

# The Forrester New Wave™: Wireless Solutions, Q3 2019

The Eight Solutions That Matter Most And How They Stack Up

by Andre Kindness

August 15, 2019

## Why Read This Report

In Forrester's evaluation of the emerging market for wireless solutions, we identified the eight most significant in the category — Aerohive, Aruba, Cambium Networks, Cisco Aironet, Cisco Meraki, Extreme Networks, Huawei, and Juniper Networks — and evaluated them. This report details our findings about how well each solution scored against 10 criteria and where they stand in relation to each other. Infrastructure and operations (I&O) professionals can use this review to select the right partner for their broader wireless needs that go beyond just wireless LAN (WLAN).

## Key Takeaways

### **Aruba Leads The Pack**

Forrester's research uncovered a market in which Aruba is a Leader; Huawei and Juniper Networks are Strong Performers; Cisco Aironet, Cambium Networks, and Extreme Networks are Contenders; and Cisco Meraki and Aerohive are Challengers.

### **Wayfinding, Location Services, And IoT Connectivity Are Key Differentiators**

Forrester found that the solutions provided at least one of these wireless values: Empowering customers with location information and real-time directions; enabling visibility into assets and people to improve operations; or connecting internet-of-things (IoT) devices to the business to support digital transformation.

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- [Create A Customer Engagement Network To Accelerate Your Digital Business](#)
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## Wireless Connectivity Solutions Must Expand Beyond Wi-Fi

For the past decade, Wi-Fi has been the exclusive wireless connectivity medium for technology devices inside enterprises; there's a thriving market of hardware, management software, and monitoring around it. However, Wi-Fi isn't the only form of wireless. Forrester's report [Internet-Of-Things Heat Maps For Operational Excellence, 2019](#) shows that 38% of respondents have implemented or are expanding their adoption of IoT solutions, with another 27% planning to implement IoT solutions or applications over the next 12 months.<sup>1</sup> Many of these devices, which may include light bulbs, thermostats, or water meters, connect through the protocols outlined in Forrester's report [LoWPAN Technologies Redefine Wireless Infrastructure And Operations](#) for a wide-ranging set of reasons, such as better battery life or meshing capabilities.

I&O pros responsible for networking are catching on to the importance of low-power wireless personal-area networking (LoWPAN) technologies and the increasing role they play in the networking fabric. You can obtain a separate management system for each LoWPAN technology — but a better approach is to use a unified wireless solution that combines the wireless technologies under one platform. It helps:

- › **Improve operational efficiency.** Bluetooth and Zigbee use the 2.4 GHz range. When it comes to troubleshooting or designing wireless environments, networking professionals should have the ability to see the various technologies using that space within the same management interface. Mistakes and management costs increase if operators try to vary information between two systems that may or may not have similar capabilities, like heat maps.
- › **Maximize wireless benefits.** Mobile phones leverage Wi-Fi to augment GPS or cellular connectivity to improve location services or data links. Similarly, multiple local and personal-area wireless technologies can improve location services or device connectivity inside buildings.
- › **Decrease the hardware overhead and management.** Each wireless technology has its own strengths and weaknesses. Most LoWPAN standards use some variation of the 802.15.4 standard, which could be embedded in a single gateway. Though some wireless technologies may require different deployment patterns, there's still overlap in what you'll need to manage them. It makes sense to leverage hardware that has most of the capabilities you want and then backfill areas with more dedicated gateways.<sup>2</sup>

## Wireless Solutions Evaluation Overview

The Forrester New Wave™ differs from our traditional Forrester Wave™. In the New Wave evaluation, we evaluate only emerging technologies, and we base our analysis on a 10-criterion survey and a 2-hour briefing with each evaluated solution. We group the 10 criteria into current offering and strategy (see Figure 1). We also review market presence.

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## The Eight Solutions That Matter Most And How They Stack Up

We included eight solutions in this assessment: Aerohive Networks, Aruba, Cambium Networks, Cisco Aironet, Cisco Meraki, Extreme Networks, Huawei, and Juniper Networks (see Figure 2 and see Figure 3). Each of these solutions has:

- › **Software to manage two or more personal- or local-area wireless technologies.** Each wireless solution includes a Wi-Fi management system and access points along with the ability to manage another wireless technology, such as ANT; Bluetooth; EnOcean; Thread; wirelessHART, ZigBee, or similar wireless technology.
- › **Hardware that offers multiple personal- or local-area wireless connectivity options.** The solution has hardware products that include access points supporting a second wireless technology or a separate gateway of Wi-Fi access points that supports one or more wireless technologies.
- › **Access points and/or gateways that are fully controlled by one management system.** Forrester evaluated vendors that have two different product lines, defined by separate management systems and correlating hardware, as two separate solutions.<sup>3</sup>
- › **Large-enterprise expertise.** We defined a large enterprise as having more than 5,000 employees; we didn't include solutions focused on small businesses or the midmarket.
- › **Active interest among Forrester clients.** We focused on solutions that are most relevant to Forrester clients, as shown by the frequency of client requests.

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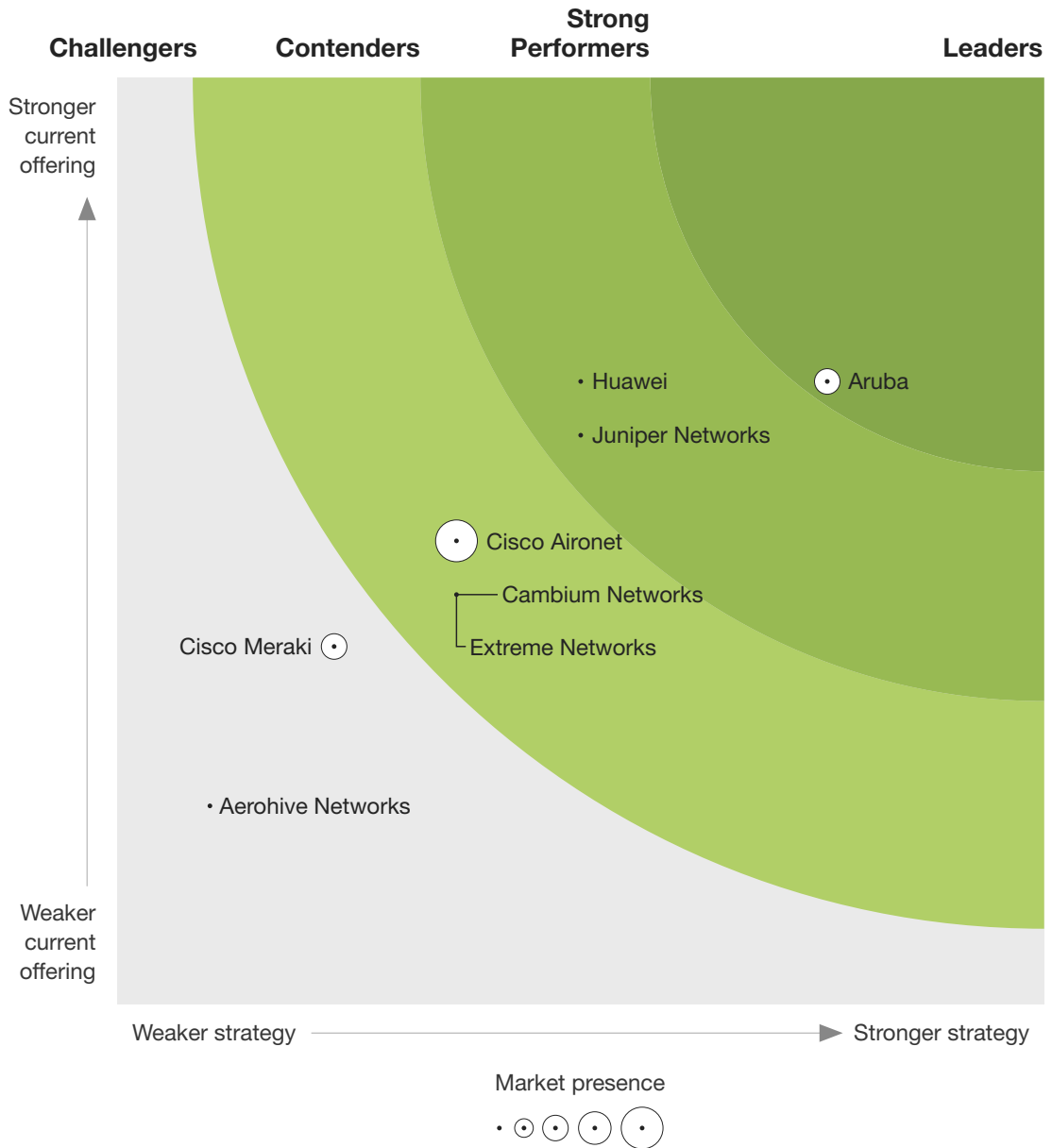
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**FIGURE 1** Assessment Criteria

<b>Assessment criteria</b>	<b>Platform evaluation details</b>
<b>Wireless connectivity options</b>	What wireless connectivity technologies does the vendor offer in its wireless product portfolio beyond Wi-Fi? Can it transmit and receive data such as firmware or settings to/from the endpoint device on the other wireless technologies?
<b>Wireless hardware options</b>	What percentage of the portfolio's Wi-Fi access points (APs) currently have the ability to provide connectivity for one or more wireless LAN/PAN technologies? Do some or all Wi-Fi APs have the ability to be upgraded by either firmware or modular base to support a second wireless technology?
<b>Configuration management</b>	Does the vendor offer a unified management solution (cloud-based, on-premises, or both options) for the wireless technologies? Can the network manager see and manage the configurations of the APs/gateways/routers for the other wireless technologies?
<b>Spectrum and device visibility</b>	Does the management software provide a heat map, show connected devices, and show hardware for all the wireless technologies? Can customers manage each wireless technology's hardware, such as channel, signal strength, or hops?
<b>Monitoring and troubleshooting</b>	Does the management software provide visibility into multiple radio frequency (RF) spectrums? Are there location services for end devices, gateways, and APs for the other wireless technologies? Does the vendor offer troubleshooting tools to solve connectivity issues or traffic issues on the wireless connections?
<b>Programmability</b>	What APIs and data modeling languages does the management system support? How much of the second technologies configuration can be configured through the APIs? Are there SDKs available? Does the vendor offer prebuilt codes, programming classes, and wireless knowledge centers/repositories?
<b>Security</b>	Are there access controls to the hardware's configuration transmitting the other wireless technologies, such as radius authentication? What types of security controls (segmentation, quarantine, or tunneling to firewalls) are there for end devices connecting to the wireless technologies?
<b>Solution positioning</b>	How well does the product vision and strategy align for the multiwireless environment for IT operations market? How is the vendor positioning its product in relation to other vendors? What differentiating capabilities is the solution or vendor offering?
<b>Road map</b>	How well does the product vision and strategy align for the multiwireless environment for IT operations market? What differentiating capabilities is the solution or vendor offering? How is the vendor addressing the unique needs of some vertical markets and industries?
<b>Market approach</b>	Is the company executing a successful go-to-market approach? Does the vendor have a well-thought-out technology and channel partner strategy?

**FIGURE 2** Forrester New Wave™: Wireless Solutions, Q3 2019

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**FIGURE 3** Solution QuickCard Overview

Company	Wireless connectivity	Wireless hardware	Config. management	Spectrum/device visibility	Monitoring and troubleshooting	Programmability	Security	Solution positioning	Road map	Market approach
Aruba	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Huawei	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Juniper Networks	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Cisco Aironet	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Cambium Networks	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Extreme Networks	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Cisco Meraki	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Aerohive Networks	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆

⬆ Differentiated   
 ⬆ On par   
 ⬆ Needs improvement

## Solution QuickCards

Forrester evaluated eight solutions and ranked them against 10 criteria. Here's our take on each.

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**Aruba: Forrester’s Take**

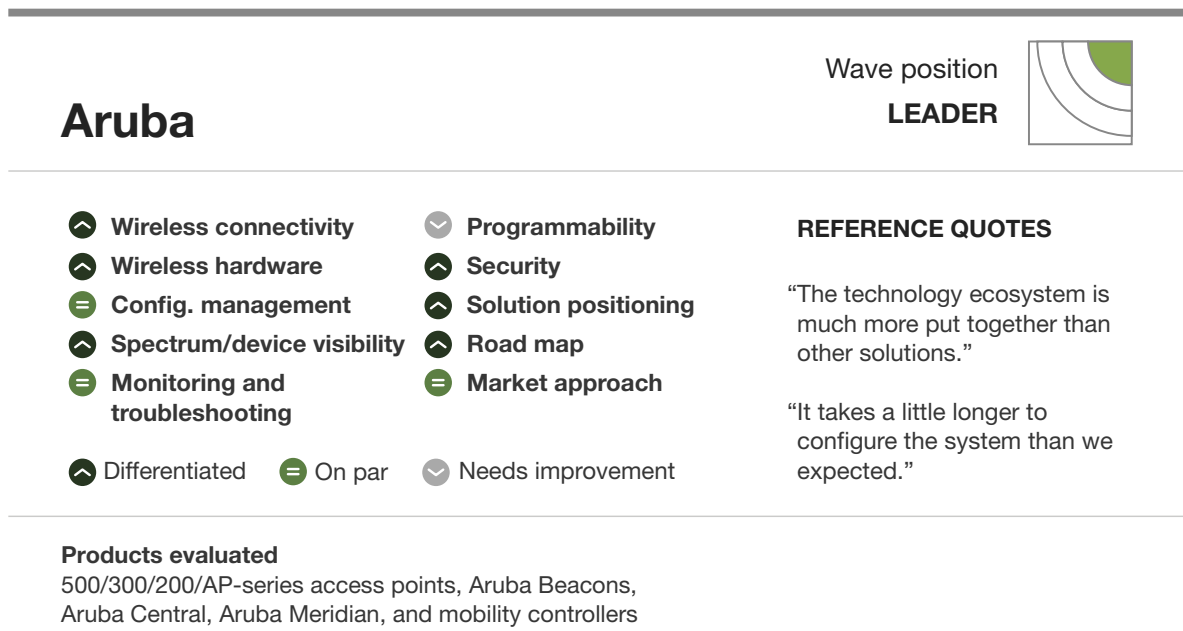
Our evaluation found that Aruba (see Figure 4):

- › **Leads the pack with robust location services and multiwireless capabilities.** Aruba provides wayfinding functionality to help contextual engagement services and offers admins location services for assets. Bluetooth, Wi-Fi, and Zigbee options also help businesses connect to IoT devices to create a businesswide networking fabric.
- › **Needs to streamline its offering.** Aruba can improve how some of the features and capabilities across multiple software packages come together to serve a particular function. This leads to increased deployment complexity and time.
- › **Is the best fit for companies needing advanced wireless services.** Organizations that need location services for customers, the ability to keep track of company assets and people, and the capacity to manage IoT devices using a LoWPAN technology should shortlist Aruba.

**Aruba Customer Reference Summary**

Customers praised Aruba Networks’ rich management interfaces, monitoring tools, and location services, especially the ability to connect IoT devices using wireless options outside of just using Wi-Fi with Aruba’s access points (APs).

**FIGURE 4** Aruba QuickCard





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**Huawei: Forrester's Take**

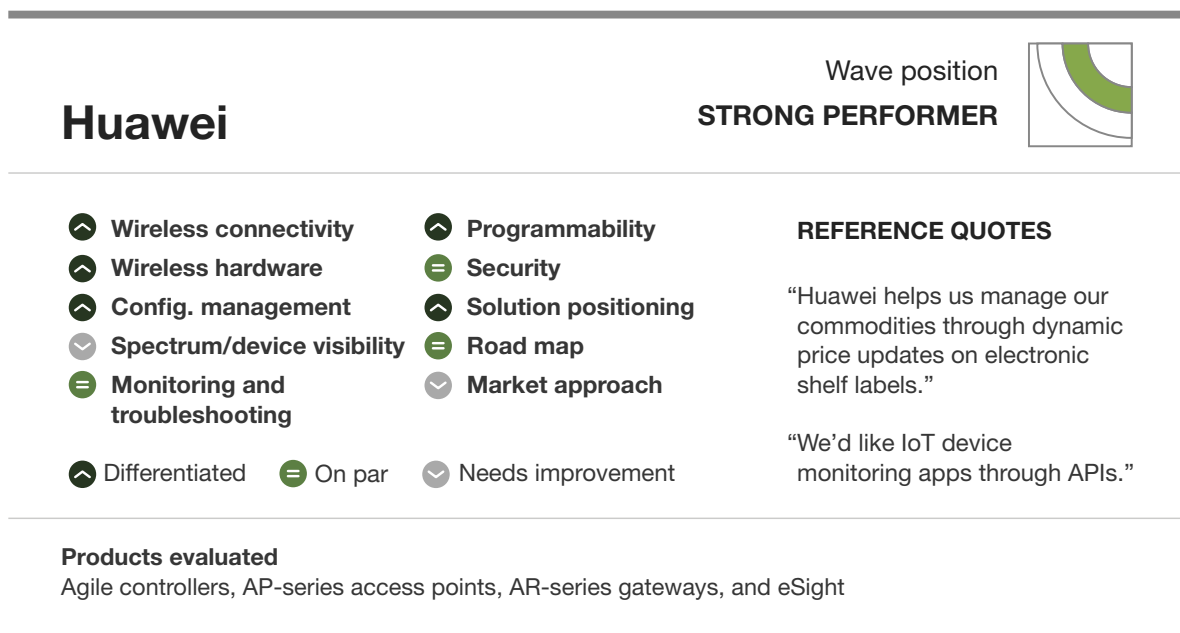
Our evaluation found that Huawei (see Figure 5):

- › **Offers multiple LoWPAN technologies and a sophisticated management system.** Huawei offers LoWPAN connectivity options with Bluetooth, RFID, and Zigbee within the APs or module add-ons. By defining attributes such as the ingress/outgress points and signal strength, the management system sets up a highly reliable LoWPAN network for IoT devices.
- › **Still needs to improve location services.** Though administrators have some basic visibility capabilities with Wi-Fi and Bluetooth, Huawei's solution lacks real-time visibility of devices on a map across all the wireless protocols.
- › **Is the best fit for companies needing to use multiple wireless technologies.** IoT device manufacturers don't all use the same LoWPAN technologies.<sup>4</sup> Companies that don't want to reduce IoT options for business decision makers should shortlist Huawei.

**Huawei Customer Reference Summary**

Huawei garnered high marks from customers for the solution's ability to support their IoT deployments under one platform. In addition, customers praised the company's ability to create specialized solutions for a particular vertical's needs, such as connectivity for electronic shelf labels.

**FIGURE 5** Huawei QuickCard



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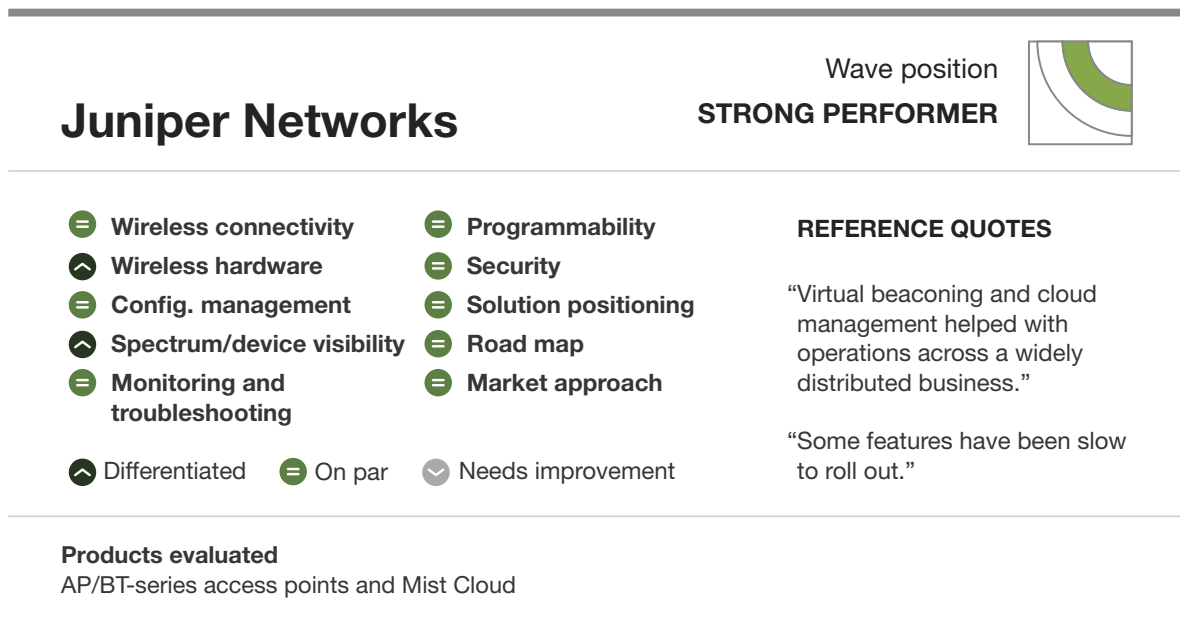
**Juniper Networks: Forrester's Take**

Our evaluation found that Juniper Networks (see Figure 6):

- › **Provides robust locations services and simplified management.** Juniper's Mist offering has set the standard in rolling out location services in an easy way by using just APs and management software with Juniper's virtual beacon technology. Customers can roll out wayfinding and also get the most granular view into assets and people for improved services and troubleshooting.
- › **Still needs to enhance its Bluetooth capabilities beyond beaconing.** Juniper's customers would benefit if it enhanced its Bluetooth capability from just beaconing into full Bluetooth 5.0 functionality to manage IoT devices.
- › **Is the best fit for companies looking for easy-to-use location services.** Juniper's solution will appeal most to firms with the daunting task of rolling out indoor location services. It offers a highly dynamic engagement that sends specific beacons based on time of day.

**Juniper Networks Customer Reference Summary**

Juniper Networks' references highlighted its simple way of deploying advanced location services and alerts setups based on high levels of granularity, such as doors.

**FIGURE 6** Juniper Networks QuickCard

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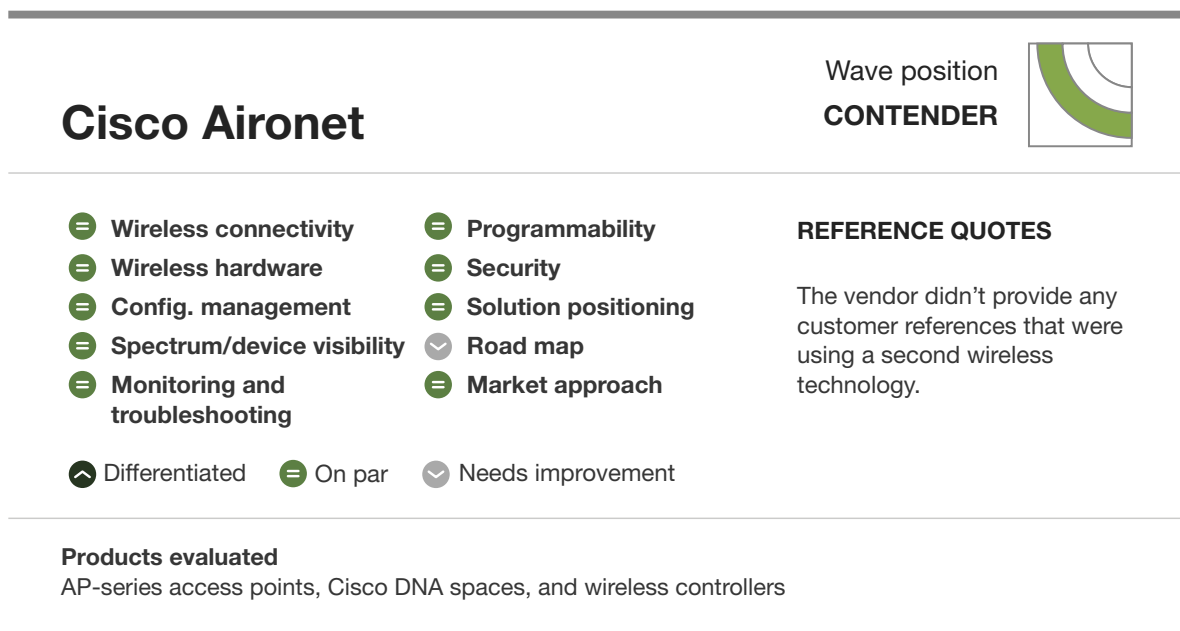
**Cisco Aironet: Forrester's Take**

Our evaluation found that Cisco Aironet (see Figure 7):

- › **Provides a variety of hardware options within its wireless platform.** Cisco customers can choose from a variety of APs with embedded wireless capabilities. Some APs have USB ports that allow customers to add third-party or Cisco dongles with other wireless options.
- › **Still needs to build out an IoT wireless connectivity platform.** Cisco Aironet must shift from just providing location services to enabling a rich set of connectivity services across Bluetooth and other wireless technologies. This will enable customers to manage thermostats, light bulbs, and other IoT devices on one platform.
- › **Is the best fit for companies with complex physical environments.** Cisco Aironet has a vast selection of controllers, APs, and antennas that can cater to a multinational company with a highly diverse set of areas, such as corporate offices, R&D centers, sales offices, and industrial buildings.

**Cisco Aironet Customer Reference Summary**

The Cisco Aironet product group couldn't provide a customer reference using any LoWPAN functionality within its wireless platform for Forrester to interview.

**FIGURE 7** Cisco Aironet QuickCard

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**Cambium Networks: Forrester’s Take**

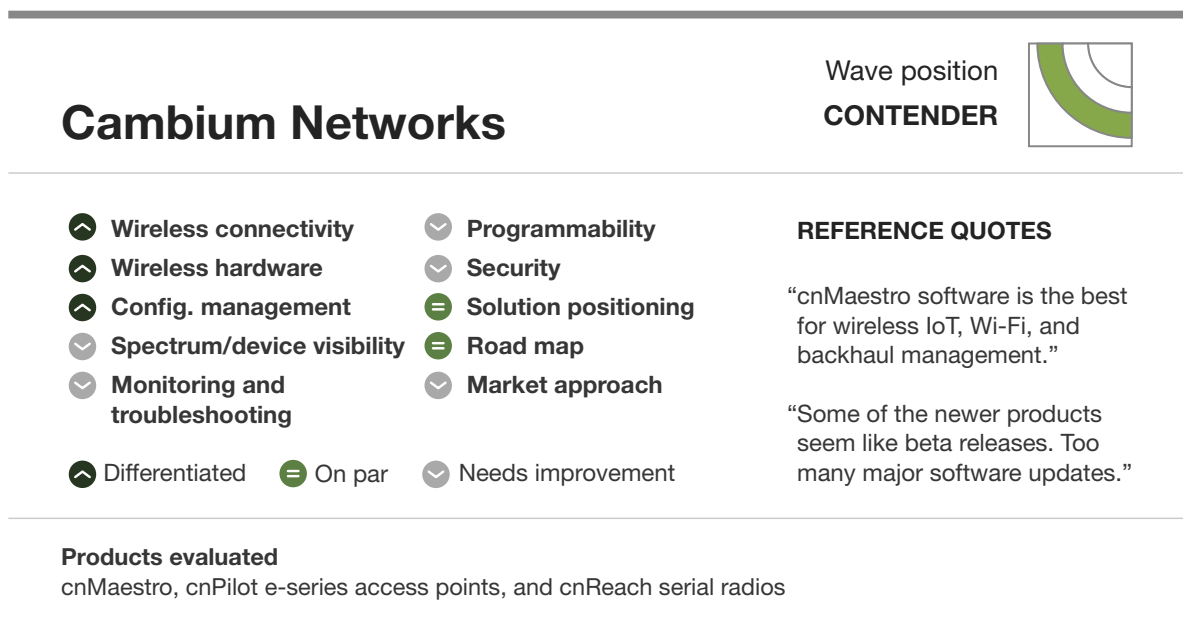
Our evaluation found that Cambium Networks (see Figure 8):

- › **Delivers a unified management platform across wireless LAN and WAN.** The company offers the ability to manage broadband, narrowband, and Wi-Fi connectivity solutions through a single management platform, cnMaestro.
- › **Still needs to add real-time device connectivity and heat maps.** While customers can do wireless planning across wide areas, Cambium doesn’t offer the ability for customers to see devices on a geographic map or spectrum patterns on a heat map.
- › **Is the best fit for areas with limited wired options.** Companies using machinery and sensors in areas challenging for wired connections, such as mines, utility substations, or oil fields, should shortlist Cambium Networks. A wide range of wireless technologies supports point-to-point and point-to-multipoint connectivity across personal, local, and wide areas.

**Cambium Networks Customer Reference Summary**

Customers indicated that Cambium was the only company that allowed them to manage a set of devices and sensors using wireless connectivity across both short and long distances through one management system.

**FIGURE 8** Cambium Networks QuickCard



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**Extreme Networks: Forrester’s Take**

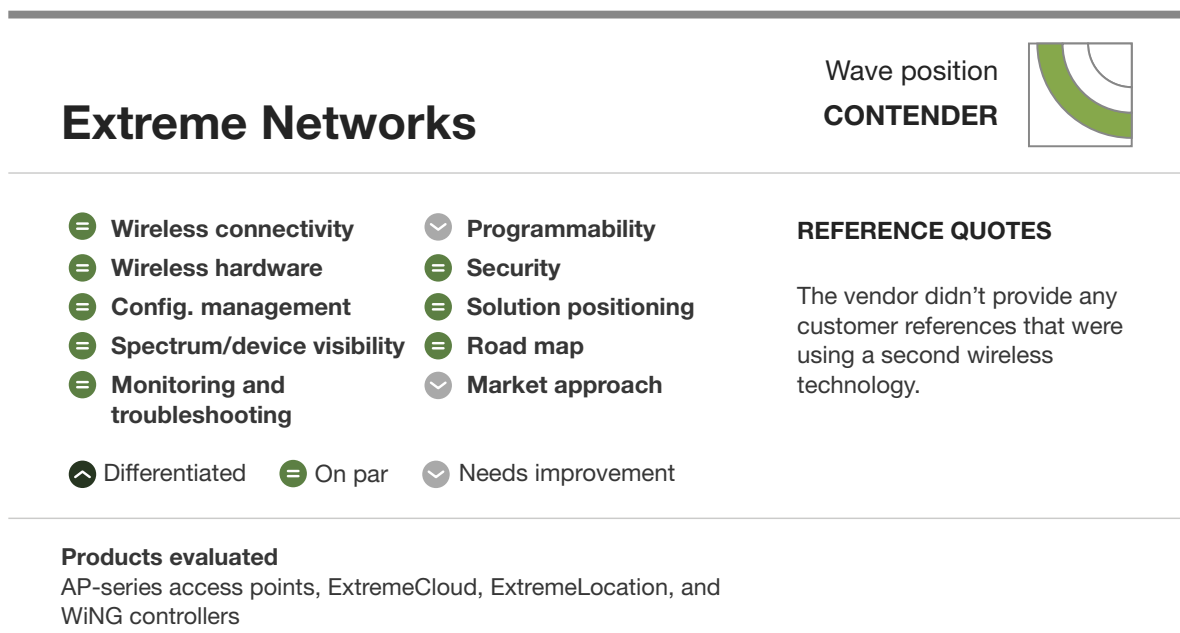
Our evaluation found that Extreme Networks (see Figure 9):

- › **Offers location analytics and traffic flow analysis.** Extreme’s wireless solution provides flow, positioning, zone, and other types of information aggregated from BLE and Wi-Fi data collection. Business and tech professionals can extract detailed location information to gain insights into movement patterns and improve customer experiences or operational efficiency.
- › **Still needs to streamline the product portfolio.** Extreme has made several acquisitions in recent years, and customers struggle to understand the tradeoffs between the different offerings, as not all of the platforms and products interoperate with one another.
- › **Is the best fit for companies looking to improve personnel and physical workflow.** Manufacturers, logistics, and retailers optimizing employee operations should consider using Extreme’s wireless solution. Zonal analysis, dwell times, and traffic flow insights could improve the location and movement of tools, components, or machinery.<sup>5</sup>

**Extreme Networks Customer Reference Summary**

Extreme Networks couldn’t provide a customer reference using any LoWPAN functionality within its wireless platform for Forrester to interview.

**FIGURE 9** Extreme Networks QuickCard



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**Cisco Meraki: Forrester’s Take**

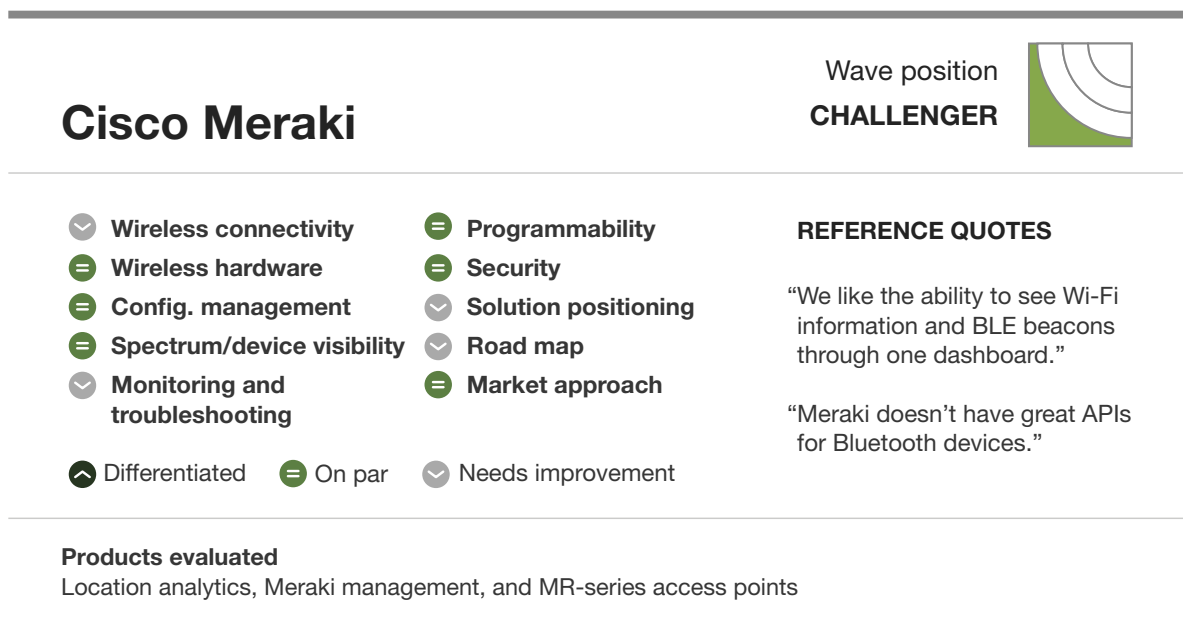
Our evaluation found that Cisco Meraki (see Figure 10):

- › **Provides an easy-to-use cloud-based management system.** Mirroring the simplicity that Apple brought to mobile phones, Meraki has brought simplicity to wireless management. Cisco, after acquiring Meraki, positioned the product line as a solution for highly distributed companies that don’t need all of the many features in the Meraki product line and prefer simplified management for smaller locations, such as a quick-service restaurant.
- › **Still needs to improve Bluetooth client visibility.** The Meraki management interface provides basic information about Bluetooth clients and AP settings. Users need to obtain location information about Bluetooth APs and clients through Meraki’s API.
- › **Is the best fit for a company with a highly replicated set of remote locations.** Quick-service restaurants, convenience stores, and other types of franchised businesses would benefit from a cloud-based management system.

**Cisco Meraki Customer Reference Summary**

Customers lauded Meraki’s simple-to-use management interface and the ability to easily find or extract information from the cloud management platform.

**FIGURE 10** Cisco Meraki QuickCard



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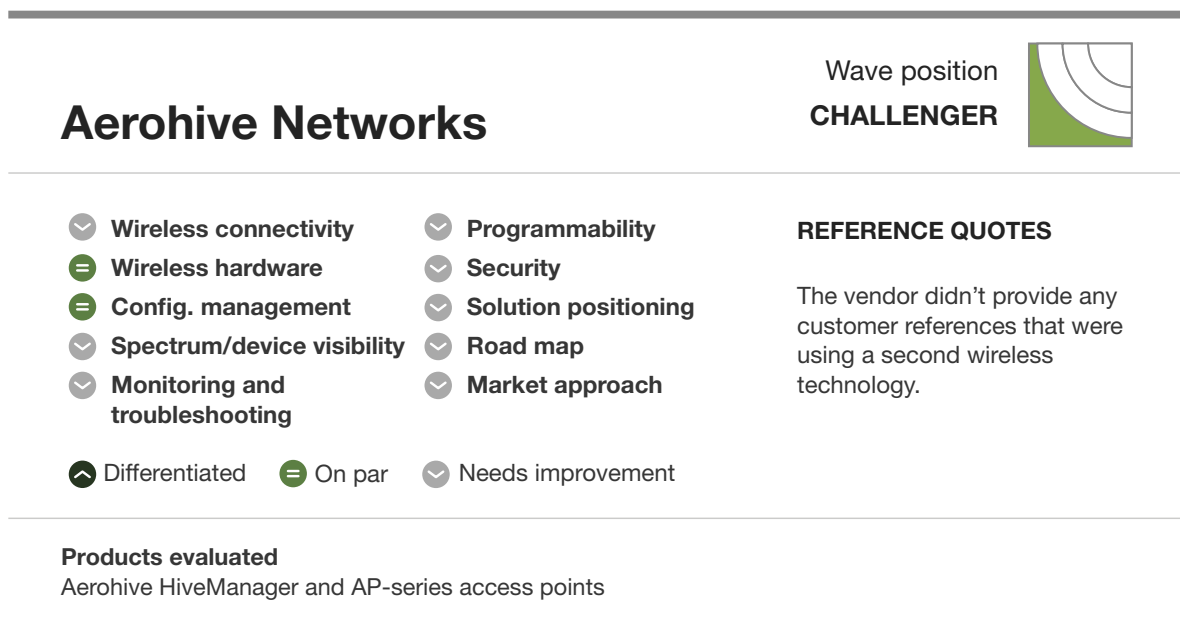
**Aerohive Networks: Forrester's Take**

Our evaluation found that Aerohive Networks (see Figure 11):

- › **Offers a single, simplified approach to on-premises and cloud-based options.** Aerohive Networks rebuilt the Aerohive management system to make the features and functions similar across both on-premises and cloud-based management versions.<sup>6</sup>
- › **Still needs to strengthen Bluetooth management and monitoring.** The Bluetooth interface has a couple of weak areas, such as real-time visibility. While an administrator can click from a list of Bluetooth devices and see the historical movement of that device between APs, the management interface doesn't display real-time location information.
- › **Is the best fit for companies that seek a consistent platform.** Customers that require both on-premises and cloud-based management, or those moving from on-premises to cloud, should look to Aerohive Networks. Teams will see higher levels of efficiency and security with consistent wireless processes and procedures.

**Aerohive Networks Customer Reference Summary**

Aerohive couldn't provide a customer reference using any LoWPAN functionality within its wireless platform for Forrester to interview.

**FIGURE 11** Aerohive Networks QuickCard

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## Supplemental Material

### The Forrester New Wave Methodology

We conducted primary research to develop a list of solutions that met our criteria for the evaluation and definition of this emerging market. We evaluated solutions against 10 criteria, seven of which we based on product functionality and three of which we based on strategy. We also reviewed market presence. We invited the top emerging solutions in this space to participate in an RFP-style demonstration and interviewed customer references. We then ranked the solutions along each of the criteria. We used a summation of the strategy scores to determine placement on the x-axis, a summation of the current offering scores to determine placement on the y-axis, and the market presence score to determine marker size. We designated the top-scoring solutions as Leaders.



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## Integrity Policy

We conduct all our research, including Forrester New Wave evaluations, in accordance with the [Integrity Policy](#) posted on our website.

## Endnotes

- <sup>1</sup> Source: Forrester Analytics Global Business Technographics® Networks And Telecommunications Survey, 2019.
- <sup>2</sup> Wi-Fi APs with Bluetooth capabilities can be deployed to provide locations services. Because Bluetooth signals aren't as strong, organizations can augment a Bluetooth service with extra Bluetooth beacons if users require more-granular location services or better coverage.
- <sup>3</sup> For multiple products lines to be considered a single solution, 75% or more of the hardware features for all the hardware must be configured by a single management system.
- <sup>4</sup> The IoT sensor and device industry uses many types of LoWPAN technologies. Usually, a manufacturer will settle on one for its products. It might not be the same LoWPAN technology that other companies in the same industry are using. For example, some thermostat manufacturers use Bluetooth, and others may use ZigBee or Z-Wave. See the Forrester report "[LoWPAN Technologies Redefine Wireless Infrastructure And Operations.](#)"
- <sup>5</sup> Companies have used this type of analysis to reduce the distance that employees must travel across job floors to carry out their jobs as well as the time they spend doing so.
- <sup>6</sup> I&O professionals will find that most cloud and on-premises versions from a single vendor have large feature and functionality differences.

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