoT	8-pin interface for digital I/O and analog input (0 to +5V)
Module	10/100/1000 BaseT RJ45; optional PoE PSE mode
Eth1	10/100/1000 BaseT RJ45 interface
Eth0+PoE	10/100/1000 BaseT RJ45; supports 802.3at PoE PD
External Antennas (AP41E only)	Four RP-SMA Male connectors
Indicators	One multicolor status LED

COMPLIANCE STANDARDS	
CE Mark	
UL 60950-1	
CAN/CSAC22.2	
No. 609501	
UL 2043	
FCC Part 15.247, 15.407, 15.107, and 15.109	
RSS-247	
ICES-003	

MOUNTING BRACKETS	
AP41BR1	Ceiling T-bar
AP41BR2	Ceiling Drywall
AP41BR3	5/8" Threaded Rod
AP41BR4	2mm (3/16") Threaded Rod

ORDERING INFORMATION	
US/FCC Domain	AP41-US (Internal Antenna) AP41E-US (External Antenna)
Rest of the World	AP41-WW (Internal Antenna) AP41E-WW (External Antenna)

MIST BLUETOOTH ANTENNA ARRAY

