Cisco Aironet 2800 Series Access Points

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Contents

Product overview	3
Features and benefits	4
802.11ac Wave 2 and beyond	5
Cisco DNA support	5
High-density experience	6
Product specifications	6
Licensing	17
Warranty information	20
Cisco environmental sustainability	20
Cisco Capital	20

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The Cisco® Aironet® 2800 Series Wi-Fi access points are highly versatile and deliver the most functionality in the industry.

Product overview



For organizations paving the way for the new 802.11ac Wave 2 standard, the Cisco Aironet 2800 Series is the perfect solution. The access points go beyond getting ready for the new standard, providing the ultimate in flexibility and versatility.

For large enterprise organizations that rely on Wi-Fi to engage with customers, the 2800 Series is a hands-off product that's intelligent enough to make decisions based on end-device activities and usage. This automation allows you to devote time to other pressing matters, secure in the knowledge that your Wi-Fi network is performing to its utmost potential.

The Aironet 2800 Series is packed with the features and capabilities that have made Cisco the industry leader, at a price point that is ideal for managing wireless growth, capacity, and coverage gaps in dense indoor environments.

With the 2800 Series, you can secure remote workers or the micro-office. Any Cisco Aironet or Catalyst access point can function as an OfficeExtend Access Point (OEAP). With an OEAP, an employee at home or in a temporary micro-office will have access to the corporate SSID and the corporate network without the need to set up a VPN or have any advanced technical know-how.

Cisco User Defined Network, a feature available in Cisco DNA Center, allows IT to give end users control of their very own wireless network partition on a shared network. End users can then remotely and securely deploy their devices on this network. Perfect for university dormitories or extended hospital stays, Cisco User Defined Network grants both device security and control, allowing each user to choose who can connect to their network. (Available second half of calendar year 2020.)

The Wi-Fi 6 readiness dashboard is a new dashboard in the Assurance menu of Cisco DNA Center. It will look through the inventory of all devices on the network and verify device, software, and client compatibility with the new Wi-Fi 6 standard. After upgrading, advanced wireless analytics will indicate performance and capacity gains as a result of the Wi-Fi 6 deployment. This is an incredible tool that will help your team define where and how the wireless network should be upgraded. It will also give you insights into the access point distribution by protocol (802.11 ac/n/abg), wireless airtime efficiency by protocol, and granular performance metrics.

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Features and benefits

Feature	Benefit
802.11ac Wave 2 support	Provides a theoretical connection rate of up to 2.6 Gbps per radio—roughly double the rates offered by today's high-end 802.11ac access points.
High Density Experience (HDX)	Best-in-class RF architecture, which provides high-performance coverage for a high density of client devices, giving the end user a seamless wireless experience. HDX includes features such as custom hardware in 802.11ac Wave 2 radios, Cisco CleanAir®, ClientLink 4.0, cross-access point noise reduction, and an optimized client roaming experience.
Multiuser Multiple-Input Multiple-Output (MU-MIMO) technology	Supporting three spatial streams, MU-MIMO enables access points to split spatial streams between client devices, to maximize throughput.
Flexible Radio Assignment	Allows the access points to intelligently determine the operating mode of serving radios based on the RF environment. The access points can operate in the following modes: • **2.4-GHz and 5-GHz mode:** One radio will serve clients in 2.4-GHz mode, while the other serves clients in 5-GHz mode. • **Dual 5-GHz mode:** Both radios inside the access point operate on the 5-GHz band, maximizing the benefits of 802.11ac Wave 2 and increasing client device capacity. • **Security Monitoring and 5-GHz mode,** One radio will serve 5-GHz clients, while the other is scanning the full spectrum for wIPS attackers, CleanAir interferers, and rogue devices.
Dual 5-GHz radio support	Enables both radios to operate in 5-GHz client serving mode, allowing an industry-leading 5.2 Gbps (2 x 2.6 Gbps) over-the-air speeds while increasing client capacity.
Smart antenna connector	An intelligent second physical antenna connector is included on 2800 Series models with an external antenna. This connector provides advanced network design flexibility for high-density and large open-area environments such as auditoriums, convention centers, libraries, cafeterias, and arenas/stadiums, allowing two sets of antennas to be connected and active on a single access point.
160-MHz channel support	Supporting channels up to 160 MHz wide, Dynamic Bandwidth Selection allows the access point to dynamically switch between 20-, 40-, 80-, and 160-MHz channels, depending on the RF channel conditions, providing the industry's best-performing wireless network.
Optimized access point roaming	Helps ensure that client devices associate with the access point in their coverage range that offers the fastest data rate available.
Zero-impact Application Visibility and Control*	Uses dedicated hardware acceleration to improve the performance of line-speed applications such as Application Visibility and Control.
Auto Link Aggregation (LAG) support	802.3ad (LACP) compliant, allowing both Gigabit Ethernet interfaces to automatically LAG, increasing overall throughput to the access point.
ClientLink 4.0	Cisco ClientLink 4.0 technology to improve downlink performance to all mobile devices, including one-, two-, and three-spatial-stream devices on 802.11a/b/g/n/ac while improving battery life on mobile devices such as smartphones and tablets.

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Feature	Benefit
CleanAir 160 MHz*	Cisco CleanAir technology, enhanced with 160-MHz channel support, provides proactive, high-speed spectrum intelligence across 20-, 40-, 80-, or 160-MHz-wide channels to combat performance problems due to wireless interference.
Cisco Mobility Express	Flexible deployment mode through the Cisco Mobility Express Solution is ideal for medium-sized deployments and can support up to 100 access points. Easy setup allows the 2800 Series Access Points to be deployed on networks without a physical controller.

* Available in a future release.

802.11ac Wave 2 and beyond

The Aironet 2800 Series extends 802.11ac speed and features to a new generation of smartphones, tablets, and high-performance laptops, providing a greater end-user experience. Whether your project involves wholesale changes to your current wireless network or upgrading your legacy Wi-Fi deployments (802.11a/b/g/n/ac wave 1 deployments), the 2800 Series can handle the job.

The 2800 Series supports 802.11ac Wave 2, providing a theoretical connection rate of up to 5.2 Gbps—that's roughly 4x the rates offered by today's high-end 802.11ac access points. The boost helps you stay ahead of the performance and bandwidth expectations of today's mobile worker, who usually uses multiple Wi-Fi devices instead of just one. As such, users are adding proportionally larger traffic loads to the wireless LAN, which has outpaced Ethernet as the default enterprise access network.

Cisco DNA support

Pairing the 2800 Series access points with the Cisco Digital Network Architecture (Cisco DNA) allows for a total network transformation. Cisco DNA allows you to truly understand your network with real-time analytics, quickly detect and contain security threats, and easily provide networkwide consistency through automation and virtualization. By decoupling network functions from the hardware, you can build and manage your entire wired and wireless network from a single user interface.

Working together, the 2800 Series and Cisco DNA offer such features as:

- Flexible Radio Assignment
- Cisco Connected Mobile Experiences
- Cisco High Density Experience
- Fast Lane
- Cisco Identity Services Engine
- And much more

The result? Your network stays relevant, becomes digital-ready, and is the lifeblood of your organization.

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High-density experience

Building on the Cisco Aironet heritage of RF excellence, the 2800 Series access points run on a purpose-built, innovative chipset with a best-in-class RF architecture. This chipset provides a high-density experience for enterprise networks designed for mission-critical, high-performance applications.

The 2800 Series is a component of Cisco's portfolio of flagship, 802.11ac-enabled access points, and delivers a robust mobility experience based on the following product features:

- 802.11ac Wave 2 with 4x4 Multiuser Multiple-Input Multiple-Output (MU-MIMO) technology supporting three spatial streams. MU-MIMO enables access points to split spatial streams between client devices to maximize throughput.

With two radios built into each access point, the 2800 Series is more versatile than any access point currently on the market. These radios are outfitted with Flexible Radio Assignment, which means that the access points automatically self-optimize to better serve the environment. For example, one of the radios broadcasts its signal on the 5-GHz channel and the other sends out a 2.4-GHz signal. The access point understands the wireless environment and will automatically switch the 2.4-GHz signal to a 5-GHz signal, increasing the reliability of your Wi-Fi use. This setting automatically works in reverse too, the access point recognizes that the RF environment has changed as reverts changes back to its original configuration.

The access point also dynamically changes the radio settings based on the wireless environment. The 2800 Series Wave 2 access point will allow one of the radios to operate in Wireless Security Monitoring mode. Allowing you to detect wireless security threats, interference, and combat rogue access. This valuable information can be culled in an easy-to-understand matrix to inform you about your customers.

- **Optimized access point roaming** to ensure that client devices associate with the access point in their coverage range that offers the fastest data rate available.
- **Cisco ClientLink 4.0** technology to improve downlink performance to all mobile devices, including one-, two-, and three-spatial-stream devices on 802.11a/b/g/n/ac. At the same time, the technology improves battery life on mobile devices.
- **Cisco CleanAir** technology enhanced with 160-MHz channel support. CleanAir delivers proactive, high-speed spectrum intelligence across 20-, 40-, and 80-, and 160-MHz* wide channels to combat performance problems due to wireless interference.
- **MIMO equalization** capabilities, which optimize uplink performance and reliability by reducing the impact of signal fade.

Product specifications

Item	Specification
Part numbers	**Cisco Aironet 2800i Access Point: Indoor environments, with internal antennas** • AIR-AP2802I-x-K9: Dual-band, controller-based 802.11a/g/n/ac • AIR-AP2802I-xK910: Eco-pack (dual-band 802.11a/g/n/ac) 10 quantity access points • AIR-AP2802I-D-K9I: Dual-band, controller-based 802.11a/g/n/ac (India only) **Cisco Aironet 2800i Access Point Configurable: Indoor environments, with internal antennas** • AIR-AP2802I-x-K9C: Dual-band, controller-based 802.11a/g/n/ac, configurable • AIR-AP2802I-xK910C: Eco-pack (dual-band 802.11a/g/n/ac) 10 quantity access points, configurable

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Item	Specification
	Cisco Aironet 2800e Access Point: Indoor, challenging environments, with external antennas • AIR-AP2802E-**x**-K9: Dual-band controller-based 802.11a/g/n/ac • AIR-AP2802E-**x**K910: Eco-pack (dual-band 802.11a/g/n/ac), 10 quantity access points **Cisco Aironet 2800e Access Point Configurable: Indoor, challenging environments, with external antennas** • AIR-AP2802E-**x**-K9C: Dual-band controller-based 802.11a/g/n/ac, configurable • AIR-AP2802E-**x**K910C: Eco-pack (dual-band 802.11a/g/n/ac), 10 quantity access points, configurable **Regulatory domains: (x = regulatory domain)** Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/go/aironet/compliance. Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Global Price List. **Cisco Wireless LAN Services** • AS-WLAN-CNSLT: Cisco Wireless LAN Network Planning and Design Service • AS-WLAN-CNSLT: Cisco Wireless LAN 802.11n Migration Service • AS-WLAN-CNSLT: Cisco Wireless LAN Performance and Security Assessment Service
Software	• Cisco Unified Wireless Network Software Release 8.2.111.0 or later • Cisco IOS® XE Software Release 16.3
Supported wireless LAN controllers	• Cisco 2500 Series Wireless Controllers, Cisco 3500 Series Wireless Controllers, Cisco Wireless Controller Module for ISR G2, Cisco Wireless Services Module 2 (WiSM2) for Catalyst® 6500 Series Switches, Cisco 5500 Series Wireless Controllers, Cisco Flex® 7500 Series Wireless Controllers, Cisco 8500 Series Wireless Controllers, Cisco 9800 Series Wireless Controllers, Cisco Virtual Wireless Controller • Cisco Catalyst 3850 Series Switches, Cisco Catalyst 3650 Series Switches • Cisco Mobility Express
802.11n version 2.0 (and related) capabilities	• 4x4 MIMO with three spatial streams • Maximal Ratio Combining (MRC) • 802.11n and 802.11a/g beamforming • 20- and 40-MHz channels • PHY data rates up to 450 Mbps (40 MHz with 5 GHz) • Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) • 802.11 Dynamic Frequency Selection (DFS) • Cyclic Shift Diversity (CSD) support
802.11ac Wave 1 capabilities	• 4x4 MIMO with three spatial streams • MRC • 802.11ac beamforming • 20-, 40-, and 80-MHz channels • PHY data rates up to 1.3 Gbps (80 MHz in 5 GHz) • Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) • 802.11 DFS • CSD support

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Item	Specification
802.11ac Wave 2 capabilities	• 4x4 MU-MIMO with three spatial streams • MRC • 802.11ac beamforming • 20-, 40-, 80, 160-MHz channels • PHY data rates up to 4680 Mbps • Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) • 802.11 DFS • CSD support
Integrated antenna	**Flexible radio (either 2.4 GHz or 5 GHz)** • 2.4 GHz, gain 4 dBi, internal antenna, omnidirectional in azimuth • 5 GHz, gain 6 dBi, internal directional antenna, elevation plane beamwidth 90° **Dedicated 5-GHz radio** • 5 GHz, gain 5 dBi, internal antenna, omnidirectional in azimuth
External antenna (sold separately)	• 2802e Series access points are certified for use with antenna gains up to 6 dBi (2.4 GHz and 5 GHz) • Cisco offers the industry's broadest selection of antennas, delivering optimal coverage for a variety of deployment scenarios
Smart antenna connector	• Available on the 2802e Series access points only • Requires the AIR-CAB002-DART-R= 2 ft smart antenna connector to RP-TNC connectors to connect a second antenna to the access point • Required when running the flexible radio as either a second 5-GHz serving radio or Wireless Security Monitoring radio
Interfaces	• 2802I/E ◦ 2x 100/1000BASE-T autosensing (RJ-45) • Management console port (RJ-45) • USB 2.0 (enabled via future software)
Indicators	• Status LED indicates boot loader status, association status, operating status, boot loader warnings, boot loader errors
Dimensions (W x L x H)	• Access point (without mounting brackets): 2802I: 8.66” x 8.68” x 2.17”, 2802E: 8.66” x 8.77” x 2.50”
Weight	**Cisco Aironet 2802i** • 3.53 lb (1.6 kg) **Cisco Aironet 2802e** • 4.6 lb (2.09 kg)
Input power requirements	• 802.3at PoE+, Cisco Universal PoE (Cisco UPOE®) • 802.3at power injector (AIR-PWRINJ6=)
Power draw	• 22.5W at the PSE (20W at the PD) with all features enabled except for the USB 2.0 port • 26.5W at the PSE (23W at the PD) with the USB 2.0 port enabled

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Item	Specification	
Environmental	**Cisco Aironet 2802i** • Nonoperating (storage) temperature: -22° to 158°F (-30° to 70°C) • Nonoperating (storage) altitude test: 25˚C, 15,000 ft. • Operating temperature: 32° to 104°F (0° to 40°C) • Operating humidity: 10% to 90% (noncondensing) • Operating altitude test: 40˚C, 9843 ft. **Cisco Aironet 2802e** • Nonoperating (storage) temperature: -22° to 158°F (-30° to 70°C) • Nonoperating (storage) altitude test: 25˚C, 15,000 ft. • Operating temperature: -4° to 122°F (-20° to 50°C) • Operating humidity: 10% to 90% (noncondensing) • Operating altitude test: 40˚C, 9843 ft.	
System memory	• 1024 MB DRAM • 256 MB flash	
Warranty	Limited lifetime hardware warranty	
Available transmit power settings	**2.4 GHz** • 23 dBm (200 mW) • 20 dBm (100 mW) • 17 dBm (50 mW) • 14 dBm (25 mW) • 11 dBm (12.5 mW) • 8 dBm (6.25 mW) • 5 dBm (3.13 mW) • 2 dBm (1.56 mW)	**5 GHz** • 23 dBm (200 mW) • 20 dBm (100 mW) • 17 dBm (50 mW) • 14 dBm (25 mW) • 11 dBm (12.5 mW) • 8 dBm (6.25 mW) • 5 dBm (3.13 mW) • 2 dBm (1.56 mW)
Frequency band and 20-MHz operating channels	**A (A regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) • 5.745 to 5.825 GHz; 5 channels **B (B regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.720 GHz; 12 channels • 5.745 to 5.825 GHz; 5 channels **C (C regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.825 GHz; 5 channels **D (D regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.745 to 5.825 GHz; 5 channels	**I (I regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels **K (K regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.620 GHz; 7 channels • 5.745 to 5.805 GHz; 4 channels **N (N regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.745 to 5.825 GHz; 5 channels **Q (Q regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 11 channels **R (R regulatory domain):**

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Item	Specification	
	E (E regulatory domain): • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) **F (F regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.250 to 5.350 GHz; 4 channels • 5.725 to 5.825 GHz; 4 channels **G (G regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.825 GHz; 5 channels **H (H regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.150 to 5.350 GHz; 8 channels • 5.745 to 5.825 GHz; 5 channels	• 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.660 to 5,805 GHz; 7 channels **S (S regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz;, 11 channels • 5.745 to 5.825 GHz; 5 channels **T (T regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.280 to 5.320 GHz; 3 channels • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) • 5.745 to 5.825 GHz; 5 channels **Z (Z regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) • 5.745 to 5.825 GHz; 5 channels
Note: Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/go/aironet/compliance.		
Maximum number of nonoverlapping channels	2.4 GHz • 802.11b/g: ◦ 20 MHz: 3 • 802.11n: ◦ 20 MHz: 3	5 GHz • 802.11a: ◦ 20 MHz: 25 FCC, 16 EU • 802.11n: ◦ 20 MHz: 25 FCC, 16 EU ◦ 40 MHz: 12 FCC, 7 EU ◦ 20 MHz: 25 FCC, 16 EU ◦ 40 MHz: 12 FCC, 7 EU ◦ 80 MHz: 6 FCC, 3 EU ◦ 160 MHz 2 FCC, 1 EU
Note: This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.		

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Item	Specification
Compliance standards	◦ UL 60950-1 ◦ CAN/CSA-C22.2 No. 60950-1 ◦ UL 2043 ◦ IEC 60950-1 ◦ EN 60950-1 ◦ EN 50155 for 2800e (Operating temperature -20° to 50°C) • Radio approvals: ◦ FCC Part 15.107, 15.109, 15.247, 15.407, 14-30 ◦ RSS-247 (Canada) ◦ EN 300.328, EN 301.893 (Europe) ◦ ARIB-STD 66 (Japan) ◦ ARIB-STD T71 (Japan) ◦ EMI and susceptibility (Class B) ◦ ICES-003 (Canada) ◦ VCCI (Japan) ◦ EN 301.489-1 and -17 (Europe) ◦ EN 60601-1-2 EMC requirements for the Medical Directive 93/42/EEC • IEEE standards: ◦ IEEE 802.11a/b/g, 802.11n, 802.11h, 802.11d ◦ IEEE 802.11ac • Security: ◦ 802.11i, Wi-Fi Protected Access 3 (WPA3), WPA2, WPA ◦ 802.1X ◦ Advanced Encryption Standards (AES) • Extensible Authentication Protocol (EAP) types: ◦ EAP-Transport Layer Security (TLS) ◦ EAP-Tunneled TLS (TTLS) or Microsoft Challenge Handshake Authentication Protocol Version 2 (MCSHAPv2) ◦ Protected EAP (PEAP) v0 or EAP-MSCHAPv2 ◦ EAP-Flexible Authentication via Secure Tunneling (FAST) ◦ PEAP v1 or EAP-Generic Token Card (GTC) ◦ EAP-Subscriber Identity Module (SIM) • Multimedia: ◦ Wi-Fi Multimedia (WMM) • Other: ◦ FCC Bulletin OET-65C ◦ RSS-102

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Item	Specification					
Data rates supported	802.11b: 1, 2, 5.5, and 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps 802.11n HT20: 6.5 to 216.7 Mbps (MCS0 to MCS23) 802.11n HT40: 13.5 to 450 Mbps (MCS0 to MCS23) 802.11ac VHT20: 6.5 to 288.9 Mbps (MCS0 to 8 – SS 1, MCS0 to 9 – SS 2 and 3) 802.11ac VHT40: 13.5 to 600 Mbps (MCS0 to 9 – SS 1 to 3) 802.11ac VHT80: 29.3 to 1300 Mbps (MCS0 to 9 – SS 1 to 3) 802.11ac VHT160: 58.5 to 2304 Mbps (MCS0 to 9 – SS 1 and 2, MCS0 to 8 – SS 3)						
Transmit power and receive sensitivity							
Spatial streams		**5-GHz radio**		**2.4-GHz flexible radio**		**5-GHz flexible radio**	
		Total Tx power (dBm)	**Rx sensitivity (dBm)**	**Total Tx power (dBm)**	**Rx sensitivity (dBm)**	**Total Tx power (dBm)**	**Rx sensitivity (dBm)**
802.11/11b							
1 Mbps	1	NA	NA	23	-101	NA	NA
11 Mbps	1	NA	NA	23	-88	NA	NA
802.11a/g							
6 Mbps	1	23	-93	23	-91	23	-92
24 Mbps	1	23	-89	23	-87	23	-89
54 Mbps	1	23	-81	23	-77	22	-80
802.11n HT20							
MCS0	1	23	-93	23	-91	23	-93
MCS4	1	23	-88	23	-86	23	-87
MCS7	1	23	-79	23	-77	22	-78
MCS8	2	23	-93	23	-91	21	-93
MCS12	2	23	-86	23	-85	23	-86
MCS15	2	23	-79	23	-77	21	-78
MCS16	3	23	-93	23	-91	23	-92
MCS20	3	23	-85	23	-84	22	-84
MCS23	3	23	-78	23	-76	18	-77

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Item	Specification						
802.11n HT40							
MCS0	1	23	-90			23	-89
MCS4	1	23	-85			23	-84
MCS7	1	23	-76			23	-75
MCS8	2	23	-90			23	-89
MCS12	2	23	-83			23	-83
MCS15	2	23	-76			21	-76
MCS16	3	23	-90			23	-89
MCS20	3	23	-82			23	-81
MCS23	3	23	-75			20	-74
802.11ac VHT20							
MCS0	1	23	-93			23	-92
MCS4	1	23	-88			23	-87
MCS7	1	23	-82			22	-80
MCS8	1	23	-77			21	-75
MCS0	2	23	-93			23	-91
MCS4	2	23	-86			23	-84
MCS7	2	23	-79			21	-77
MCS8	2	23	-75			20	-73
MCS9	2	NA	NA			NA	NA
MCS0	3	23	-93			23	-91
MCS4	3	23	-85			22	-83
MCS7	3	23	-78			20	-76
MCS8	3	23	-74			19	-72
MCS9	3	23	-72			18	-70

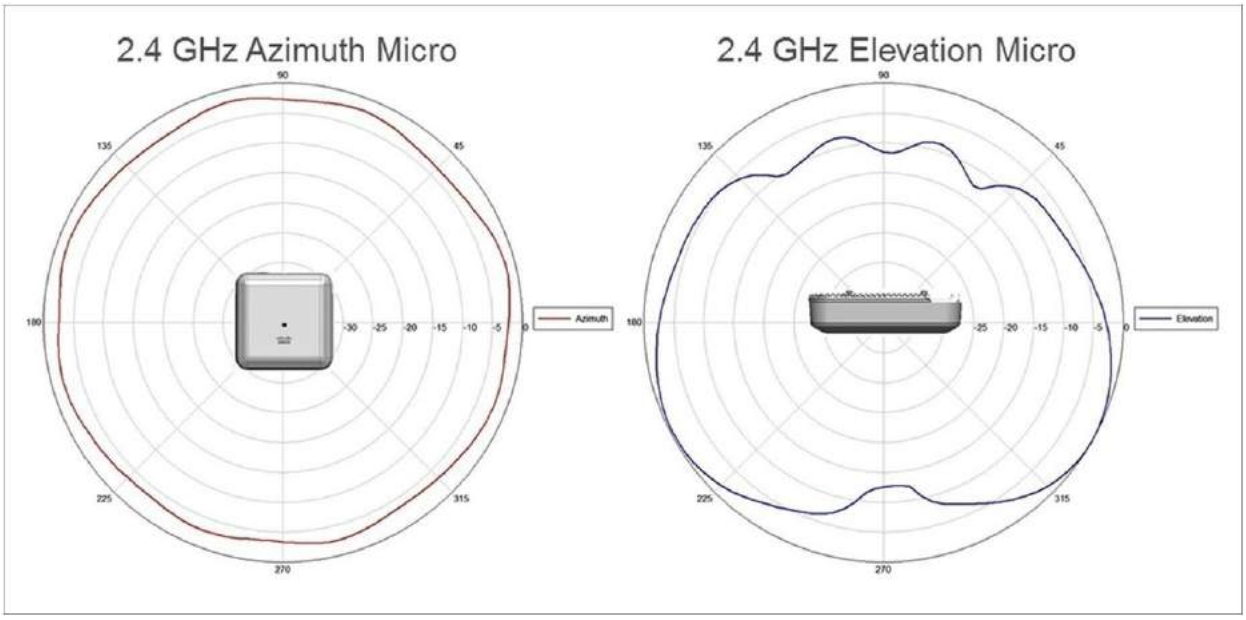
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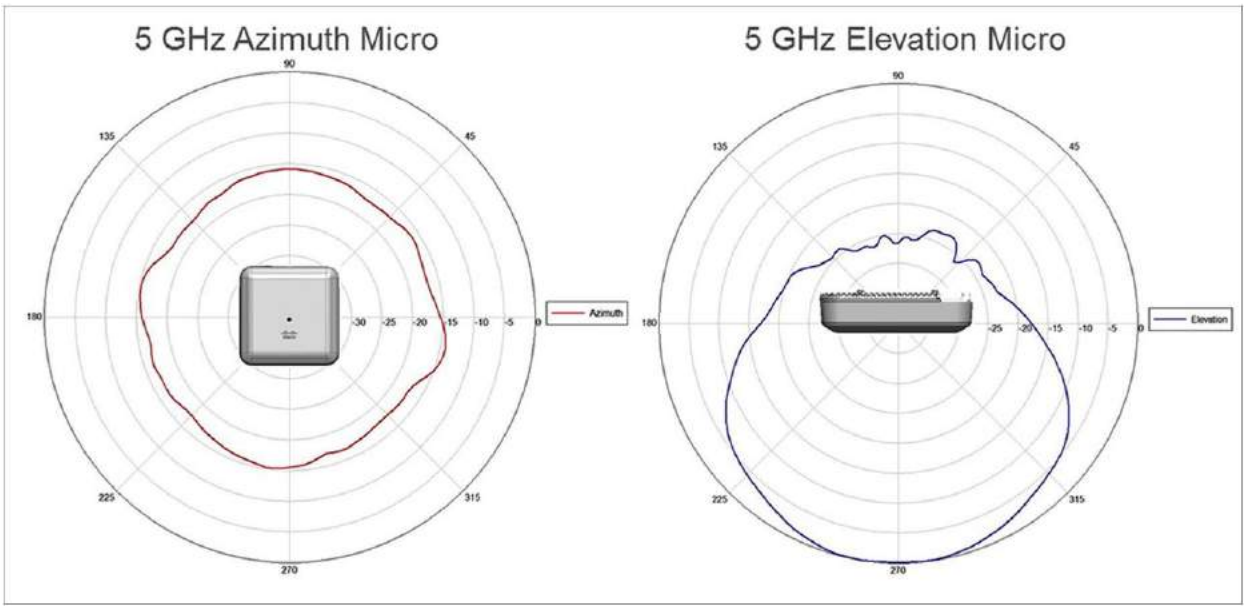
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802.11ac VHT40							
MCS0	1	23	-90			23	-89
MCS4	1	23	-85			23	-84
MCS7	1	23	-78			22	-77
MCS8	1	23	-75			21	-73
MCS9	1	23	-73			20	-72
MCS0	2	23	-90			23	-89
MCS4	2	23	-83			23	-82
MCS7	2	23	-76			21	-75
MCS8	2	23	-73			20	-72
MCS9	2	23	-71			19	-69
MCS0	3	23	-90			23	-89
MCS4	3	23	-82			23	-80
MCS7	3	23	-74			20	-73
MCS8	3	23	-70			19	-68
MCS9	3	23	-69			18	-67
802.11ac VHT80							
MCS0	1	23	-87			23	-86
MCS4	1	23	-83			23	-81
MCS7	1	23	-76			22	-74
MCS8	1	23	-72			21	-70
MCS9	1	23	-69			20	-68
MCS0	2	23	-87			23	-86
MCS4	2	23	-80			23	-79
MCS7	2	23	-73			21	-72
MCS8	2	23	-69			20	-68
MCS9	2	23	-67			19	-66

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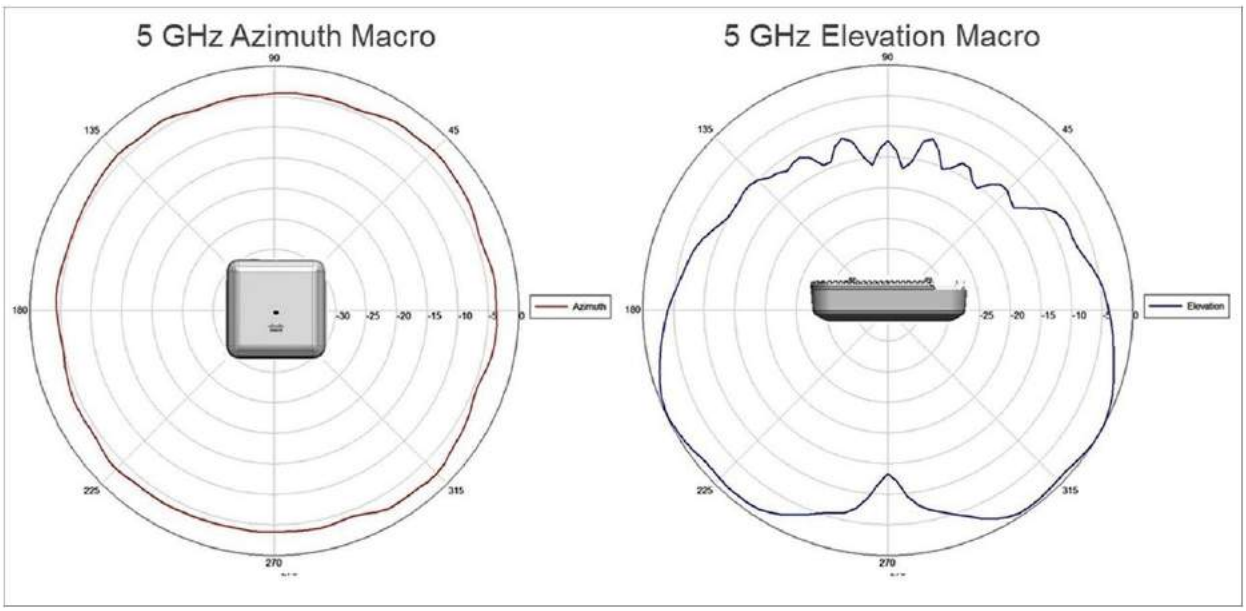
Item		Specification					
MCS0	3	23	-87			23	-86
MCS4	3	23	-77			23	-77
MCS7	3	23	-72			20	-70
MCS8	3	23	-67			19	-66
MCS9	3	22	-65			18	-64
802.11ac VHT160							
MCS0	1	23	-83			23	-83
MCS4	1	23	-78			23	-78
MCS7	1	23	-71			22	-71
MCS8	1	23	-67			21	-68
MCS9	1	23	-66			20	-66
MCS0	2	23	-83			23	-83
MCS4	2	23	-76			23	-76
MCS7	2	23	-69			21	-69
MCS8	2	23	-65			20	-66
MCS9	2	23	-63			19	-63
MCS0	3	23	-82			23	-83
MCS4	3	23	-74			22	-74
MCS7	3	23	-67			20	-68
MCS8	3	23	-62			19	-62

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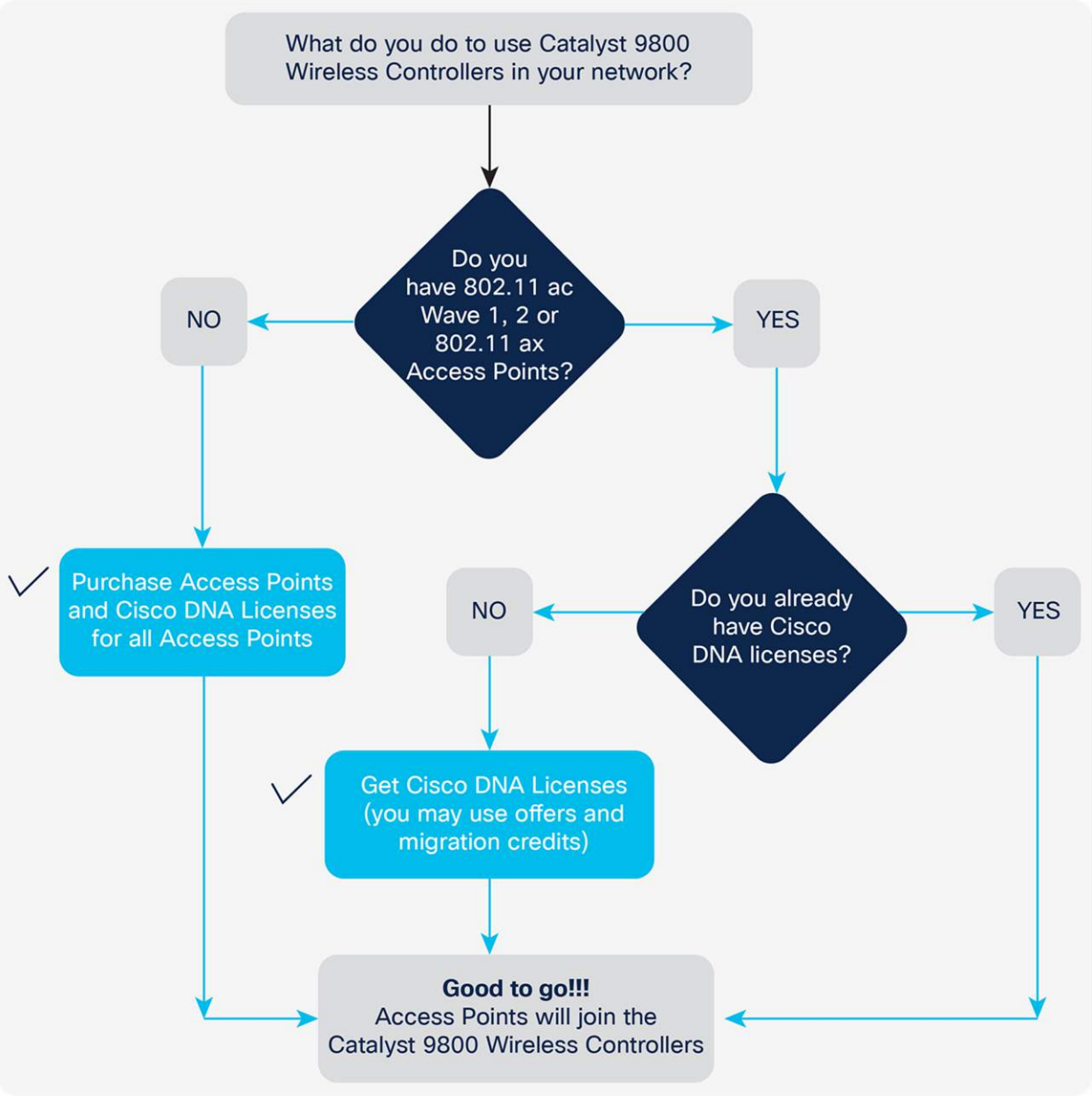
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Licensing

In order to connect any access points to the **controller**, Cisco DNA software subscriptions are required. To be entitled to connect to a Cisco Catalyst 9800 Series Wireless Controller, the access point requires a Cisco DNA subscription license.

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Access points connecting to a Cisco Catalyst 9800 Series controller have new and simplified software subscription packages.

They can support three tiers of Cisco DNA software: Cisco DNA Essentials, Cisco DNA Advantage or Cisco DNA Premier.

Cisco DNA software subscriptions provide Cisco innovations on the access point. They also include perpetual Network Essentials and Network Advantage licensing options, which cover wireless fundamentals such as 802.1X authentication, Quality of Service (QoS), and Plug and Play (PnP); telemetry and visibility; and Single Sign-On (SSO), as well as security controls.

Cisco DNA subscription software has to be purchased for a 3-, 5-, or 7-year subscription term. If not renewed by the end of the term, Cisco DNA features will expire, whereas Network Essentials and Network Advantage features will remain.

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For the full feature list of Cisco DNA Software, including the perpetual Network Essentials and Network Advantage, please see the feature matrix:

https://www.cisco.com/c/m/en_us/products/software/dna-subscription-wireless/en-sw-sub-matrix-wireless.html?oid=porew018984

Two modes of licensing are available:

- Smart Licensing (SL) simplifies and adds flexibility to licensing. It is:
  - Simple: Procure, deploy, and manage licenses easily. Devices self-register, removing the need for Product Activation Keys (PAKs).
  - Flexible: Pool license entitlements in a single account. Move licenses freely through the network, wherever you need them.
  - Smart: Manage your license deployments with real-time visibility into ownership and consumption.
- Specific License Reservation (SLR) is a feature used in highly secure networks. It provides a method for customers to deploy a software license on a device (product instance) without communicating usage information to Cisco. There is no communication with Cisco or a satellite. The licenses are reserved for every controller. It is node-based licensing.

Four levels of license are supported on the **Cisco Catalyst 9800 Series Wireless Controllers**. The controllers can be configured to function at any one of the four levels:

- Cisco DNA Essentials: At this level the Cisco DNA Essentials feature set will be supported.
- Cisco DNA Advantage: At this level the Cisco DNA Advantage feature set will be supported.
- NE: At this level the Network Essentials feature set will be supported.
- NA: At this level the Network Advantage feature set will be supported.

Cisco DNA Premier is a bundle with ISE licenses and Cisco DNA Spaces Extend. It is inclusive of Cisco DNA Advantage, so at this level the Cisco DNA Advantage feature set will be supported. For customers who purchase Cisco DNA Essentials, Network Essentials will be supported and will continue to function even after term expiration. And for customers who purchase Cisco DNA Advantage or Cisco DNA Premier, Network Advantage will be supported and will continue to function even after term expiration.

Initial bootup of the controller will be at the Cisco DNA Advantage level.

For questions, contact the Cisco Catalyst 9800 Series Wireless Controllers Licensing mailer group at ask-catalyst9800licensing

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Warranty information

The Cisco Aironet 2800 Series Access Points come with a limited lifetime warranty that provides full warranty coverage of the hardware for as long as the original end user continues to own or use the product. The warranty includes 10-day advance hardware replacement and ensures that software media are defect-free for 90 days. For more details, visit https://www.cisco.com/go/warranty.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance
Sustainability inquiries	Contact: csr_inquiries@cisco.com

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