

Cisco 8540 Wireless Controller

Optimized for 802.11ac Wave2 performance, the intent-driven Cisco DNA™ ready Cisco® 8540 Wireless Controller is a highly scalable, service-rich, resilient, and flexible platform that enables next-generation wireless networks for medium-sized to large enterprise and campus deployments.

Product Overview

The Cisco 8540 Wireless Controller provides centralized control, management, and troubleshooting for high-scale deployments in service provider and large campus deployments. It offers flexibility to support multiple deployment modes in the same controller: for example, centralized mode for campus, Cisco FlexConnect™ mode for lean branches managed over the WAN, and mesh (bridge) mode for deployments where full Ethernet cabling is unavailable. As a component of the Cisco Unified [Wireless Network](#), this controller provides real-time communications between [Cisco Aironet® access points](#), the [Cisco Prime® Infrastructure](#), and the [Cisco Mobility Services Engine](#), and is interoperable with other Cisco controllers.

The Cisco Digital Network Architecture (Cisco DNA) is an open and extensible, software-driven architecture that accelerates and simplifies your enterprise network operations. The programmable architecture frees your IT staff from time-consuming, repetitive network configuration tasks so they can focus instead on innovation that positively transforms your business. SD-Access, as part of Cisco DNA, enables policy-based automation from edge to cloud with foundational capabilities. Cisco DNA Assurance, also part of Cisco DNA, provides a single source to monitor, modify, and manage your network and application data.

Figure 1. Cisco 8540 Wireless Controller



Features and Benefits

The Cisco 8540 Wireless Controller, optimized for 802.11ac Wave2 performance, high scale, and enhanced system uptime, supports:

- Intent-driven programmability and streaming telemetry.
- Subsecond access point and client failover for uninterrupted application availability.
- Extraordinary visibility into application traffic, using Cisco Application Visibility and Control (AVC), the technology that includes the Network-Based Application Recognition 2 (NBAR2) engine, Cisco's Deep Packet Inspection (DPI) capability. This allows to mark, prioritize, and block to conserve network bandwidth and enhance security. Customers can optionally export the flows to Cisco Prime Infrastructure or a third-party NetFlow collector.

- Embedded wireless Bring-Your-Own-Device (BYOD) policy classification engine that allows classification of client devices and application of user group based policies.
- Deployment of guest access and Bonjour and Chromecast services in centralized deployments.
- Software-defined segmentation with Cisco TrustSec® technology, reducing Access Control List (ACL) maintenance, complexity and overhead.
- Integrated Cisco CleanAir® technology, providing the industry's only self-healing and self-optimizing wireless network.
- Wi-Fi Alliance Passpoint (Hotspot 2.0) for mobile data offload.
- Network-based mobility management with Proxy Mobile IPv6 Mobility Access Gateway (MAG) and eGRE support for integration with cellular data networks.
- Simplified GUI wizard for quick setup and intuitive dashboards for monitoring and troubleshooting.
- Cisco DNA and SD-Access Wireless, as well as Cisco DNA Assurance.

Table 1. Features and Benefits

Feature	Benefits
Cisco DNA SD-Access Wireless	<p>SD-Access Wireless is Cisco's next-generation architecture for enterprise networks. It is the industry's first policy-based automation from the edge to the cloud. It enables network access in minutes for any user or device to any application without compromising on security.</p> <p>SD-Access Wireless enables policy-based automation for wired and wireless, automated provisioning of wired and wireless networks, group-based policy for users and connected devices, and a distributed wireless data plane for campus deployments. In addition, all client roams are treated as Layer 2 roams across the network for distributed traffic.</p> <p>Learn more at https://www.cisco.com/c/en/us/solutions/enterprise-networks/software-defined-access/index.html</p>
Cisco DNA Analytics and Assurance	<p>Cisco DNA Analytics and Assurance offers comprehensive network visibility. It collects data from users, devices, and applications to proactively identify problems. Network analytics and automation help IT quickly resolve issues, so you can increase availability and deliver a better user experience.</p> <p>Learn more at https://www.cisco.com/c/en/us/solutions/enterprise-networks/dna-analytics-assurance.html</p>
Scalability and performance	<p>Optimized to enable 802.11ac Wave 2 next-generation networks. Consolidate multiple controllers into one controller with support for up to 6000 access points and 64,000 clients with a single point of touch</p> <ul style="list-style-type: none"> • 40-Gbps throughput • 6000 access points • 64,000 clients • 4096 VLANs • 100 access points in up to 2000 Cisco FlexConnect groups
RF management	<ul style="list-style-type: none"> • Proactively identifies and mitigates signal interference for better performance • Provides both real-time and historical information about RF interference affecting network performance across controllers, through systemwide integration with Cisco CleanAir technology
Multimode with indoor, outdoor mesh access points	<ul style="list-style-type: none"> • Versatile controller with support for centralized, distributed, and mesh deployments to be used at different places in the network, offering maximum flexibility for medium-sized campus, enterprise, and large branch networks • Centralized control, management, and client troubleshooting • Seamless client access in the event of a WAN link failure (local data switching) • Highly secure guest access • Efficient access point upgrade that optimizes the WAN link utilization for downloading access point images • Cisco OfficeExtend technology that supports corporate wireless service for mobile and remote workers with secure wired tunnels to indoor Cisco Aironet access points supporting OfficeExtend mode
Comprehensive end-to-end security	<ul style="list-style-type: none"> • Offers Control and Provisioning of Wireless Access Points (CAPWAP)-compliant Datagram Transport Layer Security (DTLS) encryption on the control plane between access points and controllers across remote WAN links • Management frame protection detects malicious users and alerts network administrators • Rogue detection for Payment Card Industry (PCI) compliance • Rogue access point detection and detection of denial-of-service attacks

Feature	Benefits
End-to-end voice	<ul style="list-style-type: none"> • Supports Cisco Unified Communications for improved collaboration through messaging, presence, and conferencing • Supports all Cisco Unified IP Phones for cost-effective, real-time voice services
Fault tolerance and high availability	<ul style="list-style-type: none"> • Subsecond access point and client failover for uninterrupted application availability • Multi 1 Gigabit or 10 Gigabit Ethernet connectivity • Solid-state device-based storage – no moving parts • Hot-swappable redundant AC or DC power supply and solid-state storage with no incremental system downtime • Enhanced system uptime with fast system restarts
Service provider Wi-Fi	<ul style="list-style-type: none"> • Wi-Fi Alliance Passpoint (Hotspot 2.0) certified, facilitating hotspot operation for mobile data offloads • Network-based mobility management with Proxy Mobile IPv6 Mobility Access Gateway (MAG) and eGRE support for integration with cellular data networks
Cisco Enterprise Wireless Mesh	<ul style="list-style-type: none"> • Allows access points to dynamically establish wireless connections without the need for a physical connection to the wired network • Available on select Cisco Aironet access points, Enterprise Wireless Mesh is ideal for warehouses, manufacturing floors, shopping centers, and any other location where extending a wired connection may prove difficult or aesthetically unappealing
WLAN express setup	<ul style="list-style-type: none"> • Simplified GUI wizard for quick setup and intuitive dashboards for monitoring and troubleshooting
High-performance video	<ul style="list-style-type: none"> • Cisco VideoStream technology optimizes the delivery of video applications across the WLAN
Mobility, security, and management for IPv6 and dual-stack clients	<ul style="list-style-type: none"> • Highly secure, reliable wireless connectivity and consistent end-user experience • Increased network availability through proactive blocking of known threats • Equips administrators for IPv6 planning, troubleshooting, and client traceability from Cisco Prime Infrastructure
Environmentally responsible	<ul style="list-style-type: none"> • Organizations may choose to turn off access point radios to reduce power consumption during off-peak hours

Perpetual Licensing

The Cisco 8540 Wireless Controller provides right-to-use (with End-User License Agreement [EULA] acceptance) license enablement for faster time to deployment, with flexibility to add additional access points (up to 6000 access points) as business needs grow.

- Additional access point capacity licenses can be added over time.
- Right-to-use licensing (with EULA acceptance) for faster and easier license enablement.
- Starting with the 8.2 release, the Cisco 8540 Wireless Controller also provides an option to enable licensing using [Cisco Smart Software Licensing](#), designed for easy monitoring and consumption of licenses.
- Manage license deployments with real-time visibility to ownership and consumption.
- Pools license entitlements in a single account. Licenses can be moved freely through the network—wherever they are needed.

New Term-Based Licensing

With the Cisco DNA architecture, we are also introducing term-based software packages: Cisco DNA Essentials, Cisco DNA Advantage, and Cisco ONE Advantage. In addition to on-box capabilities, the Cisco DNA packages unlock additional functionality in Cisco DNA Center, enabling controller-based software-defined automation in your network.

License consumption is further simplified with the following three package combinations. Cisco Embedded Support is included in all the three packages.

Essentials: Term-based (3, 5, or 7 years per access point) Cisco DNA Essentials package, term-based access point license, and term-based Cisco Prime Lifecycle and Assurance infrastructure licenses.

Advantage: Term-based (3, 5, or 7 years per access point) Cisco DNA Advantage package. It also includes everything in the Cisco DNA Essentials package.

Cisco ONE Advantage: Term-based (3, 5, or 7 years per access point) Cisco DNA Advantage package (includes Cisco DNA Essentials package), Cisco Identity Services Engine (ISE) Base, ISE Plus and Cisco Connected Mobile Experiences (CMX) Base.

You can continue to deploy your network using perpetual licensing or the new term-based packages. The term based licensing provides you with additional benefit of using the same Cisco DNA license on any Cisco WLAN controllers and with any Aironet access point.

Product Specifications

Table 2. Product Specifications

Item	Specifications
Wireless	IEEE 802.11a, 802.11b, 802.11g, 802.11d, WMM/802.11e, 802.11h, 802.11n , 802.11k, 802.11r, 802.11u, 802.11w, 802.11ac Wave1 and Wave2
Wired/switching/routing	IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX specification, 1000BASE-T, 1000BASE-SX, 1000BASE-LH, IEEE 802.1Q VLAN tagging, IEEE 802.1AX Link Aggregation
Data Request For Comments (RFC)	<ul style="list-style-type: none"> • RFC 768 UDP • RFC 791 IP • RFC 2460 IPv6 • RFC 792 ICMP • RFC 793 TCP • RFC 826 ARP • RFC 1122 Requirements for Internet Hosts • RFC 1519 CIDR • RFC 1542 BOOTP • RFC 2131 DHCP • RFC 5415 CAPWAP Protocol Specification • RFC 5416 CAPWAP Binding for 802.11
Security standards	<ul style="list-style-type: none"> • Wi-Fi Protected Access (WPA) • IEEE 802.11i (WPA2, RSN) • RFC 1321 MD5 Message-Digest Algorithm • RFC 1851 ESP Triple DES Transform • RFC 2104 HMAC: Keyed Hashing for Message Authentication • RFC 2246 TLS Protocol Version 1.0 • RFC 2401 Security Architecture for the Internet Protocol • RFC 2403 HMAC-MD5-96 within ESP and AH • RFC 2404 HMAC-SHA-1-96 within ESP and AH • RFC 2405 ESP DES-CBC Cipher Algorithm with Explicit IV • RFC 2407 Interpretation for ISAKMP • RFC 2408 ISAKMP • RFC 2409 IKE • RFC 2451 ESP CBC-Mode Cipher Algorithms • RFC 3280 Internet X.509 PKI Certificate and CRL Profile • RFC 4347 Datagram Transport Layer Security • RFC 5426 TLS Protocol Version 1.2
Encryption	<ul style="list-style-type: none"> • Wired Equivalent Privacy (WEP) and Temporal Key Integrity Protocol-Message Integrity Check (TKIP-MIC): RC4 40, 104 and 128 bits (both static and shared keys) • Advanced Encryption Standard (AES): Cipher Block Chaining (CBC), Counter with CBC-MAC (CCM), Counter with Cipher Block Chaining Message Authentication Code Protocol (CCMP) • Data Encryption Standard (DES): DES-CBC, 3DES • Secure Sockets Layer (SSL) and Transport Layer Security (TLS): RC4 128-bit and RSA 1024- and 2048-bit • DTLS: AES-CBC • IPsec: DES-CBC, 3DES, AES-CBC • 802.1AE MACsec encryption

Item	Specifications
Authentication, Authorization, and Accounting (AAA)	<ul style="list-style-type: none"> • IEEE 802.1X • RFC 2548 Microsoft Vendor-Specific RADIUS Attributes • RFC 2716 PPP EAP-TLS • RFC 2865 RADIUS Authentication • RFC 2866 RADIUS Accounting • RFC 2867 RADIUS Tunnel Accounting • RFC 2869 RADIUS Extensions • RFC 3576 Dynamic Authorization Extensions to RADIUS • RFC 5176 Dynamic Authorization Extensions to RADIUS • RFC 3579 RADIUS Support for EAP • RFC 3580 IEEE 802.1X RADIUS Guidelines • RFC 3748 Extensible Authentication Protocol (EAP) • Web-based authentication • TACACS support for management users
Management	<ul style="list-style-type: none"> • Simple Network Management Protocol (SNMP) v1, v2c, v3 • RFC 854 Telnet • RFC 1155 Management Information for TCP/IP-Based Internets • RFC 1156 MIB • RFC 1157 SNMP • RFC 1213 SNMP MIB II • RFC 1350 TFTP • RFC 1643 Ethernet MIB • RFC 2030 SNMP • RFC 2616 HTTP • RFC 2665 Ethernet-Like Interface types MIB • RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and Virtual Extensions • RFC 2819 RMON MIB • RFC 2863 Interfaces Group MIB • RFC 3164 Syslog • RFC 3414 User-Based Security Model (USM) for SNMPv3 • RFC 3418 MIB for SNMP • RFC 3636 Definitions of Managed Objects for IEEE 802.3 MAUs • Cisco private MIBs
Management Interfaces	<ul style="list-style-type: none"> • Web-based: HTTP/HTTPS • Command-line interface: Telnet, Secure Shell (SSH) Protocol, serial port • Cisco Prime Infrastructure
Interfaces and Indicators	<ul style="list-style-type: none"> • 4 x 10 Gigabit Ethernet interfaces or 4 x 1 Gigabit Ethernet interfaces • Small Form-Factor Pluggable Plus (SFP+) options (only Cisco SFP+s supported), including S-Class Optics • Small Form-Factor Pluggable (SFP) options (only Cisco SFPs supported), including S-Class Optics • 1 x service port: 1 Gigabit Ethernet port (RJ-45) • 1 x redundancy port: 1 Gigabit Ethernet port (RJ-45) • 1 x Cisco Integrated Management Controller port: 1 10/100/1000 Ethernet (RJ-45) • 1 x console port: Serial port (RJ-45) • LED indicators: Network Link, Diagnostics
Physical dimensions	<ul style="list-style-type: none"> • Dimensions (WxDxH): 18.96 x 30.18 x 3.43 in. (48.2 x 76.6 x 8.70 cm) including handles • Weight: 44 lb (19.9 kg) with 2 power supplies
Environmental conditions	<p>Air temperature:</p> <ul style="list-style-type: none"> • Appliance operating: 41° to 104°F (5° to 40°C), derate the maximum temperature by 1.0°C per every 1000 ft. (305m) of altitude above sea level • Appliance nonoperating: -40° to 149°F (-40° to 65°C) <p>Humidity:</p> <ul style="list-style-type: none"> • Appliance operating: 10% to 90%; noncondensing at 82°F (28°C) • Appliance nonoperating: 5% to 93% at 82°F (28°C)

Item	Specifications
	Altitude: <ul style="list-style-type: none"> • Appliance operating: 0 to 3,000m (0 to 10,000 ft.) • Appliance nonoperating: 0 to 12,192 m (0 to 40,000 ft.) Electrical input: <ul style="list-style-type: none"> • AC input frequency range: 47 to 63 Hz • Input voltage range: <ul style="list-style-type: none"> ◦ Minimum: 90 VAC ◦ Maximum: 264 VAC ◦ Maximum power 538W • Heat dissipation: 1836 BTU/hr • Sound power level measure: <ul style="list-style-type: none"> ◦ A-weighted per ISO 7779 LpAm (dBA), operation at 77°F (25°C): 59.4
Regulatory compliance	CE Markings per directives 2004/108/EC and 2006/95/EC Safety: <ul style="list-style-type: none"> • UL 60950-1 Second Edition • CAN/CSA-C22.2 No. 60950-1 Second Edition • EN 60950-1 Second Edition • IEC 60950-1 Second Edition • AS/NZS 60950-1 • GB4943 2001 EMC - Emissions: <ul style="list-style-type: none"> • 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • EN55022 Class A • ICES003 Class A VCCI Class A • EN61000-3-2 EN61000-3-3 KN22 Class A • CNS13438 Class A EMC - Immunity: <ul style="list-style-type: none"> • EN55024 • CISPR24 • EN300386 • KN24

Warranty Information

Find warranty information on Cisco.com at the [Product Warranties](#) page.

The Cisco 8540 Wireless Controller is backed by a warranty that includes:

- 3 years parts coverage
- 10-day Advance Replacement (AR): Cisco or its service center will use commercially reasonable efforts to ship a replacement within ten (10) working days after receipt of the RMA request. Actual delivery times might vary depending on customer location

This warranty also includes a 90-day software warranty on media and ongoing downloads of BIOS, firmware, and drivers.

Ordering Information

For ordering details, please consult the part numbers in Table 3. To place an order, visit the [Cisco Ordering Home Page](#). To download software, visit the [Cisco Software Center](#).

Table 3. Ordering Information

Product name	Part number	Services 8x5xNBD
Cisco 8540 Wireless Controller	AIR-CT8540-K9	CON-SNT-AIRCT85R
Cisco 8540 Wireless Controller supporting 1000 access points	AIR-CT8540-1K-K9	CON-SNT-AIRCT85T
Perpetual licenses		
Cisco 8540 Wireless Controller upgrade SKU	LIC-CT8540-UPG	
Cisco 8540 Wireless Controller 1 access point adder license	LIC-CT8540-1A	CON-ECMU-LICCT85C
Cisco 8540 Wireless Controller DTLS license	LIC-CT8540-DTLS-K9	
Term-based licenses		
Cisco DNA Essentials 3-, 5-, or 7-year term license per year per access point for wireless	AIR-DNA-E	Embedded Support included
Cisco DNA Advantage 3-, 5-, or 7-year term License per year per access point for wireless	AIR-DNA-A	Embedded Support included
Cisco ONE Advantage 3-, 5-, or 7-year term license per year per access point for wireless	C1-AIR-K9-T	Embedded Support included
Accessories		
Spare SSD for Cisco Wireless Controller 5520 and 8540	AIR-SD240G0KS2-EV=	
Spare fan - Cisco 8540 Wireless Controller	AIR-FAN-C240M4=	
Rail mounting kit	UCSC-RAILB-M4=	

Cisco ONE Software

Cisco ONE™ Software offers a valuable and flexible way to buy software for the access domain. At each stage in the product lifecycle, Cisco ONE Software helps make buying, managing, and upgrading your network and infrastructure software easier. Cisco ONE Software provides:

- Flexible licensing models to smoothly distribute customers' software spending over time
- Investment protection for software purchases through software services-enabled license portability
- Access to updates, upgrades, and new technology from Cisco through Cisco® Software Support Services (SWSS)

Cisco ONE for Wireless, available for the Cisco 8540 Wireless Controller, is a complete software solution that helps you deliver and manage business-class wireless connectivity for all your employees and customers. It helps unlock the business potential in your wireless network while providing all the capabilities required to deploy, manage, and track wireless performance and activity. Cisco ONE for Access Wireless is available in subscription and perpetual offers for broad deployment flexibility in branch and campus environments: Cisco ONE for Advantage, Foundation for Wireless, Advanced Mobility Services, and Cloud Mobility Services are the four offers currently available in Cisco ONE for Access Wireless.

For ordering information for Cisco ONE Software for Wireless go to

<https://www.cisco.com/c/en/us/products/software/one-access/cisco-one-for-access-wireless-part-numbers.html>.

Cisco Services

Lower support costs and improve availability risk management with our [Product Support Services](#). They help you increase operational efficiency through automated network-equipment inventory management and award-winning support. They allow you to:

- More effectively manage risk, plan for equipment upgrades, and comply with your corporate policies.
- Identify and resolve issues quickly and reduce downtime.
- Streamline contract management and access support resources faster.

Cisco Embedded Support for Cisco DNA Term Components

Cisco Embedded Support delivers the right support for Cisco software products and suites. It will keep your business applications performing as expected and protect your investment. Cisco Embedded Support for the Essentials and Advantage term components is included. Cisco Embedded Support provides access to Cisco Technical Assistance Center (TAC) support, major software updates, maintenance and minor software releases, and the Cisco Embedded Support site, for increased productivity with anytime access.

[Learn more about Cisco Services for Enterprise Networks](#)

Cisco Capital

Financing to Help You Achieve Your Objectives

Cisco Capital[®] can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx. Accelerate your growth. Optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. [Learn more.](#)

For More Information

For more information about the Cisco 8540 Wireless Controller, visit <https://www.cisco.com/c/en/us/products/wireless/8540-wireless-controller/index.html>.



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