Enterprise Networking:
The Foundation for Digitisation

Cisco Catalog Volume 3:
Europe, Middle East, Africa and Russia

01100
10110
11110

Feature

Cisco DNA

Digital Network Architecture
Welcome to the world of open, programmable and adaptable

Accelerating Digitisation with DNA

cisco

Cisco Digital Network Architecture

The Next Era of Networking Has Arrived

Digitization is fueled by major technology trends: mobility, the Internet of Things, cloud computing, and analytics1. Businesses seeking to digitize need to evolve to a network with real-time insights and personalized experiences, automation and assurance, and security and compliance.

What Is Cisco Digital Network Architecture?

Cisco® Digital Network Architecture (DNA) provides an open, software-driven platform that integrates critical innovations in networking software, such as virtualization, automation, analytics, and cloud, into one architecture. It gives you a roadmap to digitization and helps enable business and IT to innovate faster, reduce costs, and lower risk with services that are easy to consume.

Network Requirements for the Digital Organization

Insights and Experiences
New Business Models | **Faster Innovation**

Automation and Assurance
Speed, Simplicity, Visibility | **Reduced Cost and Complexity**

Security and Compliance
Real-Time and Dynamic Threat Defense | **Lower Risk**

Cisco Digital Network Architecture

Greater Business Agility

85% faster network services provisioning[1]

Lower Costsy

79% reduction in network installation costs[2]

Investment Protection

2x software value than with individual components with license portability[3]

Reduced Risk

100X faster threat detection[4]

Resource Optimization

80% more energy savings and reduced maintenance costs[5]

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[1]Based on Cisco APIC-EM with IWAN—Estimate based on workflow changing from 900 CLI lines to 10 GUI clicks.

[2]Cisco APIC-EM with PnP—Based on average installation cost for customer deployments.

[3]Cisco ONE Software Buying Model for Access and WAN.

[4]Cisco 2016 Annual Security Report.

[5]Cisco Energy Management Solution with Philips LED Systems.

Cisco Digital Network Architecture
Network-Enabled Applications

Cloud Service Management

▲ Open APIs | Developers Environment ▲

Automation

Analytics

▲ Open and Programmable | Standards-Based ▲

Virtualization

Cloud Enabled | Software Delivered

Cisco DNA Guiding Principles:

- Cloud managed to unify policy orchestration across the network
- Designed for automation to make networks and services easy to deploy, manage, and maintain
- Pervasive analytics to provide insights into network operations, IT infrastructure, and the business
- Virtualization to run services anywhere, independent of the underlying platform: physical, virtual, on premises, or in the cloud
- Open, extensible, and programmable at every layer, integrating Cisco and third-party technology, open APIs, and a developer platform

Cisco DNA Innovations :

Automation
Cisco Application Policy Infrastructure Controller Enterprise Module (APIC-EM): Serves as the Cisco DNA controller and supports a range of automation services

- Cisco Plug and Play: Reduces deployment time from four weeks to days and decreases day-zero deployment costs by up to 79 percent compared to traditional methods
- Cisco Easy Quality of Service (EasyQoS): Enables the network to dynamically update network-wide QoS settings based on application policy
- Cisco Intelligent WAN (IWAN): Allows IT to deploy a full-service branch office with just 10 clicks

Virtualization
- Evolved Cisco IOS® XE Software: Provides open, model-based APIs for third-party application development, software-defined management, application hosting, and edge computing

- Cisco Enterprise Network Functions Virtualization (NFV): Decouples hardware from software and provides flexible deployment options, including a customized Cisco platform, or Cisco UCS E-Series and C-Series Servers

Analytics
- Cisco Connected Mobile Experiences (CMX) Cloud: Provides you with valuable insights and allows personalized engagement using location and presence information

Security
These innovations enable you to use your network as a powerful security sensor and enforcer:
- Cisco StealthWatch®: Provides network visibility and security analytics to rapidly detect and contain threats
- Cisco TrustSec® and Cisco Identity Services Engine (ISE): Use software defined segmentation to control network access, enforce security policies, and help meet compliance requirements

Next Steps

For more information about Cisco Digital Network Architecture (DNA), visit cisco.com/go/dna.

The Network Strikes Back
Cisco Game Plan

Win Deals
Win Rewards
Win Competitions

Win with Cisco Game Plan
Your new gamified learning experience!

- **Snappy short videos**

- **Earn badges**

- **Track your progress against your colleagues**

- **Compete against other companies in your country**

- **Accelerate your sales knowledge**

- **Progress at your own pace**

- **Rewards and prizes as you play**

So far we've given away **tickets to the Rugby World Cup, $$$$$ of travel vouchers and VIP hospitality packages to the 2016 Monaco Grand Prix**. This time, become a Cyber Agent and complete the mission for a chance to win a top secret assignment - a **trip to Iceland**. You'll also have the chance to boost your spy kit with security gadgets including night vision cameras, GPS trackers and Apple Watches.

Cisco Game Plan combines social, business and video to give you all the tools to be successful in today's competitive environment.

Want the thrill of being the best? Cisco Game Plan will help you win - all the time!

So get ready, get set, GAME ON!

Register today www.ciscogameplan.com

Sales Acceleration

Switches

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Cisco Catalog – EMEAR

Vol.3

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What's New

Cisco ONE Software

The More Flexible, Cost-Effective Solution Makes Buying Your Infrastructure Software Faster and Easier

Simplify Wi-Fi: Mobility Express Solution

With Cisco Digital Network Architecture

Cisco Network as a Sensor and Enforcer

Activate Your Cisco Network as a Power ful Security Sensor and Enforcer

What's New - Tools

Free Cloud-Based Tools

Cisco Cloud-Based Predictive RF Tool

The **Cisco Cloud-Based Predictive RF Planner Tool** will make an initial site estimate of the number and placement of Cisco wireless access points needed for your customer sites. You will be able to easily create a bill of materials without the expense and time required of a physical onsite survey.

Features:

- Easy RF proposal generation
- Supports all Cisco Access points – Aironet, Meraki
- Supported on all Browsers
- Simple drag & draw from RF legends provided
- Optimized for better access points covergage
- Several coverage models (Data, Voice, Location)
- User-friendly display (sliding ruler to see the exact edge of a given coverage value, extensible and contextual menus to oer options without clogging screen)

Wireless Design Made Easy
Scalable. Intelligent. Cloud Ready.

🌐 www.cisco.com/web/partners/tools/rf-planner-tool.html

Cisco Active Advisor

The **Cisco Active Advisor** is a cloud-based service that provides essential lifecycle information about your network inventory. Available standalone or in conjunction with other Cisco network management applications, Cisco Active Advisor can help you reduce the overall risk of your network by keeping up-to-date with the status of your products.

Cisco Active Advisor shows the following information, and is constantly expanding its functions:

- Warranty and service contract status
- Product advisories:
- Cisco Product Security Incident Response Team (PSIRT) and field notices
- End-of-life notifications:
  Hardware and software

A free, cloud service
that manages the lifecycle of Cisco's network products.

Automatically create a network inventory and find:

End-of-life products

Expired Warranty and Service Contracts

Security advisories

With Cisco Active Advisor you can:

| Reduce Risk | Improve Network Health | Save Money and Time |

🌐 www.cisco.com/go/activeadvisor

What's New - Products

Enterprise networks today are required to be secure, reliable, and connectable seamlessly anywhere, anytime, for any user, and on any device. This catalog introduces the lineup of new products designed to deliver enterprise networks that help steer small- and medium-sized companies toward business success.

ⓘ Please contact your authorized Cisco partner, authorized Cisco distributor or Cisco reseller for details on the release date.

Meraki / Catalyst Switching

High Performance 11ac Wave 2 Wireless

The Cisco Meraki MR42, MR52, and MR53 ushers in the next generation of WLAN to the Meraki access point family with support for IEEE's new 802.11ac Wave 2 and Multigigabit technology (MR53). This enhancement to the 'ac' standard brings support for Multi-User- Multiple Input Multiple Output, or MU-MIMO. MU-MIMO allows wireless networks to more efficiently service a large number of phones, tablets, and other mobile devices by allowing the access point to communicate with multiple devices concurrently, rather than consecutively. This increases total network performance and improves the end user experience, especially when large numbers of devices are connected.

Cisco Meraki MR42/MR52/MR53 ⊙→ P56

The Road to Multigigabit and Affordable Fiber Aggregation Switching

The Increase in wireless speeds, with the introduction of 802.11ac wave 2, beyond 1 Gig requires the switches to support more than 1 Gig on the switch port. The new Cisco Meraki MS350-24x, available in 24 or 48x SFP interfaces; offer the support of the Multigigabit technology to match the high speed on the wireless access point. The new Cisco Meraki MS425-16/MS425-32, available in 16 or 32 x SFP+ interfaces offer Next Generation aggregation switching with 40Gb QSFP+ uplinks. The Cisco Meraki MS410-16/MS410-32, available with 16 or 32 x SFP interfaces, offer a more affordable way to provide Fiber aggregation to the campus. The Cisco MS410 features SFP+ uplink connectors, plus redundant, hot swappable power supplies and fans

Cisco Meraki MS350-24x/MS410/MS425 ⊙→ P57

Simplify Mission Critical Networks

The Cisco Meraki MX65/MX65W are Meraki's first security appliances incorporating dedicated Power over Ethernet (PoE+) ports. Now it's possible to power two devices, up to 30 W each, without requiring a separate power injector.

The model is available with a wireless option, providing IEEE 802.11ac WiFi with improved coverage thanks to a new wireless chipset and antenna design. There are also 8 dedicated 1 GE LAN ports and 2 WAN interfaces, perfect for customers looking to build dual-active VPNs with our Intelligent WAN technology.

Cisco Meraki MX65/MX65W ⊙→ P57

NEW!! Cisco Catalyst 6800 Series Supervisor Engine 6T

Future-Proof Your Foundation for Digital Business
The future of business is digital, and the resulting exponential growth in network traffic requires enhanced backbone switching capacity, superior performance, and higher scalability. The Cisco Catalyst 6800 Supervisor Engine 6T gives you just that.

Use it to build, manage, secure, and scale your enterprise backbone capacity to 6 terabits per second (Tbps) while unlocking the full performance of the 6807-XL chassis with 440 Gbps per slot. It is also compatible with the next-generation 10/40/100-Gbps line cards. The high-performance dual-core CPU allows you to manage 2000 Instant Access host ports.

Maximize Investment Protection
Using the Cisco Catalyst 6800 Supervisor Engine 6T means strong investment protection for customer deployments. It's compatible with the 6807-XL chassis, 6500-E chassis, and existing line cards. It also offers full feature parity and code maturity with the Supervisor Engine 2T from day one.

Benefits
- **Unlock 440 Gbps per slot** on the Cisco Catalyst 6807-XL chassis
- **Future-proof your network** through interoperability with next-generation 10/40/100- Gbps line cards
- **Establish investment protection** through compatibility with Cisco Catalyst 6500-E chassis and existing line cards

NEW!! Cisco Catalyst 4500E Supervisor Engine 8L-E

The Cisco Catalyst 4500E Supervisor Engine 8L-E provides 48 Gbps per slot with best in class features such as Flexible NetFlow (FNF), integrated Wireshark, TrustSec and MACSec security, and APIC-EM orchestration leading to reduced total cost of ownership (TCO) and industry-leading investment protection. These capabilities, along with four SFP/SFP+ uplinks and up to 240 Gigabit Ethernet Power over Ethernet (PoE), PoE Plus (PoEP), and Cisco Universal PoE (UPoE) ports, make this supervisor engine the leading Cisco Access low-scale supervisor engine in the Cisco Catalyst Family.

The Supervisor Engine 8L-E is also built with price-performance aggregation deployments in mind, helping to enable denser Gigabit Ethernet and 10 Gigabit Ethernet fiber deployments with enterprise-class aggregation functions.

NEW!! Cisco Catalyst 3650 Mini Switches

The Cisco Catalyst 3650 Series adds new mini switches to the existing 3650 family of switches. These switches are less than 12" deep and quieter than the existing 3650 switches, making them perfect to deploy in tight wiring cabinets, racks, or user spaces where depth of the switch is a concern. You can avoid replacing the cabinets or mounting the switch at an angle and as a result reduce downtime to the network.

These switches enable the same uniform wired-wireless policy enforcement, application visibility, flexibility, application optimization, and superior resiliency as the existing 3650 switches. They come in 24- and 48-port 10M/100M/1000M switch SKUs (WS-C3650-24PDM and WS-C3650-48FQM) and support all the same features as the existing 3650 switches except that they come with fixed fans, fixed power supplies, and support for external RPS2300 for redundancy.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

The More Flexible, Cost-Effective Solution Makes Buying Your Infrastructure Software Faster and Easier

What if buying complete IT solutions across your data center, WAN, and access domains were as simple as a single purchase? With Cisco ONE Software, we are making it easier for you to extract the value in your network infrastructure.

Making Software Buying Simple

Cisco ONE Software is a valuable and flexible way to buy software for your data center, WAN, and access domains. 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 is organized by domains (Data Center, WAN, and Access) and feature sets (Foundation, Advanced Applications, and Advanced Security). Cisco ONE for Access offers a comprehensive

feature set for wired and wireless access. Cisco ONE for WAN provides complete functionality for the branch and network edge. Cisco ONE for Data Center provides functionality for physical and virtualized data centers, across network and compute resources, and provides secure, scalable support for private and hybrid clouds. Finally, Cisco ONE Advanced Security provides a robust set of threat defense capabilities and central policy management.

Cisco ONE for Access

Cisco ONE for Access is a simple and economical solution for deploying branch and campus switches and wireless access points. It offers an uncompromised user experience in a highly secure and feature-rich access infrastructure.

Cisco ONE Foundation for Switching provides a solution to:

● Manage a large switching infrastructure more efficiently.

● Help reduce expenses by simplifying network deployment and management.

● Centralize network access policies across wired and wireless networks.

● Manage wired, wireless, and VPN users and devices easily.

● Help improve the energy efficiency of your connected devices.

Cisco ONE Campus Fabric:

● Delivers a better user experience in complex switching environments.

● Helps you scale your network for business expansion and increases resiliency for your mission-critical applications.

Cisco ONE Foundation for Wireless offers connectivity and management solutions to:

● Build business-class Wi-Fi networks.

● Create trusted wireless LAN (WLAN) access points.

● Manage mobile devices across the network more efficiently.

● Deliver location-based services for your users.

● Provide highly secure access for guest and employee access.

Cisco ONE Advanced Mobility Services:

● Help you create personalized mobile experiences for your users and start unlocking the potential of your business with wireless security and advance mobile location and analytics.

	Cisco ONE for Access		Cisco ONE for WAN	Cisco ONE for Data Center	
Advanced Security	Threat Defence for Access		Threat Defence for WAN	Threat Defence for Data Center	
	ISE		ASA, FS	ASA 5585, FP, FS	
Advanced Applications	Campus Fabric	Advanced Mobility Services	WAN Collaboration	Data Center Fabric	Enterprise Cloud Suite
Foundation	Foundation for Switching	Foundation for Wireless	Foundation for WAN	Foundation for Data Center Networking	Foundation for Compute
Infrastructure and Base OS	Switching Catalyst 2K, 3K,4K, 6K	Wireless AP, WLC	WAN ISR, ASR	Networking Nexus 5K, 6K, 7K	Compute X86, UCS

■ Cisco ONE Software: Buy All Applications/Licenses as a Suite

Software Suites Offered as a Solution
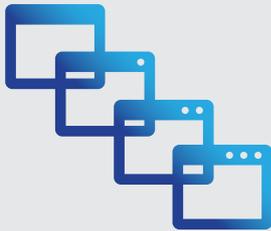
- Customer buys all licenses in one package and has freedom to turn on what they need

Licensing Portability Access to Ongoing Innovation
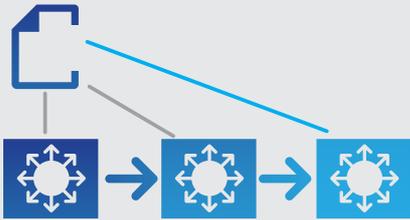
- License can be moved to new hardware as it is purchased
- Incentive to upgrade frequently to optimize performance

Perpetual, Subscription & ELA Options

- License can be purchased to be used forever
- License subscription can be purchased for a finite time
- Enterprise License Agreements allow customer to purchase all licenses for multiple devices in one package and distribute over time

Cisco ONE for WAN

Cisco ONE for WAN provides rich capabilities for branch offices and the network edge. If you want to implement new branch-office initiatives and secure IP WAN connections, this is the right solution.

Cisco ONE Foundation for WAN connects and better secures your branch offices while keeping WAN bandwidth costs under control and gives you solutions to:

- Improve application performance.
- Deploy hybrid WANs with high reliability.
- Automate deployment with centralized policies and distributed enforcement.
- Strengthen network security.
- Manage the energy use of connected devices more easily.

Cisco ONE WAN Collaboration integrates voice and video across your branches to increase productivity and helps remote branch facilities to:

- Extend rich-media capabilities to branches with more secure video.
- Improve branch and cloud telephony reliability.
- Simplify transition to IP collaboration at your own pace and budget.
- Migrate easily from time-division multiplexing (TDM) to Session Initiation Protocol (SIP) trunking.
- Manage collaboration sessions centrally.

Cisco ONE for Data Center

Cisco ONE for Data Center can help you build a scalable, resilient, and efficient data center. You can move workloads and resources between different cloud models, quickly, more securely, and in compliance with your policies. You can also reduce costs and increase IT agility with highly secure private, public, and hybrid clouds for your physical and virtual environments.

Cisco ONE Foundation for Data Center Networking:

- mproves visibility and consistency across physical and virtual networks.
- Delivers global reach across your businesses and data centers.
- Delivers automation to simplify management of compute and virtual network environments.
- Adds performance and port density with greater fault tolerance.
- Increases operational efficiency with performance and power management.

Cisco ONE Foundation for Compute:

- Increases security in your virtual environments.
- Deploys foundational automation across compute and virtual infrastructure layers across private and hybrid environments.
- Uses programmable application containers for your converged data center.
- Monitors performance and energy of your compute and virtual network environments.
- Manages multiple UCS domains from a single management console.

Cisco ONE Data Center Fabric:

- Helps you create a scalable, intelligent network by converging your LANs and SANs.

Cisco ONE Enterprise Cloud Suite:

- Delivers the tools for creating, monitoring, self-service ordering, and lifecycle management of your private cloud. It provides unified provisioning and management of both Cisco and multi-vendor hardware.

Sales Acceleration

Switches

Wireless

Routers

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Services

Simplify Wi-Fi: Mobility Express Solution

With Cisco Digital Network Architecture

Automation and Agility

Easy, efficient and deployed in minutes! Advanced controller features to optimize network performance plus best practice settings configured 'out of the box'

Lower Risk and Compliance

Network compliance
Business continuance

Insights & Analytics

Gain actionable insights to aid business decisions with AP management, application and client presence information

Investment Protection

Simple and easy to expand as number or size of sites grows beyond 25 APs

■ Four 802.11ac Wave 2 Access Points

Features	Cisco Aironet 1830	Cisco Aironet 1850	Cisco Aironet 2800	Cisco Aironet 3800
Number of Radios	3x3	4x4	4x4	4x4
Spatial Streams	2	4	3	3
Dual Radio	Yes	Yes	Yes	Yes
Max Data Rate (5GHz)	870 Mbps	1.7 Gbps	5.2 Gbps	5.2 Gbps
Max Data Rate (5GHz + 2.4GHz)	1.17 Gbps	2.22 Gbps	2.817 Gbps	2.817 Gbps
AC channel width	80Mhz with dynamic bandwidth selection (DBS)	80Mhz with dynamic bandwidth selection (DBS)	160Mhz with dynamic bandwidth selection (DBS)	160Mhz with dynamic bandwidth selection (DBS)
MU-MIMO – For 802.11ac Wave 2 Devices	2 Spatial Streams	3 Spatial Streams	3 Spatial Streams	3 Spatial Streams
Gigabit Ethernet Ports (GbE)	1	2	2	1x Gbe & 1x mGig (1, 2.5, and 5Gbps)
Universal Serial Bus (USB)	1	1	1	1
Mobility Express Deployment Mode Support	Yes	Yes	Yes	Yes
Centralized Deployment Mode Support	Yes	Yes	Yes	Yes
FlexConnect Deployment Mode Support	Yes	Yes	Yes	Yes
Converged Access Deployment Mode Support	Yes	Yes	Future	Future
Spectrum Analysis	Future	Future	Yes, with CleanAir	Yes, with CleanAir
Internal Antenna Models Available	Yes	Yes	Yes	Yes
External Antenna Models Available	No	Yes	Yes	Yes
US List Price ($US)	695.00	995.00	1295-1395	1650-1750

Cisco Wireless App

Configure Wireless, View Key Performance Indicators & Analytics

Download from Google Play or the Apple App Store

Mobility Express Solution

NEW

802.11ac Wave 2

No controller appliance needed as the 1830 & 1850 AP have on-board controller functionality. Cost-efficient and highly functional.

Must-see videos

Why Wireless?
tinyurl.com/CiscoWhyWirelessPartner

Cisco Mobility Express
tinyurl.com/CiscoMobilityExpress

Cisco 1830 Series AP
tinyurl.com/CiscoAP1830

Cisco 1850 Series AP
tinyurl.com/CiscoAP1850

Overview of Access Points

■ Four 802.11ac Wave 2 Access Points

Features	Cisco Aironet 1830	Cisco Aironet 1850	Cisco Aironet 2800	Cisco Aironet 3800	Aruba AP-325	Aruba AP-330	Ruckus R710
Standard	802.11ac Wave2	802.11ac Wave2	802.11ac Wave2	802.11ac Wave2	802.11ac Wave2	802.11ac Wave2	802.11ac Wave2
SU-MIMO	3x3:2	4x4:4	4x4:3	4x4:3	4x4:4	4x4:4	4x4:4
MU-MIMO	3x3:2	4x4:3	4x4:3	4x4:3	4x4:3	4x4:2SS	4x4:3
AC channel width	80Mhz with dynamic bandwidth selection (DBS)	80Mhz with dynamic bandwidth selection (DBS)	160Mhz with dynamic bandwidth selection (DBS)	160Mhz with dynamic bandwidth selection (DBS)	80Mhz	80Mhz/160Mhz up to 2x2:2	80Mhz
Number of Radios	1x 2.4GHz / 1 x 5GHz	1x 2.4GHz / 1 x 5GHz	1 x XOR (FRA, 2.4 and 5GHz capable) / 1 x 5GHz	1 x XOR (FRA, 2.4 and 5GHz capable) / 1 x 5GHz	1x 2.4GHz / 1 x 5GHz	1x 2.4GHz / 1 x 5GHz	1x 2.4GHz / 1 x 5GHz
Speed	Up to 870 Mbps	Up to 1.733Gbps	Up to 5.2 Gbps	Up to 5.2 Gbps	Up to 1.733Gbps	Up to 1.733Gbps	Up to 1.733Gbps
Antenna	Internal	Internal/External	Internal/External	Internal/External	Internal/External	Internal/External	Internal
Ethernet Ports	1x 10/100/1000	2x 10/100/1000	2x 10/100/1000	1x 10/100/1000 + 1x mGig (1, 2.5, and 5Gbps)	2x 10/100/1000	1x 10/100/1000, SmartRate Up to 2.5Gbps	2x 10/100/1000
Spectrum Intelligence	Spectrum Analysis	Spectrum Analysis	HDX CleanAir 160	HDX CleanAir 160	Spectrum Analysis	Spectrum Analysis	Spectrum Analysis
Beam Forming	Transmit Beamforming	Transmit Beamforming	ClientLink 4.0	ClientLink 4.0	Transmit Beamforming	Transmit Beamforming	Transmit Beamforming
Roaming	Optimized Roaming/ CCX/ 802.11r	Optimized Roaming/ CCX/ 802.11r	Optimized Roaming/ CCX/ 802.11r	Optimized Roaming/ CCX/ 802.11r	ClientMatch	ClientMatch	-
Management	Onboard controller, FlexConnect, Converged & Central Managed	Onboard controller, FlexConnect, Converged & Central Managed	Onboard controller version 8.3 and higher, FlexConnect, Converged & Central Managed	Onboard controller version 8.3 and higher, FlexConnect, Converged & Central Managed	Aruba Instant / Controller	Aruba Instant / Controller	Aruba Instant / Controller
US List Price ($US)	695.00	995.00	1295-1395	1650-1750	1395	1695	1295
Key differentiator	· Lowest price Wave 2 Access Point in the market	· Same AP as competitor but cheaper	· x/or dual-radio Flexible Radio Assignment (FRA)* · High Density eXperience (HDX)features	· x/or dual-radio Flexible Radio Assignment (FRA) · High Density eXperience (HDX) features · mGig · Modularity	** Denotes feature availability post-FCS		

* Flexible Radio Assignment

5GHz Serving — 2.4GHz Serving
- Default operating mode
- Serving clients on both 2.4GHz and 5GHz

5GHz Serving — 5GHz Serving
- Dual 5GHz Support, both radios serving clients on 5GHz
- Maximum over-the-air data rate up to 5.2Gbps

5GHz Serving — Wireless Security Monitor
- Wireless Security Monitoring
- Scans both 2.4GHz and 5GHz for security threats
- Serving clients of 5GHz

5GHz Serving — Proactively monitors network performance
- Proactively monitors network performance
- Serving clients of 5GHz

5GHz Serving — Enhanced Location
- Enhanced Location**
- Improves client location accuracy
- Serving clients of 5GHz

Sales Acceleration

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Activate Your Cisco Network as a Powerful Security Sensor and Enforcer

Cybercrime is now a major global business, rendering traditional approaches to security inadequate. Organizations need to add another layer of protection by using the network itself to detect anomalous behavior and enforce security policies. The Cisco 'Network as a Sensor' and 'Network as an Enforcer' solutions deliver deep visibility and pervasive control to mitigate threats before, during, and after an attack.

The Enterprise Cybercrime Landscape

Global enterprise networks face an epidemic of cybercrime. Fully 100 percent of the business networks analyzed by Cisco threat research teams contained traffic going to websites that host malware, according to the Cisco 2014 Annual Security Report.

Cybercrime is a major global business composed of extremely profitable crime syndicates. Cybercriminals build malware directly targeting an organization's specific vulnerabilities, often discovered through extensive surveillance of the organization's networks and business practices. These threats can remain in the network for months gathering data about the company's network, devices, and users before launching attacks elsewhere in the organization's environment.

Further complicating matters, the number of potential points of infiltration into the organizations is expanding because of the growth in mobility, cloud, and the Internet of Things (IoT). The continuous growth of connected endpoints exponentially expands the attack surface for malware. An average organization uses as many as 40 separate security tools to defend against threats. However, it's nearly impossible to correlate data from so many disparate systems and uncover the source and trajectory of security threats.

Instead, your customers can leverage the network itself as a sensor and enforce to complement traditional security systems and better detect and mitigate threats in the earliest stages of attack.

Cisco Network as a Sensor

With so many access attempts occurring beyond the traditional enterprise network perimeter, you now need security everywhere. Fortunately, your Cisco network already contains what you need to do the job. We call it the Cisco Network as a Sensor solution. By simply activating the embedded security capabilities in your Cisco network, you can transform your network into a full-blown security monitoring system that gives you broad and deep visibility into your network and everything that connects to it.

If you can't see network threats, how can you defend against them? The Cisco Network as a Sensor solution addresses this issue head-on.

You get the global network visibility you need in the form of detailed security analytics generated by Cisco IOS Flexible NetFlow, contextual data from the Cisco Identity Services Engine (ISE), and real-time monitoring and alerts from partner technology, Lancope StealthWatch.

The solution determines the baseline profile for your network. From there it can then rapidly detect malicious activities – abnormal data movements, suspicious traffic, advanced threats – anywhere in your environment. You see how your traffic is flowing, which devices are accessing your network and what malicious activities might be taking place on your network.

Network as a Sensor

Cisco IOS Flexible NetFlow
Cisco Identity Services Engine (ISE)
Lancope StealthWatch

Detect Rich Endpoint Context

Detect Anomalous Traffic Flows

Detect User Access Policy Violations

Sales Acceleration

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Services

– Network as a Sensor –

– Network as an Enforcer –
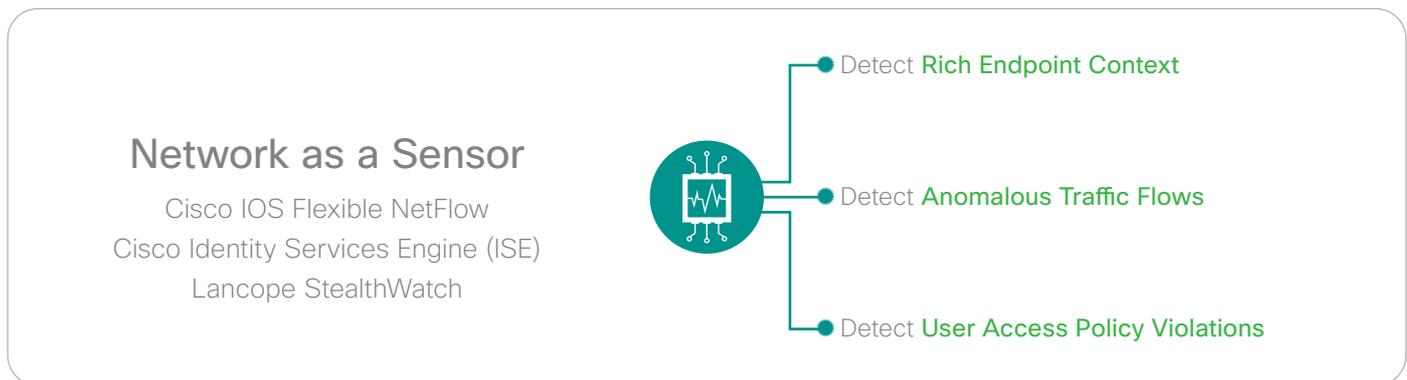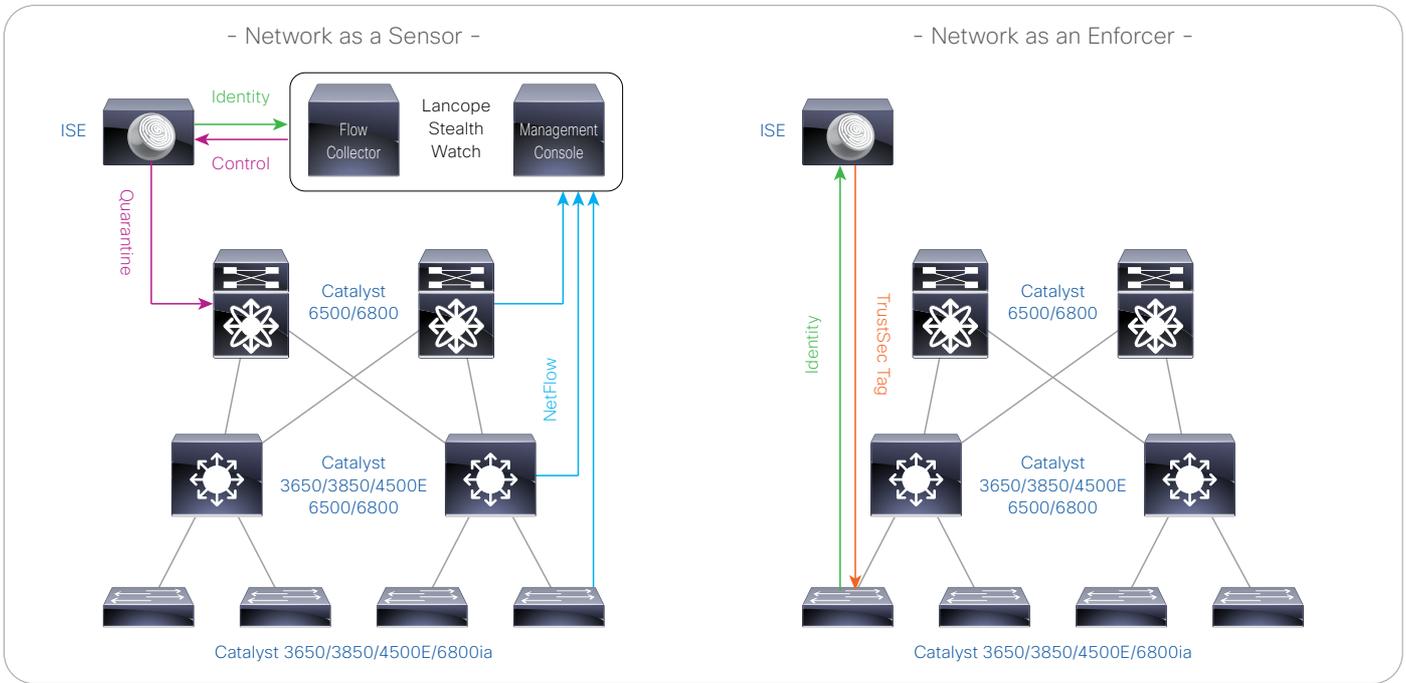
■ Cisco Catalyst Switches Compatibility

	NetFlow	TrustSec
2960-CX (LAN Base)	Lite	–
3560-CX	Lite	SGT, SGACL
2960-X (LAN Base/IP Lite)	Lite	SXP
3650	Full Flexible	SGT, SGACL
3850	Full Flexible	SGT, SGACL
4500E (SUP8-E)	Full Flexible	SGT, SGACL
6500 (Sup2T / Sup6T)	Full Flexible	SGT, SGACL
6800 (SUP2T / SUP6T)	Full Flexible	SGT, SGACL

Cisco NetFlow

• Full Flexible – Provides full scale NetFlow for all traffic without CPU impact

• Lite – Provides sampled NetFlow, reducing total visibility

Cisco TrustSec

• SGT – Supports inline packet tagging

• SGACL – Supports SGT-based access control

• SXP – Supports exchange of tag assignment with upstream SGT-capable device

Cisco Network as an Enforcer

Each network connection, whether created by cloud services, mobility, the Internet of Things (IoT), or something else, represents a potential attack entry point. Your challenge is to balance the network access that users and devices need with risk mitigation.

The good news is that your Cisco network already contains the tools to do that. You just need to activate them to allow your network to serve as an enforcer of network security policy. For example, you can contain threats by using Cisco TrustSec and Cisco ISE to partition your network into smaller segments. Through a software-defined approach to network segmentation, you can then protect the segments using specific group policies that determine user access based on user roles and their business needs and greatly reduce your "attack surface." That means that even if hackers do make their way into your network, they can no longer move freely about and cause widespread damage.

With your Cisco network acting as a network security enforcer, you centrally apply your security policies networkwide. The right users and devices now enjoy the right access, and you contain the impact of an attack. Cisco ISE serves as the centralized policy engine that provides real-time access control decisions for Cisco switches, routers, and security devices.
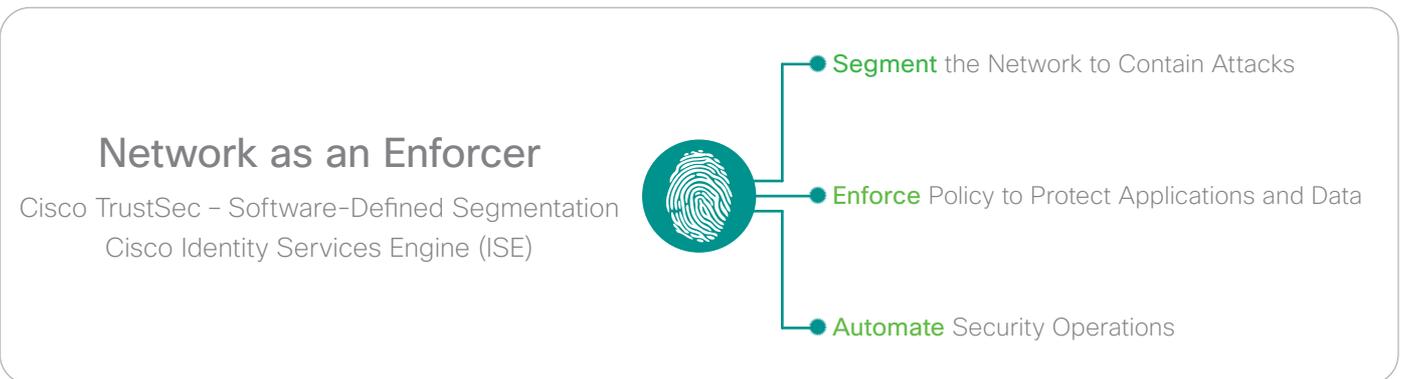
Network as an Enforcer

Cisco TrustSec – Software-Defined Segmentation
Cisco Identity Services Engine (ISE)

• **Segment** the Network to Contain Attacks

• **Enforce** Policy to Protect Applications and Data

• **Automate** Security Operations

Switches

L2 / L3 Switches

Line-up of Cisco Catalyst Switches

	L2	L3
Core		Cisco Catalyst 4500-X Series Cisco Catalyst 6500 Series Cisco Catalyst 6800 Series
Core / Access		Cisco Catalyst 3650 Series Cisco Catalyst 3850 Series (mGig) Cisco Catalyst 4500E Series (mGig)
Access	Cisco Catalyst 2960-X Series Cisco Catalyst 2960-Plus Series	
Compact	Cisco Catalyst 2960-CX Series	Cisco Catalyst 3560-CX Series (mGig)

Series	Description	
Cisco Catalyst 2960-CX Series	L2 compact switches suitable for deployment in the access layer. These switches deliver basic network services even outside the wiring closet.	See page 20.
Cisco Catalyst 3560-CX Series	L3 compact switches suitable for deployment in the access layer. These switches deliver advanced network services even outside the wiring closet.	See page 20
Cisco Catalyst 2960-Plus Series	L2 fixed-configuration switches suitable for deployment in the access layer. FE is supported on all downlink ports.	See page 21.
Cisco Catalyst 2960-X Series	L2/L3 fixed-configuration switches suitable for deployment in the access layer. GE and stacking are supported on all downlink ports.	See page 22.
Cisco Catalyst 3650 Series	L2/L3 fixed-configuration switches suitable for deployment in the access layer or core layer. Provide a wireless controller function to server as an integrated platform for wired/wireless LAN networks.	See page 23.
Cisco Catalyst 3850 Series	Next-generation L2/L3 fixed-configuration switches suitable for deployment in the access layer or core layer. Provide a wireless controller function to server as an integrated platform for wired/wireless LAN networks.	See page 24.
Cisco Catalyst 4500E Series	L2/L3 modular switches suitable for deployment in the access layer or core layer. The superior cost performance of these switches ensure the protection of investment over long periods.	See page 26.
Cisco Catalyst 4500-X Series	L3 fixed-configuration switches suitable for deployment in the core layer. Deliver excellent expandability and performance in environments with space constraints.	See page 27.
Cisco Catalyst 6500 Series	L3 modular switches suitable for deployment in the core layer. Provide a wide range of network services thanks to their top-of-the-industry performance.	See page 28.
Cisco Catalyst 6800 Series	L3 fixed-configuration/modular switches suitable for deployment in the core layer. Provide network services optimized for 10/40/100 Gigabit Ethernet.	See page 29

Selection of Cisco Catalyst Switches

■ Access Switches and Core Switches

Medium-sized corporate networks today are generally configured in two layers with access switches and core switches. Access switches are used to connect the end devices such as client PCs, IP phones and wireless access points; and core switches are used to consolidate lines by connecting multiple access switches. Switches with higher performance than access switches should be selected for core switches as their role is to consolidate a large number of lines.

■ L2 Switches and L3 Switches

Switches can be categorized into L2 switches (Layer 2 switches) and L3 switches (Layer 3 switches) based on their functionality. In general, L2 switches are used for access switches and L3 switches are used for core switches, respectively. However, L3 switches should also be selected for access switches when offering services with higher added value to the end users such as MACsec, which is a part of the Cisco TrustSec solution. The Cisco Catalyst 3650/3850/4500E Series support the upgrade from L2 to L3 switches via a Cisco IOS upgrade license.

■ Configuration/Connection Examples

Core Switches

Access Switches

Backbone

Compact Switches

(8/12 ports)

Wireless Access Point

(24/48 ports)

Accommodated directly in access switches mounted in a wiring closet
Connect devices that require a high level of reliability/security or PoE.
Example: Telepresence, VDI client, server, a large number of PCs and IP phones, etc.

Accommodated in a desktop compact switch
Extend the access security levels while optimizing the cabling per isle.
Example: A several PC units, 1 to 2 IP phones, etc.

Accommodated in a wireless access point
Ensure connectivity from any location or device.
Example: Laptops, smartphones, etc.

Diverse Endpoint Devices

■ Fixed-Configuration Switches and Modular Switches

Typically, fixed-configuration switches (or box-type switches) are referred to as having low cost and low performance; and modular switches (or chassis-type switches) are referred to as having high cost and high performance. However, when the port unit prices of multiple fixed-configuration switches and a single modular switch are put to comparison, the latter cost may become lower as the number of ports increases.

High-performance switches should generally be selected for the core switches. However, in a small-sized network, a sufficient performance and redundant configuration can be achieved by connecting the fixed-configuration Cisco Catalyst 3650/3850 Series switches in a stack.

■ Compact Switches

In some physical environments such as an office, it may be impossible or labor- and cost-intensive to run separate wiring from access switches installed in a wiring closet to the end devices such as a client PC, IP phone and wireless access points. The Cisco Catalyst 2960-CX/3560-CX Series compact switches have been developed to resolve these issues.

All models feature space-saving dimensions of under 5 cm x 27 cm x 24 cm with weight under 2 kg as well as a stylish, fanless low-noise design, making them suitable for installation in locations that are within sight of end users, such as on a desktop, counter or wall.

In addition to addressing issues related to the cable wiring, installation space, some models also support the innovative PoE pass-through functionality to resolve any power supply issues.

Ports

Cisco Catalyst Switches support the following interface ports for uplink and downlink connections:

- Fast Ethernet port (FE)
- Gigabit Ethernet port (GE)
- Multigigabit Ethernet port (mGig)
- SFP module slot (SFP)
- Dual-Purpose port (GE/SFP)
- 10GBASE-T port (10GB-T)
- X2 module slot (X2)
- SFP+ module slots (SFP/SFP+)
- CFP module slot (CFP)

The bracketed notations are abbreviations used in the specification comparison tables in this catalog. A dual-purpose port is an interface combining a Gigabit Ethernet port with an SFP module slot and is notated as GE/SFP (Either one can be activated independently). Similarly, SFP+ module slots are notated as SFP/SFP+ due to their compatibility with SFP. SFP/SFP+ modules can be mounted to X2 or CFP module slots using an appropriate converter.

In most cases, the supported port interfaces and number of ports of each product can be determined from their SKU (Refer to page 14 for details).

■ Ports Supported by Fixed-Configuration Cisco Catalyst Switches (e.g.)

● **Uplink**
- Gigabit Ethernet port (GE)
- SFP module slot (SFP)
- Dual-Purpose port (GE/SFP)
- 10GBASE-T port (10 GB-T)
- SFP+ module slot (SFP/SFP+)

● **Downlink**
- Fast Ethernet port (FE)
- Gigabit Ethernet port (GE)
- Multigigabit Ethernet port (mGig)
- SFP module slot (SFP)
- SFP+ module slot (SFP/SFP+)

How to Distinguish Specifications from SKU of Cisco Catalyst Switches

The SKU of each Cisco Catalyst Switch contains a broad description of the product's specification.

Cisco Catalyst 2960-CX/2960-Plus/2960-X Series

WS-C 2960 X-24 T S-L

■ **Series Number**

■ **Model Type**
- CX : Compact model
- + : FE model
- G : GE model
- X : GE model with stacking support [1] [2]
- XR : GE model with power supply redundancy/stacking support

■ **Number of Ports**
- 8, 24, or 48

■ **Downlink Ports**
- T : Data-only port
- L : Port with PoE power supply support (Full 15.4 W power on 8 ports)
- P : Port with PoE power supply support (Full 15.4 W power on 24 ports) [3]
- LP : Port with PoE power supply support (Full 15.4 W power on 24 ports)
- FP : Port with PoE power supply support (Full 15.4 W power on 48 ports)

■ **Uplink Ports**
- Q : GE port
- T : GE port
- C : GE/SFP port
- S : SFP module slot
- D : SFP/SFP+ module slot

■ **Cisco IOS**
- L or LL : LAN Lite
- S : LAN Base
- I : IP Lite

Cisco Catalyst 3560-CX/3650/3850 Series

WS-C 3850 -24 XU-S

■ **Series Number**

■ **Number of Ports**
- 8, 12, 24, or 48

■ **Downlink Ports**
- T : Data-only port
- P : Port with PoE power supply support (Full 15.4 W power on 24 ports) [4]
- PF/F/PW : Port with PoE power supply support (Full 15.4 W power on 48 ports)
- U : Port with UPOE power supply support
- S : SFP module slot
- X : mGig port or SFP/SFP+ module slot

■ **Cisco IOS**
- L : LAN Base
- S : IP Base
- E : IP Services

Cisco Catalyst 4500E Series (Chassis)

WS-C 45 07 R+E

■ **Number of Slots**
- 3, 6, 7, or 10

■ **Supervisor Engine Redundancy**
- None : Not supported
- R : Supported

Cisco Catalyst 4500E Series (Line Card)

WS-X 4748 -RJ45 -E

■ **Bandwidth per Slot**
- 46 : 24 Gbps
- 47 : 48 Gbps

■ **Port Interface**
- RJ45 : GE port
- RJ45V+ : GE port with PoE+ power supply support
- U, UPOE : GE port with UPOE power supply support
- X : mGig port
- SFP : SFP module slot
- X2 : X2 module slot
- SFP+ : SFP/SFP+ module slot

Cisco Catalyst 4500-X Series (no Network Module)

WS-C 4500 X-F -16 SFP+

■ **Cooling Fan**
- None : Front air intake/Rear exhaust
- F : Rear air intake/Front exhaust

■ **Number of Ports**
- 16 or 32

Cisco Catalyst 4500-X Series (with Network Module)

WS-C 4500 X-24 X-ES

■ **Number of Ports**
- 16 or 32

■ **Cisco IOS**
- IPB : IP Base
- ES : Enterprise Services

Cisco Catalyst 6500 Series (Chassis)

WS-C 65 09 -V-E

■ **Number of Slots**
- 3, 4, 6, 9, or 13

■ **Chassis Type**
- None : Horizontal slot
- V : Vertical slot

Cisco Catalyst 6500/6800 Series (Line Card)

WS-X 69 04 -40G - 2T

■ **Number of Ports**
- 4, 8, 16, 24, 32, or 48

■ **Port Interface**
- TX : GE port
- SFP : SFP module slot
- 10T : 10GBASE-T port
- 10G : X2 module slot or SFP/SFP+ module slot
- 40G : CFP module slot

*1 LAN Lite model does not support stacking. *2 WS-C2960X-24PSQ-L is not supported. *3 Compact switches support full 15.4 W power on 8 ports. *4 Compact switches support full 15.4 W power on 8 or 12 ports.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco IOS on Cisco Catalyst Switches

Cisco Catalyst Switches incorporate the Cisco IOS (Internetwork Operating System), which is a high-performance network infrastructure software. LAN Lite and LAN Base feature sets provide the L2 level features, and IP Lite, IP Base, IP Services, Advanced IP Services, Enterprise Services, and Advanced Enterprise Services feature sets provide the L3 level features, respectively.

Cisco IOS provided with the Cisco Catalyst 3560-CX/3650/3850/4500-X/4500E Series is delivered in a single universal image. The universal image contains the entire Cisco IOS feature set that can be activated via a software license. A software image needed to be installed in order to use the new functions on previous Cisco Catalyst Switches. However, on the Cisco Catalyst 3560-CX/3650/3850/4500-X/4500E Series Switches, advanced functions can be activated immediately using the Cisco IOS Upgrade License.

■ Activating Features via a License (For Catalyst 3650/3850 Series)
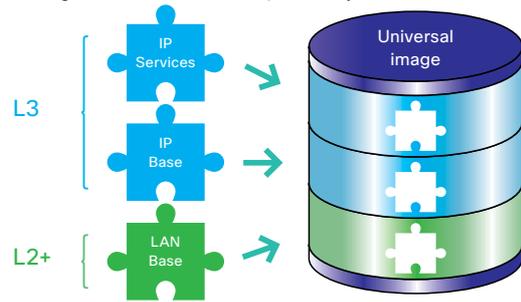
Cisco IOS Feature Sets		LAN Lite	LAN Base	IP Lite	IP Base	IP Services	Enterprise Services	Advanced IP Services	Advanced Enterprise Services
Supported Series	2960-CX	-	●	-	-	-	-	-	-
	3560-CX	-	-	-	●	●	-	-	-
	2960-Plus	●	●	-	-	-	-	-	-
	2960-X	●	●	●	-	-	-	-	-
	3650	-	●	-	●	●	-	-	-
	3850	-	●	-	●	●	-	-	-
	4500-X	-	-	-	●	-	●	-	-
	4500E	-	●	-	●	-	●	-	-
	6500	-	-	-	●	●	-	●	●
	6800	-	-	-	●	●	-	●	●
L2		- IEEE 802.1 Q trunking - STP (Spanning tree protocol) - CDP - DTP - UDLD - VTP - EtherChannel - LACP - LLDP - Storm control on port-by-port basis	All LAN Lite functions PLUS: - Flex Link - Link State Tracking - LLDP-MED	All LAN Base features					
L3		-	- Static Routing	- Static Routing - RIP - PIM Stub - EIGRP Stub - Policy-based routing (PBR)	- Static Routing - RIP - PIM Stub - EIGRP Stub - OSPF for Routed Access - WCCP*1 - Policy-based routing (PBR)	All IP Base functions PLUS: - OSPF - EIGRP - BGP - IS-IS*2 - VRF-Lite - WCCP - Policy-based routing (PBR)	All IP Base functions PLUS: - OSPF - EIGRP - BGP - IS-IS - VRF-Lite - Policy-based routing (PBR)	All IP Services functions PLUS: - IS-IS - MPLS - EoMPLS - L3 VPN	All Advanced IP Services functions PLUS: - L2 VPN (Native VPLS, A-VPLS)
Manageability		- SNMP - RMON - SPAN - TDR - Smart Ports - Smart Install (client)	All LAN Lite functions PLUS: - RSPAN - Cisco IOS IP SLA (responder)	All LAN Base features	All LAN Base functions PLUS: - Smart Install (director) - Cisco IOS EEM - Cisco IOS IP SLA (initiator)				
Security		- SSH - SSL - SCP - HTTPS - TACACS+ - RADIUS - Port security - MAC authentication bypass for voice - Private VLAN edge	All LAN Lite functions PLUS: - ALC in Layer 2-4 - DHCP snooping - Dynamic ARP inspection - IP source guard - Web authentication - TrustSec SXP	All LAN Base functions PLUS: - Router ACL - VLAN ACL - Private VLAN	All LAN Base functions PLUS: - Router ACL - VLAN ACL - Private VLAN - TrustSec SGT/SGACL - MACsec			All LAN Base functions PLUS: - Smart Install (director) - Cisco IOS EEM - Cisco IOS IP SLA (initiator)	
QoS		- SRR	All LAN Lite functions PLUS: - AutoQoS - DSCP	All LAN Base functions PLUS: - Separate policy for each VLAN					

*1 Cisco Catalyst 3560-CX/3650 Series are not supported. *2 Cisco Catalyst 6500/6800 Series require the Cisco IOS Advanced IP Services/Advanced Enterprise Services image.

New Switch Selection Decision Tree

1. What's the **purpose** of the switch?
2. **Where** will you deploy the switch?
3. Do you need **converged wired and wireless** support?
4. What are your **connectivity** needs?
5. What **type** of switch do you prefer?
6. What **features** do you need?

Purchasing a New Switch

Backbone

- **High Density (1/10/40 Gbps)**
  - Modular
    - Advanced → Catalyst 6807-XL
    - Basic → Catalyst 6500-E (SUP2T / SUP6T)
  - Standalone
    - Advanced → Catalyst 6880-X / Catalyst 6840-X
    - Basic → Catalyst 4500-X
- **Low Density (1/10 Gbps)**
  - Modular
    - Advanced → Catalyst 6500-E (SUP2T / SUP6T)
    - Basic → Catalyst 4500E (SUP8-E)
  - Standalone
    - Advanced → Catalyst 4500-X
    - Basic → Catalyst 3850 (Fiber)

Access

- **Campus**
  - Yes
    - Modular → Catalyst 4500E (SUP8-E)
    - Stackable
      - Advanced → Catalyst 3850
      - Basic → Catalyst 3650
  - No
    - Gigabit Ethernet
      - Instant Access → Catalyst 6800ia
      - Modular
        - Advanced → Catalyst 4500E (SUP8-E)
        - Basic → Catalyst 4500E (SUP8L-E)
      - Stackable
        - Advanced → Catalyst 3850
        - Basic → Catalyst 2960-X
    - Fast Ethernet → Catalyst 2960-Plus
- **Branch**
  - Yes
    - Modular → Catalyst 4500E (SUP8-E)
    - Stackable
      - Advanced → Catalyst 3850
      - Basic → Catalyst 3650
  - No
    - Gigabit Ethernet
      - Modular
        - Advanced → Catalyst 4500E (SUP8-E)
        - Basic → Catalyst 4500E (SUP8L-E)
      - Stackable
        - Advanced → Catalyst 3650
        - Basic → Catalyst 2960-X
    - Fast Ethernet → Catalyst 2960-Plus
- **Carpeted Area**
  - Advanced → Catalyst 3560-CX
  - Basic → Catalyst 2960-CX

Switch Refresh Decision Tree

Advantages over Basic Switch		5. What **features** do you need?	4. What **type** of switch do you prefer?	3. What are your **connectivity** needs?	2. Which **Cisco switch** are you upgrading?	1. What's the **purpose** of the switch?

Section 1 — Backbone

- Up to 880 Gbps per slot
- 11.4-Tbps switching

Catalyst 6807-XL — Advanced
Catalyst 6500-E (SUP2T / SUP6T) — Basic
→ Modular

- Up to 80 x 10-Gbps or 20 x 40-Gbps ports

Catalyst 6880-X / Catalyst 6840-X — Advanced
Catalyst 4500-X — Basic
→ Standalone

→ High Density (1/10/40 Gbps)

- Multiprotocol Label Switching
- Easy Virtual Network
- Service modules

Catalyst 6500-E (SUP2T / SUP6T) — Advanced
Catalyst 4500E (SUP8-E) — Basic
→ Modular

- Virtual Switching System

Catalyst 4500-X — Advanced
Catalyst 3850 (Fiber) — Basic
→ Standalone

→ Low Density (1/10 Gbps)

Upgrading from:
- Catalyst 6500-E (w/o SUP2T / SUP6T)
- Catalyst 6500 (non-E)
- Catalyst 4500E (w/o SUP7/8L-E)
- Catalyst 4500 (non-E)
- Catalyst 3750

→ **Backbone**

Section 2 — Refreshing an Old Switch

- 3x stacking bandwidth
- Modular Uplinks
- Cisco StackPower
- mGig option

Catalyst 6800ia → Catalyst 6500-E (Any)

- Built-in wireless controller
- 1.7x switching capacity
- 2x uplinks

Catalyst 4500E (SUP8-E) — Advanced
Catalyst 4500E (SUP8L-E) — Basic
→ Catalyst 4500E (w/o SUP7/8L-E)
→ Catalyst 4500 (non-E)

- Built-in wireless controller
- 6x stacking bandwidth
- NaaS/NaaE

→ **Refreshing an Old Switch**

Section 3 — Access

- 3x stacking bandwidth
- Modular Uplinks
- Cisco StackPower
- mGig option

Catalyst 3850 — Advanced
Catalyst 3650 — Basic
→ Catalyst 3750
→ Catalyst 3560

- Built-in wireless controller
- 1.7x switching capacity
- 2x uplinks

- Built-in wireless controller
- 2x stacking bandwidth
- NaaS/NaaE

Catalyst 3650 — Advanced
Catalyst 2960-X — Basic
→ Catalyst 2960-S
→ Catalyst 2960

- NaaS/NaaE
- mGig option

Catalyst 3560-CX — Advanced
Catalyst 2960-CX — Basic
→ Catalyst 3560 (Compact)
→ Catalyst 2960 (Compact)

→ **Access**

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco Catalyst 2960-CX Series

The compact switches are Layer 2 switches that are purpose built to enhance scalability and reduce costs through cable consolidation. Extend enterprise-class services to wherever you want, far from the wiring closet. They provide advanced networking features for security and management, equivalent to Cisco Catalyst 2960-X Series.

■ Highlights

● Stylish, compact, fan-less design and silent in operation.
● Deep-sleep mode: average 60 %, max 80 % on power saving.
● Operating temperature advantage: -5 °C to 45 °C.
● Various mounting options: under a desk, on a shelf, on a wall, on a DIN rail or even in a rack using mounting brackets.
● IT simplicity: zero-touch deployments & maintenance, Plug-n-Play (PnP).
● Traffic visibility: support Cisco NetFlow-Lite up to Layer 4, supported both on all downlink and uplink ports.

■ Cisco Catalyst 2960-CX Series

SKU	Downlinks		Uplinks			Cisco IOS	Web Auth	MAC sec	Max VLANs	Instant Access	PoE Output Ports			AC Power	Magnet	Rack Mount
	GE	mGig	GE	SFP	SFP/ SFP+						PoE 7.7 W	PoE 15.4 W	PoE+ 30 W			
WS-C2960CX-8TC-L	8	–	2	2	–	LAN Base	●	–	255	–	–	–	–	Internal	–[*1]	–[*2]
WS-C2960CX-8PC-L	8	–	2	2	–	LAN Base	●	–	255	–	8	8	4	Internal	–[*1]	–[*2]

[*1] Magnet and Mounting Tray (CMPCT-MGNT-TRAY=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.
[*2] Rack Mounting Brackets (RCKMNT-19-CMPCT=/RCKMNT-23-CMPCT=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.

Cisco Catalyst 3560-CX Series

The compact switches are Layer 3 switches that are purpose built to enhance scalability and reduce costs through cable consolidation. Extend enterprise-class services to wherever you want, far from the wiring closet. They provide advanced networking features for security and management, equivalent to Cisco Catalyst 3650/3850 Series.

■ Highlights

● Stylish, compact, fan-less design and silent in operation.
● Deep-sleep mode: average 60 %, max 80 % on power saving, 3.8 Watt only for a 8 port switch in deep-sleep mode.
● Operating temperature advantage: -5 °C to 45° C.
● Various mounting options: under a desk, on a shelf, on a wall, on a DIN rail or even in a rack using mounting brackets.
● IT simplicity: zero-touch deployments & maintenance, Plug-n-Play (PnP).
● Traffic visibility: support Cisco NetFlow-Lite up to Layer 4, supported both on all downlink and uplink ports.
● PoE pass-through: industry's first UPOE powered switch that can pass through up to 146 W to power up the devices connected to the switch(WS-C3560CX-8PT-S)
● new DC-DC powering option for usage in trains, buses, etc.

■ Cisco Catalyst 3560-CX Series

SKU	Downlinks		Uplinks			Cisco IOS	Web Auth	MAC sec	Max VLANs	Instant Access	PoE Output Ports			AC Power	Magnet	Rack Mount
	GE	mGig	GE	SFP	SFP/ SFP+						PoE 7.7 W	PoE 15.4 W	PoE+ 30 W			
WS-C3560CX-8TC-S	8	–	2	2	–	IP Base	●	●	1023	–	–	–	–	Internal	–[*2]	–[*3]
WS-C3560CX-8PT-S	8	–	2	–	–	IP Base	●	●	1023	–	8	8	8	External[*1]	–[*2]	–[*3]
WS-C3560CX-8PC-S	8	–	2	2	–	IP Base	●	●	1023	–	8	8	8	Internal	–[*2]	–[*3]
WS-C3560CX-8XPD-S	6	2	–	–	2	IP Base	●	●	1023	●	8	8	8	Internal	–[*2]	–[*3]
WS-C3560CX-12TC-S	12	–	2	2	–	IP Base	●	●	1023	–	–	–	–	Internal	–[*2]	–[*3]
WS-C3560CX-12PC-S	12	–	2	2	–	IP Base	●	●	1023	–	12	12	8	Internal	–[*2]	–[*3]
WS-C3560CX-12PD-S	12	–	2	–	2	IP Base	●	●	1023	●	12	12	8	Internal	–[*2]	–[*3]

■ Cisco IOS Upgrade License for Cisco Catalyst 3560-CX Series

SKU	Description
L-C3560CX-RTU=	Cisco IOS IP Services licensefor Cisco Catalyst 3560-CX Series

[*1] Power Adapter and Power Cord is Required when not using PoE receiving. [*2] Magnet and Mounting Tray (CMPCT-MGNT-TRAY=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.
[*3] Rack Mounting Brackets (RCKMNT-19-CMPCT=/RCKMNT-23-CMPCT=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.

Comparison of Cisco Catalyst Compact Switches

■ Comparison of Cisco Catalyst 2960-CG & 2960-CX Compact Switches

Parameter	Feature	2960-CG	2960-CX
Ports	Uplinks	2 x GE/SFP	2 x GE and 2 x SFP
	Downlinks	8 x GE	8 x GE
PoE	PoE	–	124 W PoE+
	Perpetual PoE	–	●[*1]
Hardware	DRAM, Flash	128 MB, 64 MB	512 MB, 128 MB
Other	Security	802.1x	802.1x, SXP[*2]
	AVC	–	NetFlow Lite

■ Comparison of Cisco Catalyst 3560-CG & 3560-CX Compact Switches

Parameter	Feature	3560-CG	3560-CX
Ports	Uplinks	2 x GE or 2 x SFP	2 x GE and SFP/SFP+[*3]
	Downlinks	8 x GE	8 x GE or 12 x GE
	mGig	–	●[*4]
PoE	PoE	124 W PoE+	240 W PoE+
	PoE pass-through	1 x UPOE, 23.8 W	2 x UPOE, 144.8 W[*1]
	DC Power	–	●[*1]
	Power Stacking	–	Horizontal[*1]
	Perpetual PoE	–	●
Ease of Management	Instant Access	–	●[*3]
Software	Cisco IOS	IP Base Only	IP Base, IP Services
Hardware	DRAM, Flash	128 MB, 64 MB	512 MB, 128 MB
Other	Security	802.1x, MACsec	802.1x, MACsec, SXP[*1], SGACL[*1]
	AVC	NO	NetFlow Lite
	IPv6	Basic	Enhanced

[*1] On roadmap. [*2] SGACL is not supported. [*3] WS-C3560CX-8XPD-S & WS-C3560CX-12PD-S only. [*4] WS-C3560CX-8XPD-S only.

Cisco Catalyst 2960-Plus Series

L2 fixed-configuration switches equipped Fast Ethernet downlink ports. Based on the Fast Ethernet models of the Cisco Catalyst 2960 Series, these switches have twice the memory capacity and support the new Cisco IOS 15.0(2)SE and higher.

■ Highlights
● Equipped with Cisco IOS LAN Base Image (Excludes LAN Lite models)
● Equipped with PoE power supplying downlink ports (PSE models)
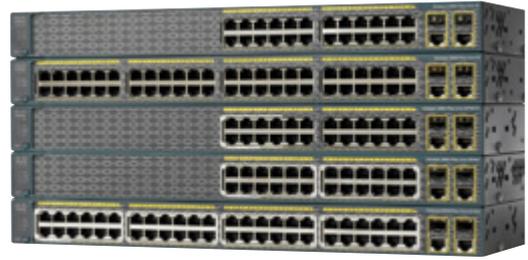
■ Cisco Catalyst 2960-Plus Series

SKU	Downlinks	Uplinks			Cisco IOS	Web Auth	Max VLANs	PoE Output Ports		AC Power	Rack Mount
	FE	GE	SFP	GE/SFP				PoE 7.7 W	PoE 15.4 W		
WS-C2960+24TC-S	24	–	–	2	LAN Lite	–	64	–	–	Internal	1 RU
WS-C2960+24LC-S	24	–	–	2	LAN Lite	–	64	8	8	Internal	1 RU
WS-C2960+24PC-S	24	–	–	2	LAN Lite	–	64	24	24	Internal	1 RU
WS-C2960+48TC-S	48	–	–	2	LAN Lite	–	64	–	–	Internal	1 RU
WS-C2960+48PST-S	48	2	2	–	LAN Lite	–	64	48	24	Internal	1 RU
WS-C2960+24TC-L	24	–	–	2	LAN Base	●	255	–	–	Internal	1 RU
WS-C2960+24LC-L	24	–	–	2	LAN Base	●	255	8	8	Internal	1 RU
WS-C2960+24PC-L	24	–	–	2	LAN Base	●	255	24	24	Internal	1 RU
WS-C2960+48TC-L	48	–	–	2	LAN Base	●	255	–	–	Internal	1 RU
WS-C2960+48PST-L	48	2	2	–	LAN Base	●	255	48	24	Internal	1 RU

Cisco Catalyst 2960 Series Transition Guide

■ Fast Ethernet Models

Stacking Supported	Stacking Not Supported
2960-SF EOS *1	2960-Plus
WS-C2960S-F24TS-S *2	WS-C2960+24TC-S
–	WS-C2960+24LC-S
–	WS-C2960+24PC-S
WS-C2960S-F48TS-S *2	WS-C2960+48TC-S
–	WS-C2960+48PST-S
WS-C2960S-F24TS-L	WS-C2960+24TC-L
WS-C2960S-F24PS-L	WS-C2960+24LC-L
	WS-C2960+24PC-L
WS-C2960S-F48TS-L	WS-C2960+48TC-L
WS-C2960S-F48LPS-L	WS-C2960+48PST-L
WS-C2960S-F48FPS-L	

■ Gigabit Ethernet Models

Stacking Supported	
2960-S EOS *1	2960-X
WS-C2960S-24TS-S *2	WS-C2960X-24TS-LL *2
WS-C2960S-48TS-S *2	WS-C2960X-48TS-LL *2
WS-C2960S-24TS-L	WS-C2960X-24TS-L
WS-C2960S-24TD-L	WS-C2960X-24TD-L
–	WS-C2960X-24PSQ-L *2
WS-C2960S-24PS-L	WS-C2960X-24PS-L
WS-C2960S-24PD-L	WS-C2960X-24PD-L
WS-C2960S-48TS-L	WS-C2960X-48TS-L
WS-C2960S-48TD-L	WS-C2960X-48TD-L
WS-C2960S-48LPS-L	WS-C2960X-48LPS-L
WS-C2960S-48FPS-L	WS-C2960X-48FPS-L
WS-C2960S-48LPD-L	WS-C2960X-48LPD-L
WS-C2960S-48FPD-L	WS-C2960X-48FPD-L
–	WS-C2960XR-24TS-I
–	WS-C2960XR-24TD-I
–	WS-C2960XR-24PS-I
–	WS-C2960XR-24PD-I
–	WS-C2960XR-48TS-I
–	WS-C2960XR-48TD-I
–	WS-C2960XR-48LPS-I
–	WS-C2960XR-48FPS-I
–	WS-C2960XR-48LPD-I
–	WS-C2960XR-48FPD-I

■ Comparison of Main Features

	2960-Plus	2960-SF 2960-S	2960-X
Cisco IOS 15.0(2)SE and higher	●	●	●
Cisco IOS IP Lite	–	–	● *3
IPv6	●	●	●
Full PoE	●	●	●
PoE +	–	●	●
Duplexed power supply	–	–	●
FlexStack	–	●	●
FlexStack Plus	–	–	●

*1 Search for EOL10043 at cisco.com. *2 Stacking is not supported. *3 LAN Lite/LAN Base models are not supported.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco Catalyst 2960-X Series

Stackable L2/L3 fixed-configuration switches equipped Gigabit Ethernet downlink ports. A flexible and redundant power supply configuration is achieved via a stack function and mounting of multiple power supply modules or a redundant power supply system.

■ **Highlights**

● Equipped with Cisco IOS Universal Image (Supports LAN Lite/LAN Base/IP Lite)[1]
● Supports Layer 3 functions including HSRP and VRRP (IP Lite model)
● Equipped with PoE+ power supplying downlink ports (PSE model)
● Equipped with full PoE powering power supply (WS-C2960X-48FPS-L/WS-C2960X-48FPD-L/WS-C2960XR-48FPS-I/WS-C2960XR-48FPD-I)
● Supports multiple Power Supply Modules (IP Lite model)
● Supports Cisco FlexStack Plus (LAN Base/IP Lite models)

■ **Cisco Catalyst 2960-X Series**

SKU	Downlinks	Uplinks			Cisco IOS	Web Auth	Max VLANs	PoE Output Ports			Fanless	Power Supply	Power Redundancy	RPS	Flex Stack Plus	Rack Mount
	GE	GE	SFP	SFP/SFP+				PoE 7.7 W	PoE 15.4 W	PoE+ 30 W						
WS-C2960X-24TS-LL	24	–	2	–	LAN Lite	–	64	–	–	–	–	Fixed AC	–	–	–	1 RU
WS-C2960X-48TS-LL	48	–	2	–	LAN Lite	–	64	–	–	–	–	Fixed AC	–	–	–	1 RU
WS-C2960X-24TS-L	24	–	4	–	LAN Base	●	1024	–	–	–	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-24TD-L	24	–	–	2	LAN Base	●	1024	–	–	–	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-24PSQ-L	24	2	2	–	LAN Base	●	1024	8	6	3	●	Fixed AC	–	–	–	1 RU
WS-C2960X-24PS-L	24	–	4	–	LAN Base	●	1024	24	24	12	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-24PD-L	24	–	–	2	LAN Base	●	1024	24	24	12	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-48TS-L	48	–	4	–	LAN Base	●	1024	–	–	–	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-48TD-L	48	–	–	2	LAN Base	●	1024	–	–	–	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-48LPS-L	48	–	4	–	LAN Base	●	1024	48	24	12	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-48FPS-L	48	–	4	–	LAN Base	●	1024	48	48	24	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-48LPD-L	48	–	–	2	LAN Base	●	1024	48	24	12	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960X-48FPD-L	48	–	–	2	LAN Base	●	1024	48	48	24	–	Fixed AC	–	●	●[2]	1 RU
WS-C2960XR-24TS-I	24	–	4	–	IP Lite	●	1024	–	–	–	–	250 W AC	●	–	●[2]	1 RU
WS-C2960XR-24TD-I	24	–	–	2	IP Lite	●	1024	–	–	–	–	250 W AC	●	–	●[2]	1 RU
WS-C2960XR-24PS-I	24	–	4	–	IP Lite	●	1024	24	24	12	–	640 W AC	●	–	●[2]	1 RU
WS-C2960XR-24PD-I	24	–	–	2	IP Lite	●	1024	24	24	12	–	640 W AC	●	–	●[2]	1 RU
WS-C2960XR-48TS-I	48	–	4	–	IP Lite	●	1024	–	–	–	–	250 W AC	●	–	●[2]	1 RU
WS-C2960XR-48TD-I	48	–	–	2	IP Lite	●	1024	–	–	–	–	250 W AC	●	–	●[2]	1 RU
WS-C2960XR-48LPS-I	48	–	4	–	IP Lite	●	1024	48	24	12	–	640 W AC	●	–	●[2]	1 RU
WS-C2960XR-48FPS-I	48	–	4	–	IP Lite	●	1024	48	48	24	–	640 W AC	●	–	●[2]	1 RU
WS-C2960XR-48LPD-I	48	–	–	2	IP Lite	●	1024	48	24	12	–	1025 W AC	●	–	●[2]	1 RU
WS-C2960XR-48FPD-I	48	–	–	2	IP Lite	●	1024	48	48	24	–	1025 W AC	●	–	●[2]	1 RU

■ **Power Supply Module for the Cisco Catalyst 2960-XR Series**

SKU	Description	Compatible SKU
PWR-C2-250WAC	250 W AC power supply module	WS-C2960XR-24TS-I/WS-C2960XR-24TD-I/WS-C2960XR-48TS-I/WS-C2960XR-48TD-I
PWR-C2-640WAC	640 W AC power supply module	WS-C2960XR-24PS-I/WS-C2960XR-24PD-I/WS-C2960XR-48LPS-I/WS-C2960XR-48LPD-I
PWR-C2-1025WAC	1025 W AC power supply module	WS-C2960XR-48FPS-I/WS-C2960XR-48FPD-I

*1 Upgrade is not supported. *2 Cisco FlexStack Plus module (C2960X-STACK) is required.

Cisco FlexStack Plus module

When equipped with the optional Cisco FlexStack Plus Module (C2960X-STACK), the LAN Base/IP Lite models of the Cisco Catalyst 2960-X Series support connection of up to eight switches in a stack at 80 Gbps.

Cisco FlexStack Plus is backward-compatible with Cisco FlexStack. Up to four switches can be connected in a stack at 40 Gbps when (and only when) the LAN Base model of the Cisco Catalyst 2960-X Series is combined with the LAN Base model of the Cisco Catalyst 2960-SF/S Series.

■ **Combined Stacks (Cisco FlexStack & Cisco FlexStack-Plus) Compatibility List**

	2960-SF/S LAN Base	2960-X LAN Base	2960-XR IP Lite
2960-SF/S LAN Base	●	●	–
2960-X LAN Base	●	●	–
2960-XR IP Lite	–	–	●

■ **Cisco FlexStack Plus Module**

SKU	C2960X-STACK
Compatible IOS	LAN Base/IP Lite
Maximum number of devices	8
Stack bandwidth	80 Gbps
Architecture	Hardware drop table
Dynamic ring load-balancing	–
Stack convergence	100 milliseconds

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco Catalyst 3650 Series

Stackable L2/L3 fixed-configuration switches that offer the wireless controller function. These switches incorporate a 160 Gbps stack function and support multiple Power Supply Modules to achieve a flexible redundant configuration. They also provide common intelligent services for both wired/ wireless LAN networks, such as QoS and security.

■ Highlights
- Equipped with Cisco IOS XE Universal Image (Supports LAN Base / IP Base/IP Services)
- Equipped with the Unified Access Data Plane (UADP) ASIC built to support Cisco ONE (Open Network Environment)
- Built-in controller function capable of managing up to 50 wireless access points (Supports IP Base/IP Services)
- Equipped with PoE+ power supplying downlink ports (PSE model)
- Equipped with MACsec-enabled downlink./uplink ports (IP Base/IP Services models)
- Supports Cisco StackWise-160
- NEW!! WS-C3650-24PDM and WS-C3650-48FQM models are less than 12" deep

■ Cisco Catalyst 3650 Series

SKU	Wireless Throughput	Downlinks GE	SFP	Uplinks SFP/SFP+	Cisco IOS	MAC sec	Max VLANs	PoE 7.7 W	PoE 15.4 W	PoE+ 30 W	UPOE 60 W	Power Supply	Rack Mount
WS-C3650-24TS-L	20 Gpbs	24	4	-	LAN Base	-*1	255	-	-	-	-	250 W AC	1 RU
WS-C3650-24TS-S	20 Gpbs	24	4	-	IP Base	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-24TS-E	20 Gpbs	24	4	-	IP Services	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-24TD-L	20 Gpbs	24	-	4/2	LAN Base	-*1	255	-	-	-	-	250 W AC	1 RU
WS-C3650-24TD-S	20 Gpbs	24	-	4/2	IP Base	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-24TD-E	20 Gpbs	24	-	4/2	IP Services	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-24PS-L	20 Gpbs	24	4	-	LAN Base	-*1	255	24	24	13	-	640 W AC	1 RU
WS-C3650-24PS-S	20 Gpbs	24	4	-	IP Base	●	4094	24	24	13	-	640 W AC	1 RU
WS-C3650-24PS-E	20 Gpbs	24	4	-	IP Services	●	4094	24	24	13	-	640 W AC	1 RU
WS-C3650-24PD-L	20 Gpbs	24	-	4/2	LAN Base	-*1	255	24	24	13	-	640 W AC	1 RU
WS-C3650-24PD-S	20 Gpbs	24	-	4/2	IP Base	●	4094	24	24	13	-	640 W AC	1 RU
WS-C3650-24PD-E	20 Gpbs	24	-	4/2	IP Services	●	4094	24	24	13	-	640 W AC	1 RU
WS-C3650-48TS-L	40 Gbps	48	4	-	LAN Base	-*1	255	-	-	-	-	250 W AC	1 RU
WS-C3650-48TS-S	40 Gbps	48	4	-	IP Base	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-48TS-E	40 Gbps	48	4	-	IP Services	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-48TD-L	40 Gbps	48	-	4/2	LAN Base	-*1	255	-	-	-	-	250 W AC	1 RU
WS-C3650-48TD-S	40 Gbps	48	-	4/2	IP Base	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-48TD-E	40 Gbps	48	-	4/2	IP Services	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-48TQ-L	40 Gbps	48	-	4	LAN Base	-*1	255	-	-	-	-	250 W AC	1 RU
WS-C3650-48TQ-S	40 Gbps	48	-	4	IP Base	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-48TQ-E	40 Gbps	48	-	4	IP Services	●	4094	-	-	-	-	250 W AC	1 RU
WS-C3650-48PS-L	40 Gbps	48	4	-	LAN Base	-*1	255	48	25	13	-	640 W AC	1 RU
WS-C3650-48PS-S	40 Gbps	48	4	-	IP Base	●	4094	48	25	13	-	640 W AC	1 RU
WS-C3650-48PS-E	40 Gbps	48	4	-	IP Services	●	4094	48	25	13	-	640 W AC	1 RU
WS-C3650-48PD-L	40 Gbps	48	-	4/2	LAN Base	-*1	255	48	25	13	-	640 W AC	1 RU
WS-C3650-48PD-S	40 Gbps	48	-	4/2	IP Base	●	4094	48	25	13	-	640 W AC	1 RU
WS-C3650-48PD-E	40 Gbps	48	-	4/2	IP Services	●	4094	48	25	13	-	640 W AC	1 RU
WS-C3650-24PDM-L	20 Gpbs	24	-	4/2	LAN Base	-*1	255	24	24	13	-	640 W AC	1 RU <12" deep
WS-C3650-24PDM-S	20 Gpbs	24	-	4/2	IP Base	●	4094	24	24	13	-	640 W AC	1 RU <12" deep
WS-C3650-24PDM-E	20 Gpbs	24	-	4/2	IP Services	●	4094	24	24	13	-	640 W AC	1 RU <12" deep
WS-C3650-48PQ-L	40 Gbps	48	-	4	LAN Base	-*1	255	48	25	13	-	640 W AC	1 RU
WS-C3650-48PQ-S	40 Gbps	48	-	4	IP Base	●	4094	48	25	13	-	640 W AC	1 RU
WS-C3650-48PQ-E	40 Gbps	48	-	4	IP Services	●	4094	48	25	13	-	640 W AC	1 RU
WS-C3650-48FS-L	40 Gbps	48	4	-	LAN Base	-*1	255	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FS-S	40 Gbps	48	4	-	IP Base	●	4094	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FS-E	40 Gbps	48	4	-	IP Services	●	4094	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FD-L	40 Gbps	48	-	4/2	LAN Base	-*1	255	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FD-S	40 Gbps	48	-	4/2	IP Base	●	4094	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FD-E	40 Gbps	48	-	4/2	IP Services	●	4094	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FQ-L	40 Gbps	48	-	4	LAN Base	-*1	255	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FQ-S	40 Gbps	48	-	4	IP Base	●	4094	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FQ-E	40 Gbps	48	-	4	IP Services	●	4094	48	48	25	-	1025 W AC	1 RU
WS-C3650-48FQM-L	40 Gbps	48	-	4	LAN Base	-*1	255	48	48	25	-	975 W AC	1 RU <12" deep
WS-C3650-48FQM-S	40 Gbps	48	-	4	IP Base	●	4094	48	48	25	-	975 W AC	1 RU <12" deep
WS-C3650-48FQM-E	40 Gbps	48	-	4	IP Services	●	4094	48	48	25	-	975 W AC	1 RU <12" deep

■ Power Supply Module for the Cisco Catalyst 3650 Series

SKU	Description
PWR-C2-250WAC	250 W AC Power Supply Module
PWR-C2-640WAC	640 W AC Power Supply Module
PWR-C2-1025WAC	1025 W AC Power Supply Module
PWR-C2-640WAC	640 W DC Power Supply Module

■ Cisco StackWise-160 Module for the Cisco Catalyst 3650 Series

SKU	Description
C3650-STACK-KIT	Cisco StackWise-160 Module

■ Cisco IOS Upgrade License for the Cisco Catalyst 3650 Series

SKU	Description
L-C3650-24-L-S	Cisco IOS IP Base License for 24-port IP Base model
L-C3650-24-S-E	Cisco IOS IP Services License for 24-port IP Base model
L-C3650-24-L-E	Cisco IOS IP Services License for 24-port IP Base model
L-C3650-48-L-S	Cisco IOS IP Base License for 48-port IP Base model
L-C3650-48-S-E	Cisco IOS IP Services License for 48-port IP Base model
L-C3650-48-L-E	Cisco IOS IP Services License for 48-port IP Base model

■ Additional Access Point License for the Cisco 3650 Series

SKU	Additional	Primary Upgrade SKU
L-LIC-CTIOS-1A	1	L-LIC-CT3650-UPG

SKU	Bundle Model	Number of Access Point Licenses	Cisco IOS
WS-C3650-24PWS-S	WS-C3650-24PS-S	5	IP Base
WS-C3650-24PWD-S	WS-C3650-24PD-S	5	IP Base
WS-C3650-48FWS-S	WS-C3650-48FS-S	5	IP Base
WS-C3650-48FWD-S	WS-C3650-48FD-S	5	IP Base
WS-C3650-48FWQ-S	WS-C3650-48FQ-S	5	IP Base

*1 Cisco IOS IP Base/IP Services License is required.

Cisco Catalyst 3850 Series

Next-generation stackable L2/L3 fixed-configuration switches featuring a wireless controller function. These switches feature the industry's fastest 480 Gbps stack function, support for multiple Power Supply Modules and innovative power-sharing function to achieve a flexible and advanced redundant configuration. They also provide common intelligent services for both wired/wireless LAN networks, such as QoS and security.

■ Highlights

- Equipped with Cisco IOS XE Universal Image (Supports LAN Base/IP Base/IP Services)
- Equipped with the Unified Access Data Plane (UADP) ASIC built to support Cisco ONE (Open Network Environment)
- Built-in controller function capable of managing up to 100 wireless access points (Supports IP Base/IP Services)
- Equipped with Cisco Catalyst Multigigabit Technology (mGig)-enabled downlink ports (some models)
- Equipped with PoE+/UPOE power supplying downlink ports (UPOE ports are only incorporated on some PSE models)
- Equipped with MACsec-enabled downlink ports (IP Base/IP Services models)
- MACsec-enabled uplink ports (Optional, IP Base/IP Services models)
- Supports Cisco StackPower
- Supports Cisco StackWise-480

■ Cisco Catalyst 3850 Series

SKU	Wireless Throughput	Downlinks				Uplinks*1			Cisco IOS	MAC sec	Max VLANs	PoE Output Ports *3				Power Supply	Rack Mount
		GE	mGig	SFP	SFP/SFP+	SFP	SFP/SFP+	QSFP				PoE 7.7 W	PoE 15.4 W	PoE+ 30 W	UPOE 60 W		
WS-C3850-24T-L	20 Gpbs	24	–	–	–	4	2	–	LAN Base	–*2	255	–	–	–	–	350 W AC	1 RU
WS-C3850-24T-S	20 Gpbs	24	–	–	–	4	2	–	IP Base	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-24T-E	20 Gpbs	24	–	–	–	4	2	–	IP Services	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-24P-L	20 Gpbs	24	–	–	–	4	2	–	LAN Base	–*2	255	24	24	14	–	715 W AC	1 RU
WS-C3850-24P-S	20 Gpbs	24	–	–	–	4	2	–	IP Base	●	4094	24	24	14	–	715 W AC	1 RU
WS-C3850-24P-E	20 Gpbs	24	–	–	–	4	2	–	IP Services	●	4094	24	24	14	–	715 W AC	1 RU
WS-C3850-24U-L	20 Gpbs	24	–	–	–	4	2	–	LAN Base	–*2	255	24	24	14	13	715 W AC	1 RU
WS-C3850-24U-S	20 Gpbs	24	–	–	–	4	2	–	IP Base	●	4094	24	24	14	13	715 W AC	1 RU
WS-C3850-24U-E	20 Gpbs	24	–	–	–	4	2	–	IP Services	●	4094	24	24	14	13	715 W AC	1 RU
WS-C3850-24XU-L	40 Gbps	–	24	–	–	8	8	2	LAN Base	–*2	255	24	24	24	24	1100 W AC	1 RU
WS-C3850-24XU-S	40 Gbps	–	24	–	–	8	8	2	IP Base	●	4094	24	24	24	24	1100 W AC	1 RU
WS-C3850-24XU-E	40 Gbps	–	24	–	–	8	8	2	IP Services	●	4094	24	24	24	24	1100 W AC	1 RU
WS-C3850-48T-L	40 Gbps	48	–	–	–	4	4	–	LAN Base	–*2	255	–	–	–	–	350 W AC	1 RU
WS-C3850-48T-S	40 Gbps	48	–	–	–	4	4	–	IP Base	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-48T-E	40 Gbps	48	–	–	–	4	4	–	IP Services	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-48P-L	40 Gbps	48	–	–	–	4	4	–	LAN Base	–*2	255	48	28	14	–	715 W AC	1 RU
WS-C3850-48P-S	40 Gbps	48	–	–	–	4	4	–	IP Base	●	4094	48	28	14	–	715 W AC	1 RU
WS-C3850-48P-E	40 Gbps	48	–	–	–	4	4	–	IP Services	●	4094	48	28	14	–	715 W AC	1 RU
WS-C3850-48F-L	40 Gbps	48	–	–	–	4	4	–	LAN Base	–*2	255	48	48	26	–	1100 W AC	1 RU
WS-C3850-48F-S	40 Gbps	48	–	–	–	4	4	–	IP Base	●	4094	48	48	26	–	1100 W AC	1 RU
WS-C3850-48F-E	40 Gbps	48	–	–	–	4	4	–	IP Services	●	4094	48	48	26	–	1100 W AC	1 RU
WS-C3850-48U-L	40 Gbps	48	–	–	–	4	4	–	LAN Base	–*2	255	48	48	26	13	1100 W AC	1 RU
WS-C3850-48U-S	40 Gbps	48	–	–	–	4	4	–	IP Base	●	4094	48	48	26	13	1100 W AC	1 RU
WS-C3850-48U-E	40 Gbps	48	–	–	–	4	4	–	IP Services	●	4094	48	48	26	13	1100 W AC	1 RU
WS-C3850-12X48U-L	40 Gbps	36	12	–	–	8	8	2	LAN Base	–*2	255	48	48	48	36	1100 W AC	1 RU
WS-C3850-12X48U-S	40 Gbps	36	12	–	–	8	8	2	IP Base	●	4094	48	48	48	36	1100 W AC	1 RU
WS-C3850-12X48U-E	40 Gbps	36	12	–	–	8	8	2	IP Services	●	4094	48	48	48	36	1100 W AC	1 RU
WS-C3850-12S-S	20 Gbps	–	–	12	–	4	2	–	IP Base	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-12S-E	20 Gbps	–	–	12	–	4	2	–	IP Services	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-12XS-S	40 Gbps	–	–	–	12	4	2	–	IP Base	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-12XS-E	40 Gbps	–	–	–	12	4	2	–	IP Services	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-24S-S	20 Gbps	–	–	24	–	4	2	–	IP Base	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-24S-E	20 Gbps	–	–	24	–	4	2	–	IP Services	●	4094	–	–	–	–	350 W AC	1 RU
WS-C3850-24XS-S	40 Gbps	–	–	–	24	8	8	2	IP Base	●	4094	–	–	–	–	715 W AC	1 RU
WS-C3850-24XS-E	40 Gbps	–	–	–	24	8	8	2	IP Services	●	4094	–	–	–	–	715 W AC	1 RU
WS-C3850-48XS-S	40 Gbps	–	–	–	48	–	–	4	IP Base	●	4094	–	–	–	–	750 W AC	1 RU
WS-C3850-48XS-E	40 Gbps	–	–	–	48	–	–	4	IP Services	●	4094	–	–	–	–	750 W AC	1 RU
WS-C3850-48XS-F-S	40 Gbps	–	–	–	48	–	–	4	IP Base	●	4094	–	–	–	–	750 W AC	1 RU
WS-C3850-48XS-F-E	40 Gbps	–	–	–	48	–	–	4	IP Services	●	4094	–	–	–	–	750 W AC	1 RU

■ Network Module for the Cisco Catalyst 3850 Series

SKU	Description	Supported Configuration (SFP/SFP+/QSFP)
C3850-NM-4-1G	Network Module equipped with SFP module slots for 12/24/48-port models	4/0/0
C3850-NM-2-10G	Network Module equipped with SFP+ module slots for 12/24/48-port models	3/1/0, 2/2/0, 0/2/0
C3850-NM-4-10G	Network Module equipped with SFP+ module slots for 48-port models	4/0/0, 3/1/0, 2/2/0, 1/3/0, 0/4/0
C3850-NM-8-10G	Network Module equipped with SFP+ module slots for mGig models & 24-port fiber model	0/8/0
C3850-NM-2-40G	Network Module equipped with QSFP module slots for mGig models & 24-port fiber model	0/0/2

■ Power Supply Module for the Cisco Catalyst 3850 Series

SKU	Description	SKU	Description
PWR-C1-350WAC	350 W AC Power Supply Module	PWR-C3-750WAC-R	750 W AC Front-to-Back Airflow Power Supply Module for WS-C3850-48XS
PWR-C1-715WAC	715 W AC Power Supply Module	PWR-C3-750WAC-F	750 W AC Back-to-Front Airflow Power Supply Module for WS-C3850-48XS
PWR-C1-1100WAC	1100 W AC Power Supply Module	PWR-C3-750WDC-R	750 W DC Front-to-Back Airflow Power Supply Module for WS-C3850-48XS
PWR-C1-440WDC	440 W DC Power Supply Module	PWR-C3-750WDC-F	750 W DC Back-to-Front Airflow Power Supply Module for WS-C3850-48XS

*1 Network Module for the Cisco Catalyst 3850 Series is required (Except for 48-port fiber model). *2 Cisco IOS IP Base/IP Services License is required. *3 For the default power supply configuration.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

■ Additional Access Point License for the Cisco 3850 Series

SKU	Additional	Primary Upgrade SKU
L-LIC-CTIOS-1A	1	L-LIC-CT3850-UPG

■ Cisco IOS XE Upgrade License for the Cisco Catalyst 3850 Series

SKU	Description
L-C3850-12-S-E	Cisco IOS IP Services License for 12-port IP Base model
L-C3850-24-L-S	Cisco IOS IP Base License for 24-port LAN Base model
L-C3850-24-S-E	Cisco IOS IP Services License for 24-port IP Base model
L-C3850-24-L-E	Cisco IOS IP Services License for 24-port LAN Base model
L-C3850-48-L-S	Cisco IOS IP Base License for 48-port LAN Base model
L-C3850-48-S-E	Cisco IOS IP Services License for 48-port IP Base model
L-C3850-48-L-E	Cisco IOS IP Services License for 48-port LAN Base model

■ Cisco Catalyst 3850 Series Bundle

SKU	Bundle			
	Model	Network Module	Number of Access Point Licenses	Cisco IOS
WS-C3850-24PW-S	WS-C3850-24P-S	–	5	IP Base
WS-C3850-24UW-S	WS-C3850-24U-S	–	5	IP Base
WS-C3850-24XUW-S	WS-C3850-24XU-S	–	5	IP Base
WS-C3850-48W-S	WS-C3850-48P-S	–	5	IP Base
WS-C3850-48PW-S	WS-C3850-48F-S	–	5	IP Base
WS-C3850-48UW-S	WS-C3850-48U-S	–	5	IP Base
WS-C3850-12X48UW-S	WS-C3850-12X48U-S	–	5	IP Base
WS-C3850-16XS-S	WS-C3850-12XS-S	C3850-NM-4-10G	5	IP Base
WS-C3850-16XS-E	WS-C3850-12XS-E	C3850-NM-4-10G	5	IP Services
WS-C3850-32XS-S	WS-C3850-24XS-S	C3850-NM-8-10G	5	IP Base
WS-C3850-32XS-E	WS-C3850-24XS-E	C3850-NM-8-10G	5	IP Services

Cisco Catalyst Multigigabit Technology (mGig)

■ Challenges for Wired LAN Posed by 11ac "Gigabit Wireless LAN"

IEEE 802.11ac is a super-high-speed wireless standard that delivers a theoretical maximum throughput of up to 6.9 Gbps. Wireless LAN is literally entering the "Gigabit era", but the migration to 11ac is presenting wired LAN with "old and new" challenges. In other words, these are the same old challenges that were experienced during the migration from 11a/g to 11n. During the migration from 11a/g to 11n, it was obvious that Fast Ethernet switches (max 100 Mbps) had insufficient capacity to server as access switches for accommodating the access points. Similarly today, it is obvious that 1-Gigabit Ethernet switches (1 GE, max 1000 Mbps) have insufficient capacity when migrating from 11n to 11ac. Specifically:

● A bottleneck will occur if the uplink port of the access switches accommodating multiple 11ac compatible access points is 1 GE.
● A bottleneck will occur if the downlink port of the access switches accommodating 11ac Wave compatible access points is 1 GE.

Therefore, as was during the migration from 11a/g to 11n, replacement of access switches is therefore indispensable in order to unleash the full potential of 11ac.

The only current IEEE standard that is faster than 1 GE is 10 Gigabit Ethernet (10 GE) with copper or optical fiber cables. However, there are some difficulties associated with the deployment of 10 GE-compatible switches.

● Cable re-installation is required in many cases: Category 5e accounts for 46 % and Category 6 accounts for 28 % of the copper cables currently installed in corporations around the world, respectively. 10 GE via copper is not supported for Category 5e cables and is limited to a length of 55 meters for Category 6 cables. Installations of optical fiber cables and copper wire cables both require huge costs.

● Current 10 GE does not support PoE: Power supply units and power cables would be required for the access points.

■ Cisco Catalyst Multigigabit Technology (mGig)

Cisco's innovative Cisco Catalyst Multigigabit Technology (mGig) has been developed to address all of these challenges posed by the deployment of 11ac. Largely, mGig offers the following three advantages:

● Multi-speed: Category 5e cables support 100 Mbps, 1 Gbps, 2.5 Gbps and 5 Gbps; and category 6a cables support 10 Gbps, respectively.
● Cable type: A wide variety of cable types are supported including Category 5e, Category 6, and Category 6a.
● PoE: PoE (15.4 W), PoE+ (30 W), and UPOE (60 W) are supported unlike the current 10 GE.

mGig is based on the technology of the NBASE-T Alliance established by Cisco in October 2014. A large number of vendors are participating in the NBASE-T Alliance; and IEEE standardization is currently being promoted for 2.5GBASE-T for 5GBASE-T.

■ Advantages of mGig

11ac Wave 1 AP
Max 1.3 Gbps

Category 5e cables
supports 2.5 Gbps and 5 Gbps.
Category 6a cables support 10 Gbps.

mGig
Access Switch

mGig
Core Switch

11ac Wave 2 AP
Max 3.5 Gbps

PoE (15.4 W), PoE+ (30 W)
and UPOE (60 W) are supported.
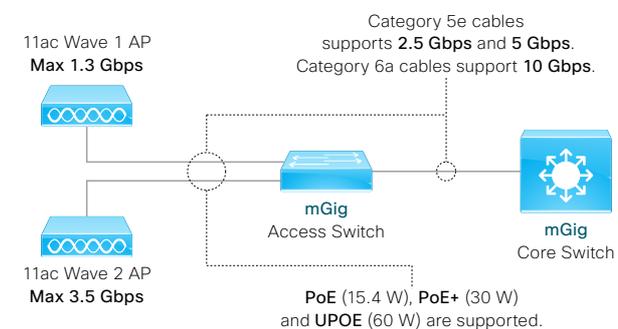
■ Cisco Catalyst Multigigabit Technology (mGig): Speeds and Cables

Cable Type	1 Gbps	2.5 Gbps	5 Gbps	10 Gbps
Cat 5e	●	●	●	–
Cat 6	●	●	●	●(55m)
Cat 6a	●	●	●	●

Cisco Catalyst 4500E Series

L2/L3 modular switches equipped with a 3/6/7/10-slot chassis. These switches can be configured with components that offer intergenerational upward and backward compatibility, including Chassis, Supervisor Engine and Line Card. Their outstanding cost performance will ensure the protection of investment over long periods.

■ Highlights

● Broad range of interface options for 10/100/1000 and mGig on copper and 1 G/10 G on Fiber
● Equipped with Cisco IOS XE Universal Image (Supports LAN Base/IP Base/ Enterprise Services)
● Equipped with the Unified Access Data Plane (UADP) ASIC built to support Cisco ONE (Open Network Environment) (WS-X45-SUP8-E)
● Support for SDN/OpenFlow 1.3
● Built-in controller function capable of managing up to 100 wireless access points (Supports IP Base/Enterprise Services on WS-X45-SUP8-E)
● Supports Cisco VSS (Switching capacity of up to 1.6 Tbps)
● Supports Cisco TrustSec (MACsec/SGT/SGACL)
● Switching capacity of up to 928 Gbps (WS-X45-SUP8-E)
● Bandwidth of up to 48 Gbps per slot
● IPv4 throughput of up to 250 Mpps (WS-X45-SUP7-E/WS-X45-SUP8-E)
● IPv6 throughput of up to 125 Mpps (WS-X45-SUP7-E/WS-X45-SUP8-E)
● Equipped with Cisco Catalyst Multigigabit Technology (mGig)-enabled downlink ports (WS-X4748-12X48U+E)

■ Chassis for the Cisco Catalyst 4500E Series

| SKU | Slots | | Supervisor Engine Redundancy | Maximum Ports (equipped with Line Card) | | | Maximum PoE Power Supply (per slot) | Slots for Power Supply Module | Rack Mount |
	Supervisor Engine	Line Card		GE	SFP	SFP+			
WS-C4503-E	1	2	–	96	96	24	1500 W	2	7 RU
WS-C4506-E	1	5	–	240	240	60	1500 W	2	10 RU
WS-C4507R+E	2	5	●	240	240	60	1500 W	2	11 RU
WS-C4510R+E	2	8	●	384	384	96	1500 W [*1]	2	14 RU

■ Supervisor Engine for the Cisco Catalyst 4500E Series

| SKU | Switching Capacity | Throughput | | SFP/SFP+ | Cisco IOS | Registered L3 Routes | | Compatible Chassis | | | |
		IPv4	IPv6			IPv4	IPv6	WS-C4503-E	WS-C4506-E	WS-C4507R+E	WS-C4510R+E
WS-X45-SUP7L-E	520 Gbps	225 Mpps	110 Mpps	4	IP Base	64K	32K	●	●	●	–
WS-X45-SUP8L-E	520 Gbps	225 Mpps	110 Mpps	4	IP Base	64K	32K	●	●	●	–
WS-X45-SUP7-E	848 Gbps	250 Mpps	125 Mpps	4	IP Base	256K	128K	●	●	●	●
WS-X45-SUP8-E	928 Gbps	250 Mpps	125 Mpps	8	IP Base	256K	128K	●	●	●	●

■ Line Card for the Cisco Catalyst 4500E Series

| SKU | Per-slot Bandwidth | Ports | | | | PoE Output Ports | | MAC sec | Power-saving (EEE) |
		GE	SFP	SFP/SFP+	mGig	PoE+	UPOE		
WS-X4648-RJ45-E	24 Gbps	48	–	–	–	–	–	–	–
WS-X4648-RJ45V+E	24 Gbps	48	–	–	–	48	–	–	–
WS-X4612-SFP-E	24 Gbps	–	12	–	–	–	–	–	–
WS-X4624-SFP-E	24 Gbps	–	24	–	–	–	–	–	–
WS-X4748-RJ45-E	48 Gbps	48	–	–	–	–	–	●	●
WS-X4748-RJ45V+E	48 Gbps	48	–	–	–	48	–	●	–
WS-X4748-UPOE+E	48 Gbps	48	–	–	–	48	48 [*2]	●	●
WS-X4748-12X48U+E	48 Gbps	36	–	–	12	48	48 [*2]	●	●
WS-X4712-SFP-E	48 Gbps	–	12	–	–	–	–	●	–
WS-X4724-SFP-E	48 Gbps	–	24	–	–	–	–	●	–
WS-X4748-SFP-E	48 Gbps	–	48	–	–	–	–	●	–
WS-X4712-SFP+E	48 Gbps	–	–	12	–	–	–	●	–

■ Power Supply Module for the Cisco Catalyst 4500E Series

| SKU | Type | Connectors | Maximum Output Power (Redundancy Mode) | | Maximum PoE Devices (Redundancy Mode) | | |
			Data	PoE	PoE 15.4 W	PoE+ 30 W	UPOE 60 W
PWR-C45-1000AC	AC	1	1000 W + 40 W	–	–	–	–
PWR-C45-1300ACV	AC	1	1000 W + 40 W	800 W	48	24	12
PWR-C45-1400AC	AC	1	1360 W + 40 W	–	–	–	–
PWR-C45-2800ACV	AC	1	1360 W + 40 W	1400 W	84	43	21
PWR-C45-4200ACV	AC	2	1360 W + 40 W	1850 W (110 V) / 3700 W (220 V)	223	114	57
PWR-C45-6000ACV	AC	2	2200 W + 40 W	1850 W (110 V) / 4800 W (220 V)	289	148	74
PWR-C45-9000ACV	AC	3	1960 W + 40 W	2500 W (110 V) / 7500 W (220 V)	384	232	116

■ Cisco IOS XE Upgrade License for the Cisco Catalyst 4500E Series

SKU	Description
L-C4500E-LB-IP	Bundled IP Base License
L-C4500E-IP-ES	Cisco IOS Enterprise Services License for Supervisor Engine
L-C4500E-LB-ES	Bundled Cisco IOS Enterprise Services License

■ Cisco Catalyst 4500E Series Bundle

| SKU | Bundle | | | | Upgrade Options | | |
	Chassis	Supervisor Engine	Line Card	Cisco IOS	WS-X4748-UPOE+E	WS-X45-SUP8-E WS-X4748-RJ45V+E	WS-X45-SUP8-E WS-X4748-UPOE+E
WS-C4503E-S7L+48V+	WS-C4503-E	WS-X45-SUP7L-E	WS-X4648-RJ45V+E	LAN Base	C4500E-S3-UPOE	–	C4500E-3NR-8E-UPOE
WS-C4506E-S7L+96	WS-C4506-E	WS-X45-SUP7L-E	WS-X4648-RJ45-E x 2	LAN Base	–	–	–
WS-C4506E-S7L+96V+	WS-C4506-E	WS-X45-SUP7L-E	WS-X4648-RJ45V+E x 2	LAN Base	C4500E-S6-UPOE	–	C4500E-6NR-8E-UPOE
WS-C4507RE-S7L+96	WS-C4507R+E	WS-X45-SUP7L-E	WS-X4648-RJ45-E x 2	LAN Base	–	–	–
WS-C4507RE+96V+	WS-C4507R+E	WS-X45-SUP7L-E	WS-X4648-RJ45V+E x 2	LAN Base	C4500E-S7-UPOE	C4500E-S7L-S8	C4500E-7R-S8E-UPOE
WS-C4510RE-S7+96V+	WS-C4510R+E	WS-X45-SUP7-E	WS-X4748-RJ45V+E x 2	LAN Base	C4500E-S7-UPOE	–	–
WS-C4510RE-S8+96V+	WS-C4510R+E	WS-X45-SUP8-E	WS-X4748-RJ45V+E x 2	LAN Base	C4510RE-S8-UPOE	–	–

*1 Slots 3, 4, 7–10 are 750 W. *2 Depends on modes of operation (Redundant 1 + 1 Mode, Redundant N + 1 Mode, Combined Mode).

Cisco Catalyst 4500-X Series

L3 fixed-configuration switches equipped with SFP+ module slots. These switches deliver the same level of performance as the latest supervisor engine of the Cisco Catalyst 4500E Series, while having a 1 RU space-saving and power-thrifty design. These switches can be expanded to accommodate SFP+ module slots using optional Network Modules.

■ Highlights
- Equipped with Cisco IOS XE Universal Image (Supports IP Base/Enterprise Services)
- Support for SDN/OpenFlow 1.3
- Supports Cisco VSS (Switching capacity of up to 1.6 Tbps)
- Cisco TrustSec-enabled hardware (MACsec/SGT/SGACL)
- Switching capacity of up to 800 Gbps
- IPv4 throughput of up to 250 Mpps
- IPv6 throughput of up to 125 Mpps
- Network module equipped with 8 SFP+ ports (Optional)
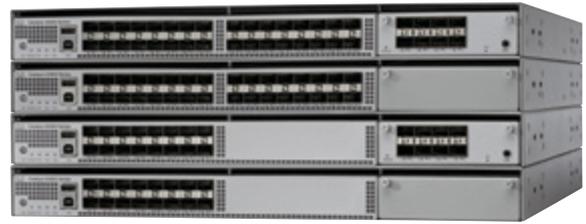
■ Cisco Catalyst 4500-X Series

SKU	SFP/SFP+		Cisco IOS	Registered L3 Routes		Multicast Routes		Cooling Fan	Power Supply Module Number of slots	Rack Mount
	Default	Maximum		IPv4	IPv6	IPv4	IPv6			
WS-C4500X-16SFP+	16	24[*1]	IP Base	64K	32K	24K	12K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-F-16SFP+	16	24[*1]	IP Base	64K	32K	24K	12K	Rear air intake/Front exhaust	2	1 RU
WS-C4500X-32SFP+	32	40[*1]	IP Base	256K	128K	32K	32K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-F-32SFP+	32	40[*1]	IP Base	256K	128K	32K	32K	Rear air intake/Front exhaust	2	1 RU
WS-C4500X-24X-IPB	24	24	IP Base	64K	32K	24K	12K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-24X-ES	24	24	Enterprise Services	64K	32K	24K	12K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-40X-ES	40	40	Enterprise Services	256K	128K	32K	32K	Front air intake/Rear exhaust	2	1 RU

■ Network Module for the Cisco Catalyst 4500-X Series

SKU	Description	Number of SFP/SFP+ Ports
C4KX-NM-8SFP+	Network Module equipped with SFP+ module slots	8

■ Power Supply Module for the Cisco Catalyst 4500-X Series

SKU	Description	Compatible SKU
C4KX-PWR-750AC-R	750 W AC Front-to-Back Cooling Power Supply Module	WS-C4500X-16SFP+/WS-C4500X-32SFP+/ WS-C4500X-24X-IPB/WS-C4500X-24X-ES/WS-C4500X-40X-ES
C4KX-PWR-750AC-F	750 W AC Back-to-Front Cooling Power Supply Module	WS-C4500X-F-16SFP+/WS-C4500X-F-32SFP+
C4KX-PWR-750DC-R	750 W DC Front-to-Back Cooling Power Supply Module	WS-C4500X-16SFP+/WS-C4500X-32SFP+/ WS-C4500X-24X-IPB/WS-C4500X-24X-ES/WS-C4500X-40X-ES
C4KX-PWR-750DC-F	750 W DC Back-to-Front Cooling Power Supply Module	WS-C4500X-F-16SFP+/WS-C4500X-F-32SFP+

■ Cisco IOS XE Upgrade License for the Cisco Catalyst 4500-X Series

SKU	Description	Compatible SKU
L-C4500X-16P-IP-ES	Cisco IOS Enterprise Services License for 16/24-port IP Base model	WS-C4500X-16SFP+/WS-C4500X-F-16SFP+/WS-C4500X-24X-IPB
L-C4500X-IP-ES	Cisco IOS Enterprise Services License for 24-port IP Base model	WS-C4500X-32SFP+/WS-C4500X-F-32SFP+

*1 Network Module for the Cisco Catalyst 4500-X Series is required.

Cisco Virtual Switching System (VSS)

Cisco Virtual Switching System (VSS) is a cluster technology for operating two Cisco Catalyst Switches as one virtual logical switch. Both the Data Plane and Switch Fabric functionalities of the switches comprising a cluster will operate at 100 % performance. It is therefore possible to configure a single logical switch capable of delivering 200% better performance than native Cisco Catalyst Switches. This technology also offers the following benefits in addition to performance improvement:

● Simple topology (No-loop network with no need for STP)
Since two physical switches are operated as one logical switch, there is no need for a redundancy protocol such as STP between the physical switches.

● Single routing instance
The second physical switch will continue to operate in the event when one of the physical switches fails. There will be no service interruption due to switching of networks and/or reconstruction of routing tables.

● Network manageability
The workload of the network administrator will be reduced as he/she only needs to configure and manage one logical switch instead of two physical switches.

Cisco Virtual Switching System (VSS) is supported on the Cisco Catalyst 4500-X/4500E/6500/6800 Series.

Physical configuration

Logical image

Two physical switches are operated as a single logical switch.

The state information including the configuration management routing table are shared using a single Cisco IOS and a single configuration file.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services
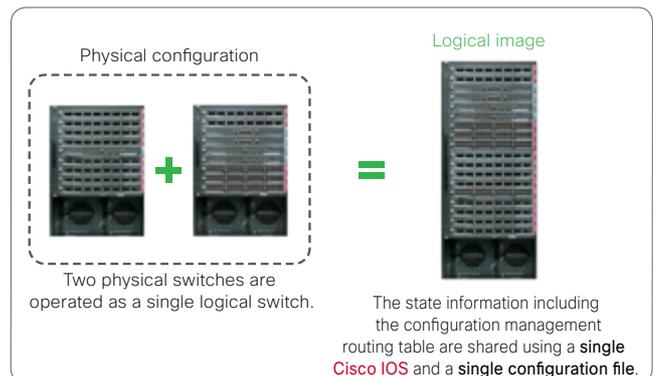
Cisco Catalyst 6500 Series

L3 modular switches equipped with a 3/4/6/7/13-slot chassis. These switches deliver the industry's top-level performance that is suitable for deployment in the core layer, providing integration with a variety of network services including wireless and security and an unmatched level of investment protection.

■ Highlights
● Equipped with Cisco IOS (Supports IP Base/IP Services/Advanced IP Services/ Advanced Enterprise Services)
● Supports Cisco VSS (Switching capacity of up to 4 Tbps)
● Supports Cisco TrustSec (MACsec/SGT/SGACL)
● Switching capacity of up to 2.08 Tbps
● Bandwidth of up to 80 Gbps per slot
● IPv4 throughput of up to 780 Mpps (WS-C6513-E)
● IPv6 throughput of up to 390 Mpps (WS-C6513-E)
● Supports various Services Modules (Wireless Services Module 2, ASA Services Module, etc.). Not supported with SUP6T.

■ Chassis for the Cisco Catalyst 6500 Series

| SKU | IPv4 Throughput | Slots | | | Supervisor Engine Redundancy | Maximum Ports (equipped with Line Card) | | | | | | Slots for Power Supply Module | Rack Mount |
		Supervisor Engine	SE/LC	Line Card		GE	SFP	SFP/ SFP+	10GB-T	X2/ SFP+	CFP/ QSFP		
WS-C6503-E	150 Mpps	1	1	1	●	96	96	64	32	32	8/16	2	4 RU
WS-C6504-E	210 Mpps	1	1	2	●	144	144	96	64	64	12/24	2	5 RU
WS-C6506-E	330 Mpps	1	1	4	●	240	240	160	80	80	20/40	2	12 RU
WS-C6509-E	510 Mpps	1	1	7	●	384	384	256	128	128	32/64	2	15 RU
WS-C6509-V-E	510 Mpps	1	1	7	●	384	384	256	128	128	32/64	2	21 RU
WS-C6513-E	720 Mpps	2	–	11	●	528	528	352	176	176	44/88	2	20 RU

■ Supervisor Engine for the Cisco Catalyst 6500 Series

| SKU | Switching Capacity | Equipped PFC | Equipped MSFC | Uplink Ports | Cisco IOS | Registered L3 Routes | | Registered NetFlow |
						IPv4	IPv6	
VS-S2T-10G	2.08 Tbps	PFC4	MSFC5	3 x 1G SFP | 2x10G X2	IP Base	256K	128K	512K per PFC4/4XL
VS-S2T-10G-XL	2.08 Tbps	PFC4XL	MSFC5	3 x 1G SFP | 2x10G X2	IP Base	1024K	512K	1024K per PFC4/4XL
C6800-SUP6T	6 Tbps	PFC4	MSFC6	8 x 1G/10G SFP+ | 2x40G QSFP	IP Services	256K	128K	512K per PFC4/4XL
C6800-SUP6T-XL	6 Tbps	PFC4XL	MSFC6	8 x 1G/10G SFP+ | 2x40G QSFP	IP Services	1024K	512K	1024K per PFC4/4XL

■ Line Card for the Cisco Catalyst 6500 Series & Cisco Catalyst 6807-XL

| SKU | | Per-slot Bandwidth | Ports | | | | | | MAC sec | VSL |
DFC4-equipped model	DFC4XL-equipped model		GE	SFP	SFP/SFP+	10GB-T	X2/SFP+	CFP/QSFP		
WS-X6824-SFP-2T	WS-X6824-SFP-2TXL	20 Gbps	–	24	–	–	–	–	–	–
WS-X6848-TX-2T	WS-X6848-TX-2TXL	40 Gbps	48	–	–	–	–	–	–	–
C6800-48P-TX	C6800-48P-TX-XL	40 Gbps	48	–	–	–	–	–	–	–
WS-X6848-SFP-2T	WS-X6848-SFP-2TXL	40 Gbps	–	48	–	–	–	–	–	–
C6800-48P-SFP	C6800-48P-SFP-XL	40 Gbps	–	48	–	–	–	–	–	–
WS-X6816-10T-2T	WS-X6816-10T-2TXL	40 Gbps	–	–	–	16	–	–	–	●
WS-X6816-10G-2T	WS-X6816-10G-2TXL	40 Gbps	–	–	–	–	16*2	–	–	●
C6800-8P10G	C6800-8P10G-XL	80 Gbps	–	–	8	–	–	2*4	●	●
C6800-16P10G	C6800-16P10G-XL	80 Gbps	–	–	16	–	–	4*4	●	●
C6800-32P10G	C6800-32P10G-XL	80 Gbps*1	–	–	32	–	–	8*4	●	●
WS-X6908-10G-2T	WS-X6908-10G-2TXL	80 Gbps	–	–	–	–	8*2	–	●	●
WS-X6904-40G-2T	WS-X6904-40G-2TXL	80 Gbps	–	–	–	–	16*3	4	●	●

■ Power Supply Module for the Cisco Catalyst 6500 Series

| SKU | Type | Connectors | Maximum Output Power | Compatible Chassis | | | | | |
				WS-C6503-E	WS-C6504-E	WS-C6506-E	WS-C6509-E	WS-C6509-V-E	WS-C6513-E
PWR-1400-AC*5	AC	1	1400 W	●	–	–	–	–	–
PWR-2700-AC/4	AC	1	2700 W	–	●	–	–	–	–
WS-CAC-3000W	AC	1	3000 W	–	–	●	●	●	●
WS-CAC-6000W	AC	2	6000 W	–	–	●	●	●	●
WS-CAC-8700W-E	AC	3	8700 W	–	–	●	●	●	●
PWR-2700-DC/4	DC	2	2700 W	–	●	–	–	–	–
WS-CDC-2500W	DC	2	2500 W	–	–	●	●	●	●
PWR-4000-DC	DC	3	4000 W	–	–	●	●	●	●
PWR-6000-DC	DC	4	6000 W	–	–	●	●	●	●

■ Fan Tray for the Cisco Catalyst 6500 Series

SKU	Description
WS-C6503-E-FAN	Fan Tray for WS-C6503-E
FAN-MOD-4HS=	Fan Tray for WS-C6504-E
WS-C6506-E-FAN	Fan Tray for WS-C6506-E

SKU	Description
WS-C6509-E-FAN	Fan Tray for WS-C6509-E
WS-C6509-V-E-FAN	Fan Tray for WS-C6509-V-E
WS-C6513-E-FAN=	Fan Tray for WS-C6513-E

■ Cisco Catalyst 6500 Series Bundle

| SKU | Bundle | | | | |
	Chassis	Supervisor Engine	Line Card	Fan tray	Cisco IOS
VS-C6503E-SUP2T	WS-C6503-E	VS-S2T-10G	–	WS-C6503-E-FAN	IP Services
VS-C6504E-SUP2T	WS-C6504-E	VS-S2T-10G	–	FAN-MOD-4HS	IP Services
VS-C6506E-SUP2T	WS-C6506-E	VS-S2T-10G	–	WS-C6506-E-FAN	IP Services
VS-C6506E-S2T-6816	WS-C6506-E	VS-S2T-10G	WS-X6816-10G-2T x 2	WS-C6506-E-FAN	IP Services
VS-C6506E-S2T-6904	WS-C6506-E	VS-S2T-10G	WS-X6904-40G-2T x 2	WS-C6506-E-FAN	IP Services
VS-C6509E-SUP2T	WS-C6509-E	VS-S2T-10G	–	WS-C6509-E-FAN	IP Services
VS-C6509E-S2T-6816	WS-C6509-E	VS-S2T-10G	WS-X6816-10G-2T x 2	WS-C6509-E-FAN	IP Services
VS-C6509E-S2T-6904	WS-C6509-E	VS-S2T-10G	WS-X6904-40G-2T x 2	WS-C6509-E-FAN	IP Services
VS-C6509VE-SUP2T	WS-C6509-V-E	VS-S2T-10G	–	WS-C6509-V-E-FAN	IP Services
VS-C6513E-SUP2T	WS-C6513-E	VS-S2T-10G	–	WS-C6513-E-FAN	IP Services

*1 Cisco Catalyst 6807-XL supports 160 Gbps. *2 SFP+ Converter (CVR-X2-SFP10G) is required to mount SFP+ module.
*3 X2 module is not supported. FourX SFP+ Converter (CVR-CFP-4SFP10G) is required to mount SFP+ module.
*4 QSFP Active Optical breakout Cable (QSFP-4X10G-AOCxM) or QSFP Converter (CVR-4SFP10G-QSFP on roadmap) is required to mount QSFP module. *5 Power Entry Module (PEM-20A-AC+) is required.

Cisco Catalyst 6800 Series

L3 switches optimized for 10/40/100 Gigabit Ethernet. The product lineup includes the fixed-configuration Cisco Catalyst 6840-X/6880-X Series, the modular Cisco Catalyst 6807-XL, and the Cisco Catalyst 6800ia Series dedicated for Cisco Catalyst Instant Access.

■ Highlights
● Equipped with Cisco IOS (Supports IP Base/IP Services/Advanced IP Services/Advanced Enterprise Services) *1
● Supports Cisco VSS (C6807-XL has a switching capacity of up to 22.8 Tbps)
● Supports Cisco TrustSec (MACsec/SGT/SGACL)
● Switching capacity of up to 11.4 Tbps (C6807-XL)
● Bandwidth of up to 880 Gbps per slot (C6807-XL)
● IPv4 throughput of up to 300 Mpps (C6880-X)
● IPv6 throughput of up to 150 Mpps (C6880-X)
● Equipped with 2 Native uplink ports of 40 G QSFP (C6824-X-LE-40G/C6840-X-LE-40G)

■ Chassis for the Cisco Catalyst 6840-X Series

| SKU | Switching Capacity | Ports | | Maximum Ports | | Cisco IOS | Registered L3 Routes | | Registered NetFlow | Slots for Power Supply Module | Rack Mount |
		SFP/SFP+	QSFP	SFP/SFP+	QSFP		IPv4	IPv6			
C6816-X-LE	80 Gbps	16	–	16	4*3	IP Services	256K	128K	512K	2	2 RU
C6832-X-LE	160 Gbps	32	–	32	8*3	IP Services	256K	128K	1024K	2	2 RU
C6824-X-LE-40G	160 Gbps	24	2	24 + 8*2	2 + 6*3	IP Services	256K	128K	1024K	2	2 RU
C6840-X-LE-40G	240 Gbps	40	2	40 + 8*2	2 + 10*3	IP Services	256K	128K	1536K	2	2 RU

■ Power Supply Module for the Cisco Catalyst 6840-X Series

SKU	Description
C6840-X-750W-AC	750 W AC Power Supply Module
C6840-X-1100W-AC	1100 W AC Power Supply Module
C6840-X-750W-DC	750 W DC Power Supply Module
C6840-X-1100W-DC	1100 W DC Power Supply Module

■ Chassis for the Cisco Catalyst 6880-X Series

| SKU | Slots for Port Card | Switching Capacity | Maximum Ports (equipped with Line Card) | | Cisco IOS | Registered L3 Routes | | Registered NetFlow | Slots for Power Supply Module | Rack Mount |
			SFP +	QSFP*3		IPv4	IPv6			
C6880-X-LE	4	2 Tbps	80	20	IP Services	256K	128K	512K	2	4.85 RU
C6880-X	4	2 Tbps	80	20	IP Services	2048K	1024K	512K	2	4.85 RU

■ Multi-rate Port Card for the Cisco Catalyst 6880-X Series

| SKU | Per-slot Bandwidth | SFP/SFP+ | Registered L3 Routes | | Multicast Routes | | MAC sec | Compatible Chassis | |
			IPv4	IPv6	IPv4	IPv6		C6880-X-LE	C6880-X
C6880-X-LE-16P10G	80 Gbps	16	256K	128K	128K	128K	●	●	–
C6880-X-16P10G	80 Gbps	16	2048K	1024K	128K	128K	●	–	●

■ Power Supply Module for the Cisco Catalyst 6880-X Series

SKU	Description
C6880-X-3KW-AC	3000 W AC Power Supply Module
C6880-X-3KW-DC	3000 W DC Power Supply Module

■ Fan Tray for the Cisco Catalyst 6880-X Series

SKU	Description
C6880-X-FAN	Fan Tray for the Cisco Catalyst 6880-X Series

■ Chassis for Cisco Catalyst for 6807-XL

| SKU | Slots | | Maximum Ports (equipped with Line Card) | | | | | | Slots for Power Supply Module | Rack Mount |
	Supervisor Engine	Line Card	GE	SFP	SFP/SFP+	10GB-T	X2/SFP+	CFP/QSFP		
C6807-XL	2	5	240	240	160	80	80	20/40	4	10 RU

■ Supervisor Engine for Cisco Catalyst 6807-XL

| SKU | Switching Capacity | Equipped PFC | Equipped MSFC | Uplink Ports | Cisco IOS | Registered L3 Routes | | Registered NetFlow |
						IPv4	IPv6	
VS-S2T-10G	2.08 Tbps	PFC4	MSFC5	3 x 1G SFP | 2x10G X2	IP Base	256K	128K	512K per PFC4/4XL
VS-S2T-10G-XL	2.08 Tbps	PFC4XL	MSFC5	3 x 1G SFP | 2x10G X2	IP Base	1024K	512K	1024K per PFC4/4XL
C6800-SUP6T	6 Tbps	PFC4	MSFC6	8 x 1G/10G SFP+ | 2x40G QSFP	IP Services	256K	128K	512K per PFC4/4XL
C6800-SUP6T-XL	6 Tbps	PFC4XL	MSFC6	8 x 1G/10G SFP+ | 2x40G QSFP	IP Services	1024K	512K	1024K per PFC4/4XL

■ Power Supply Module for Cisco Catalyst for 6807-XL

SKU	Description
C6800-XL-3KW-AC	3000 W AC Power Supply Module

■ Fan Tray for Cisco Catalyst for 6807-XL

SKU	Description
C6807-XL-FAN	Fan Tray for Cisco Catalyst 6807-XL

■ Cisco Catalyst 6807-XL Bundle

| SKU | Bundle | | | | |
	Chassis	Supervisor Engine	Power Supply Module	Fan Tray	Cisco IOS
C6807-XL-S2T-BUN	C6807-XL	VS-S2T-10G	C6800-XL-3KW-AC x 2	C6807-XL-FAN	IP Services
C6807-XL-S6T-BUN	C6807-XL	C6800-SUP6T	C6800-XL-3KW-AC x 2	C6807-XL-FAN	IP Services

■ Cisco Catalyst 6800ia Series

| SKU | Downlinks | | Cisco IOS | MAC sec | PoE Output Ports | | | | Power Supply | Power Redundancy | RPS | Flex Stack Plus | Rack Mount |
	GE	SFP/SFP +			PoE 7.7 W	PoE 15.4 W	PoE + 30 W	UPOE 60 W					
C6800IA-48TD	48	2	–*4	●	–	–	–	–	Fixed AC	–	●	●	1 RU
C6800IA-48FPD	48	2	–*4	●	48	48	24	–	Fixed AC	–	●	●	1 RU
C6800IA-48FPDR	48	2	–*4	●	48	48	24	–	1025 W AC	●*5	●	●	1 RU

*1 Cisco Catalyst 6840-X/6880-X Series supports the Cisco IOS IP Services/Advanced Enterprise Services.
*2 SFP+ direct-attach breakout cable (QSFP-4SFP10G-CUxM, QSFP-4x10G-ACxM) or SFP+ Active Optical breakout Cable (QSFP-4X10G-AOCxM) is required to mount SFP/SFP+ module.
*3 QSFP Converter (CVR-4SFP10G-QSFP on roadmap) is required to mount QSFP module. *4 Integrated with the Instant Access parent switch.
*5 Power Supply Module for C6800IA-48FPDR (PWR-C2-1025WAC) is required.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco Catalyst 4500/6500/6800 Series Transition Guide

■ Chassis for the Cisco Catalyst 4500 Series

Legacy Models	Current Models
WS-C4503[1]	WS-C4503-E
WS-C4506[1]	WS-C4506-E
WS-C4507R-E[2]	WS-C4507R+E
WS-C4510R-E[2]	WS-C4510R+E

■ Supervisor Engine for the Cisco Catalyst 4500 Series

Legacy Models	Current Models
WS-X4516-10GE[4]	WS-X45-SUP7L-E WS-X45-SUP8L-E WS-X45-SUP7-E WS-X45-SUP8-E
WS-X45-SUP6L-E[5]	WS-X45-SUP7L-E WS-X45-SUP8L-E
WS-X45-SUP6-E[6]	WS-X45-SUP7-E WS-X45-SUP8-E

■ Line Card for the Cisco Catalyst 4500 Series

Legacy Models	Current Models
WS-X4148-RJ[7]	WS-X4648-RJ45-E WS-X4748-RJ45-E
WS-X4248-RJ45V[8]	WS-X4648-RJ45V+E WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4306-GB[9]	WS-X4612-SFP-E WS-X4624-SFP-E WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E
WS-X4418-GB[10]	WS-X4612-SFP-E WS-X4624-SFP-E WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E
WS-X4506-GB-T[10]	WS-X4648-RJ45V+E WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4612-SFP-E WS-X4624-SFP-E WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E
WS-X4548-GB-RJ45[4]	WS-X4648-RJ45-E WS-X4748-RJ45-E
WS-X4524-GB-RJ45V[11]	WS-X4648-RJ45V+E WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4548-GB-RJ45V[4]	WS-X4648-RJ45V+E WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4548-RJ45V+[12]	WS-X4648-RJ45V+E WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4648-RJ45V-E[4]	WS-X4648-RJ45V+E WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E

■ Chassis for the Cisco Catalyst 6500/6800 Series

Legacy Models	Suggested Models
WS-C6503[13]	C6807-XL
WS-C6506[13]	C6807-XL
WS-C6509[13]	C6807-XL
WS-C6509-NEB[14]	WS-C6509-V-E
WS-C6509-NEB-A[15]	WS-C6509-V-E
WS-C6513[16]	WS-C6513-E

■ Supervisor Engine for the Cisco Catalyst 6500/6800 Series

Legacy Models	Current Models (PFC4)	Current Models (PFC4XL)
WS-SUP32-GE-3B[17]	VS-S2T-10G or C6800-SUP6T	VS-S2T-10G-XL or C6800-SUP6T-XL
WS-SUP32-10GE-3B[17]	VS-S2T-10G or C6800-SUP6T	VS-S2T-10G-XL or C6800-SUP6T-XL
WS-SUP720-3B[18]	VS-S2T-10G or C6800-SUP6T	VS-S2T-10G-XL or C6800-SUP6T-XL
WS-SUP720-3BXL[18]	–	VS-S2T-10G-XL or C6800-SUP6T-XL
VS-S720-10G-3C[19]	VS-S2T-10G or C6800-SUP6T	VS-S2T-10G-XL or C6800-SUP6T-XL
VS-S720-10G-3CXL[19]	–	VS-S2T-10G-XL or C6800-SUP6T-XL

■ Line Card for the Cisco Catalyst 6500/6800 Series

Legacy Models	Current Models (PFC4)	Current Models (PFC4XL)
WS-X6148-FE-SFP[20]	WS-X6848-SFP-2T C6800-48P-SFP	WS-X6848-SFP-2TXL C6800-48P-SFP
WS-X6148A-GE-TX[21]	WS-X6848-TX-2T	WS-X6848-TX-2TXL
WS-X6548-GE-TX[20]	WS-X6848-TX-2T	WS-X6848-TX-2TXL
WS-X6516A-GBIC[20]	WS-X6824-SFP-2T	WS-X6824-SFP-2TXL
WS-X6724-SFP[19]	WS-X6824-SFP-2T	WS-X6824-SFP-2TXL
WS-X6748-GE-TX[22]	C6800-48P-TX	C6800-48P-TX-XL
WS-X6748-SFP[22]	WS-X6848-SFP-2T C6800-48P-SFP	WS-X6848-SFP-2TXL C6800-48P-SFP
WS-X6716-10T-3C[19]	–	–
WS-X6716-10T-3CXL[19]	–	–
WS-X6716-10G-3C[19]	WS-X6816-10G-2T C6800-16P10G	–
WS-X6716-10G-3CXL[19]	–	WS-X6816-10G-2TXL C6800-16P10G-XL
WS-X6708-10G-3C[22]	C6800-8P10G	–
WS-X6708-10G-3CXL[22]	–	C6800-16P10G-XL
WS-X6908-10G-2T[22]	C6800-8P10G	–
WS-X6908-10G-2TXL[22]	–	C6800-16P10G-XL
WS-X6904-40G-2T[22]	C6800-16P10G C6800-32P10G	–
WS-X6904-40G-2TXL[22]	–	C6800-16P10G-XL C6800-32P10G-XL
WS-X6816-10T-2T[22]	–	–
WS-X6816-10T-2TXL[22]	–	–

*1 Search for EOL6869 at cisco.com. *2 Search for EOL8168 at cisco.com. *4 Search for EOL8162 at cisco.com. *5 Search for EOL9604 at cisco.com. *6 Search for EOL8975 at cisco.com.
*7 Search for EOL9420 at cisco.com. *8 Search for EOL9424 at cisco.com. *9 Search for EOL8969 at cisco.com. *10 Search for EOL7380 at cisco.com. *11 Search for EOL6879 at cisco.com.
*12 Search for EOL9426 at cisco.com. *13 Search for EOL3037 at cisco.com. *14 Search for EOL6564 at cisco.com. *15 Search for EOL6720 at cisco.com. *16 Search for EOL8193 at cisco.com.
*17 Search for EOL7769 at cisco.com. *18 Search for EOL8147 at cisco.com. *19 Search for EOL9892 at cisco.com. *20 Search for EOL7770 at cisco.com. *21 Search for EOL9058 at cisco.com.
*22 Search for EOL10550 at cisco.com.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Modules & Accessories

■ Cisco Redundant Power System (RPS) 2300

SKU	Description	Compatible Series									
		2960-CX	3560-CX	2960-Plus	2960-X	3650	3850	4500E	4500-X	6500	6800
PWR-RPS2300	Cisco RPS 2300 Chassis	-	-	-	● *1 *2	-	-	-	-	-	● *3
C3K-PWR-750WAC	750 W AC Power Supply Module for Cisco RPS 2300	-	-	-	● *1 *2	-	-	-	-	-	● *3
CAB-RPS2300=	Spare 14-pin RPS Cable for Cisco RPS 2300	-	-	●	-	-	-	-	-	-	-
CAB-RPS2300-E=	Spare 22-pin RPS Cable for Cisco RPS 2300	-	-	-	● *1 *2	-	-	-	-	-	● *3

■ Cisco Transceiver Module

SKU	Description	Compatible Series									
		2960-CX	3560-CX	2960-Plus	2960-X	3650	3850	4500E	4500-X	6500	6800
GLC-GE-100FX	100BASE-FX SFP Module	●	●	●	●	●	●	●	-	●	●
GLC-T	1000BASE-T SFP Module	-	-	●	●	●	●	●	●	●	●
GLC-SX-MMD	1000BASE-SX SFP Module (DOM)	●	●	●	●	●	●	●	●	●	●
GLC-LH-SMD	1000BASE-LX SFP Module (DOM)	●	●	●	●	●	●	●	●	●	●
GLC-BX-D	1000BASE-BX SFP Module (1490 nm)	●	●	●	●	●	●	●	●	●	●
GLC-BX-U	1000BASE-BX SFP Module (1310 nm)	●	●	●	●	●	●	●	●	●	●
GLC-EX-SMD	1000BASE-EX SFP Module	●	●	-	●	●	●	●	●	●	●
GLC-ZX-SMD	1000BASE-ZX SFP Module	●	●	●	●	●	●	●	●	●	●
SFP-10G-SR	10GBASE-SR SFP+ Module	-	●	-	●	●	●	●	●	●	●
SFP-10G-LR	10GBASE-LR SFP+ Module	-	●	-	●	●	●	●	●	●	●
SFP-10G-LRM	10GBASE-LRM SFP Module	-	●	-	●	●	●	●	●	●	●
SFP-10G-ER	10GBASE-ER SFP+ Module	-	●	-	●	●	●	●	●	●	●
X2-10GB-CX4	10GBASE-CX4 X2 Module	-	-	-	-	-	-	●	-	●	● *4
X2-10GB-LRM	10GBASE-LRM X2 Module	-	-	-	-	-	-	●	-	●	● *4
X2-10GB-SR	10GBASE-SR X2 Module	-	-	-	-	-	-	●	-	●	● *4
X2-10GB-LR	10GBASE-LR X2 Module	-	-	-	-	-	-	●	-	●	● *4
X2-10GB-ER	10GBASE-ER X2 Module	-	-	-	-	-	-	●	-	●	● *4
X2-10GB-ZR	10GBASE-ZR X2 Module	-	-	-	-	-	-	●	-	●	● *4
CVR-X2-SFP	TwinGig Converter for X2 Module	-	-	-	-	-	-	●	-	-	-
CVR-X2-SFP10G	SFP+ Converter for X2 Module	-	-	-	-	-	-	●	-	●	● *4
CFP-40G-SR4	40GBASE-SR4 CFP Module	-	-	-	-	-	-	-	-	●	● *4
CFP-40G-LR4	40GBASE-LR4 CFP Module	-	-	-	-	-	-	-	-	●	● *4
CVR-CFP-4SFP10G	FourX SFP+ Converter for CFP Module	-	-	-	-	-	-	-	-	●	● *4
CVR-QSFP-SFP10G	SFP/SFP+ Converter for QSFP Module	-	-	-	-	-	-	-	-	●	● *4
CVR-4SFP10G-QSFP	QSFP Converter for SFP+ Module	-	-	-	-	-	●	●	●	●	● *5

*1 LAN Lite model does not support stacking. *2 IP Lite model is not supported. *3 Cisco Catalyst 6880-Series and Cisco Catalyst 6807-XL are not supported.
*4 Cisco Catalyst 6880-X and Cisco Catalyst 6800ia Series are not supported. *5 Cisco Catalyst 6800ia Series are not supported.

Wireless

Wireless Access Points / Controllers

New 802.11ac Wave 2 Cisco Aironet Access Points

Cisco Aironet 2800/3800 Series are Cisco's latest access points that support IEEE 802.11ac Wave 2 technology, for high-density, enterprise class, future-proof Wireless deployments. With 11ac Wave 2, Cisco Aironet 2800/3800 Series provide a data rate of up to 2.6 Gbps per 5 GHz radio, and even allow to get two radios in the same AP on 5GHz, totalising up to 5.2Gbps, providing the necessary foundation and versatility for enterprise best-in-class and service provider networks to stay ahead of the performance and bandwidth expectations and needs of their wireless users.

■ MU-MIMO

With 11n and 11ac Wave 1, a device can transmit multiple spatial streams at once, but only directed to a single address. For individually addressed frames, only a single device (or user) gets data at a time. This is referred to as SU-MIMO (Single-User Multiple Input and Multiple Output).

With the advent of 11ac Wave 2, a new technology is defined, called MU-MIMO (Multi-User MIMO). Using this technology, an access point can use its antennas and radio systems to transmit to different clients, all at the same time over the same frequency spectrum. These parallel transmissions improve RF efficiency when client devices also support 11ac Wave 2.

Cisco Aironet 2800 and 3800 Series support 4 x 4 SU-MIMO or MU-MIMO with three spatial streams, and up to 160GHz channels in 5GHz.

■ Link Aggregation and NBASE-T

Many switches support links up to 1 Gbps throughput. However, with newer 11ac Wave 2 access points, the potential exists that the access point traffic could exceed 1 Gbps. It is not likely to occur until MU-MIMO and 4 spatial stream 11 ac Wave 2 clients become more commonplace, but, to address this potential issue, Cisco have implemented Link Aggregation into the Cisco Aironet 1850, 2800 and 3800 Series. Link Aggregation is the only method to gain higher throughput on acccess point that does not support multi-gigabit technologies such as NBASE-T which is supported on the Aironet 3800 Series Access Points, with auto-negociation of 100/1G/2.5G/5G and 10Gigabits Ethernet based on the quality and length of the Ethernet cable used between the switch and the AP.

■ SU-MIMO
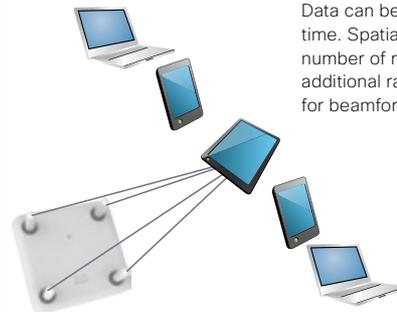
Data can be directed to one client at a time. Spatial streams are limited to the number of receivers on the client. Any additional radios on the AP are used for beamforming.

■ MU-MIMO
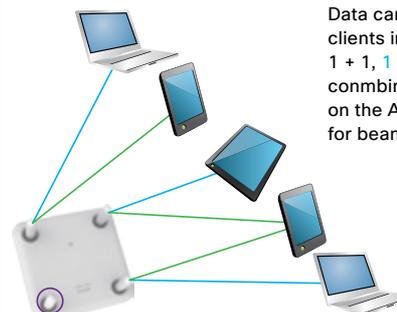
Data can be directed to different clients in concurrent streams in a 1 + 1, 1 + 1 + 1, or 1 + 2 stream conmbinations. Additional radio on the AP (Tx antenna) is used for beamforming.

Cisco Mobility Express Solution

The Cisco Mobility Express Solution is specifically designed to help small and medium-sized networks easily and cost-effectively deliver enterprise-class wireless access to employees and customers.
Cisco Mobility Express Solution is an on-premise, managed Wi-Fi solution that:

● Provides an easy, over-the-air interface for deployment in under **10 minutes**
● Is ideal for small and medium-sized deployments of up to **25 access points** and **500 clients**
● Is supported on Cisco Aironet 3800/2800/1850/1830 Series
● Can control other access points, such as Cisco Aironet 1700/2700/3700 Series

In the Cisco Mobility Express Solution, one access point (AP), running the Cisco Mobility Express wireless controller, is designated as the master AP. Other access points, referred to as subordinate APs, associate to this master AP. The master AP operates as a wireless controller, to manage and control the subordinate APs, and also operates as an access point to serve clients. The subordinate APs behave as normal lightweight access points to serve clients.

3-step over-the-air wireless network configuration

Master AP operates as a wireless controller

Subordinate APs behave as normal lightweight APs

Aironet 1850/1830

Aironet 1700/2700/3700 and so on

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services
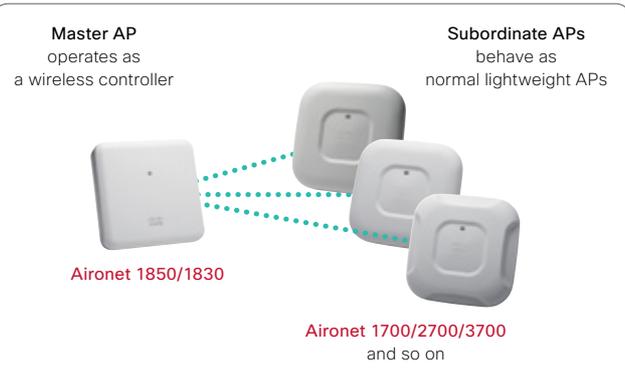
Why Cisco?

Robust Stability

Cisco was one of the first corporations to foresee that wireless LAN would eventually either replace wired LAN or occupy the same position as wired LAN. In order for this transition to occur, high-speed communication was one of the primary requirements for wireless LAN. Cisco Wireless products are the best acheiving products on the market, with IEEE 802.11ac PHY rates of 2.6 Gbps. However, high-speed communication alone is not enough to promote the use of wireless LAN in business. In addition to providing a high level of reliability without security risks such as information leakage and data theft, it is critical that wireless LAN has the required stability to ensure that user convenience is not compromised by factors such as impaired or broken communications. Cisco has developed a wide array of technologies and solutions to address such needs. Cisco's wireless products provide unparalleled stability based on over 15+ years of development achievements.

- Stability is pursued from the hardware design phase, including the use of custom chips.
- Radio interference is avoided intelligently based on reliable information related to the "type", "location", "impact range" and "degree of impact" of the source of interference.
- Automatic calibration is performed in areas where service is unavailable. In the unlikely event of failure of a wireless access point, a neighboring wireless access point takes its place automatically.
- Performance and stability of conventional IEEE 802.11a/g/n clients are enhanced as well, not just the IEEE 802.11ac clients.
- Dual-band compatible clients are automatically guided to a clean, interference-free 5 GHz band.
- Cisco verifies the compatibility with a wide array of vendors through the Wi-Fi Alliance certification as well as proprietary certification programs.

## Unparalleled Level of Visualization

Radio waves are invisible, and this fact can often cause a nightmare for wireless LAN network administrators. Potential problems related to the radio environment may include " The communication speed is slowing down without any known cause", " Some kind of interference is occurring but its level of impact is unknown", etc. Visualization of wireless LAN is therefore one of the important trends today. Cisco's wireless access points incorporate a dedicated custom chip which functions as a measuring instrument and/or analyzer for the radio wave environment. Unlike the software-based data used in competitors' products, Cisco visualizes the radio wave intensity and type, location, impact range and degree of impact of the interference source in great precision and detail, based on highly accurate hardware-based data. The quality of the radio wave can also be visualized using this data. Visualization also includes identification of protocols and applications in the wireless LAN, making it " completely transparent" and significantly enhancing the network manageability.

■ Quantifying and Graphically Visualizing the Radio Wave Quality (AQ) in a Floor Map
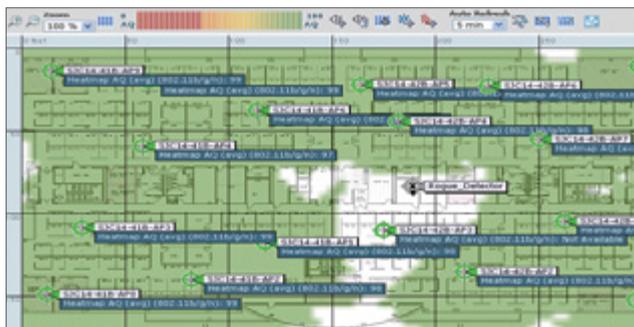
Cisco ClientLink 4.0

In a mixed environment with low-speed clients (e.g. IEEE 802.11a/g clients) and high-speed clients (e.g. IEEE 802.11n/ac clients), the communication performance of the entire wireless LAN network will be dragged down by the slower clients. The Cisco ClientLink technology implemented on Cisco Aironet Access Points uses the signal processing expansion function, which is embedded in the chipset, to analyze the uplink communication signals from the client and strengthen/optimize the downlink communication signals to enhance the communication performance of low-speed clients. Cisco ClientLink 4.0 implemented on the Cisco Aironet 2800/3800 Series use the fourth antenna of the access points to also enhance the communication performance of IEEE 802.11n-compatible clients supporting up to three data streams, including the iPhone, iPad and latest laptops, as well as 802.11ac Wave 1 and Wave 2. The communication performance of all IEEE 802.11 compatible clients is enhanced without implementing special hardware or software on the client side.
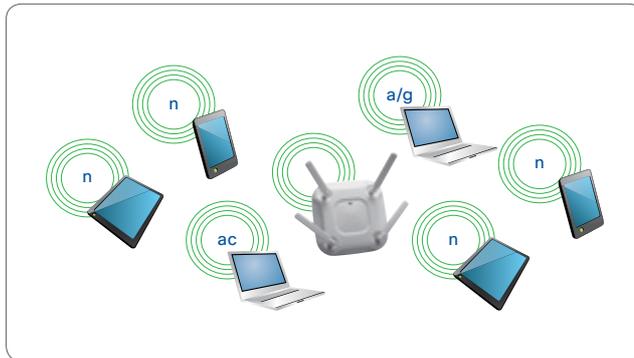
Cisco CleanAir

Cisco CleanAir is an innovative technology for the Controller-based Wireless Solution that enables construction of self-recovering, self-optimizing wireless LAN environments.

In conventional technologies, the network administrators were required to move around carrying a sensor-equipped laptop in order to identify the source of radio interference. In Cisco CleanAir, Cisco Aironet Access Points with built-in ASIC (a dedicated custom chip) serve the roles of a measuring instrument and an analyzer for the wireless environment; and the data obtained from the Cisco Aironet Access Points are presented in a visualized manner. This enables network administrators to identify the cause of a problem and fix it promptly and efficiently. This technology also offers the wireless resource

management function which alleviates problems by automatically optimizing the frequency band after detecting a radio interference.

Cisco CleanAir can be implemented for the following products:

- Cisco Aironet 1570/1700/2700/3700/2800/3800: Collects data by detecting and categorizing the radio interference in wireless LAN network.[*1]
- Cisco Wireless Controller: Analyzes the collected data to identify the cause and dynamically optimizes the entire wireless LAN network.
- Cisco Mobility Service Engine (MSE): Tracks wireless LAN devices and collects the location information and the radio interference range.
- Cisco Prime Infrastructure: Visualizes the entire wireless LAN environment.

*1 Cisco Aironet 1700 support Cisco CleanAir Express in AireOS 8.0 or later. Aironet 1570/2700/3700 Series support the 80 MHz channel bandwidth of IEEE 802.11ac. 2800/3800 up to 160MHz.

# Cisco Connected Mobile Experiences (CMX) Solutions

Cisco Connected Mobile Experiences (CMX) is a revolutionary solution that collects and analyzes the location of wireless LAN (Wi-Fi) devices such as smartphones and tablets for business utilization. This solution supports the monetization of wireless LAN in a wide range of sectors including retail, services, transportation, healthcare, education, and government offices. This solution already has an excellent deployment track record overseas. Cisco CMX provides the services described below.

■ Location Analysis

This function anonymously detects and traces Wi-Fi device signals to obtain, aggregate and visualize the number of Wi-Fi users and their movement for analysis.

In the Copenhagen Airport case study, for example, this function enabled analysis of the general movement route and staying area/time of travelers (i.e. Wi-Fi users) during their departure and arrival, enabling better understanding of their different behavior patterns. This has enabled optimization of personnel allocation based on crowding and adjustment of the facility layout for improved customer convenience, helping to deliver services that guarantee high levels of customer satisfaction in a cost-effective manner. This function has also facilitated effective attraction of customers through optimization of the advertisement layout, contributing to bursting the earnings of duty free shops and tenant stores.

■ Offering a Variety of Analysis Methods including Traffic Line Information and Residence Time
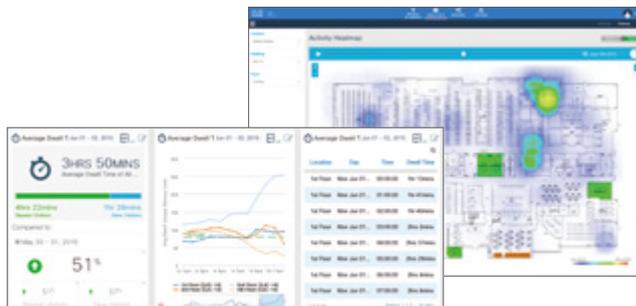
■ Customer Engagement

The ability to capture new and keep existing customers by delivering more value is essential to continued growth in all industries. Cisco CMX allows customers mobile users to connect through your onsite wireless LAN. It opens a direct channel of communication that lets you better understand and deliver what your guests want. When you more effectively engage your mobile users, you can:

- Increase loyalty of existing customers and attract new customers by providing them with a personalized experience
- Heighten the guest experience by providing wireless access and key information during their journey
- Increase brand exposure through social media check-in and feed streaming
- Increase visitor satisfaction by helping them make decisions more aligned with their needs

■ Venue Efficiency

By helping you better understand how your visitors actually behave while at your site, Cisco CMX helps you make the best use of your floor plan. With this improved insight, you can:

- Determine the most trafficked locations to position advertisements, products or services
- Adjust venue layout to optimize traffic flow in periods of high use
- Staff service locations to accommodate visitor flows and time of day
- Evaluate impact of floor plan adjustments

For your customers and your business, the Cisco CMX solution can deliver the right information at the right time.

■ Cisco CMX for Facebook Wi-Fi

Cisco has also begun a new Cisco CMX service called Cisco CMX for Facebook Wi-Fi in collaboration with Facebook. In hotels and shops that are deploying this service, Wi-Fi users can use free wireless LAN by checking in with the facility using the facility's wireless network. This solution not only improves user convenience but also offers a variety of business benefits including better customer recognition thanks to the increased number of check-ins and marketing based on the customer information collected anonymously by Facebook.

■ Cisco CMX Cloud NEW

Cisco CMX Cloud revolutionizes the delivery of wireless guest access and in-venue analytics, integrating seamlessly with Cisco wireless infrastructure. This cloud-delivered Software-as-a-Service (SaaS) offering is quick to deploy and intuitive to use. The affordable subscription-billing model helps reduce initial investments in equipment (capital expenditures [CapEx]) and IT resources. Ultimately, this solution accelerates how wireless infrastructure can deliver business outcomes by:

- Detecting all Wi-Fi devices in the venue and providing analytics on their presence, including dwell times, new vs. repeat visitors, and peak times
- Providing an easy-to-use guest-access solution for visitors through a custom portal using various authentication methods including social, self-registration, and Short Message Service (SMS)
- Engaging visitors directly on the guest portal page or mobile app with location-based content

■ Cisco Connected Mobile Experiences Cloud

SKU	Description	SKU	Description
AIR-CMX-SVC-CX*1	CMX Cloud Connect.	AIR-CMX-SVC-CPAX*1	CMX Cloud Connect with Presence Analytics.

CMX On-Premises
Best for Advanced Use Cases and Better Control

Detect
Connect
Engage
Analytics

CMX Cloud
Best for Ease of Deployment and Consumption

Different Deployment Options, Same Software

*1 AIR-CMX-CLOUD is required.

Wireless Product Line

Cisco Aironet Access Points

■ Indoor Access Points

All indoor models of the Cisco Aironet Access Points are compatible with the IEEE 802.11 standards including IEEE 802.11a/b/g/n and the latest standard IEEE 802.11ac which provides throughput up to 2.6 Gbps (some models are 802.11ac Wave2 compatible). A wide lineup of models are available including: (1) Lightweight compact models featuring a streamlined body with built-in antenna and integrated LAN/power cable using PoE (Power over Ethernet) for stylish installation without spoiling the aesthetics of the office; (2) Heavy-duty models with a wide selection of external antennas and featuring a rigid metal chassis to support a wide range of operating temperatures for use in factories, warehouses and stores where environmental requirements are strict; and (3) High-performance models for telecommuters and satellite offices offering the same level of security and network services as the headquarters office.

■ Outdoor Access Points

The outdoor models of the Cisco Aironet Access Points deliver high-speed and stable wireless LAN environments in various locations such as in a massive city-size area, inside a company building, a factory ground, or a mining field. Featuring a chassis with IEC IP67 waterproof and NEMA Type 4X certified outdoor dust/rust resistance, a wide lineup of outdoor models is available to meet the diversifying customer needs in the harshest of environments. Available models include the lightweight compact model with a polished exterior design that blends into the surrounding environment, the PoE power supplying model capable of powering surveillance cameras, and the model with built-in cable modem for utilizing the existing cable network.

Cisco Wireless Controller

Cisco Wireless Controller is a platform that enables centralized management of multiple Cisco Aironet Access Points including remote bases. This platform automates the configuration management required for deploying/adding Cisco Aironet Access Points to reduce the workload of the network administrator, as well as provide the control functions needed to establish a stable wireless LAN environment. The control functions include load balancing of Cisco Aironet Access Points and prompt and dynamic response to changes in the wireless environment.

Mobility Services

Cisco Mobility Engine (MSE) delivers a wide range of mobility services such as collecting the location of mobile devices, the presence of devices, and help easily create portals for customized Guest Access that looks professional. You can opt for CMX (Customer Mobile Experiences) on the MSE or from the Cloud for Presence Analytics and Guest as a Service.

MSE also supports the Adaptive Wireless Detection Protection System (aWIPS) to analyze over-the-air attacks on your wireless network.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco Aironet Access Points

4 Tx / 4 Rx Antennas			Cisco Aironet 3700 Series `11ac`		Cisco Aironet 1850 Series*3 `11ac`	Cisco Aironet 2800 Series `11ac`	Cisco Aironet 3800 Series `11ac`
3 Tx / 4 Rx Antennas			Cisco Aironet 2700 Series `11ac`				
3 Tx / 3 Rx Antennas		Cisco Aironet 1700 Series `11ac`		Cisco Aironet 1830 Series*2 `11ac`			
2 Tx / 2 Rx Antennas	Cisco Aironet 700 Series	Cisco Aironet 700 W Series					
	2 streams	2 streams	3 streams	2 streams	3 streams		
	11n, SU-MIMO	**11ac Wave 1, SU-MIMO**		**11ac Wave 2, MU-MIMO**			

■ Cisco Aironet Indoor Access Points

All models of Cisco Aironet Indoor Access Points are compatible with the IEEE 802.11n standard; and some models are also compatible with IEEE 802.11ac delivering high-speed and stable wireless LAN environments with a theoretical maximum throughput of between 300 Mbps and 2.6 Gbps. A broad selection of models is available for various installation environments and network requirements.

- Built-in antenna model: These models feature a streamlined body and an integrated LAN/power cable using PoE (Power over Ethernet) for stylish installation without spoiling the aesthetics of the office.
- External antenna model: These models feature a rigid metal chassis and support a wide range of operating temperatures for use in factories, warehouses and stores where environmental requirements are very strict. A wide selection of antennas are available for these models to suit different installation environments (Refer to page 39-40 for details on the Cisco Aironet Antennas).

There are two types of models for Cisco Aironet Indoor Access Points: Standalone and Controller-based models. The Controller-based models are designed to operate in linkage with the Cisco Wireless Controller.

■ Highlights

- IEEE 802.11n-compatible (All models)
- IEEE 802.11ac Wave 1 (Cisco Aironet 1700/2700/3700 Series)
- IEEE 802.11ac Wave 2 (Cisco Aironet 1830/1850/2800/3800 Series)
- Supports 2.4 GHz/5 GHz dual-band (All models)
- Supports Cisco CleanAir Express (Controller-based models of the Cisco Aironet 1700 Series)
- Supports Cisco CleanAir (Controller-based models of Cisco Aironet 2x00/3x00 Series, refer to page 33 for details on the technology)
- Supports Cisco OfficeExtend (Controller-based models, excluding some models)
- Supports Cisco ClientLink (excluding some models, refer to page 33 for details on the technology)
- Supports Cisco BandSelect (Controller-based models, excluding some models)

For details on Cisco Aironet Indoor Access Points, visit the following Web site:

🌐 www.cisco.com/go/ap

*1 2 Tx / 3 Rx Antennas. *2 2.4 GHz: 3 Tx / 3 Rx Antennas with 2 streams SU-MIMO. 5 GHz: 3 Tx / 3 Rx Antennas with 2 streams SU-MIMO or 2 streams MU-MIMO.
*3 2.4 GHz: 3 Tx / 4 Rx Antennas with 3 streams SU-MIMO. 5 GHz: 4 Tx / 4 Rx Antennas with 3/4 streams SU-MIMO or 3 streams MU-MIMO.

IEEE 802.11ac

IEEE 802.11ac is the successor of IEEE 802.11n, which is the current mainstream wireless standard. It outperforms typical 1 GE wired LAN with a maximum theoritical throughput of 6.9 Gbps, compared against the theoretical maximum throughput of 600 Mbps of 11n. 11ac achieves higher communication speeds by strengthening the following three elements:

- Higher density modulation method: Increased from 64QAM to 256QAM (11n)
- Expansion of channel bonding: Increased from 40 MHz max. (11n) to 80 MHz max. (11ac Wave 1) or up to 160 MHz (11ac Wave 2, AP2800/3800)
- Further evolved MIMO (Multiple Input Multiple Output): Increased the maximum number of data streams in 11n from 4 to 8 and upgraded the simultaneous communication capability from 1:1 to 1:n (Multi-User MIMO)

Among Ciscos' wireless access points, the Cisco Aironet 1800/2800/3800 Series are 802.11ac Wave 2 access points, while the Cisco Aironet 1570/2700/3700 Series are 802.11ac Wave 1.

Not all 11ac-compatible access points are created equal. Cisco has added Cisco High Density Experience (HDX) technology to the Cisco Aironet 1570/2700/3700/2800/3800 Series to handle the increased performance and density expected in these networks. Cisco HDX provides performance tuning,

RF interference mitigation, spectrum monitoring, and roaming optimization for high client density networks.

■ IEEE 802.11n/ac Specification Comparison

Standard/Number of Data Streams		Theoretical Maximum Throughput			
		20 MHz	40 MHz	80 MHz	160 MHz
IEEE 802.11n	1 stream	72 Mbps	150 Mbps	–	–
	2 streams	**144 Mbps**	300 Mbps	–	–
	3 streams	**216 Mbps**	**450 Mbps**	–	–
	4 streams	288 Mbps	**600 Mbps**	–	–
IEEE 802.11ac	1 stream	–	200 Mbps	433 Mbps	866 Mbps
	2 streams	–	400 Mbps	**866 Mbps**	1733 Mbps
	3 streams	–	600 Mbps	1299 Mbps	**2600 Mbps**
	4 streams	–	800 Mbps	**1733 Mbps**	3466 Mbps
	5 streams	–	1000 Mbps	2166 Mbps	4333 Mbps
	6 streams	–	1200 Mbps	2599 Mbps	5200 Mbps
	7 streams	–	1400 Mbps	3033 Mbps	6066 Mbps
	8 streams	–	1600 Mbps	3466 Mbps	6933 Mbps

What is Meant by a "x" Included in the SKU

Correspondence table of symbols and countries of the "x" that is included in the SKU is as follows.

■ Standalone Access Points*1

Country	EU*	Egypt	Ghana	Iceland	Iraq	Israel	Kazakhstan	Kenya	Lebanon	Morocco	Nigeria	Russia	Saudi Arabia	South Africa	Switzerland	Tunisia	Turkey	Ukraine	U.A.E
x	E	I	E	E	E	I	E	E	E	I	E	R	E	E	E	E	E	E	E

■ Controller-based Indoor Access Points*1

Country	EU*	Egypt	Ghana	Iceland	Iraq	Israel	Kazakhstan	Kenya	Lebanon	Morocco	Nigeria	Russia	Saudi Arabia	South Africa	Switzerland	Tunisia	Turkey	Ukraine	U.A.E
x	E	I	E	E	E	I	E	E	E	I	E	R	E	E	E	E	E	E	E

■ Controller-based Outdoor Access Points*1

Country	EU*	Egypt	Ghana	Iceland	Iraq	Israel	Kazakhstan	Kenya	Lebanon	Morocco	Nigeria	Russia	Saudi Arabia	South Africa	Switzerland	Tunisia	Turkey	Ukraine	U.A.E
x	E	C	E	E	M	I	E	E	E	I	E	R	M	E	E	E	E	E	C, M

■ Controller-based Universal Access Points*1

Country	EU*	Egypt	Ghana	Iceland	Iraq	Israel	Kazakhstan	Kenya	Lebanon	Morocco	Nigeria	Russia	Saudi Arabia	South Africa	Switzerland	Tunisia	Turkey	Ukraine	U.A.E
x	UX	UX	UX	UX	UX	–	–	UX	UX	UX	UX	–	UX	UX	UX	UX	UX	UX	UX

Customers are responsible for verifying approval for use in their individual countries. To verify approval that corresponds to a particular country, see http://www.cisco.com/go/aironet/compliance. *The EU countries are: Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK

*1 Not all models available for all regulatory domains. Not all regulatory domains have been approved. As they are approved, the SKU will be available on the Global Price List.

■ Cisco Aironet 2800/3800 Series 〈NEW〉

SKU	ME Master	Controller based	Clean Air	Office Extend	Clientlink 4.0	Band Select	IEEE 802 11n	IEEE 802 11ac W2	2.4 GHz	5 GHz / Dual 5GHz	GE ports	PoE+ (PD)	Antenna
AIR-AP2802I-x-K9C	●*7	●	●	–	●	●	●	●	●	● / ●	2	Required	Built-in
AIR-AP3802I-x-K9C	●*7	●	●	–	●	●	●	●	●	● / ●	2*1	● or DC	Built-in
AIR-AP2802E-x-K9C	●*7	●	●	–	●	●	●	●	●	● / ●	2	Required	External
AIR-AP3802E-x-KC	●*7	●	●	–	●	●	●	●	●	● / ●	2*1	● or DC	External

■ Cisco Aironet 700 Series

SKU	Stand alone	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802 11n	IEEE 802 11ac	2.4 GHz	5 GHz	GE ports	PoE (PD)	Antenna
AIR-CAP702W-x-K9	–*3	●	–	–	–	●	●	–	●	●	4*4	●*2	Built-in
AIR-CAP702I-x-K9	–	●	–	–	–	●	●	–	●	●	1	●*2	Built-in

■ Cisco Aironet 1700 Series

SKU	Stand alone	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802 11n	IEEE 802 11ac	2.4 GHz	5 GHz	GE ports	PoE (PD)	Antenna
AIR-CAP1702I-x-K9	–*3	●	●*5	●	–	●	●	●	●	●	2*6	●*2	Built-in

■ Cisco Aironet 1830 Series

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802 11n	IEEE 802 11ac W2	2.4 GHz	5 GHz	GE ports	PoE (PD)	Antenna
AIR-AP1832I-x-K9C	●*7	–	–	–	–	●	●	●	●	●	1	●*2 *8	Built-in
AIR-AP1832I-UXK9C	●*7	–	–	–	–	●	●	●	●	●	1	●*2 *8	Built-in
AIR-AP1832I-x-K9	–	●	–	–	–	●	●	●	●	●	1	●*2 *8	Built-in
AIR-AP1832I-UXK9	–	●	–	–	–	●	●	●	●	●	1	●*2 *8	Built-in

■ Cisco Aironet 1850 Series

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802 11n	IEEE 802 11ac W2	2.4 GHz	5 GHz	GE ports	PoE (PD)	Antenna
AIR-AP1852I-x-K9C	●*7	–	–	–	–	●	●	●	●	●	2*6	●*2 *9	Built-in
AIR-AP1852E-x-K9C	●*7	–	–	–	–	●	●	●	●	●	2*6	●*2 *9	External
AIR-AP1852I-UXK9C	●*7	–	–	–	–	●	●	●	●	●	2*6	●*2 *9	Built-in
AIR-AP1852E-UXK9C	●*7	–	–	–	–	●	●	●	●	●	2*6	●*2 *9	External
AIR-AP1852I-x-K9	–	●	–	–	–	●	●	●	●	●	2*6	●*2 *9	Built-in
AIR-AP1852E-x-K9	–	●	–	–	–	●	●	●	●	●	2*6	●*2 *9	External
AIR-AP1852I-UXK9	–	●	–	–	–	●	●	●	●	●	2*6	●*2 *9	Built-in
AIR-AP1852E-UXK9	–	●	–	–	–	●	●	●	●	●	2*6	●*2 *9	External

■ Cisco Aironet 2700 Series

SKU	Stand alone	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802 11n	IEEE 802 11ac	2.4 GHz	5 GHz	GE ports	PoE (PD)	Antenna
AIR-CAP2702I-x-K9	–*3	●	●	●	●	●	●	●	●	●	2*6	●*2 *10	Built-in
AIR-CAP2702E-x-K9	–*3	●	●	●	●	●	●	●	●	●	2*6	●*2 *10	External

■ Cisco Aironet 3700 Series

SKU	Stand alone	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802 11n	IEEE 802 11ac	2.4 GHz	5 GHz	GE ports	PoE (PD)	Antenna
AIR-CAP3702I-x-K9	–*3	●	●	●	●	●	●	●	●	●	1	●*2 *10	Built-in
AIR-CAP3702E-x-K9	–*3	●	●	●	●	●	●	●	●	●	1	●*2 *10	External
AIR-CAP3702P-x-K9	–*3	●	●	–	●	●	●	●	●	●	1	●*2 *10	External

■ Cisco Hyperlocation Solution for the Cisco Aironet 3700 Series

SKU	Description	SKU	Description
AIR-RM3010L-x-K9=	Hyperlocation Module with Advance Security.	AIR-ANT-LOC-01=	Hyperlocation Antenna, Model 1, Attached Omni.

*1 One NBASE-T/mGIG port included. *2 The Cisco Aironet Power Supply Option is required when not using PoE receiving (Refer to page 40 for details). *3 Migration to the standalone model is supported via software.
*4 PoE power supplying GE x 1 is included. *5 Cisco CleanAir Express is supported in Cisco AireOS 8.0 or higher. *6 AUX x 1 is included. *7 Supported in Cisco Mobility Express software.
*8 Full features are supported when powered via PoE+, AIR-PWRINJ4= or AIR-PWR-C=. (If PoE is the source of power, the USB port is disabled).
*9 Full features are supported when powered via PoE+, AIR-PWRINJ4= or AIR-PWR-C=.
　(If PoE is the source of power, the Cisco Aironet 1852E 2.4-GHz radio will shift to 2 x 3 from 3 x 4, and the AUX and USB port are disabled).
*10 Full features are supported when powered via PoE+, AIR-PWRINJ4= or AIR-PWR-B=.
　(If PoE is the source of power, the Cisco Aironet 2702 2.4/5-GHz radios will shift to 3 x 3 from 3 x 4, the Cisco Aironet 3702 2.4/5-GHz radios will shift to 3 x 3 from 4 x 4).

Outdoor Access Points

■ Cisco Aironet Outdoor Access Points

The Cisco Aironet Outdoor Access Points deliver high-speed and stable wireless LAN environments in various locations such as in a massive city-size area, inside a company building, a factory ground, or a mining field.

Featuring a chassis with IEC IP67 waterproof and NEMA Type 4X certified outdoor dust/rust resistance, a wide lineup of outdoor models is available to meet the diversifying customer needs in the harshest of environments.

● Built-in antenna models: Cisco Aironet 1532I and Cisco Aironet 1572IC4 have a polished exterior design that blends into the surrounding environment.

● External antenna models: A wide selection of antennas are available for Cisco Aironet 1532E and Cisco Aironet 1572EAC/EC to suit different installation environments (Refer to page 47-48 for details on the Cisco Aironet antennas).

● Built-in cable modem models: Cisco Aironet 1572IC incorporate a cable modem that is compatible with DOCSIS 3.0, an international standard for communication services via coaxial cables used for cable television, etc.

■ Highlights

● IEC IP67 waterproof (All models)

● NEMA Type 4X certified outdoor dust/rust resistance (Cisco Aironet 1570 Series)

● Designed for hazardous environments, certified Class 1 Div2/Zone2 enclosure from third-party vendors (for all models). Or directly use Aironet 1552H

● Supports GPS (Cisco Aironet 1570 Series) [1]

● IEEE 802.11n compatible (All models)

● IEEE 802.11ac compatible (Cisco Aironet 1570 Series)

● Supports 2.4 GHz/5 GHz dual-band (All models)

● Supports Cisco CleanAir (Cisco Aironet 1570 Series, Refer to page 41 for details on the technology)

● Supports ClientLink (Cisco Aironet 1570 Series, Refer to page 41 for details on the technology)

● Supports Cisco BandSelect (All models)

● Supports Cisco High Density Experience (HDX) (Cisco Aironet 1570 Series)

Cisco Aironet 1532I

Cisco Aironet 1532E

Cisco Aironet 1572EAC/EC

Cisco Aironet 1572IC

Model Name	Dimensions (Height x Width x Depth)	Maximum Weight
Cisco Aironet 1532I	10.16 x 17.78 x 22.86 cm	2.27 kg
Cisco Aironet 1532E	10.16 x 17.78 x 25.40 cm	2.49 kg
Cisco Aironet 1572IC	29.97 x 20.07 x 20.07 cm	5.22 kg
Cisco Aironet 1572EAC	29.97 x 20.07 x 16.00 cm	6.12 kg
Cisco Aironet 1572EC	29.97 x 20.07 x 16.00 cm	6.12 kg

■ Cisco Aironet 1530 Series

SKU	Clean Air	ClientLink 2.0	ClientLink 3.0	Band Select	Ports GE	Ports SFP	Ports Cable	AC	DC	PoE (PSE)	PoE (PD)	UPOE (PD)	PoC (PD)	Built-in Dual-band	External Dual-band	External Single-band
AIR-CAP1532I-x-K9	–	–	–	●	2	–	–	–	●	–	–	●[4]	–	3[2]	–	–
AIR-CAP1532E-x-K9	–	–	–	●	2	–	–	–	●	–	●[4]	–	–	–	2	2 + 2

■ Cisco Aironet 1570 Series

SKU	Clean Air	ClientLink 2.0	ClientLink 3.0	Band Select	Ports GE	Ports SFP	Ports Cable	AC	DC	PoE (PSE)	PoE (PD)	UPOE (PD)	PoC (PD)	Built-in Dual-band	External Dual-band	External Single-band
AIR-AP1572ICn-x-K9[3]	●	–	●	●	2	1	1	–	●	–	–	–	●	4	–	–
AIR-AP1572EAC-x-K9	●	–	●	●	2	1	–	●	●	●[4]	–	●	–	–	4	2 + 2
AIR-AP1572ECn-x-K9[3]	●	–	●	●	2	1	1	–	●	–	–	–	●	–	4	2 + 2

*1 GPS Antenna (AIR-ANT-GPS-1) is required. *2 2.4 GHz: 3 Tx / 3 Rx Antennas with 3 streams. 5 GHz: 2 Tx / 3 Rx Antennas with 2 streams.
*3 If "n" is "1", Diplex Filter split of: 5-42/88-1000 MHz. If "n" is "2", Diplex Filter split of: 5-85/108-1002 MHz. If "n" is "3", Diplex Filter split of: 5-65/108-1002 MHz. *4 PoE+ power supply is supported.

Wireless

Cisco Aironet Antennas and Accessories

■ Cisco Aironet 2.4 GHz Omni-directional Antenna

SKU	Installation/Dimensions	Gain (dBi)
AIR-ANT2420V-N	12.70 x 2.54 cm	2.0
AIR-ANT2450V-N	27.94 x 2.54 cm	5.0
AIR-ANT2455V-N	31.75 x 2.54 cm	5.5
AIR-ANT2480V-N	49.53 x 2.22 cm	8.0

■ Cisco Aironet 2.4 GHz Directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
AIR-ANT2413P2M-N	Patch 19.81 x 19.81 x 3.05 cm 0.61 kg	13.0

■ Cisco Aironet Dual-band Omni-directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
AIR-ANT2524V4C-R	Ceiling mount 18.42 x 18.42 x 2.54 cm 0.59 kg	2.0 (2.4 GHz) 4.0 (5 GHz)
AIR-ANT2544V4M-R	Wall mount 55.37 x 16.00 cm 0.67 kg	4.0 (2.4 GHz) 4.0 (5 GHz)
AIR-ANT2547V-N	28.19 x 3.18 cm 170 g	4.0 (2.4 GHz) 7.0 (5 GHz)
AIR-ANT2547VG-N	28.19 x 3.18 cm 170 g	4.0 (2.4 GHz) 7.0 (5 GHz)
AIR-ANT2568VG-N	37.59 x 3.81 cm 204 g	6.0 (2.4 GHz) 8.0 (5 GHz)

■ Cisco Aironet 5 GHz Omni-directional Antenna

SKU	Installation/Dimensions	Gain (dBi)
AIR-ANT5140V-N	12.70 x 2.54 cm	4.0
AIR-ANT5175V-N	29.59 x 2.54 cm	7.5
AIR-ANT5180V-N	27.94 x 2.54 cm	8.0

■ Cisco Aironet 5 GHz Directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
AIR-ANT5114P2M-N	Patch 19.81 x 19.81 x 3.05 cm 0.61 kg	14.0

■ Cisco Aironet Dual-band Dipole Antenna

SKU	Color/Dimensions/Weight	Gain (dBi)
AIR-ANT2524DB-R	Black 16.84 x 2.11 cm 36.85 g	2.0 (2.4 GHz) 4.0 (5 GHz)
AIR-ANT2524DG-R	Grey 16.84 x 2.11 cm 36.85 g	2.0 (2.4 GHz) 4.0 (5 GHz)
AIR-ANT2524DW-R	White 16.84 x 2.11 cm 36.85 g	2.0 (2.4 GHz) 4.0 (5 GHz)
AIR-ANT2535SDW-R	White 8.38 x 3.18 cm 48.19 g	3.0 (2.4 GHz) 5.0 (5 GHz)

■ Cisco Aironet Dual-band Directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
AIR-ANT2566P4W-R	Patch 16.00 x 27.94 x 3.05 cm 0.64 kg	6.0 (2.4 GHz) 6.0 (5 GHz)
AIR-ANT2566D4M-R	Patch 25.40 x 25.40 x 4.09 cm 1.36 kg	6.0 (2.4 GHz) 6.0 (5 GHz)
AIR-ANT2588P3M-N	Patch 30.48 x 17.78 x 2.79 cm 0.45 kg	8.0 (2.4 GHz) 8.0 (5 GHz)
AIR-ANT2513P4M-N	Patch 30.48 x 17.78 x 2.79 cm 0.45 kg	13.0 (2.4 GHz) 13.0 (5 GHz)

For details on Cisco Aironet Antennas, visit the following Web site:

www.cisco.com/go/antenna

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

■ Cisco Aironet 2.4 GHz Omni-directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		1852E	2702E	3702E	3702P	1532E	1572E
	2.4 GHz	5 GHz						
AIR-ANT2420V-N	2.0	-	-	-	-	-	-	●
AIR-ANT2450V-N	5.0	-	-	-	-	-	●	●
AIR-ANT2455V-N	5.5	-	-	-	-	-	-	-
AIR-ANT2480V-N	8.0	-	-	-	-	-	●	●

■ Cisco Aironet 5 GHz Omni-directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		1852E	2702E	3702E	3702P	1532E	1572E
	2.4 GHz	5 GHz						
AIR-ANT5140V-N	-	4.0	-	-	-	-	-	●
AIR-ANT5175V-N	-	7.5	-	-	-	-	-	-
AIR-ANT5180V-N	-	8.0	-	-	-	-	●	●

■ Cisco Aironet 2.4 GHz Directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		1852E	2702E	3702E	3702P	1532E	1572E
	2.4 GHz	5 GHz						
AIR-ANT2413P2M-N	13.0	-	-	-	-	-	●	●

■ Cisco Aironet 5 GHz Directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		1852E	2702E	3702E	3702P	1532E	1572E
	2.4 GHz	5 GHz						
AIR-ANT5114P2M-N	-	14.0	-	-	-	-	●	●

■ Cisco Aironet Dual-band Di-pole Antenna Model Compatibility Comparison

SKU	Gain (dBi)		1852E	2702E	3702E	3702P	1532E	1572E
	2.4 GHz	5 GHz						
AIR-ANT2524DB-R	2.0	4.0	●	●	●	●	-	-
AIR-ANT2524DG-R	2.0	4.0	●	●	●	●	-	-
AIR-ANT2524DW-R	2.0	4.0	●	●	●	●	-	-
AIR-ANT2535SDW-R	3.0	5.0	●	●	●	●	-	-

■ Cisco Aironet Dual-band Omni-directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		1852E	2702E	3702E	3702P	1532E	1572E
	2.4 GHz	5 GHz						
AIR-ANT2524V4C-R	2.0	4.0	●	●	●	●	-	-
AIR-ANT2544V4M-R	4.0	4.0	●	●	●	●	-	-
AIR-ANT2547V-N	4.0	7.0	-	-	-	-	-	●
AIR-ANT2547VG-N	4.0	7.0	-	-	-	-	●	●
AIR-ANT2568VG-N	6.0	8.0	-	-	-	-	-	●

■ Cisco Aironet Dual-band Directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		1852E	2702E	3702E	3702P	1532E	1572E
	2.4 GHz	5 GHz						
AIR-ANT2566P4W-R	6.0	6.0	●	●	●	●	-	-
AIR-ANT2566D4M-R	6.0	6.0	●	●	●	●	-	-
AIR-ANT2588P3M-N	8.0	8.0	-	-	-	-	●	●
AIR-ANT2513P4M-N	13.0	13.0	-	-	-	●	-	●

■ Cisco Aironet Power Supply Options

SKU	Description	Compatible Models								
		700	700W	1830	1850	1700	2700	3700	1530	1570
AIR-PWRINJ4=	Power Injector	●	●	●	●	●	●	●	-	-
AIR-PWRINJ5=	Power Injector	●	●	●*1	●*2	●	●*3	-	-	-
AIR-PWRINJ-30=	Power Injector	-	-	-	-	-	-	-	●	-
AIR-PWRINJ1500-2=	Power Injector	-	-	-	-	-	-	-	●	●*4
AIR-PWR-B=	Power Supply Module	●	-	-	-	●	●	●	-	-
AIR-PWR-C=	Power Supply Module	-	●	●	●	-	-	-	-	-
AIR-PWRADPT2-1530=	Power Supply Module	-	-	-	-	-	-	-	●	-

*1 Full features are supported when powered via PoE+, AIR-PWRINJ4= or AIR-PWR-C= (The AIR-PWRINJ5 supports PoE receiving only). (If PoE is the source of power, the USB port is disabled).
*2 Full features are supported when powered via PoE+, AIR-PWRINJ4= or AIR-PWR-C= (The AIR-PWRINJ5 supports PoE receiving only).
     (If PoE is the source of power, the Cisco Aironet 1852E 2.4-GHz radio will shift to 2 x 3 from 3 x 4, and the AUX and USB port are disabled).
*3 Full features are supported when powered via PoE+, AIR-PWRINJ4= or AIR-PWR-B= (The AIR-PWRINJ5 supports PoE receiving only).
     (If PoE is the source of power, the Cisco Aironet 2702 2.4/5-GHz radios will shift to 3 x 3 from 3 x 4).
*4 Cisco Aironet 1572IC4 is not supported.

Cisco Wireless Controller

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Appliance/ Virtual Machine	Cisco 2500 Series Wireless Controller	Cisco Virtual Wireless Controller	Cisco 5500 Series Wireless Controller	Cisco 8500 Series Wireless Controller
Module		Cisco Wireless Services Module 2 (WiSM2)

Number of Access Points → More

■ **Cisco Wireless Controller**

Cisco Wireless Controller is a platform that enables controller-based management of multiple Cisco Aironet Access Points including remote sites. An extensive lineup of products includes expansion modules for integrating services to the Cisco Catalyst 6500 Series, software products for VMware ESX/ESXi and Linux Kernel-based Virtual Machine (KVM), and dedicated hardware appliances. A flexible licensing system is adopted for the number of managed Cisco Aironet Access Points, making it one of the most cost-effective solutions in the industry. The required number of managed access points can be selected based on the network requirements at the time of deployment; and the number of managed access points can be expanded flexibly based on the post-deployment network requirements.

■ **Cisco 2500 Series Wireless Controller**   Dimensions (Height x Width x Depth): 4.39 x 20.32 x 17.15 cm   Maximum Weight: 1.59 kg

SKU	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
	Default	Maximum						GE	SFP	SFP +	
AIR-CT2504-5-K9	5	75	1,000	500	1 Gbps	●	●	4	–	–	–[*1]
AIR-CT2504-15-K9	15	75	1,000	500	1 Gbps	●	●	4	–	–	–[*1]
AIR-CT2504-25-K9	25	75	1,000	500	1 Gbps	●	●	4	–	–	–[*1]
AIR-CT2504-50-K9	50	75	1,000	500	1 Gbps	●	●	4	–	–	–[*1]

■ **Cisco Virtual Wireless Controller**

SKU	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
	Default	Maximum						GE	SFP	SFP +	
L-AIR-CTVM-5-K9	5	3,000	32,000	25,000	500 Mbps	●	–	–	–	–	–

■ **Cisco Wireless Services Module 2 (WiSM2)**

SKU	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
	Default	Maximum						GE	SFP	SFP +	
WS-SVC-WISM2-1-K9	100	1,000	15,000	5,000	20 Gbps	●	●	–	–	–	–
WS-SVC-WISM2-3-K9	300	1,000	15,000	5,000	20 Gbps	●	●	–	–	–	–
WS-SVC-WISM2-5-K9	500	1,000	15,000	5,000	20 Gbps	●	●	–	–	–	–
WS-SVC-WISM2-K-K9	1,000	1,000	15,000	5,000	20 Gbps	●	●	–	–	–	–

■ **Cisco 5500 Series Wireless Controller (5508/5520)**

SKU	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
	Default	Maximum						GE	SFP	SFP +	
AIR-CT5508-12-K9	12	500	7,000	5,000	8 GB/s	●	●	–	8	–	1 RU
AIR-CT5508-25-K9	25	500	7,000	5,000	8 GB/s	●	●	–	8	–	1 RU
AIR-CT5508-50-K9	50	500	7,000	5,000	8 GB/s	●	●	–	8	–	1 RU
AIR-CT5520-K9	0	1,500	20,000	25,000	20 Gbps	●	●	–	–	2[*2]	1 RU
AIR-CT5520-50-K9	50	1,500	20,000	25,000	20 Gbps	●	●	–	–	2[*2]	1 RU

■ **Cisco 8500 Series Wireless Controller (8510/8540)**

SKU	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
	Default	Maximum						GE	SFP	SFP +	
AIR-CT8510-300-K9	300	6,000	64,000	50,000	10 Gbps	●	●	–	–	2	1 RU
AIR-CT8510-500-K9	500	6,000	64,000	50,000	10 Gbps	●	●	–	–	2	1 RU
AIR-CT8510-1K-K9	1,000	6,000	64,000	50,000	10 Gbps	●	●	–	–	2	1 RU
AIR-CT8510-3K-K9	3,000	6,000	64,000	50,000	10 Gbps	●	●	–	–	2	1 RU
AIR-CT8510-6K-K9	6,000	6,000	64,000	50,000	10 Gbps	●	●	–	–	2	1 RU
AIR-CT8540-K9	0	6,000	64,000	50,000	40 Gbps	●	●	–	–	4[*2]	2 RU
AIR-CT8540-1K-K9	1,000	6,000	64,000	50,000	40 Gbps	●	●	–	–	4[*2]	2 RU

*1 Rack Mounting Brackets (AIR-CT2504-RMNT) is required. *2 Can also use SFP-T for Gigabit Ethernet connectivity

Additional Access Point License for Cisco 2500 Series Wireless Controller[*1]

SKU	Additional	Compatible Models
L-LIC-CT2504-1A	1	2504
L-LIC-CT2504-5A	5	2504
L-LIC-CT2504-25A	25	2504

Additional Access Point License for Cisco Virtual Wireless Controller[*2]

SKU	Additional	Compatible Models
L-LIC-CTVM-1A	1	–
L-LIC-CTVM-5A	5	–
L-LIC-CTVM-25A	25	–

Additional Access Point License for Cisco Wireless Services Module 2 (WiSM2)[*3]

SKU	Additional	Compatible Models
L-LIC-WISM2-100A	100	6500/6800
L-LIC-WISM2-200A	200	6500/6800

Additional Access Point License for Cisco 5500 Series Wireless Controller[*4]

SKU	Additional	Compatible Models
L-LIC-CT5508-1A	1	5508
L-LIC-CT5508-25A	25	5508
L-LIC-CT5508-50A	50	5508
L-LIC-CT5508-100A	100	5508
L-LIC-CT5508-250A	250	5508
LIC-CT5520-1A	1	5520

Additional Access Point License for Cisco 8500 Series Wireless Controller[*5]

SKU	Additional	Compatible Models
L-LIC-CT8500-1A	1	8510
L-LIC-CT8500-100A	100	8510
L-LIC-CT8500-500A	500	8510
L-LIC-CT8500-1000A	1,000	8510
LIC-CT8540-1A	1	8540

*1 L-LIC-CT2504-UPG is required. *2 L-LIC-CTVM-UPG is required. *3 L-LIC-WISM2-UPG is required.
*4 L-LIC-CT5508-UPG or L-LIC-CT5540-UPG is required. *5 L-LIC-CT8500-UPG or L-LIC-CT8540-UPG is required.

<div style="float:left"></div>

Cisco Wireless Controller Software Options

Unlike traditional products, the Cisco Catalyst 3650/3850 Series and the Supervisor Engine 8-E for Cisco Catalyst 4500E Series incorporate the Cisco IOS XE based wireless controller software. Rich features of the Cisco IOS including Flexible NetFlow, advanced QoS and dACL (downloadable Access Control List) can be provided for wireless LAN networks as well, typically for integrated branch offices up to 50 or 100 Access Points. See page 33.

Cisco Wireless Controller Software Specification Comparison

	AireOS	IOS-XE
Resilience	Client SSO, N+1, High-availability option SKU	AP SSO, Multiple LAG, High-availability in the Stack
QoS	Alloy QoS in Software	High level of QoS (MQC) in Hardware
Security	Dynamic ACLs, SGT/SG-ACL	Dynamic and downloadable ACLs, SGT/SG-ACL
Roaming	L2 and L3 FSR, IEEE 802.11r/k/u/v/w, Neighbor List	L2 and L3 FSR, 802.11r/k/w
Service	Static Netflow, AVC, Bonjour	Flexible Netflow, AVC, Bonjour
Command Line Interface	Telnet/SSH	Cisco IOS CLI, Secure Shell, EEM/TCL/TK

Deployment Modes

Cisco's wireless solutions can be broadly classified into Standalone systems that operate Cisco Aironet Access Points individually and Controller-based systems that centrally manage multiple Cisco Aironet Access Points using a Cisco Wireless Controller. Multiple expansion modes are also supported in Controller-based systems.

Mobility Express (P30)	FlexConnect	Converged Access (P25)	Centralized
Aironet 1830/1850	WAN	3650/3850/4500E (SUP8-E)	Intranet
Small Networks	Branch	Large Branch	Campus
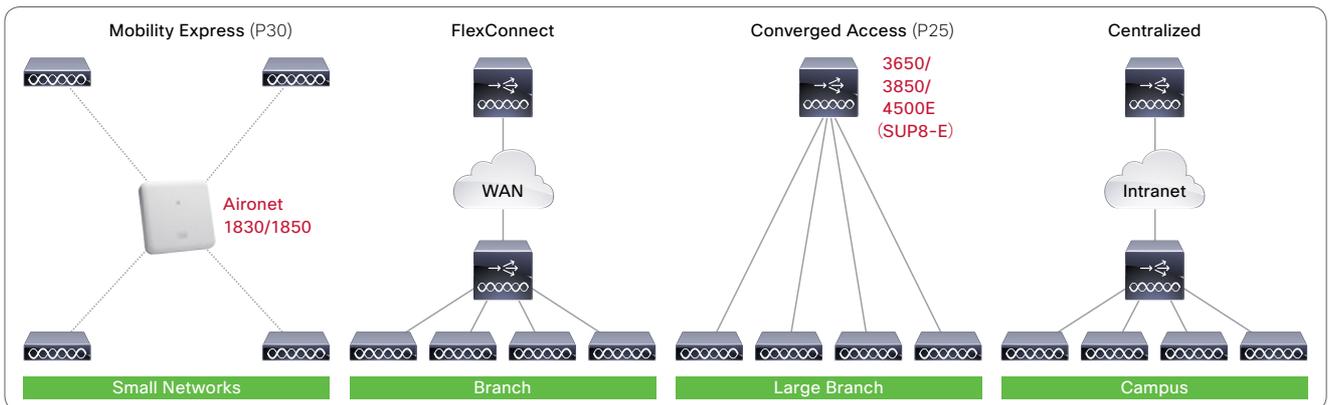
The Mesh Mode, FlexConnect + Mesh Mode, OfficeExtend Mode, Monitor Mode, Rogue Detector Mode, and Sniffer Mode are also supported.

Cisco Wireless Controller Deployment Mode Compatibility Comparison

Platform	Deployment Modes					
	Mobility Express	FlexConnect	Converged Access	Centralized	Mesh	OfficeExtend
Cisco Aironet 1830/1850 Series Access Points	●	–	–	●	–	–
Cisco 2500 Series Wireless Controller	–	●	–	●	●	●
Cisco Virtual Wireless Controller	–	●	–	–	●[*1]	–
Cisco 5500 Series Wireless Controller	–	●	–	●	●	●
Catalyst 3650/3850/Sup8E as Mobility Controller (MC)	–	–	●	–	–	–
Cisco Wireless Services Module 2 (WiSM2)	–	●	–	●	●	●
Cisco 8500 Series Wireless Controller	–	●	–	●	●	●

*1 FlexConnect + Mesh Mode required

Wireless

Mobility Services & Network Management Tools

Cisco Mobility Service Engine (MSE)

Cisco Mobility Service Engine (MSE) is a platform that provides a wide range of mobility services including Cisco CleanAir, Cisco Base Location Services, Cisco Connected Mobile Experiences (CMX), and Cisco Wireless Intrusion Prevention System (wIPS). This platform is implemented as a software product on VMware ESX/ESXi or as a hardware appliance.

■ Cisco Connected Mobile Experiences (CMX) release 10

Cisco CMX 10 is a platform that enhances the Cisco wireless LAN by:

- Calculating the location of all wireless devices in a venue, including mobile devices, tags, rogue access points, and wireless interferers.
- Generating advanced location analytics (CMX Analytics).
- Providing a visitor wireless onboarding platform (CMX Connect).
- Calculating the location of Bluetooth Low Energy (BLE) beacons.

■ Cisco Connected Mobile Experiences (CMX) release 10 License

● Cisco CMX Base License
  Provides the ability to determine the location of Wi-Fi clients, Bluetooth low energy (BLE) beacons, devices, and RFID tags, CMX Connect, third-party integration using standard REST APIs.

● Cisco CMX Advanced License
  Provides all the CMX Base services and CMX Analytics.

● Cisco wIPS Monitor Mode License
  Provides wIPS for Cisco Aironet Access Points in monitor mode (will be available in a future release).

● Cisco wIPS Enhanced Local Mode License
  Provides wIPS for Cisco Aironet Access Points in local mode (will be available in a future release).

■ Cisco Mobility Services Engine (MSE)

SKU	Description	Managed Access Points	
		Location service CMX	wIPS Monitor Mode wIPS Enhanced Local Mode
L-MSE-7.0-K9	Software product	5,000	10,000
AIR-MSE-3365-K9	Hardware appliance	5,000	10,000

■ Cisco CMX Base License

SKU		Supported Access Points
MSE 8.0[*1]	CMX 10.x[*2]	
L-LS-1AP	L-LS-1AP-N	1
L-LS-100AP	–	100
L-LS-1000AP	–	1,000

■ Cisco CMX Advanced License

SKU		Supported Access Points
MSE 8.0[*1]	CMX 10.x[*2]	
L-AD-LS-1AP	L-AD-LS-1AP-N	1
L-AD-LS-100AP	–	100
L-AD-LS-1000AP	–	1,000
L-UPG-LS-1AP	L-UPG-LS-1AP-N	1

■ Cisco wIPS Monitor Mode License

SKU		Supported Access Points
MSE 8.0[*1]	CMX 10.x[*2]	
L-WIPS-MM-1AP	TBD	1
L-WIPS-MM-100AP	TBD	100
L-WIPS-MM-1000AP	TBD	1,000

■ Cisco wIPS Enhanced Local Mode License

SKU		Supported Access Points
MSE 8.0[*1]	CMX 10.x[*2]	
L-WIPS-ELM-1AP	TBD	1
L-WIPS-ELM-100AP	TBD	100
L-WIPS-ELM-1000AP	TBD	1,000

*1 L-MSE-PAK is required. *2 L-MSE-PAK-N is required. *3 R-MGMT3X-N-K9 is required.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

43

Routers

Integrated Services Routers

Line-up of Cisco ISR

Previously, even the small-scale bases were required to install a wide range of devices including switches, wireless access points and WAN optimization appliances. Cisco Integrated Services Routers (ISR) are "super routers" that are capable of integrating the network services provided by these multiple devices into a single platform. These routers are not only capable of integrating multiple services but also have the flexibility to add new services as required via license activation and/or addition of expansion modules. Adoption of these routers results in simpler network configuration, helping to reduce the device costs as well as operation and maintenance costs.

Routing

Switching

Wireless
(Access Points/Controller)

Security
(Firewall/IPS/VPN)

Unified Communication
(Call Control/Messaging)

WAN Optimization

Cisco ISR can integrate
the routing service & other services
into a single unit!
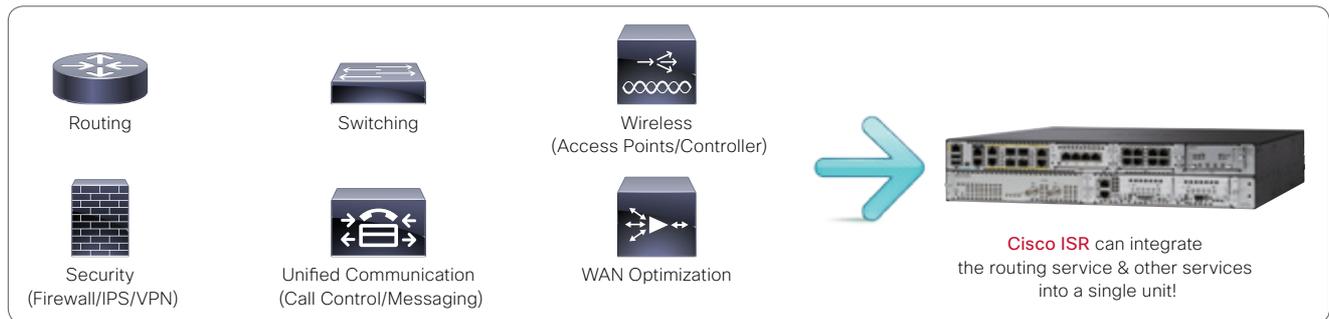
High ↑

Performance & Functionality

4451

4431

3945

4351

3925

4331

2951

4321

2921

2911

2901

1941

891F/891-24X
892FSP/897VA/899G

1921

819H/G/HG

881W/881-V

867VAE

Fixed-configuration	Modular (EHWIC/SM) *1	Modular (NIM/SM-X) *1

*1 Primary expansion slots incorporated on the platform. Refer to pages 50-51 for details on the compatible expansion modules.

Cisco ISR 800 Series	Fixed-configuration second-generation integrated services routers suitable for deployment in small-sized bases, home offices and Machine-to-Machine (M2M) environments.	See page 46 for details.
Cisco ISR 1900/2900/3900 Series	Modular second-generation integrated services routers suitable for deployment in small- to large-sized bases.	See page 47 for details.
Cisco ISR 4000 Series	Modular second-generation integrated services routers suitable for deployment in bases that require a provision of application-aware services.	See page 48 for details.

Routers

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Selection of Cisco ISR

Routers with higher performance and expandability should be selected for traffic-intensive data centers than the sites/branches. Cisco ISR not only allows selection of bundle models according to the services required at the data centers or sites/branches, but also respond flexibly to changes in the business needs by means of license activation of Cisco IOS technologies and addition of expansion modules.

■ Sample inter-base network configuration: small-scale network

Cisco ISR 881
Branch A

Cisco ISR 4431
Center

WAN

Cisco ISR 891F
Branch B
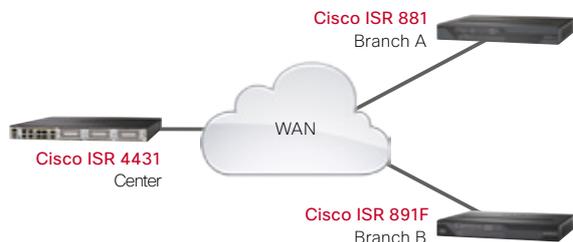
■ Sample inter-base network configuration: Medium-scale network

Cisco ISR 891F
Branch A

Cisco ASR 1001-X
Center

WAN

Cisco ISR 4331
Branch B

Benefits of Migrating to Cisco ISR 4000 Series

The Cisco ISR 4000 Series build on 20 years of branch-office routers, adding services and horsepower for the needs of modern branch offices and allowing businesses to:

● Quickly open new remote offices or easily add additional services

● Operate an entire branch office with a single box

● Give IT departments more time for innovation by automating repetitive tasks and orchestrating security and application services

The Cisco ISR 4000 Series address the problems that modern branch offices face, without giving up any of the existing services of previous-generation Cisco ISRs. It also brings virtualization to networking so that IT can adopt services faster and repurpose resources as needs change. And it delivers additional computing power for local application survivability, data backup, and local analytics processing.

The new architecture of the Cisco ISR 4000 Series delivers up to 2 Gbps in a converged platform, typically 4 to 10 times faster than the previous-generation ISRs. Cisco ISR 4000 series is the leading platform to deploy Cisco Intelligent WAN and provide Transport Independence, Application Performance based routing (PFRv3), Application visibility, monitoring, control and optimization, Secure Direct Cloud Access and SDN zero touch deployment and automation. Not only does this architecture allow a branch office to run the network with a single box, it also allows use of that box to converge network, computing, and storage resources in the same platform. The virtualization technology available both embedded within the Cisco ISR 4000 Series and through additional data center-class server modules (Cisco UCS E Series Servers) offers new levels of converged capability.

■ Series Comparison

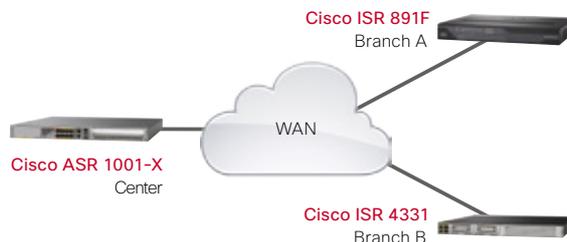| Branch Network Needs	Features	Cisco ISR 1800/2800/3800 Series	Cisco ISR 1900/2900/3900 Series	Cisco ISR 4000 Series	Benefits
Scale with high performance	Maximum throughput	Up to 50 Mbps	Up to 350 Mbps	Up to 2 Gbps	4 to 10 times performance increase for the same price as the ISR G2
	Separate data, control, and services planes	–	–	●	Minimal performance impact as network services are added and throughput increases
	Integrated service container	–	–	●	No need for additional branch appliances; add network services using pluggable virtual machines
	Integrated compute with Cisco UCS E-Series Servers	–	●	●	Local compute resources for applications, data backup, and analytics
	Cisco IOS XE Operating System	–	–	●	Higher availability for network services with multicore processing
Uncompromised user experience	Cisco Application Visibility and Control (AVC)	–	●	●	Visibility into 1000+ applications for capacity planning and prioritization
	Intelligent path selection (PfR v3)	–	●	●	Improve application experience and lower costs with path selection using real-time analytics
	WAN optimization (WAAS and Akamai)	–	●	●	Improve application performance and offload WAN with Layer 4-7 optimization and intelligent caching
Security	Sourcefire Intrusion Detection System (IDS)	–	●	●	Industry-leading advanced threat defense
	Cloud Web Security with Advanced Malware Protection (AMP)	–	●	●	Scale secure direct Internet access with consistent policy enforcement
	Multicore hardware VPN acceleration	–	–	●	High-performance encryption for secure WAN
Reduced costs and increased business agility	Pay-as-you-grow performance and services	–	–	●	Ability to buy what you need today and upgrade anytime without complete equipment upgrades
	Cisco ONE Software Suites	–	●	●	Predictable OpEx spend, license portability, and investment protection
	Intelligent WAN app with Cisco APIC Enterprise Module	–	●	●	Automated provisioning for faster deployment

Cisco ISR 800 Series

Fixed-configuration Integrated Services Routers suitable for deployment in small-sized branches, home offices and Machine-to-Machine (M2M) environments. In addition to the routing service, a wide variety of services including switching, wireless security, unified communication, and WAN optimization can be integrated using a single router unit.

■ Highlights
- Equipped with Cisco IOS Universal Image (Compatible with IP Base/Advanced Security/Advanced IP Services)
- Built-in managed switch
- Built-in IEEE 802.11n-compatible wireless access point (C881W-x-K9)
- Supports 4G LTE wireless WAN (C819G-4G-GA-K9/C819HG-4G-G-K9/C899G-LTE-GA-K9)

■ Cisco ISR 800 Series (1 of 2)

SKU	Description	Dimensions (Height x Width x Depth)	Maximum Weight
C819H-K9	Cisco 819H Integrated Services Router M2M Hardened Model	4.39 x 19.56 x 20.57 cm	1.45 kg
C819G-4G-GA-K9	Cisco 819G Integrated Services Router 4G LTE 2.0 Wireless WAN M2M Model	4.24 x 19.56 x 18.29 cm	1.04 kg
C819HG-4G-G-K9	Cisco 819HG Integrated Services Router 4G LTE Wireless WAN M2M Hardened Model	4.39 x 19.56 x 20.57 cm	1.45 kg
CISCO867VAE	Cisco 867VAE Integrated Services Router IP Base Model	4.45 x 24.13 x 22.86 cm	2.49 kg
CISCO867VAE-K9	Cisco 867VAE Integrated Services Router Advanced Security Model	3.85 x 20.90 x 19.80 cm	2.49 kg
C881W-x-K9 *1	Cisco 881W Integrated Services Router Wireless Model	4.82 x 32.51 x 26.42 cm	2.49 kg
C881-V-K9	Cisco 881-V Integrated Services Router	4.82 x 32.51 x 24.89 cm	2.49 kg
C891F-K9	Cisco 891F Integrated Services Router	4.62 x 32.28 x 24.84 cm	2.49 kg
C891-24X/K9	Cisco 891-24X Integrated Services Router	4.62 x 43.82 x 30.48 cm	2.49 kg
C892FSP-K9	Cisco 892FSP Integrated Services Router	4.62 x 32.28 x 24.84 cm	2.49 kg
C897VA-K9	Cisco 897VA Integrated Services Router	4.62 x 32.28 x 24.84 cm	2.49 kg
C899G-LTE-GA-K9	Cisco 899G Integrated Services Router 4G LTE 2.0 Wireless WAN Model	4.82 x 32.51 x 26.42 cm	2.58 kg

■ Cisco ISR 800 Series (2 of 2)

SKU	Cisco IOS	Downlink Ports		Uplink Ports						Speedup	Wireless		Security			Voice	Rack mount
		FE	GE	FE	GE	GE/SFP	ISDN	xDSL	Voice	WAASX	AP	4G LTE	FW	IPS	VPN	GW Call Control MSG	
C819H-K9	Advanced IP Services	4	–	–	1	–	–	–	–	●	–	–	●	●	●	–	–*7
C819G-4G-GA-K9	Advanced IP Services	4	–	–	1	–	–	–	–	●	–	●	●	●	●	–	–*7
C819HG-4G-G-K9	Advanced IP Services	4	–	–	1	–	–	–	–	●	–	●	●	●	●	–	–*7
CISCO867VAE	IP Base	4	–	–	1	–	–	1*2	–	–	–	–	–	–	–	–	–
CISCO867VAE-K9	Advanced Security	4	1	–	1	–	–	1*2	–	–	–	–	●	–	●	–	–
C881W-x-K9	Advanced Security	4	–	1	–	–	–	–	–	–	●	–	●	–*5	●	–	–
C881-V-K9	Advanced IP Services	4	–	1	–	–	–	–	7*3	–	–	–	●	●	●	●*6	–
C891F-K9	Advanced IP Services	–	8	1	–	1	1	–	–	●*4	–	–	●	●	●	–	–*8
C891-24X/K9	Advanced IP Services	–	24	–	–	2	–	–	–	–	–	–	●	●	●	–	–*9
C892FSP-K9	Advanced IP Services	–	8	–	1	1	–	–	–	●*4	–	–	●	●	●	–	–*8
C897VA-K9	Advanced IP Services	–	8	–	1	–	1	1*2	–	●*4	–	–	●	●	●	–	–*8
C899G-LTE-GA-K9	Advanced IP Services	–	8	–	1	1	–	–	–	●*4	–	●	●	●	●	–	–*8

*1 If "x" is "A", A domain for FCC, and if "x" is "E", E domain for ETSI. *2 Annex M is not supported. *3 BRI x 2, FXS x 4, FXO x 1. *4 Feature Licenses are required. *5 Cisco IOS Advanced IP Services License is required. *6 Call Control and Messaging (MSG) are not supported. *7 DIN Rail Mount and Floor/Wall Mount are supported (Optional). *8 ACS-890-RM-19 is required. *9 ACS-2901-RM-19 is required.

Machine-to-Machine (M2M)

Machine-to-Machine (M2M) is a technology that aggregates the intercommunications between machines without human intervention. This technology is already used in a wide range of devices such as vending machines, surveillance systems and sensor-equipped measuring instruments; and its adoption is expected to continue at an accelerated pace. The most important elements for network devices offering the M2M technology are compactness, mobility and durability.

In the case of vending machines, for example, the network device needs to be compact to allow installation inside the machines. Mobility is also important as it is cheaper to use the mobile 4G network than installing a wired broadband line for each vending machine. Depending on the installation location, the network device must also have the durability to withstand the high temperatures in summer. Cisco 819H/G/HG has been developed to address these issues. Both models

feature a palm-sized compact chassis and are compatible with 4G LTE 2.0 wireless LAN. Furthermore, Cisco 819H/HG can operate in temperatures between -23 and +60 deg C and in up to 95% humidity and have superior vibration and impact resistance to withstand industrial use. A wide variety of mounting options are supported including DIN rail, floor and wall mounting.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco ISR 1900/2900/3900 Series

Modular Integrated Services Routers suitable for deployment in small- to large- sized Branches. In addition to the routing service, these routers can integrate a wide variety of services including switching, wireless security, unified communication, WAN optimization and service virtualization.

■ Highlights
● Equipped with Cisco IOS Universal Image (Compatible with IP Base/SEC/UC/APP)
● Field replaceable Cisco Services Performance Engine (SPE) motherboard (Cisco ISR 3900 Series)
● Equipped with multi-core CPU and large-capacity memory
● Various network services are integrated via Expansion Modules (EHWIC/SM slots)
● Supports the Cisco UCS E Series Server
● Built-in IEEE 802.11n-compatible wireless access point (CISCO1941W-x/K9)

■ Cisco ISR 1900/2900/3900 Series Bundles Comparison

Bundles	Characters Included in SKU	Bundled Licenses/Modules				
		IOS SEC	IOS UC	IOS APP	CME/SRST	PVDM3
Security Bundles	SEC	●	–	–	–	–
Voice and Video Bundles	V	–	●	–	–	●
CME-SRST Bundles	CME-SRST	–	●	–	●	●
Voice and Video Security Bundles	VSEC	●	●	–	–	●
Application Experience Bundles	AX	●	–	●	–	–

■ Cisco ISR 1900 Series

SKU	Cisco IOS	Expansion Slots				Ports					Speedup	Wireless			Security			Voice	Rack mount
		EHWIC	ISM	SM	PVDM	FE	GE	ISDN Backup	xDSL	Voice	WAAS	AP	WLC	4G	FW	IPS	VPN	GW Call Control MSG	
CISCO1921/K9	IP Base	2	–	–	–	–*1	2	–*1	–*1	–	–	–	–	–*1	–*3	–*3	–*3	–	–*4
CISCO1921-SEC/K9	IP Base + SEC	2	–	–	–	–*1	2	–*1	–*1	–	–	–	–	–*1	●	●	●	–	–*4
C1921-AX/K9	IP Base + SEC + APP	2	–	–	–	–*1	2	–*1	–*1	–	●	–	–	–*1	●	●	●	–	–*4
CISCO1941/K9	IP Base	2	1	–	–	–*1	2	–*1	–*1	–	–*2	–	–*1	–*1	–*3	–*3	–*3	–	●
CISCO1941W-x/K9	IP Base	2	–	–	–	–*1	2	–*1	–*1	–	–*2	●	–	–*1	–*3	–*3	–*3	–	●
CISCO1941-SEC/K9	IP Base + SEC	2	1	–	–	–*1	2	–*1	–*1	–	–*2	–	–*1	–*1	●	●	●	–	●
C1941-AX/K9	IP Base + SEC + APP	2	1	–	–	–*1	2	–*1	–*1	–	●	–	–*1	–*1	●	●	●	–	●

■ Cisco ISR 2900 Series

SKU	Cisco IOS	Expansion Slots				Ports					Speedup	Wireless			Security			Voice	Rack mount
		EHWIC	ISM	SM	PVDM	FE	GE	ISDN Backup	xDSL	Voice	WAAS	AP	WLC	4G	FW	IPS	VPN	GW Call Control MSG	
CISCO2901/K9	IP Base	4	1	–	2	–*1	2	–*1	–*1	–*1	–*2	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO2901-SEC/K9	IP Base + SEC	4	1	–	2	–*1	2	–*1	–*1	–*1	–*2	–	–*1	–*1	●	●	●	–*7	●
C2901-AX/K9	IP Base + SEC + APP	4	1	–	2	–*1	2	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●
CISCO2911/K9	IP Base	4	1	1	2	–*1	3	–*1	–*1	–*1	–*6	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO2911-SEC/K9	IP Base + SEC	4	1	1	2	–*1	3	–*1	–*1	–*1	–*6	–	–*1	–*1	●	●	●	–*7	●
C2911-AX/K9	IP Base + SEC + APP	4	1	1	2	–*1	3	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●
CISCO2921/K9	IP Base	4	1	1	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO2921-SEC/K9	IP Base + SEC	4	1	1	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	●	●	●	–*7	●
C2921-AX/K9	IP Base + SEC + APP	4	1	1	3	–*1	4*5	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●
CISCO2951/K9	IP Base	4	1	2	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO2951-SEC/K9	IP Base + SEC	4	1	2	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	●	●	●	–*7	●
C2951-AX/K9	IP Base + SEC + APP	4	1	2	3	–*1	4*5	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●

■ Cisco ISR 3900 Series

SKU	Cisco IOS	Expansion Slots				Ports					Speedup	Wireless			Security			Voice	Rack mount
		EHWIC	ISM	SM	PVDM	FE	GE	ISDN Backup	xDSL	Voice	WAAS	AP	WLC	4G	FW	IPS	VPN	GW Call Control MSG	
CISCO3925/K9	IP Base	4	1	2	4	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO3925-SEC/K9	IP Base + SEC	4	1	2	4	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	●	●	●	–*7	●
C3925-AX/K9	IP Base + SEC + APP	4	1	2	4	–*1	4*5	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●
CISCO3945/K9	IP Base	4	1	4	4	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO3945-SEC/K9	IP Base + SEC	4	1	4	4	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	●	●	●	–*7	●
C3945-AX/K9	IP Base + SEC + APP	4	1	4	4	–*1	4*5	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●
CISCO3925E/K9	IP Base	3	–	2	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO3925E-SEC/K9	IP Base + SEC	3	–	2	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	●	●	●	–*7	●
C3925E-AX/K9	IP Base + SEC + APP	3	–	2	3	–*1	4*5	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●
CISCO3945E/K9	IP Base	3	–	4	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	–*3	–*3	–*3	–*7	●
CISCO3945E-SEC/K9	IP Base + SEC	3	–	4	3	–*1	4*5	–*1	–*1	–*1	–*6	–	–*1	–*1	●	●	●	–*7	●
C3945E-AX/K9	IP Base + SEC + APP	3	–	4	3	–*1	4*5	–*1	–*1	–*1	●	–	–*1	–*1	●	●	●	–*7	●

*1 Expansion Module is required. *2 Feature Licenses are required. *3 Cisco IOS SEC License is required. *4 ACS-1900-RM-19 is required. *5 SFP module slot or dual-purpose port is included.
*6 Feature Licenses or Expansion Modules are required. *7 Feature Licenses, etc. are required according to the Cisco IOS UC License and configuration.

Cisco ISR 4000 Series

Modular Integrated Services Routers suitable for deployment in Branches that require a provision of application-aware services. In addition to the routing service, these routers can integrate a wide variety of services including switching, wireless, security, unified communication, WAN optimization and service virtualization. Since the control, data, and service resources are isolated at the hardware level, it is possible to deliver application-aware services with high availability even when at high loads.

■ Highlights
- Equipped with Cisco IOS XE Universal Image (Compatible with IP Base/SEC/UC/AX)
- Equipped with multi-core CPU and 4 GB memory (Cisco 4321/4331/4351; Cisco 4321 is expandable to 8 GB, Cisco 4331/4351 are expandable to 16 GB)
- Equipped with multi-core CPU, 4 GB memory for the control plane and 2 GB Memory for the data plane (Cisco 4431/4451; control plane memory is expandable to 16 GB)
- Various network services are integrated via Expansion Modules (NIM/SM-X slots)
- Supports the Cisco UCS E Series Server

■ Cisco ISR 4000 Series Bundles Comparison

Bundles	Characters Included in SKU	Bundled Licenses/Modules				
		IOS SEC	IOS UC	IOS APP	CME/SRST	PVDM4
Security Bundles	SEC	●	–	–	–	–
Voice Bundles	V	–	●	–	–	●[*1]
Voice Security Bundles	VSEC	●	●	–	–	●[*1]
Application Experience Bundles	AX	●	–	●	–	–
Application Experience Voice Bundles	AXV	●	●	●	–	●[*1]

■ Cisco ISR 4000 Series

SKU	Cisco IOS	NIM	SM/SM-X	PVDM	FE	GE	ISDN Backup	xDSL	Voice	WAAS	AP	WLC	4G	FW	IPS	VPN	GW Call Control MSG	Rack mount
ISR4321/K9	IP Base	2	-	1	-	2*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●
ISR4321-SEC/K9	IP Base + SEC	2	-	1	-	2*2	-*3	-*3	-*3	-*4	-	-*3	-*3	●	●	●	-*6	●
ISR4321-V/K9	IP Base + UC	2	-	1	-	2*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	●	●
ISR4321-AX/K9	IP Base + SEC + APP	2	-	1	-	2*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●
ISR4321-AXV/K9	IP Base + SEC + UC + APP	2	-	1	-	2*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●
ISR4331/K9	IP Base	2	1	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●
ISR4331-SEC/K9	IP Base + SEC	2	1	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	●	●	●	-*6	●
ISR4331-V/K9	IP Base + UC	2	1	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	●	●
ISR4331-AX/K9	IP Base + SEC + APP	2	1	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●
ISR4331-AXV/K9	IP Base + SEC + UC + APP	2	1	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●
ISR4351/K9	IP Base	3	2	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●
ISR4351-SEC/K9	IP Base + SEC	3	2	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	●	●	●	-*6	●
ISR4351-V/K9	IP Base + UC	3	2	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	●	●
ISR4351-AX/K9	IP Base + SEC + APP	3	2	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●
ISR4351-AXV/K9	IP Base + SEC + UC + APP	3	2	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●
ISR4431/K9	IP Base	3	-	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●
ISR4431-SEC/K9	IP Base + SEC	3	-	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	●	●	●	-*6	●
ISR4431-V/K9	IP Base + UC	3	-	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	●	●
ISR4431-AX/K9	IP Base + SEC + APP	3	-	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●
ISR4431-AXV/K9	IP Base + SEC + UC + APP	3	-	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●
ISR4451-X/K9	IP Base	3	2	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●
ISR4451-X-SEC/K9	IP Base + SEC	3	2	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	●	●	●	-*6	●
ISR4451-X-V/K9	IP Base + UC	3	2	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	●	●
ISR4451-X-AX/K9	IP Base + SEC + APP	3	2	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●
ISR4451-X-AXV/K9	IP Base + SEC + UC + APP	3	2	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●
ISR4451XWAAS-200G	IP Base + SEC + APP	2	2	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●

*1 Cisco 4321 is not supported. *2 SFP module slot or dual-purpose port is included. *3 Expansion Module is required. *4 Feature Licenses or Expansion Modules are required. *5 Cisco IOS SEC License is required.
*6 Feature Licenses, etc. are required according to the Cisco IOS UC License and configuration.

Q Cisco IOS on the Cisco ISR 4000 Series

The Cisco IOS Technology Package Licenses for Cisco ISR 4000 Series are available in the following four types: IP Base/Security (SEC)/Unified Collaboration (UC)/Application Experience (APP).

As with Cisco ISR 800/1900/2900/3900 Series, the IP Base/SEC/UC Licenses are technology sets that provide the IP control functions, IP security functions and IP telephony functions, respectively. The new APP License is a technology set integrating the DATA License, which provides the comprehensive IP control functions of Cisco ISR 1900/2900/3900 Series, with the Cisco Wide Area Application Services (WAAS) License or the Application Visibility & Control (AVC) License.

The APP License is also available for the Cisco ISR 800/1900/2900/3900 Series. Refer to page 49 for details of the APP License.

Routers

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services
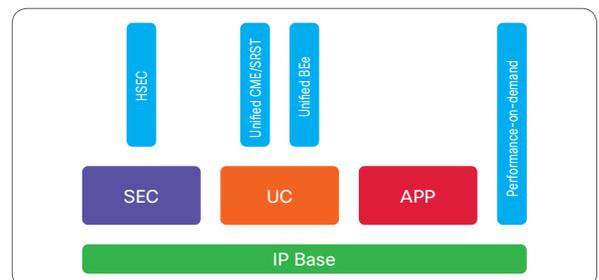
Modules & Accessories

■ Cisco IOS Technology Package Licenses

SKU	Description	800	1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351	4431	4451
		Compatible Models																
L-SL-19-SEC-K9	Cisco IOS SEC License for Cisco ISR 1900 Series	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–
L-SL-29-SEC-K9	Cisco IOS SEC License for Cisco ISR 2900 Series	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–
L-SL-39-SEC-K9	Cisco IOS SEC License for Cisco ISR 3900 Series	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–
SL-4320-SEC-K9	Cisco IOS SEC License for Cisco ISR 4321	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
SL-4330-SEC-K9	Cisco IOS SEC License for Cisco ISR 4331	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
SL-4350-SEC-K9	Cisco IOS SEC License for Cisco ISR 4351	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
SL-44-SEC-K9	Cisco IOS SEC License for Cisco ISR 4400 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●
L-SL-29-UC-K9	Cisco IOS UC License for Cisco ISR 2900 Series	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–
L-SL-39-UC-K9	Cisco IOS UC License for Cisco ISR 3900 Series	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–
SL-4320-UC-K9	Cisco IOS UC License for Cisco ISR 4321	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
SL-4330-UC-K9	Cisco IOS UC License for Cisco ISR 4331	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
SL-4350-UC-K9	Cisco IOS UC License for Cisco ISR 4351	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
SL-44-UC-K9	Cisco IOS UC License for Cisco ISR 4400 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●
SL-19-APP-K9	Cisco IOS APP License for Cisco ISR 1900 Series	–	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–
SL-29-APP-K9	Cisco IOS APP License for Cisco ISR 2900 Series	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–
SL-39-APP-K9	Cisco IOS APP License for Cisco ISR 3900 Series	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–
SL-4320-APP-K9	Cisco IOS APP License for Cisco ISR 4321	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
SL-4330-APP-K9	Cisco IOS APP License for Cisco ISR 4331	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
SL-4350-APP-K9	Cisco IOS APP License for Cisco ISR 4351	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
SL-44-APP-K9	Cisco IOS APP License for Cisco ISR 4400 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●

■ Cisco IOS Feature Licenses

SKU	Description	800	1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351	4431	4451
		Compatible Models																
L-FL-29-HSEC-K9	Cisco IOS HSEC License for Cisco 2921/2951[*1]	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–
L-FL-39-HSEC-K9	Cisco IOS HSEC License for Cisco 3925/3945[*1]	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–
L-FL-39E-HSEC-K9	Cisco IOS HSEC License for Cisco 3925E/3945E[*1]	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
FL-4320-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4321[*1]	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
FL-4330-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4331[*1]	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
FL-4350-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4351[*1]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
FL-44-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4400 Series[*1]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●
L-FL-CME-SRST-5	Cisco Unified CME or SRST 5 License[*2 *3]	●	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
L-FL-CME-SRST-25	Cisco Unified CME or SRST 25 License[*2]	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
L-FL-CME-SRST-100	Cisco Unified CME or SRST 100 License[*2]	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-5-RED	Cisco Unified BEe 5 Redundant Configuration License[*2]	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-25-RED	Cisco Unified BEe 25 Redundant Configuration License[*2]	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-100-RED	Cisco Unified BEe 100 Redundant Configuration License[*2]	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-500-RED	Cisco Unified BEe 500 Redundant Configuration License[*2]	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-1000-RED	Cisco Unified BEe 1000 Redundant Configuration License[*2]	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●
L-FL-29-SNA	Cisco IOS SNA Switching License for Cisco ISR 2900 Series[*4]	–	–	–	–	●	●	●	●	–	–	–	–	–	–	–	–	–
L-FL-39-SNA	Cisco IOS SNA Switching License for Cisco ISR 3900 Series[*4]	–	–	–	–	–	–	–	–	●	●	●	●	–	–	–	–	–
L-FL-C800-APP	Cisco IOS APP License for Cisco ISR 800 Series[*5]	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FL-4320-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4321	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–
FL-4330-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4331	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–
FL-4350-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4351	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
FL-44-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4400 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●

*1 Cisco IOS SEC License is required. *2 Cisco IOS UC License is required. *3 Cisco ISR 800 Series only supports Cisco 881-V. *4 Cisco IOS APP License is required.
*5 Cisco ISR 800 Series only supports Cisco 891F/892FSP/897VA/899G.

Cisco IOS APP License

The Cisco IOS APP License is a technology set integrating the DATA License, which provides the comprehensive IP control functions of Cisco ISR 1900/2900/3900 Series, with the Cisco Wide Area Application Services (WAAS) License or the Application Visibility & Control (AVC) License. This license is delivered as a Feature License for Cisco ISR 800 Series and as a Technology Package License or Application Experience Bundle for Cisco ISR 1900/2900/3900/4000 Series.

■ Cisco IOS APP License

SKU	Bundle License/Memory							
	SEC	DATA	WAAS-X	ISR WAAS	vWAAS	WAAS/vWAAS Optimized Connections	AVC	DRAM
L-FL-C800-APP	–	–	●	–	–	–	●	●
SL-19-APP-K9	–	●	●	–	–	–	●	–
SL-29-APP-K9	–	●	●	–	●[*1]	1300	●	–
SL-39-APP-K9	–	●	●	–	●	2500	●	–
SL-4320-APP-K9	–	●	–	●	–	2500	●	–
SL-4330-APP-K9	–	●	–	●	●	2500	●	–
SL-4350-APP-K9	–	●	–	●	●	2500	●	–
SL-44-APP-K9	–	●	–	●	●[*2]	2500	●	–

■ Cisco ISR Application Experience Bundle

Platform	Bundled License/Memory							Maximum WAN Bandwidth (Mbps)/TCP Optimized Connections (Maximum)			
	SEC	DATA	WAAS-X	ISR WAAS	vWAAS	AVC	DRAM	WAAS-X ISR-WAAS	vWAAS[*3]		
									1300	2500	6000
1921	●	●	●	–	–	●	–	0.512/50	–	–	–
1941	●	●	●	–	–	●	●	4/150	–	–	–
2901	●	●	●	–	–	●	●	6/150	–	–	–
2911/2921	●	●	●	–	●	●	–	6/200	80/1300	150/2500	200/6000 to
2951	●	●	●	–	●	●	–	6/400	80/1300	150/2500	200/6000 to
3925/3945/3925E/3945E	●	●	●	–	●	●	–	6/400	80/1300	150/2500	200/6000 to
4321	●	●	–	●	–	●	●	15/200	–	–	–
4331/4351	●	●	–	●	–	●	–	25/750	80/1300	150/2500	200/6000 to
4431	●	●	–	●	–	●	●	50/1300	–	–	–
4451	●	●	–	●	●	●	–	150/2500	80/1300	150/2500	200/6000 to

*1 Cisco 2901 is not supported. *2 Cisco 4321/4431 is not supported. *3 Cisco UCS E Series Server for Cisco ISR 2900/3900/4000 Series is required.

■ Extension Module for Cisco ISR 1900/2900/3900/4000 Series (1 of 2)

SKU	Description	Slot	Compatible Models															
			1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351	4431	4451
EHWIC-4ESG	Gigabit EtherSwitch Module (L2, 4-port GE)	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
EHWIC-4ESG-P	Gigabit EtherSwitch Module (L2, 4-port GE/PoE)	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
EHWIC-D-8ESG	Gigabit EtherSwitch Module (L2, 8-port GE)	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
EHWIC-D-8ESG-P	Gigabit EtherSwitch Module (L2, 8-port GE/PoE)	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
SM-ES2-16-P	Enhanced EtherSwitch Module (L2, 16-port FE/GE/PoE)	SM	-	-	-	●	●	●	●	●	●	●	●	-	-	-	-	-
SM-ES2-24	Enhanced EtherSwitch Module (L2, 24-port FE/GE)	SM	-	-	-	●	●	●	●	●	●	●	●	-	-	-	-	-
SM-ES2-24-P	Enhanced EtherSwitch Module (L2, 24-port FE/GE/PoE)	SM	-	-	-	●	●	●	●	●	●	●	●	-	-	-	-	-
SM-ES3-16-P	Enhanced EtherSwitch Module (L2/L3, 16-port FE/GE/PoE)	SM	-	-	-	●	●	●	●	●	●	●	●	-	-	-	-	-
SM-ES3-24-P	Enhanced EtherSwitch Module (L2/L3, 24-port FE/GE/PoE)	SM	-	-	-	●	●	●	●	●	●	●	●	-	-	-	-	-
SM-ES3G-16-P	Enhanced EtherSwitch Module (L2/L3, 16-port GE/PoE)	SM	-	-	-	●	●	●	●	●	●	●	●	-	-	-	-	-
SM-ES3G-24-P	Enhanced EtherSwitch Module (L2/L3, 24-port GE/PoE)	SM	-	-	-	●	●	●	●	●	●	●	●	-	-	-	-	-
NIM-ES2-4	EtherSwitch Module (L2, 4-port GE)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-ES2-8	EtherSwitch Module (L2, 8-port GE)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-ES2-8-P	EtherSwitch Module (L2, 8-port GE/PoE+)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
SM-X-ES3-16-P	SM-X EtherSwitch Module (L2/L3, 16-port GE/PoE+) *1	SM	-	-	-	●	●	●	●	●	●	●	●	-	●	●	-	●
SM-X-ES3-24-P	SM-X EtherSwitch Module (L2/L3, 24-port GE/PoE+) *1	SM	-	-	-	●	●	●	●	●	●	●	●	-	●	●	-	●
SM-X-ES3D-48-P	SM-X EtherSwitch Module (L2/L3, 48-port GE/PoE+) *1	SM	-	-	-	-	●	●	●	●	●	●	●	-	-	●	-	●
EHWIC-1GE-SFP-CU	GE/SFP WAN Module (1 port)	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
WIC-1B-S/T-V3	ISDN BRI Module (1-port)	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
HWIC-4B-S/T	ISDN BRI Module (4-port)	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
NIM-VAB-A	Multi Mode VDSL2/ADSL/2/2+ (Annex A)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-VA-B	Multi Mode VDSL2/ADSL/2/2+ (Annex B)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-VAB-M	Multi Mode VDSL2/ADSL/2/2+ (Annex M)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-1T	Serial WAN Module (1-port)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2T	Serial WAN Module (2-port)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4T	Serial WAN Module (4-port)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
SM-X-1T3/E3	T3/E3 Module (1 port) *1	SM	-	-	-	-	●	●	●	●	●	●	●	-	●	●	-	●
NIM-1GE-CU-SFP	GE/SFP Module (1-port)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2GE-CU-SFP	GE/SFP Module (2-port)	NIM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
SM-X-6X1G	GE/SFP Service Module (6-port) *1	SM	-	-	-	-	-	-	-	-	-	-	-	●	●	●	-	●
SM-X-4X1G-1X10G	GE/SFP (4-port) or SFP+ (1-port) Service Module *1	SM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	-	●
EHWIC-4G-LTE-ST	4G LTE Wireless WAN Module for Sprint	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
EHWIC-4G-LTE-VZ	4G LTE Wireless WAN Module for Verizon	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
EHWIC-4G-LTE-AT	4G LTE Wireless WAN Module for AT&T	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
EHWIC-4G-LTE-GB	4G LTE Wireless WAN Module for Europe	EHWIC	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-

*1 SM-X slot is used for the Cisco ISR 4000 Series.

4G LTE Wireless WAN Solutions

Mobile 4G LTE networks can be deployed rapidly as primary or backup WAN by incorporating the 4G LTE Wireless WAN Module on Cisco ISR 1900/2900/3900/4000 Series. Bandwidth can be utilized even more efficiently by using the module in combination with Cisco Wide Area Application Services (WAAS).

■ Deployed as Primary WAN

Small-scale Bases
Mobile 4G LTE Network
Primary WAN
Head Office
Mobile Bases

■ Deployed as Backup WAN

Mobile 4G LTE Network
Backup WAN
Head Office
Bases
Primary WAN

Sales Acceleration

Switches

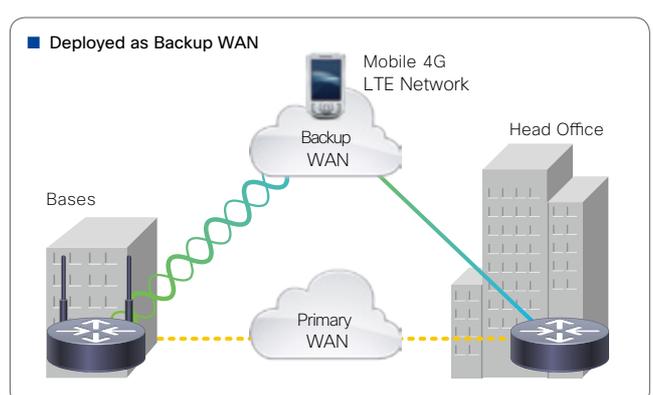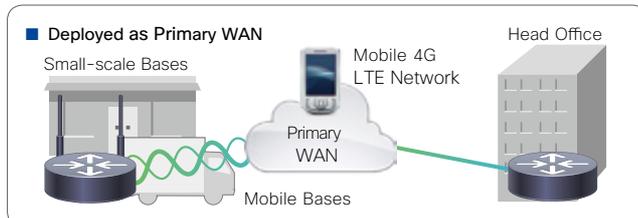Wireless

Routers

Meraki

Small Business

Services

■ Extension Module for Cisco ISR 1900/2900/3900/4000 Series (2 of 2)

SKU	Description	Slot	1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351	4431	4451
NIM-4G-LTE-GA	4G LTE Wireless WAN Module for Global	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4G-LTE-VZ	4G LTE Wireless WAN Module for Verizon	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4G-LTE-ST	4G LTE Wireless WAN Module for Sprint	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4G-LTE-NA	4G LTE Wireless WAN Modulefor North America	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
VIC3-2FXS/DID	Voice Module (2-port FXS/DID)	EHWIC	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
VIC2-2BRI-NT/TE	Voice Module (2-port BRI)	EHWIC	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
NIM-2FXS	Voice Module (2-port FXS)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4FXS	Voice Module (4-port FXS)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-2FXO	Voice Module (2-port FXO)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4FXO	Voice Module (4-port FXO)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-2FXS/4FXO	Voice Module (2-port FXS and 4-port FXO)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4E/M	Voice Module (4-port E/M)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-2BRI-NT/TE	Voice Module (2-port BRI)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4BRI-NT/TE	Voice Module (4-port BRI)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
VWIC3-1MFT-T1/E1	Voice/WAN Module (1-port T1/E1) [*2]	EHWIC	●	●	●	●	●	●	●	●	●	●	●	–	–	–	–	–
VWIC3-4MFT-T1/E1	Voice/WAN Module (4-port T1/E1)	EHWIC	–	–	–	–	●	●	●	●	●	●	●	–	–	–	–	–
NIM-1MFT-T1/E1	Voice/WAN Module (1-port T1/E1)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-2MFT-T1/E1	Voice/WAN Module (2-port T1/E1)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-4MFT-T1/E1	Voice/WAN Module (4-port T1/E1)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-8MFT-T1/E1	Voice/WAN Module (8-port T1/E1)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-1CE1T1-PRI	Voice/WAN Module (1-port T1/E1/G.703)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-2CE1T1-PRI	Voice/WAN Module (2-port T1/E1/G.703)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
NIM-8CE1T1-PRI	Voice/WAN Module (8-port T1/E1/G.703)	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
PVDM3-16	High-density Packet Voice/Video DSP Module (16-channel)	PVDM3	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
PVDM3-32	High-density Packet Voice/Video DSP Module (32-channel)	PVDM3	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
PVDM3-64	High-density Packet Voice/Video DSP Module (64-channel)	PVDM3	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
PVDM3-128	High-density Packet Voice/Video DSP Module (128-channel)	PVDM3	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
PVDM3-192	High-density Packet Voice/Video DSP Module (192-channel)	PVDM3	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
PVDM3-256	High-density Packet Voice/Video DSP Module (256-channel)	PVDM3	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–	–
PVDM4-32	High-density Packet Voice/Video DSP Module (16-channel)	PVDM4[*3]	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
PVDM4-64	High-density Packet Voice/Video DSP Module (32-channel)	PVDM4[*3]	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
PVDM4-128	High-density Packet Voice/Video DSP Module (64-channel)	PVDM4[*3]	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
PVDM4-256	High-density Packet Voice/Video DSP Module (128-channel)	PVDM4[*3]	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
PVDM4-64U128	Factory Upgrade from PVDM4-64 to PVDM4-128	PVDM4[*3]	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
PVDM4-64U256	Factory Upgrade from PVDM4-64 to PVDM4-256	PVDM4[*3]	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●

■ Cisco UCS E Series Servers for Cisco ISR 1900/2900/3900/4000 Series

SKU	CPU Cores	Memory Default	Memory Maximum	Internal Drive Slots	RAID	Slot	1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351	4431	4451
UCS-EN120E-54/K9	4	4 GB	4 GB	1	–	EHWIC	●	●	–	●	●	●	●	●	●	●	●	–	–	–	–	–
UCS-EN120E-58/K9	4	8 GB	8 GB	1	–	EHWIC	●	●	–	●	●	●	●	●	●	●	●	–	–	–	–	–
UCS-EN120E-108/K9	4	8 GB	8 GB	1	–	EHWIC	●	●	–	●	●	●	●	●	●	●	●	–	–	–	–	–
UCS-EN120E-208/K9	4	8 GB	8 GB	1	–	EHWIC	●	●	–	●	●	●	●	●	●	●	●	–	–	–	–	–
UCS-EN140N-M2/K9	4	8 GB	8 GB	1	–	NIM	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
UCS-EN120S-M2/K9	2	4 GB	16 GB	2	0/1	SM[*1]	–	–	–	–	●	●	●	●	●	●	●	–	●	●	–	●
UCS-E140S-M2/K9	4	8 GB	16 GB	2	0/1	SM[*1]	–	–	–	●	●	●	●	●	●	●	●	–	●	●	–	●
UCS-E160D-M2/K9	6	8 GB	96 GB	3	0/1/5	SM[*1]	–	–	–	–	–	–	–	●	●	●	●	–	–	●	–	●
UCS-E180D-M2/K9	8	8 GB	96 GB	3	0/1/5	SM[*1]	–	–	–	–	–	–	–	●	●	●	●	–	–	●	–	●

Cisco Wide Area Application Services (WAAS)

What is Cisco WAAS?

Cisco Wide Area Application Services (WAAS) is an effective solution for achieving optimization of inter-office WAN and application acceleration. This solution addresses the WAN-specific issues such as delays to enhance the TCP-based application performance.

■ Same Level of Application Performance as LAN Connection

Cisco WAAS enables applications to be used via WAN with the same level of performance as via LAN.

- Optimized throughput: Enhances the WAN environment even further by improving the behavior of the transport protocol.
- More efficient bandwidth: Minimizes the sending/receiving of redundant data patterns using DRE (Data Redundancy Elimination) and compression technology.
- Application speedup: Achieves efficient utilization of bandwidth by eliminating delays using technologies such as read-ahead, protocol proxy and caching.

■ Full Support for Citrix XenDesktop and XenApp

VDI (Virtual Desktop Infrastructure) solutions that are becoming increasingly popular to address the challenges in the fields of business flexibility and sustainability as well as compliance/security requirements. However, since the communications from a client to a virtual desktop (i.e. server) are achieved via a network, network delay and bandwidth limit need to be considered carefully (especially via WAN).

Cisco WAAS has obtained Citrix's compatibility certification for their VDI solutions Citrix XenDesktop and XenApp and delivers the following benefits.

- Enhances the virtual desktop performance on WAN by up to 70%
- Increases the number of simultaneous Citrix client connections by up to twice without the costly upgrade of the WAN bandwidth.
- Up to 60 % reduction of the WAN bandwidth requirements
- Up to 98 % optimization of the printing via WAN
- Supports Citrix MSI (Multi Stream ICA)

For details on **Cisco WAAS**, visit the following Web site:

www.cisco.com/go/waas

Cisco WAAS Product Portfolio

Cisco WAAS is available in various types to suit different purposes and scales. These products can be used to achieve WAN optimization and application acceleration in a variety of operating environments, resulting in enhanced corporate productivity.

Cisco WAAS Appliances

Cisco vWAAS
on
Cisco UCS C Series
Rack Servers

Cisco vWAAS
on
Cisco UCS E Series
Servers

Cisco ISR WAAS
on
Cisco ISR
4000 Series

Cisco WAAS Express
on
Cisco ISR
800/1900/2900/3900 Series

Network Scale → **Large**

Cisco WAAS Express	Software products suitable for bases, integrated into Cisco IOS on the Cisco ISR 800/1900/2900/3900 Series, and activated by Cisco IOS Feature License or Cisco IOS APP license.
Cisco ISR WAAS	Software products suitable for bases or data centers/headquarters, integrated into Cisco IOS XE on the Cisco ISR 4000 Series, and activated by Cisco IOS APP License.
Cisco vWAAS	Software products suitable for bases or data centers/headquarters, implemented on VMware ESX/ESXi which is supported by Cisco UCS E Series Servers and Cisco UCS C Series Rack Servers.
Cisco WAAS Appliances	Hardware appliances suitable for bases or data centers/headquarters.

Routers

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cisco Intelligent WAN (IWAN) with Akamai Connect

Cisco Intelligent WAN (IWAN) with Akamai Connect is a suite of integrated WAN optimization, application acceleration, and intelligent caching features in Cisco ISRs running Application Experience services.
The solution extends the well-known Akamai Intelligent Platform with HTTP caching across the last mile into the branch office, turbo charging the application optimization features of the Cisco IWAN. Akamai Connect caching integrates with Cisco IWAN features such as Application Visibility and Control (AVC), Cisco Performance Routing (PfR), and Cisco Wide Area Application Services (WAAS). It is available across the Cisco ISR portfolio and Cisco WAAS Appliances, allowing you to deploy full-service branch-office operations.

Users can access bandwidth-intensive applications instantly, over any network, regardless of where the application is hosted – data center, private cloud, public cloud, or the Internet.

■ Mobile Assisted Selling Application Benchmark Results in Seconds (s)

	Without Akamai Connect	With Akamai Connect 1st Hit	With Akamai Connect 2nd Hit
ERP App	57 s	18 s	2 s
Repair App	70 s	28 s	< 1 s
Catalog App	28 s	13 s	< 1 s

■ Training/Digital Signage Application Benchmark Results in Pixels (p) and Seconds (s)

	Without Akamai Connect	With Akamai Connect
Default Quality	144 p	720 p (HD Automatic)
Time to Load (720 p HD)	14 s	Instant

■ Cisco IWAN with Akamai Connect License

SKU	Description
SL-200-AKC	License for up to 200 WAAS connections
SL-750-AKC	License for up to 750 WAAS connections
SL-1300-AKC	License for up to 1300 WAAS connections
SL-2500-AKC	License for up to 2500 WAAS connections
SL-6K-AKC	License for up to 6000 WAAS connections

■ Cisco WAAS Specification Comparison

Series Name	SKU/Platform		WAN Bandwidth (Max)	TCP Optimized Connections (Max)	WAN Optimization	App Speedup	AppNav	Central Manager Mode Managed Devices
Cisco WAAS Express	L-FL-C880-WAASX[*1]		1.5 Mbps	75	●	–	–	–
	L-FL-C890-WAASX[*1]		2 Mbps	75	●	–	–	–
	L-FL-C1941-WAASX[*1]		4 Mbps	150	●	–	–	–
	L-FL-C2901-WAASX[*1]		6 Mbps	150	●	–	–	–
	L-FL-C2911-WAASX[*1]		6 Mbps	200	●	–	–	–
	L-FL-C2921-WAASX[*1]		6 Mbps	200	●	–	–	–
	L-FL-C2951-WAASX[*1]		6 Mbps	200	●	–	–	–
	L-FL-C3900-WAASX[*1]		10 Mbps	500	●	–	–	–
Cisco ISR WAAS	Cisco 4321		15 Mbps	200	●	●	●	–
	Cisco 4331		25 Mbps	750	●	●	●	–
	Cisco 4351		25 Mbps	750	●	●	●	–
	Cisco 4431		50 Mbps	1,300	●	●	●	–
	Cisco 4451		150 Mbps	2,500	●	●	●	–
Cisco vWAAS	LIC-200-VWAAS		20 Mbps	200	●	●	–	–
	LIC-750-VWAAS		50 Mbps	750	●	●	–	–
	LIC-1300-VWAAS		80 Mbps	1,300	●	●	–	–
	LIC-2500-VWAAS		150 Mbps	2,500	●	●	–	–
	LIC-6K-VWAAS		200 Mbps	6,000	●	●	–	–
	LIC-12K-VWAAS		310 Mbps	12,000	●	●	–	–
	LIC-50K-VWAAS		700 Mbps	50,000	●	●	–	–
Cisco WAAS Appliances	WAVE-294-K9	4 GB Memory	10 Mbps	200	●	●	–	250 (200) [*7][*8]
		8 GB Memory[*2]	20 Mbps	400	●	●	–	250 (200) [*7][*8]
	WAVE-594-K9	8 GB Memory	50 Mbps	750	●	●	●[*5]	1,000 (800) [*7][*8]
		12 GB Memory[*3]	100 Mbps	1,300	●	●	●[*5]	1,000 (800) [*7][*8]
	WAVE-694-K9	16 GB Memory	200 Mbps	2,500	●	●	●[*6]	2,000 (2,000) [*7][*8]
		24 GB Memory[*4]	200 Mbps	6,000	●	●	●[*6]	2,000 (2,000) [*7][*8]

■ Modules for Cisco Wide Area Application Services (WAAS) Appliance

SKU	Description	GE Ports	SFP Ports
WAVE-INLN-GE-4T	GE Module for the Cisco WAAS Appliances[*9]	4	–
WAVE-INLN-GE-8T	GE Module for the Cisco WAAS Appliances	8	–
WAVE-INLN-GE-4SX	SFP Module for the Cisco WAAS Appliances	–	4
WAVE-APNV-GE-12T	AppNav GE Module for the Cisco WAVE 694 WAAS Appliances	12	–
WAVE-APNV-GE-12SFP	AppNav SFP Module for the Cisco WAVE 694 WAAS Appliances	–	12

■ Cisco WAAS Central Manager

Cisco WAAS Central Manager is a mandatory management tool for all Cisco WAAS implementations. Generally, Cisco WAAS Central Manager is either implemented to a single Cisco WAAS Appliance in the data center or headquarters accommodating the data and application servers, or as Cisco Virtual WAAS (vWAAS) on the VMware ESX/ESXi server.
Cisco WAAS Central Manager can be used to centrally manage a wide range of Cisco WAAS devices distributed across multiple bases, including the Cisco

800/1900/2900/3900 Series with activated Cisco WAAS Express, Cisco ISR 4000 Series with activated Cisco ISR WAAS, and Cisco WAAS Appliances, and so on. An intuitive GUI provides access to functions such as deployment and real-time monitoring of Cisco WAAS devices, fault management and logging, as well as the custom reporting function for creating scheduled reports for up to 2,500 Cisco WAAS devices in the Cisco WAAS topology.

*1 Maximum DRAM supported by the platform is required. *2 MEM-294-8GB is required. *3 MEM-594-12GB is required. *4 MEM-694-24GB is required.
*5 Cisco AppNav 10 GE Bundle (WAVE-APNV-10GE) is required. *6 Cisco AppNav GE or SFP Module is required. *7 Performance indicators based on Cisco WAAS software release 5.1.
*8 The maximum number of managed devices is reduced by 20 % in an environment containing routers equipped with Cisco WAAS Express. *9 Incorporated on WAVE-294-K9 by default.

Meraki

Cisco Meraki

100% Cloud Managed Networking

The Cisco Meraki portfolio of networking devices are centrally managed from the cloud. This feature-rich, easy-to-use cloud architecture enables customers to solve new business problems and reduce operating costs.
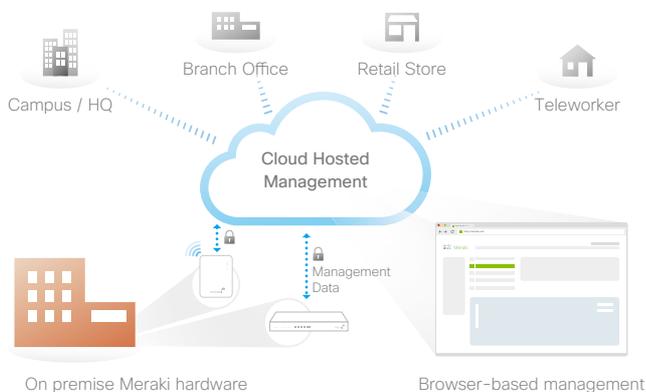
- Manage entire network from a single dashboard
- Control users, applications, and devices
- No controller hardware or management software to install and maintain
- Secure (PCI and HIPAA-compliant) cloud infrastructure
- Scales from small sites to million-user deployments
- Automatic monitoring and alerts
- Seamless over-the-web upgrades

Campus / HQ   Branch Office   Retail Store   Teleworker

Cloud Hosted Management

Management Data

On premise Meraki hardware   Browser-based management

Cisco Meraki Cloud Managed Products

■ Cloud Managed Wireless

- Indoor and outdoor access point models
- IEEE 802.11ac and 802.11n with ultra-high performance, up to 1.9 Gbps
- Integrated wireless security and guest access
- Third radio dedicated to security and RF optimization (indoor models)
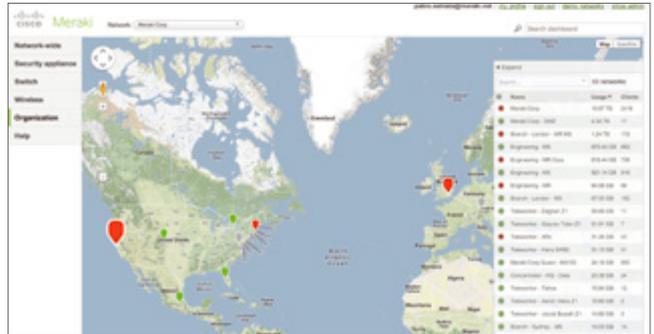- Ideal for high-density campuses, branches, teleworkers, and rugged/outdoor environments
- Built-in traffic shaping, location analytics, group policies—all configurable with just a few mouse clicks

■ Cloud Managed Switches

- GE access switches and 10 GE aggregation switches
- Centrally managed with monitoring and alerts
- Ultra reliable and includes lifetime warranty
- Optimized for voice and video traffic with PoE available on all ports
- Virtual and physical stacking
- Remote-troubleshooting (e.g. cable testing, etc.)

■ Cloud Managed Security Appliances

- Complete networking, security, and application control
- Centrally managed from the cloud
- Includes firewall, auto VPN and branch routing
- IPS, Content Filtering, Anti-Virus
- Six models scale from small branches to campuses

■ Mobile Device Management

- Centrally provision, manage corporate PCs and Mobile devices
- Locate and Track corporate devices anywhere in the world
- Protect devices enforcement, enterprise remote wipe, and integrated network access control
- Network-wide visibility and control
- No on-site controller hardware

For details on Cisco Meraki, visit the following Web site:

🌐 www.cisco.com/go/meraki

Meraki Promotions

Meraki Systems Manager provides cloud-based over-the-air centralized management, diagnostics, monitoring, and security of the mobile devices managed by your organization. Manage distributed deployments of all of your devices with Systems Manager — without an on-site appliance. Managed devices connect securely to Meraki's cloud, enabling you to locate devices, deploy software and apps, deliver content, enforce security policies, and monitor all your devices through an intuitive and powerful web-based dashboard.

Receive up to 100 devices of Meraki EMM for free with any Cisco purchase

No license required until network reaches 100+ devices, then licenses are required per device

Meraki Set Sail Switching Promotion

Set Sail – 5:1 Switch Promotion

From now until 7/30/16, first-time Meraki Switch customers are eligible for a special promotion: buy any MS Switch with a 1-year cloud management license, and get upgraded to a 5-year license at no additional cost.

Check out **meraki.com/setsail** for more details!

SET SAIL with MERAKI SWITCHES

SMOOTH SAILING FOR 5 YEARS

Use Cases

Features Most Used by Our Customers

	Retail	Education	Corporate Office
MX Security	Site-to-Site VPN	Content Filtering	IPS with Sourcefire
MS Switching	Cloning Configurations	Virtual Stacking	Layer 3 and Redundancy
MR Wireless	Cloud CMX Analytics	High-Density WiFi	BYOD Policies
SM Mobility	Tablet Management	Application Management	Security Policy Enforcement

Retail Customers

From guest WiFi to line busting and inventory management, Meraki's cloud-managed networking lowers operational costs and improves customer experience. Customer Stories:

- Sealanes
- E la Carte
- BQ
- Ironman Asia Pacific
- Neinver
- Psichogios Publications
- SternPartner GmbH & Co. KG
- Clint Newell Auto Group
- Tommy Bahama
- Rocky Mountain Chocolate Factory Canada
- Ben Bridge Jeweler
- Hydroscand AB
- Peet's Coffee & Tea
- Westfield Malls
- Francesco Smalto

Education Customers

■ **Higher Education**

Meraki's cloud networking platform is the solution of choice for higher education campuses, delivering superior performance, reliability, management, and cost savings to leading universities. Customer Stories:

- Study Group
- Hautes études d'ingénieur (HEI)
- Albany State University
- MIT
- Stanford University
- City College of San Francisco

■ **K-12 Education**

Meraki's cloud networking solution is ideal for large districts and independent schools alike, providing performance and manageability at a fraction of the cost and complexity of traditional solutions. Customer Stories:

- Schalmont Central School District
- Hills Educational Foundation
- Avenues: The World School
- Region 9 Education Service Center

Other Customers

■ **Healthcare**

Meraki's HIPAA-compliant cloud networking solutions are ideal for enabling mobile healthcare applications, as well as Internet access for patients and visitors, on a single, easy to manage platform. Customer Stories:

- Infors HT ● Zürcher Höhenkliniken Wald und Davos ● Kindred Healthcare
- Montefiore Medical Center ● Talbert House ● Mosaic ● EPIC Management

■ **Industrial/Manufacturing**

Meraki's self-optimizing wireless and ruggedized hardware provide reliable connectivity in even the least forgiving environments. Customer Stories:

- Sealanes ● BQ ● Infors HT ● Cardno ● Hydroscand AB ● ERG S.p.A.
- Saxon Energy Services ● Columbia Steel ● Safety Kleen

■ **Architecture/Construction**

Meraki networks are designed for rapid, zero-touch deployments without on-site IT. Cloud based multi-site / remote management tools make Meraki ideal for distributed, remote, and dynamic environments. Customer Stories:

- Cardno ● Pennoni Associates Inc. ● Sullivan & McLaughlin
- C&S Companies ● ZGF Architects ● Clune Construction

■ **Hospitality and Tourism**

Meraki`s cloud networking solution provides reliable, cost-effective, and centrally managed networking that is easy for hotel employees and problem free for guests. Customer Stories:

- Hoteles Center ● bluegr Hotels & Resorts ● The Field Museum ● eTravel
- Friedrichstadt-Palast ● Hafen Hamburg & Empire Riverside Hotel

■ **Event Venues**

Meraki's plug and play deployment, application traffic shaping, and high-capacity networks are ideal for events of all sizes. Customer Stories:

- Ironman Asia Pacific ● Eastview Church ● The National Gallery
- Monterey Jazz Festival ● ClueCon ● Capital FM Arena

For details on Cisco Meraki Customer Stories, visit the following Web site:
https://meraki.cisco.com/customers

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Cloud Managed Wireless

■ Cisco Meraki MR Cloud Managed Wireless Access Points

Model	Indoor Access Points					
	MR18	MR32	MR34	MR42 NEW	MR52 NEW	MR53 NEW
Radios Specification	1 x 11b/g/n radio 1 x 11a/n radio 1 x WIDS/WIPS radio	1 x 11b/g/n radio 1 x 11a/n/ac radio 1 x Bluetooth Low Energy radio 1 x WIDS/WIPS radio	1 x 11b/g/n radio 1 x 11a/n/ac radio 1 x WIDS/WIPS radio	1 x 11b/g/n radio 1 x 11a/n/ac Wave 2 radio 1 x Bluetooth Low Energy radio 1 x WIDS/WIPS radio	1 x 802.11b/g/n radio 1 x 802.11 a/n/ac Wave 2 radio 1 x WIDS/WIPS radio 1 x Bluetooth Low Energy radio	1 x 802.11b/g/n radio 1 x 802.11 a/n/ac Wave 2 radio 1 x WIDS/WIPS radio 1 x Bluetooth Low Energy radio
11n and 11ac Capabilities	2 x 2 MIMO 2 streams	2 x 2 MIMO 2 streams	3 x 3 MIMO 3 streams	3 x 3 SU/MU-MIMO 3 streams	4x4 SU/MU-MIMO 4 streams 160MHz channel	4x4 SU/MU-MIMO 4 streams 160MHz Channel
Max Data Rate	600 Mbps	1.2 Gbps	1.75 Gbps	1.9 Gbps	2.5Gbps*	2.5Gbps*
Interface	1 × GE	1 × GE	1 × GE	1 × GE	2 x 1 Gigabit interface	1 x 1 mGigabit interface 1 x 1 Gigabit interface

* Refers to maximum over-the-air data frame rate capability of the radio chipset, and may exceed data rates allowed by IEEE 802.11ac-compliant operation

Cloud Managed Switches

■ Cisco Meraki MS Cloud Managed Switches

Model	Layer 2 Access Switches			Layer 3 Access Switches			
	MS220-8 MS220-8P	MS220-24 MS220-24P	MS220-48 MS220-48LP MS220-48FP	MS320-24 MS320-24P	MS320-48 MS320-48LP MS320-48FP	MS350-24 MS350-24P MS350-24X	MS350-48 MS350-48LP MS350-48FP
Downlinks	8 x GE	24 x GE	48 x GE	24 x GE	48 x GE	24 x GE 16 x GE + 8 x mGIG - MS350-24x	48 x GE
Uplinks	2 x SFP	4 x SFP	4 x SFP	4 x SFP/SFP+	4 x SFP/SFP+	4 x SFP/SFP+	4 x SFP/SFP+
Stacking	Virtual	Virtual	Virtual	Virtual	Virtual	Virtual + Physical	Virtual + Physical
PoE/PoE+ Power Budget	124 W (-8P)	370 W (-24P)	370 W (-48LP) 740 W (-48FP)	370 W (-24P)	370 W (-48LP) 740 W (-48FP)	370 W (-24P) UPoE (60W)-MS350-24x	370 W (-48LP) 740 W (-48FP)
Switching Capacity	20 Gbps	48 Gbps	104 Gbps	128 Gbps	176 Gbps	128 Gbps	176 Gbps

Cloud Managed Security Appliances

■ Cisco Meraki MX Cloud Managed Security Appliance Series

Model	Small Branch				Medium Branch	
	MX64	MX64W	MX65 NEW	MX65W NEW	MX84	MX100
Recommended Max Users	50	50	50	50	200	500
Stateful Firewall Throughput	250Mbps	250Mbps	250Mbps	250Mbps	500 Mbps	750 Mbps
Advanced Security Throughput	80 Mbps	80 Mbps	80 Mbps	80 Mbps	200 Mbps	600 Mbps
Maximum VPN sessions	25	25	25	25	100	250
Interfaces	5 x GE USB 3G/4G	5 x GE USB 3G/4G	12 x GE (2 PoE+) USB 3G/4G	12 x GE (2 PoE+) USB 3G/4G	10 x GE 2 x SFP USB 3G/4G	9 x GE 2 x SFP USB 3G/4G
Wireless	–	1 x 11b/g/n radio 1 x 11a/n/ac radio 2 x 2 MIMO 2 streams 1.2 Gbps	–	1 x 11b/g/n radio 1 x 11a/n/ac radio 2 x 2 MIMO 2 streams 1.2 Gbps	–	–

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Outdoor Access Points		
MR66	MR72	Model
1 x 11b/g/n radio 1 x 11a/n radio	1 x 11b/g/n radio 1 x 11a/n/ac radio 1 x Bluetooth Low Energy radio	Radios Specification
2 x 2 MIMO 2 streams	2 x 2 MIMO 2 streams	11n and 11ac Capabilities
600 Mbps	1.2 Gbps	Max Data Rate
1 × GE	1 × GE	Interface

MR52/MR53 NEW

- 802.11ac Wave 2 4-stream 4x4 SU/MU-MIMI
- 160 MHz channel
- Multigigabit Support (MR53)

Aggregation Switches						
MS410-16 NEW	MS410-32 NEW	MS420-24	MS420-48	MS425-16 NEW	MS425-32 NEW	Model
16 x SFP	32 x SFP	24 x SFP/SFP+	48 x SFP/SFP+	16 x SFP+	32 x SFP+	Downlinks
2 x SFP/SFP+	4 x SFP/SFP+	–	–	2x 40 QSFP+	2x 40 QSFP+	Uplinks
Virtual + Physical	Virtual + Physical	Virtual	Virtual	Virtual + Physical Stacking	Virtual + Physical Stacking	Stacking
–	–	–	–	N/A	N/A	PoE/PoE+ Power Budget
72 Gbps	144 Gbps	480 Gbps	960 Gbps	480 Gbps	800 Gbps	Switching Capacity

MS350-24x NEW

- 8 Multigigabit (1/2.5/5/10G) ports
- UPoE (60W) capable

Large Branch, Campus / Concentrator		
MX400	MX600	Model
2,000	10,000	Recommended Max Users
1 Gbps	1 Gbps	Stateful Firewall Throughput
1 Gbps	1 Gbps	Advanced Security Throughput
1,000	5,000	Maximum VPN sessions
With modules*: Up to 20 x GbE Up to 16 x SFP Up to 4 x SFP+ USB 3G/4G	With modules*: Up to 20 x GbE Up to 16 x SFP Up to 4 x SFP+ USB 3G/4G	Interfaces
–	–	Wireless

MX65/MX65W NEW

- 10 x GE LAN including 2 PoE+, and 2 x GE WAN
- 2-stream 11ac, up to 1.2 Gbps (MX65W)

Small Business
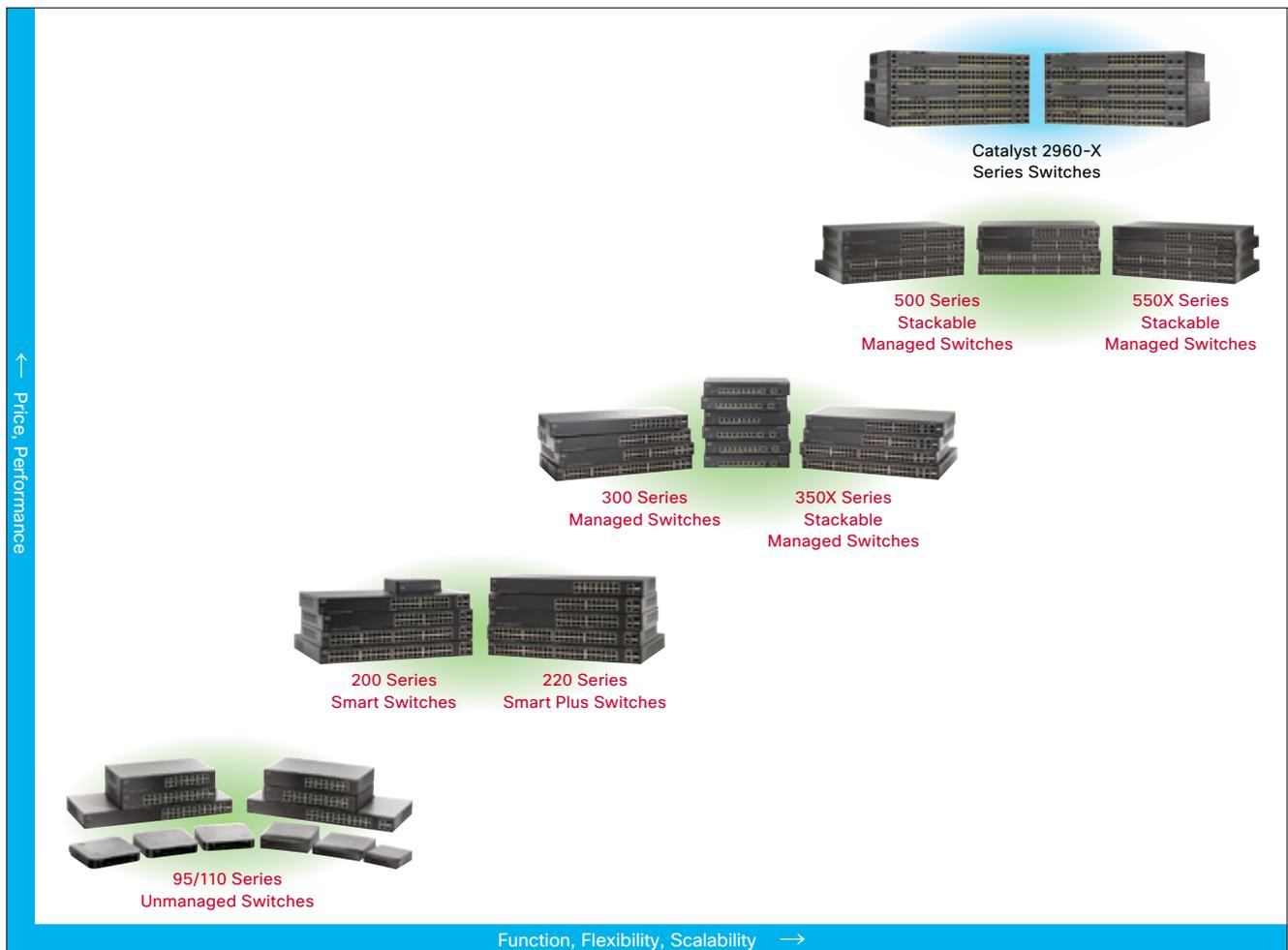
Cisco Small Business Switches

Cisco Small Business Switches provide nonblocking, wire-speed switching for 10-, 100-, and 1000-Mbps network clients. These switches can be used to replace the current workgroup hub or switch and to deliver full 1- and 10-Gbps speeds to high-requirement workstations as necessary while continuing to serve other clients at their current speeds.

The switches can also be used to create a local area network within the business, with appropriate link speeds for each user's requirements. Either way, they're perfect for graphics, videos, and other applications that have to move large files across the network quickly.

- **95/110 Series Unmanaged Switches**
  Reliable network performance at an affordable price. Setup is easy with no software to install and nothing to configure.
- **200 Series Smart Switches**
  Entry-level managed switch features and easy management at a great price. Build a business-class network with the features you need.
- **220 Series Smart Plus Switches**
  Get the powerful features, security, and performance of a managed switch with the affordability that's closer to smart switches.
- **300 Series Managed Switches**
- **350X Series Stackable Managed Switches**
  The ideal combination of affordability and advanced network features for small business, these easy to use fully managed switches are the cornerstone of your network.
- **500 Series Stackable Managed Switches**
- **550X Series Stackable Managed Switches**
  Advanced features, high reliability, and performance at a price you can afford. These stackable managed switches, built for demanding environments, deliver a powerful networking foundation for today and tomorrow.

Positioning Map

Catalyst 2960-X Series Switches

500 Series Stackable Managed Switches

550X Series Stackable Managed Switches

300 Series Managed Switches

350X Series Stackable Managed Switches

200 Series Smart Switches

220 Series Smart Plus Switches

95/110 Series Unmanaged Switches

← Price, Performance

Function, Flexibility, Scalability →

■ Cisco Small Business 95 Series Unmanaged Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE			PoE Input Ports	AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/ SFP	10 GB-T	SFP+	10GB-T /SFP+	Ports	Power Budget	IEEE 802.3					
SF95D-05	SF90D-05	SF95D-05-xx	5	–	–	–	–	–	–	–	–	–	–	External	●	–	–
SF95D-08	SF90D-08	SF95D-08-xx	8	–	–	–	–	–	–	–	–	–	–	External	●	–	–
SF95D-16	SF90D-16	SF95D-16-xx	16	–	–	–	–	–	–	–	–	–	–	External	●	–	–
SF95-24	SF90-24	SF95-24-xx	24	–	–	–	–	–	–	–	–	–	–	Internal	●	–	1 RU
SG95D-05	SG90D-05	SG95D-05-xx	–	5	–	–	–	–	–	–	–	–	–	External	●	–	–
SG95D-08	SG90D-08	SG95D-08-xx	–	8	–	–	–	–	–	–	–	–	–	External	●	–	–
SG95-16	SG92-16	SG95-16-xx	–	16	–	–	–	–	–	–	–	–	–	Internal	●	–	–
SG95-24	SG92-24	SG95-24-xx	–	22	–	2	–	–	–	–	–	–	–	Internal	●	–	1 RU

Small Business

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

■ Cisco Small Business 110 Series Unmanaged Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE			PoE Input Ports	AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T/SFP+	Ports	Power Budget	IEEE 802.3					
SF110D-05	SF100D-05	SF110D-05-xx	5	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF110D-08	SF100D-08	SF110D-08-xx	8	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF110D-08HP	SF100D-08P	SF110D-08HP-xx	8	-	-	-	-	-	-	4	32 W	af	-	External	●	-	-
SF110D-16	SF100D-16	SF110D-16-xx	16	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF110D-16HP	SF100D-16P	SF110D-16HP-xx	16	-	-	-	-	-	-	8	64 W	af	-	External	●	-	-
SF110-16	SF100-16	SF110-16-xx	16	-	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF110-24	SF100-24	SF110-24-xx	24	-	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF112-24	SF102-24	SF112-24-xx	-	22	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG110D-05	SG100D-05	SG110D-05-xx	-	5	-	-	-	-	-	-	-	-	-	External	●	-	-
SG110D-08	SG100D-08	SG110D-08-xx	-	8	-	-	-	-	-	-	-	-	-	External	●	-	-
SG110D-08HP	SG100D-08P	SG110D-08HP-xx	-	8	-	-	-	-	-	4	32 W	af	-	External	●	-	-
SG110-16	SG100-16	SG110-16-xx	-	16	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG110-16HP	n/a	SG110-16HP-xx	-	16	-	-	-	-	-	8	64 W	af	-	Internal	●	-	1 RU
SG110-24	SG100-24	SG110-24-xx	-	22	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG110-24HP	n/a	SG110-24HP-xx	-	22	-	2	-	-	-	12	100 W	af	-	Internal	-	-	1 RU
SG112-24	SG102-24	SG112-24-xx	-	22	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU

■ Cisco Small Business 200 Series Smart Switches/Cisco Small Business 220 Series Smart Plus Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE			PoE Input Ports	AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T/SFP+	Ports	Power Budget	IEEE 802.3					
SF200-24	n/a	SLM224GT-xx	24	-	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF200-24P	n/a	SLM224PT-xx	24	-	-	2	-	-	-	12	100 W	af	-	Internal	-	-	1 RU
SF200-24FP	n/a	SF200-24FP-xx	24	-	-	2	-	-	-	24	180 W	af	-	Internal	-	-	1 RU
SF200-48	n/a	SLM248GT-xx	48	-	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF200-48P	n/a	SLM248PT-xx	48	-	-	2	-	-	-	24	100 W	af	-	Internal	-	-	1 RU
SG200-08	n/a	SLM2008T-xx	-	8	-	-	-	-	-	-	-	-	1	External	●	-	-
SG200-08P	n/a	SLM2008PT-xx	-	8	-	-	-	-	-	4	32 W	af	-	External	●	-	-
SG200-10FP	n/a	SG200-10FP-xx	-	8	-	2	-	-	-	8	62 W	af	-	External	●	-	1 RU
SG200-18	n/a	SLM2016T-xx	-	16	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG200-26	n/a	SLM2024T-xx	-	24	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG200-26P	n/a	SLM2024PT-xx	-	24	-	2	-	-	-	12	100 W	af	-	Internal	-	-	1 RU
SG200-26FP	n/a	SG200-26FP-xx	-	24	-	2	-	-	-	24	180 W	af	-	Internal	-	-	1 RU
SG200-50	n/a	SLM2048T-xx	-	48	-	2	-	-	-	-	-	-	-	Internal	-	-	1 RU
SG200-50P	n/a	SLM2048PT-xx	-	48	-	2	-	-	-	24	180 W	af	-	Internal	-	-	1 RU
SG200-50FP	n/a	SG200-50FP-xx	-	48	-	2	-	-	-	48	375 W	af	-	Internal	-	-	1 RU
SF220-24	SF200E-24	SF220-24-xx	24	-	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF220-24P	SF200E-24P	SF220-24P-xx	24	-	-	2	-	-	-	24	180 W	af/at	-	Internal	-	-	1 RU
SF220-48	SF200E-48	SF220-48-xx	48	-	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF220-48P	SF200E-48P	SF220-48P-xx	48	-	-	2	-	-	-	48	375 W	af/at	-	Internal	-	-	1 RU
SG220-26	n/a	SG220-26-xx	-	24	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG220-26P	n/a	SG220-26P-xx	-	24	-	2	-	-	-	24	180 W	af/at	-	Internal	-	-	1 RU
SG220-50	n/a	SG220-50-xx	-	48	-	2	-	-	-	-	-	-	-	Internal	-	-	1 RU
SG220-50P	n/a	SG220-50P-xx	-	48	-	2	-	-	-	48	375 W	af/at	-	Internal	-	-	1 RU

■ Cisco Small Business 300 Series Managed Switches/Cisco Small Business 350X Series Stackable Managed Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE			PoE Input Ports	AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T/SFP+	Ports	Power Budget	IEEE 802.3					
SF300-08	n/a	SRW208-K9-xx	8	-	-	-	-	-	-	-	-	-	-	External	●	-	1 RU
SF302-08	n/a	SRW208G-K9-xx	8	-	-	2	-	-	-	-	-	-	-	External	●	-	1 RU
SF302-08PP	SF302-08P	SF302-08PP-K9-xx	8	-	-	2	-	-	-	8	62 W	af/at	-	External	●	-	1 RU
SF302-08MPP	SF302-08MP	SF302-08MPP-K9-xx	8	-	-	2	-	-	-	8	124 W	af/at	-	External	●	-	1 RU
SF300-24	n/a	SRW224G4-K9-xx	24	2	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF300-24PP	SF300-24P	SF300-24PP-K9-xx	24	2	-	2	-	-	-	24	180 W	af/at	-	Internal	-	-	1 RU
SF300-24MP	n/a	SF300-24MP-K9-xx	24	2	-	2	-	-	-	24	375 W	af/at	-	Internal	-	-	1 RU
SF300-48	n/a	SRW248G4-K9-xx	48	2	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF300-48PP	SF300-48P	SF300-48PP-K9-xx	48	2	-	2	-	-	-	48	375 W	af/at	-	Internal	-	-	1 RU
SG300-10	n/a	SRW2008-K9-xx	-	8	-	2	-	-	-	-	-	-	-	External	●	-	1 RU
SG300-10PP	SG300-10P	SG300-10PP-K9-xx	-	8	-	2	-	-	-	8	62 W	af/at	-	External	●	-	1 RU
SG300-10MPP	SG300-10MP	SG300-10MPP-K9-xx	-	8	-	2	-	-	-	8	124 W	af/at	-	External	●	-	1 RU
SG300-10SFP	n/a	SG300-10SFP-K9-xx	-	-	8	2	-	-	-	-	-	-	-	External	●	-	1 RU
SG300-20	n/a	SRW2016-K9-xx	-	18	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG300-28	n/a	SRW2024-K9-xx	-	26	-	2	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG300-28PP	SG300-28P	SG300-28PP-K9-xx	-	26	-	2	-	-	-	24	180 W	af/at	-	Internal	-	-	1 RU
SG300-28MP	n/a	SG300-28MP-K9-xx	-	26	-	2	-	-	-	24	375 W	af/at	-	Internal	-	-	1 RU
SG300-28SFP	n/a	SG300-28SFP-K9-xx	-	-	26	2	-	-	-	-	-	-	-	Internal	-	-	1 RU
SG300-52	n/a	SRW2048-K9-xx	-	50	-	2	-	-	-	-	-	-	-	Internal	-	-	1 RU
SG300-52P	n/a	SG300-52P-K9-xx	-	50	-	2	-	-	-	48	375 W	af/at	-	Internal	-	-	1 RU
SG300-52MP	n/a	SG300-52MP-K9-xx	-	50	-	2	-	-	-	48	740 W	af/at	-	Internal	-	-	1 RU
SG350XG-2F10	n/a	SG350XG-2F10-K9-xx	-	-	-	-	10	2	-	-	-	-	-	Internal	-	●	1 RU
SG350XG-24T	n/a	SG350XG-24T-K9-xx	-	-	-	-	22	-	2	-	-	-	-	Internal	-	●	1 RU
SG350XG-24F	n/a	SG350XG-24F-K9-xx	-	-	-	-	-	22	2	-	-	-	-	Internal	-	●	1 RU
SG350XG-48T	n/a	SG350XG-48T-K9-xx	-	-	-	-	46	-	2	-	-	-	-	Internal	-	●	1 RU

■ Cisco Small Business 500 Series Stackable Managed Switches/Cisco Small Business 550X Series Stackable Managed Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE			PoE Input Ports	AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/ SFP	10 GB-T	SFP+	10GB-T /SFP+	Ports	Power Budget	IEEE 802.3					
SF500-24	n/a	SF500-24-K9-xx	24	–	2	2	–	–	–	–	–	–	–	Internal	●	●	1 RU
SF500-24P	n/a	SF500-24P-K9-xx	24	–	2	2	–	–	–	24	180 W	af/at	–	Internal	–	●	1 RU
SF500-24MP	n/a	SF500-24MP-K9-xx	24	–	2	2	–	–	–	24	375 W	af/at	–	Internal	–	●	1 RU
SF500-48	n/a	SF500-48-K9-xx	48	–	2	2	–	–	–	–	–	–	–	Internal	●	●	1 RU
SF500-48P	n/a	SF500-48P-K9-xx	48	–	2	2	–	–	–	48	375 W	af/at	–	Internal	–	●	1 RU
SF500-48MP	n/a	SF500-48MP-K9-xx	48	–	2	2	–	–	–	48	740 W	af/at	–	Internal	–	●	1 RU
SG500-28	n/a	SG500-28-K9-xx	–	24	2	2	–	–	–	–	–	–	–	Internal	●	●	1 RU
SG500-28P	n/a	SG500-28P-K9-xx	–	24	2	2	–	–	–	24	180 W	af/at	–	Internal	–	●	1 RU
SG500-28MPP	n/a	SG500-28MPP-K9-xx	–	24	2	2	–	–	–	24	740 W	af/at	–	Internal	–	●	1 RU
SG500-52	n/a	SG500-52-K9-xx	–	48	2	2	–	–	–	–	–	–	–	Internal	–	●	1 RU
SG500-52P	n/a	SG500-52P-K9-xx	–	48	2	2	–	–	–	48	375 W	af/at	–	Internal	–	●	1 RU
SG500-52MP	n/a	SG500-52MP-K9-xx	–	48	2	2	–	–	–	48	740 W	af/at	–	Internal	–	●	1 RU
SG500X-24	n/a	SG500X-24-K9-xx	–	24	–	–	–	4	–	–	–	–	–	Internal	–	●	1 RU
SG500X-24P	n/a	SG500X-24P-K9-xx	–	24	–	–	–	4	–	24	375 W	af/at	–	Internal	–	●	1 RU
SG500X-24MPP	n/a	SG500X-24MPP-K9-xx	–	24	–	–	–	4	–	24	740 W	af/at	–	Internal	–	●	1 RU
SG500X-48	n/a	SG500X-48-K9-xx	–	48	–	–	–	4	–	–	–	–	–	Internal	–	●	1 RU
SG500X-48P	n/a	SG500X-48P-K9-xx	–	48	–	–	–	4	–	48	375 W	af/at	–	Internal	–	●	1 RU
SG500X-48MP	n/a	SG500X-48MP-K9-xx	–	48	–	–	–	4	–	48	740 W	af/at	–	Internal	–	●	1 RU
SG500XG-8F8T	n/a	SG500XG-8F8T-K9-xx	–	–	–	–	8	8	–	–	–	–	–	Internal	–	●	1 RU
SG550XG-8F8T	n/a	SG550XG-8F8T-K9-xx	–	–	–	–	8	8	–	–	–	–	–	Internal	–	●	1 RU
SG550XG-24T	n/a	SG550XG-24T-xx	–	–	–	–	22	–	2	–	–	–	–	Internal	–	●	1 RU
SG550XG-24F	n/a	SG550XG-24F-xx	–	–	–	–	–	22	2	–	–	–	–	Internal	–	●	1 RU
SG550XG-48T	n/a	SG550XG-48T-K9-xx	–	–	–	–	46	–	2	–	–	–	–	Internal	–	●	1 RU

■ Cisco SFP/SFP+ Transceivers

| SKU	Description
MFEFX1	100Base-FX SFP transceiver, for multi-mode fiber, 1310 nm wavelength, support up to 2 km
MFELX1	100Base-LX SFP transceiver, for single-mode fiber, 1310 nm wavelength, support up to 15 km
MFEBX1	100Base-BX-20U SFP transceiver for single-mode fiber, 1310 nm wavelength, support up to 20 km
MGBT1	1000BASE-T SFP transceiver, for Category 5 copper wire, support up to 100 m
MGBSX1	1000BASE-SX SFP transceiver, for multi-mode fiber, 850 nm wavelength, support up to 500 m
MGBLX1	1000BASE-LX SFP transceiver, for single-mode fiber, 1310 nm wavelength, support up to 10 km
MGBLH1	1000BASE-LH SFP transceiver, for single-mode fiber, 1310 nm wavelength, support up to 40 km
MGBBX1	1000BASE-BX-20U SFP transceiver, for single-mode fiber, 1310 nm wavelength, support up to 10 km
SFP-H10GB-CU1M, SFP-H10GB-CU3M, SFP-H10GB-CU5M	10GBASE-CU SFP transceiver, for Twinax cable, support up to 1, 3, 5 m
SFP-10G-SR	10GBASE-SR SFP+ transceiver, for multi-mode fiber, 850 nm wavelength, support up to 400 m
SFP-10G-LR	10GBASE-LR SFP+ transceiver, for single-mode fiber, 1310 nm wavelength, support up to 10 km
SFP-10G-LRM	10GBASE-LRM SFP+ transceiver, for multi-mode fiber and single-mode fiber, 1310 nm wavelength, support up to 300 m

Simple Configuration and Management

Cisco Small Business Products are designed to be configured and managed by small businesses, they include an embedded web-based configuration utility. Their simple graphical user interfaces (GUIs) help your staff easily configure, manage, and troubleshoot your network. (Cisco Small Business 95/110 Series Unmanaged Switches are ready to use right out of the box, there is no software to install and nothing to configure.)

■ Cisco FindIT Network Discovery Utility

Easily integrated with your web browser, the Cisco FindIT Network Discovery Utility automatically discovers any Cisco Small Business devices in your network, and allows you to easily view important information about the device or to connect to the device administration interface. You will also be notified of the availability of firmware updates, and about any devices that are no longer under warranty or covered by a support contract.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services
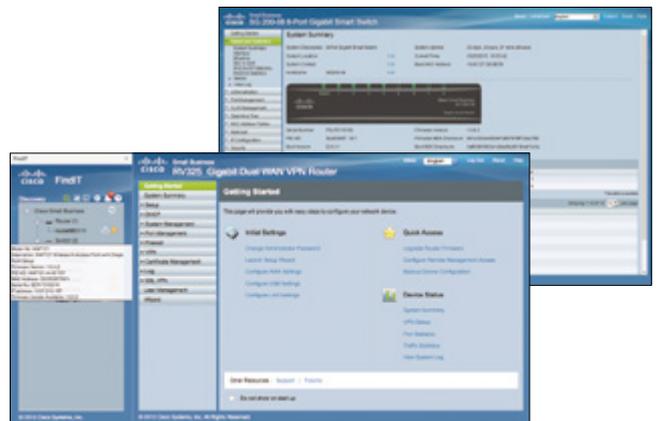
Cisco Small Business Wireless Access Points

Positioning Map

Cisco Small Business Wireless Access Points combine business-class features with the reliability and performance needed for small business networks. The

Single Point Setup(SPS) feature makes deployment of multiple access point easy and cost effective.

↑ Price, Performance

Standalone
SPS 4 Cluster

100 Series
Wireless Access Points

Standalone
SPS 8 Cluster

11ac WAP 371   WAP 351

300 Series
Wireless Access Points

Standalone
SPS 16 Cluster

500 Series
Wireless Access Points

Aironet Access Points
Standalone
or
Controller-based

Function, Flexibility, Scalability →

■ Cisco Small Business Wireless Access Points

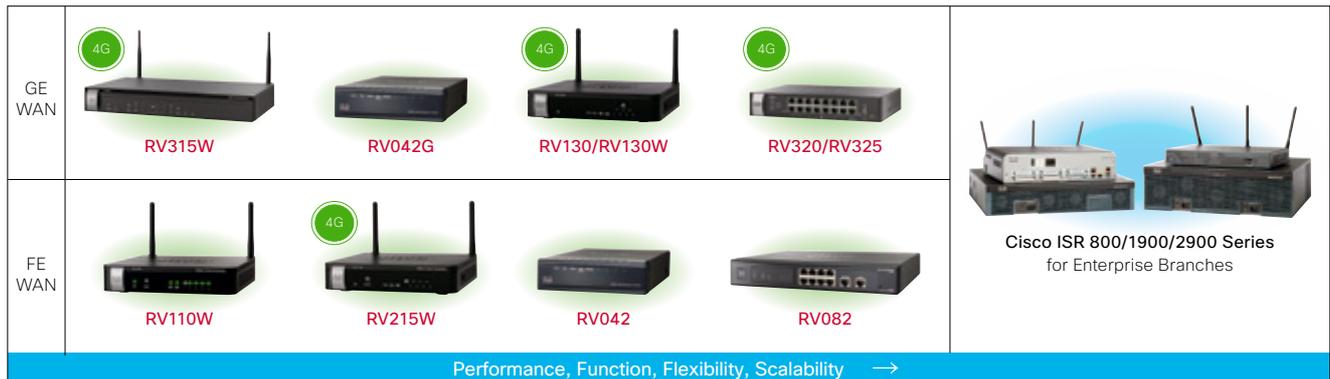| SKU | Mounting | Wireless Data Rate | Active Users per Radio | IEEE 802 | | | | | 2.4 GHz | 5 GHz | Concurrent Radios | Ports | | PoE Ports | | AC Power |
				11a	11b	11g	11n	11ac				FE	GE	Input	Output	
WAP121-x-K9-xx	Desk, Wall	300 Mbps	16	–	●	●	●	–	●	–	–	1	–	1*1	–	External
WAP131-x-K9-xx	Desk, Wall	300 Mbps	16	●	●	●	●	–	●	●	●	–	1	1*1	–	External
WAP321-x-K9	Horizontal	300 Mbps	32	●	●	●	●	–	●	●	–	–	1	1*2	–	External
WAP351-x-K9	Horizontal	300 Mbps	32	●	●	●	●	–	●	●	●	–	5	1*2	1	External
WAP361-x-K9	Wall Plate AP	1200 Mbps	32	●	●	●	●	●	●	●	●	–	5	1*2	1	External
WAP371-x-K9	Horizontal	1299 Mbps	32	●	●	●	●	●	●	●	●	–	1	1*2	–	External
WAP551-x-K9	Horizontal	450 Mbps	32	●	●	●	●	–	●	●	–	–	1	1*2	–	–
WAP561-x-K9	Horizontal	450 Mbps	32	●	●	●	●	–	●	●	●	–	1	1*2	–	–

*1 Power Adapter (included) or Power Injector is required when not using PoE receiving. *2 Power Adapter or Power Injector is required when not using PoE receiving.

Cisco Small Business Routers

Positioning Map

Cisco Small Business Routers are affordable, highly secure network access devices, designed and built for small businesses. Cisco offers a broad range of

small business routers to meet any requirement from basic Internet connectivity to high-capacity, business-critical networking.

GE WAN

4G RV315W   RV042G   4G RV130/RV130W   4G RV320/RV325

FE WAN

RV110W   4G RV215W   RV042   RV082

Cisco ISR 800/1900/2900 Series
for Enterprise Branches

Performance, Function, Flexibility, Scalability →

■ Cisco Small Business RV Series Routers

| New SKU | Existing SKU | WAN Ports | | | LAN Ports | | IPsec Throughput | IPsec VPN Tunnels | | IEEE 802 | | | 2.4 GHz | AC Power |
		FE	GE	3G/4G	FE	GE		Site-to-Site	Remote Access	11b	11g	11n		
CVR100W-x-K9-xx	n/a	1	–	–	4	–	5 Mbps	1	3	●	●	●	●	External
RV042	n/a	2	–	–	4	–	59 Mbps	50	50	–	–	–	–	External
RV042G-K9-xx	n/a	–	2	–	–	4	75 Mbps	50	50	–	–	–	–	External
RV082	n/a	2	–	–	8	–	97 Mbps	100	50	–	–	–	–	Internal
RV110W-x-xx-K9	n/a	1	–	–	4	–	5 Mbps	1	5	●	●	●	●	External
RV130-K9-xx	RV180-K9-xx	–	1	1*1	–	4	50 Mbps	10	10	–	–	–	–	External
RV130W-x-K9-xx	RV120W-x-xx RV180W-x-K9-xx	–	1	1*1	–	4	50 Mbps	10	10	●	●	●	●	External
RV215W-x-K9-xx	n/a	1	–	1*1	4	–	5 Mbps	1	5	●	●	●	●	External
RV315W-x-K9-xx	n/a	–	2	1*1	8	–	100 Mbps	50	50	●	●	●	●	External
RV320-K9-xx	n/a	–	2	1*1	–	4	100 Mbps	25	25	–	–	–	–	External
RV325-K9-xx	n/a	–	2	1*1	–	14	100 Mbps	25	25	–	–	–	–	External

*1 3G/4G modem is required.

Cisco Low-end Product Series Comparison

Switches

Catalyst 2960-X Series Switches
- 24- & 48-port GE, 24- & 48-port GE with 10 GE models and PoE options
- Enable scalable, secure and energy-efficient business operations with intelligent services and a range of advanced Cisco IOS software features
- Cisco FlexStack Plus for stacking of up to 8 switches with 80 Gbps of stack throughput (optional)

500/550X Series Stackable Managed Switches
- 24- & 48-port FE, 28- & 52-port GE, 24- & 48-port GE with 10 GE,
- 16- to 48-port 10 GE models and PoE+ options
- Advanced QoS, security, EEE, IPv6 support, and L3 switching
- True stacking of up to 8 switches
- Recommended models: SF500-24, SG500-28, SG500-28P

300/350X Series Managed/Stackable Managed Switches
- 8- to 48-port FE, 10- to 52-port GE,
  12- to 48-port 10 GE models and PoE+ options
- Enhanced QoS, security, EEE, IPv6 support, and L3 switching
- True stacking of up to 4 switches
- Recommended models: SG300-10, SG300-10MPP, SG300-28

200/220 Series Smart/Smart Plus Switches
- 24- & 48-port FE and 8- to 50-port GE models with PoE+ options
- Basic QoS, security, EEE and IPv6 support
- Recommended models: SF200-24, SG200-08, SG200-26

95/110 Series Unmanaged Switches
- 5- to 24-port FE and GE models with PoE+ options
- No configuration or management required
- QoS and Energy Efficient Ethernet (EEE) on all models and energy-efficient design on GE models
- Recommended models: SF95-24, SG95D-08, SG95-24

Function, Flexibility, Scalability →

Price, Performance ↑

Wireless Access Points

Aironet Access Points
- IEEE 802.11 a/b/g/n/ac (Aironet 1700/1830/1850/2700/3700)
- 2.4 and 5 Ghz
- The fourth antenna provides exceptional performance compared to other IEEE 802.11ac solutions (Aironet 2700/3700)
- Available in highly secure, enterprise-scale Controller-based mode, or Standalone mode

500 Series Wireless Access Points
- IEEE 802.11 a/b/g/n
- 2.4 or 5 Ghz (WAP551), 2.4 and 5 Ghz (WAP561),
- Up to 450 Mbps with 3 x 3 MIMO
- Manage up to 16 APs in a cluster

300 Series Wireless Access Points
- IEEE 802.11 a/b/g/n (WAP321/WAP351), IEEE 802.11 a/b/g/n/ac (WAP371)
- 2.4 or 5 Ghz (WAP321), 2.4 and 5 Ghz (WAP351/WAP371),
- Up to 300 Mbps with 2 x 3 MIMO (WAP321/WAP351[*1]),
  Up to 1.3 Gbps with 3 x 3 MIMO (WAP371[*2])
- Manage up to 8 APs in a cluster

11ac WAP371

WAP351

100 Series Wireless Access Points
- IEEE 802.11 b/g/n
- 2.4 Ghz (WAP121), 2.4 and 5 Ghz (WAP131)
- Up to 300 Mbps with 2 x 2 MIMO
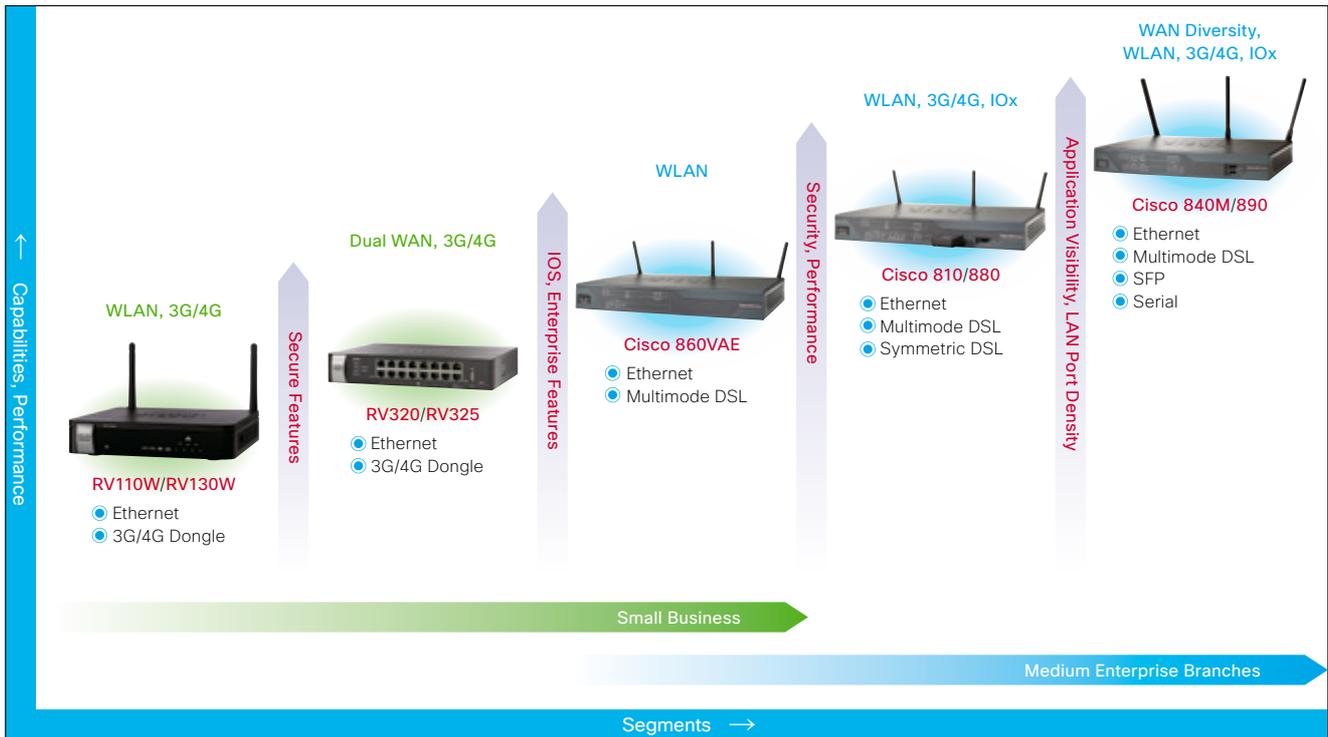- Manage up to 4 APs in a cluster

WAP131

Function, Flexibility, Scalability →

Price, Performance ↑

*1 2 x 2 MIMO (5 Ghz).   *2 2 x 2 MIMO (2.4 Ghz).

Small Business

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Routers

WAN Diversity, WLAN, 3G/4G, IOx

Cisco 840M/890
- Ethernet
- Multimode DSL
- SFP
- Serial

WLAN, 3G/4G, IOx

Cisco 810/880
- Ethernet
- Multimode DSL
- Symmetric DSL

WLAN

Cisco 860VAE
- Ethernet
- Multimode DSL

Dual WAN, 3G/4G

RV320/RV325
- Ethernet
- 3G/4G Dongle

WLAN, 3G/4G

RV110W/RV130W
- Ethernet
- 3G/4G Dongle

↑ Capabilities, Performance

Secure Features

IOS, Enterprise Features

Security, Performance

Application Visibility, LAN Port Density

Small Business

Medium Enterprise Branches

Segments →

■ Low End Routers Specification Comparison

	RV110W/215W	RV130/130W	RV320/325	Cisco 860VAE	Cisco 810	Cisco 880	Cisco 840M	Cisco 890
Multiple Active WAN Interfaces	1 FE + 4G Dongle	1 GE + 4G Dongle	2 GE + 4G Dongle	–	GE + 4G	FE/xDSL + 4G	GE/GE	GE/SFP + GE + xDSL + 4G
FE/GE WAN	1 FE	1 GE	2 GE	1 GE	1 GE	1 FE	2 GE	1 FE (891F), 1 GE (892FSP)
GE SFP	–	–	–	–	–	–	–	1
Switch Ports	4	4	4/14	5 (4 + 1)	4	4	4 or 8	8 or 24
POE	–	–	–	1	–	2	–	4 or 8
VDSL2/ADSL2	–	–	–	Yes	–	886VA, 887VA	–	896VA, 897VA
G.SHDSL (ATM/EFM)	–	–	–	–	–	888	–	898EA
WWAN	4G Dongle (RV215W)	4G Dongle	4G Dongle	–	HSPA, EVDO, HSPA+, 4G LTE	HSPA, EVDO, HSPA+, 4G LTE	EVDO, HSPA	4G LTE
IEEE 802.11n	2.4 GHz	2.4 GHz (RV130W)	–	2.4 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	–	2.4 GHz/5 GHz
WLAN Deployment Modes	Standalone	Standalone	Standalone	Standalone	Standalone, Controller-based	Standalone, Controller-based	–	Standalone, Controller-based
Serial	–	–	–	–	–	–	Optional	–
T1, ISDN, V.92	–	–	–	–	–	ISDN	–	ISDN &V.92
Compute	–	–	–	–	–	IOx	IOx	IOx
Voice Interfaces	–	–	–	–	–	Select Models	–	–
Warranty	LLW	LLW	LLW	1 Year	1 Year	1 Year	1 Year	1 Year
Typical Lifecycle	3 Years	3 Years	3 Years	5 Years	5 Years	5 Years	5 Years	5 Years
OS	Linux	Linux	Linux	IOS	IOS	IOS	IOS	IOS
Routing Features	Static, RIP	Static, RIP	Static, RIP	Static, RIP, BGP	Static, RIP, BGP, OSPF, EIGRP	Static, RIP, BGP, OSPF, EIGRP	Static, RIP, BGP, OSPF, EIGRP	Static, RIP, BGP, OSPF, EIGRP
PPPoX	PPPoE	PPPoE	PPPoE	●	●	●	●	●
Firewall	Layer 4 FW	Layer 4 FW	Layer 4 FW	Layer 4 FW	Layer 4 FW	Layer 4 FW	Layer 4 FW	Layer 4 FW
VPN	Site to Site (IPsec), Remote Access (PPTP)	Site to Site (IPsec), Remote Access (IPsec, PPTP)	Site to Site (IPsec), Remote Access (IPsec, SSL, PPTP)	Site to Site (IPSec), Remote Access (Easy VPN, Flex VPN)	Site to Site, Hub-Spoke, Remote Access, Any to Any (IPSec VPN, DMVPN, GETVPN, Flex VPN, SSL)	Site to Site, Hub-Spoke, Remote Access, Any to Any (IPSec VPN, DMVPN, GETVPN, Flex VPN, SSL)	Site to Site, Hub-Spoke, Remote Access, Any to Any (IPSec VPN, DMVPN, GETVPN, Flex VPN, SSL)	Site to Site, Hub-Spoke, Remote Access, Any to Any (IPSec VPN, DMVPN, GETVPN, Flex VPN, SSL)
Content Filtering	–	●*1	●*1	CWS	CWS	CWS	CWS	CWS
NAT/PAT	●	●	●	●	●	●	●	●
QoS	Priority queuing (5-tuple)	Priority queuing (5-tuple)	Rate limiting or Priority queuing (5-tuple)	QoS	HQoS	HQoS	HQoS	HQoS
AVC	–	–	–	–	●	●	●	●
CLI	–	–	●	IOS	IOS	IOS	IOS	IOS
IPSLA	–	–	–	●	●	●	●	●
EEM	–	–	–	●	●	●	●	●

*1 To be supported in future software release.

Services

Cisco Smart Net Total Care Service

Your IT infrastructure is the lifeline that connects your business to customers and suppliers. Business success requires maintaining high service levels for your network while reducing costs and expanding your network as your business grows. Cisco Smart Net Total Care can help you meet these objectives by providing technical services and smart capabilities that:

- **Resolve problems faster**
  Identify issues quickly and streamline your incident management processes to reduce network downtime and improve IT service levels.

- **Reduce risk**
  Access to Cisco technical experts combined with smart, proactive tools and capabilities minimizes risks to business continuity.

- **Increase operational efficiency**
  Proactive management and automated processes mean fewer support resource requirements and lower costs for managing your network.

Resolve Problems Faster

24 x 7 x 365 TAC assistance on product use, configuration, and troubleshooting

Get replacement hardware in as little as two hours

Automated diagnostic and support capabilities speed time-to-resolution

Improve Risk Management

Visibility into covered and uncovered devices – comply with corporate policies

Identify IT that is nearing end-of-life – simplify upgrades, planning and budgeting

Ensure that Cisco products are running current, supported software

Increase Operational Efficiency

Reduce the time and staff required for contract management and renewal

Improve planning with inventory and support contracts visibility

Pinpoint and manage product and security alerts – only those relevant to your network

Cisco Smart Assist Service

Cisco Smart Assist Service is a related service to extend the value of Cisco Smart Net Total Care.

This service can help you accelerate the time to enable and use smart capabilities. It provides assistance for installing the Cisco collector and accessing the Smart Net Total Care portal. It also offers onboarding and enablement services such as smart capability training, support for product inventory collection, installed base (IB) reconciliation (twice per year), and Cisco TAC support for the portal and collections.

Feature / Functionality	Smart Net Total Care (SNTC)	Smart Assist
Smart Capabilities Entitlement	●	Through SNTC
Onboarding Installation Assistance	Customer Self-Service	Cisco Assisted
Onboarding Smart Capabilities Training	Customer Self-Service	Cisco Assisted
IB Reconciliation	Customer Self-Service	Twice per year
Technical Support for Portal & Collections	Community Support	TAC

Services

Cisco Smart Net Total Care helps reduce downtime with fast, expert technical support and flexible hardware coverage provided by the Cisco Technical Assistance Center (TAC). Its integrated smart capabilities provide current information about the customer's installed base, contracts, and security alerts to enhance the efficiency of support workflows.

Technical Service and Incident Management

- **Cisco TAC**
  The Cisco TAC is staffed by Cisco professionals certified in a broad range of Cisco products and technologies and service provider architectures. We provide you with access by phone, fax, or email 24 hours a day, 365 days a year and can assist you with product use, configuration, and troubleshooting issues.

- **Advance hardware replacement**
  With our customized hardware support service plans, you can have confidence knowing that your hardware can support your ongoing business needs. Cisco offers multiple service levels with different shipment options.

■ Advance Hardware Replacement Service Levels

Service Level	Description
Smart Net Total Care 24 x 7 x 2	2-hour response, 24 hours a day, 7 days per week, including holidays
Smart Net Total Care 24 x 7 x4	4-hour response, 24 hours a day, 7 days a week, including holidays
Smart Net Total Care 8 x 5 x4	4-hour response, local business hours based on depot time, 5 days a week
Smart Net Total Care 8 x 5 x Next Business Day	Next-business-day delivery, local business hours based on depot time, 5 days a week

- **Onsite support**
  Cisco is committed to providing professional, customer-focused support services in person at your location. Smart Net Total Care Onsite service includes installation of advance replacement parts.

■ Onsite Support Service Levels

Service Level	Description
Smart Net Total Care Onsite 24 x 7 x 2	2-hour response, 24 hours a day, 7 days per week, including holidays
Smart Net Total Care Onsite 24 x 7 x 4	4-hour response, 24 hours a day, 7 days a week, including holidays
Smart Net Total Care Onsite 8 x 5 x 4	Based on depot time. 4-hour response, 9 a.m. to 5 p.m., if the request is received before 1 p.m., the service (including parts, labor, and materials) will be provided the same day. For requests received after 1 p.m., the service will be provided the following business day.
Smart Net Total Care Onsite 8 x 5 x NextBusiness Day	Based on depot time. Next business day, 9 a.m. to 5 p.m., if the request is received before 3 p.m., the service (including parts, labor, and materials) will be provided the next business day. After 3 p.m., the service (including parts, labor, and materials) will be provided the following business day.

- **Software updates**
  Cisco provides OS software updates for your licensed feature set. Software releases and any supporting documentation are available through Cisco.com Software Central at http://software.cisco.com/swcentral/home.html.

- **Online self-help support**
  Cisco provides access to the Cisco Support website, which includes Cisco's extensive knowledge library, software downloads, and support tools designed to help users resolve network issues quickly without opening a case.

Security and Product Alerts

- **Hardware alerts**
  Hardware alerts inform you about devices that have reached or are approaching end of life in your network.

- **Software alerts**
  Software alerts inform you about end-of-life issues with specific software versions you are using.

- **Security alerts**
  Security alerts are Product Security Incident Response Team (PSIRT) alerts that inform you about security vulnerabilities associated with specific devices in your network.

- **Field notices**
  Field notices inform you about significant issues (other than security vulnerability issues) with a hardware device or software version.

Service Coverage Management

- **Service coverage reports**
  Device data from installed base collections can be matched against service contracts and purchase orders to identify coverage gaps. View all service contracts and coverage levels, including 24-month advance visibility into upcoming renewal dates. Reviewing coverage information can help ensure that devices in your network have the right kind of coverage for their intended use.

- **Service coverage and renewal management workflow**
  This feature gives you the ability to document and annotate those devices that do not require service coverage and why. You can also assign tasks to people responsible for architectural or budget planning to ask for recommendations about renewing coverage versus replacing specific devices before their service contracts expire.

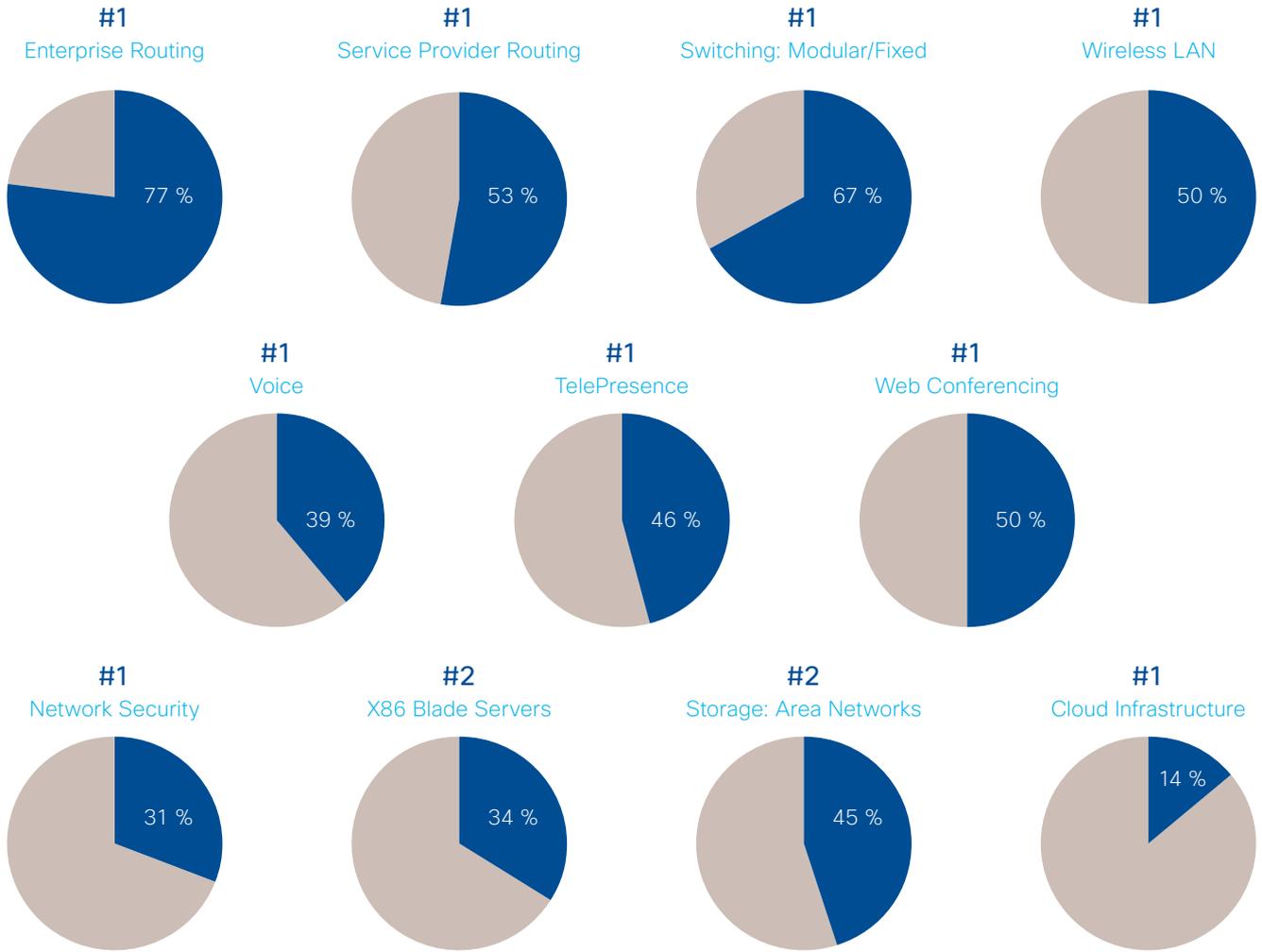## Product Lifecycle Management

- **Role-based access control (RBAC)**
  The Smart Net Total Care portal gives you control over the types of data that users can see. User views within the portal are based on the user's role, allowing administrators to assign roles and designate network device data visibility for portal users, including partners. For example, a certain group of network administrators may be given access to data for a specific segment of the network, and other groups of users may be restricted to specific types of information such as device configuration data or security alerts.

- **Device data file uploads**
  In addition to data uploads from the Cisco collector, data can be uploaded using manual file uploads (such as from a spreadsheet) or third-party collection mechanisms. After data is uploaded into the portal, it can be analyzed and enriched with Cisco support information.

Sales Acceleration

Switches

Wireless

Routers

Meraki

Small Business

Services

Our Leading Market Share

#1
Enterprise Routing

77 %

#1
Service Provider Routing

53 %

#1
Switching: Modular/Fixed

67 %

#1
Wireless LAN

50 %

#1
Voice

39 %

#1
TelePresence

46 %

#1
Web Conferencing

50 %

#1
Network Security

31 %

#2
X86 Blade Servers

34 %

#2
Storage: Area Networks

45 %

#1
Cloud Infrastructure

14 %

Source: Dell'Oro, Synergy, Infonetics, ACG; Q1'CY15 Market share data (Network Security share DOES include Sourcefire; Web Conferencing is SaaS; Cloud Infrastructure is Q4'CY14 Synergy data).

CISCO™

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