Cisco 5000 Enterprise Network Compute System

Contents

The Cisco® 5000 Enterprise Network Compute System is a compute appliance family designed for a virtualized, Software-Defined Branch (SD-Branch) network architecture. The system offers service flexibility, performance, and lower total cost of ownership for the next-generation branch office.

Product overview

The Cisco 5000 Enterprise Network Compute System (ENCS) is a line of compute appliances designed for the Cisco SD-Branch and Enterprise Network Functions Virtualization (ENFV) solution. It delivers a new standard of software-defined flexibility and performance, and offers a low Total Cost of Ownership (TCO). The 5000 ENCS is a hybrid platform that combines the best attributes of a traditional router and a traditional server and offers the same functionality with a smaller infrastructure footprint. Offered with the Cisco Integrated Services Virtual Router (ISRv) and NFV Infrastructure Software (NFVIS) as the hosting layer, the platform offers a complete solution for a simplified deployment. It also accelerates some functions in hardware such as inter-VM traffic flows, IP Security (IPsec) crypto, and RAID for storage. Built-in lights-out management is also supported with Cisco Integrated Management Controller on certain models.

Figure 1 shows the Cisco 5000 Enterprise Network Compute System family. The Cisco 5400 ENCS (bottom) consists of three models: the 5412, 5408, and 5406. The Cisco 5100 ENCS (top) consists of one model: the 5104. It is available in three storage-capacity variants (64G, 200G, and 400G).

Figure 1.
Cisco 5000 Enterprise Network Compute System Family

Cisco SD-Branch delivers a fully functional virtualized solution for network and application services. The main building blocks of the solution include:

- An orchestration environment to allow easy automation of the deployment of virtualized network services, consisting of multiple Virtualized Network Functions (VNF)
- The VNFs, which provide the desired network functionality, or even non-networking software applications, required at a deployment location
- The NFV Infrastructure Software platform to facilitate the deployment and operation of VNFs and hardware components
- x86-based compute resources, such as the Enterprise Network Compute System, to provide the CPU, memory, and storage required to deploy and operate VNFs and run applications

Figure 2 shows the main components of Cisco's Enterprise NFV solution.

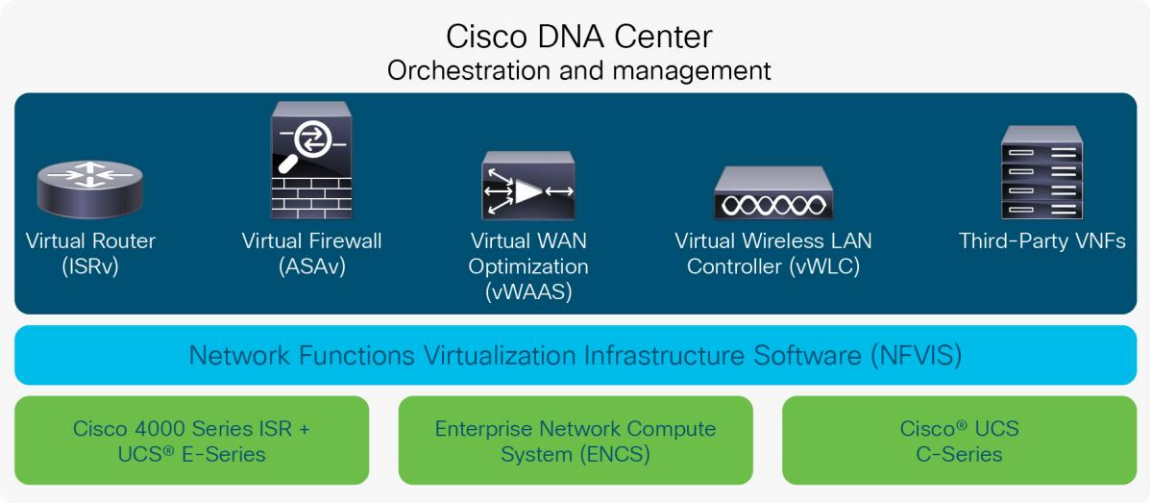

Figure 2.
SD-Branch Building Blocks

For more information on the Cisco SD-Branch solution, visit: https://www.cisco.com/go/sd-branch.

Support for Cisco Software-Defined WAN (Cisco SD-WAN)

Cisco SD-WAN capability can be enabled on both ENCS 5100 and 5400. Cisco SD-WAN offers an entirely new way to manage and operate your WAN infrastructure. Cisco SD-WAN is a cloud delivered architecture that offers secure, flexible and rich services with the following key benefits:

- **Better user experience:** The ability to deploy applications in minutes, on any platform, with a consistent user experience. Deliver predictable performance for applications residing in the data center or in the cloud.
- **Greater agility:** Faster, easier deployment and operation of your WAN, and get faster performance using less bandwidth. Add new revenue generating services in minutes not months.
- **Advanced threat protection:** Securely connect your users to applications in minutes and protect your data from the WAN edge to the cloud. Secure segmentation for critical assets and multi-layer, robust security that encrypts all data.

With this integration, the Cisco IOS XE SD-WAN software provides SD-WAN capability on

- The broadest range of WAN interfaces
- Rich services and app policies
- Strong price / performance economics across the WAN Edge portfolio

And for customers, the Cisco IOS XE SD-WAN software enables important steps towards IBN for WAN, i.e.

a. Centralized management and operational simplicity
b. Secure connectivity on the hybrid WAN
c. Optimized access to SaaS and Public Cloud
d. Predictable Application Quality of Experience with policy-based automation

SD-WAN integrated security

In order to efficiently connect to multiple cloud infrastructures many enterprise customers want to build an SD-WAN infrastructure that uses Direct Internet Access (DIA). This can save costs and reduce complexity by reducing WAN traffic backhauled to your data centers; however connecting branches directly to the internet without the right security controls exposes your network to threats and vulnerabilities.

With Cisco SD-WAN and the ENCS 5000 series platforms, you have integrated security built-right-in for branch DIA security with these integrated security capabilities:

- Application aware enterprise firewall
- Intrusion prevention
- DNS layer enforcement (Umbrella)
- URL Filtering

And with Cisco SD-WAN security integration you will reduce complexity by having a single management interface (vManage) for both the network and security.

For more info on Cisco SD-WAN and vManage see: https://www.cisco.com/go/sd-wan.

Unified access security and multi-factor authentication

Zero trust security model, allows secure connections to all applications (whether on premises or in the cloud) based on the trust worthiness of users and devices.

The Cisco SD-WAN subscriptions are aligned across three subscription licenses of **Cisco DNA Essentials, Cisco DNA Advantage and Cisco DNA Premier**, each expanding functionally. The **Cisco DNA Essentials** covers all types of connectivity & router life cycle management, support for Network & application visibility coupled with basic premise and transport security. The **Cisco DNA Advantage** provides for Advanced WAN topologies, Application aware policies supported by enhanced network security. The **Cisco DNA Premier** provides for Cloud connectivity with unlimited segmentation, Advanced Application optimization & Network Analytics, secured by advanced threat protection.

For more information on Cisco SD-WAN please refer to https://www.cisco.com/c/en/us/products/software/one-wan-subscription/index.html.

Platform architecture highlights

Table 1 lists the primary hardware architectural features and benefits of the 5000 systems. The software's comprehensive portfolio of services spans multiple technology areas, including security, WAN optimization, application and network Quality of Service (QoS), and embedded management.

Table 1. Architectural highlights

Architectural features	Benefits/Description
End-to-end easily deployable solution	• Vertically integrated solution with industry-leading software – includes Cisco ISRv, NFV Infrastructure Software, Virtual Wide-Area Applications Services (vWAAS), Virtual Adaptive Security Appliance (ASAv), and Virtual Wireless LAN Controller (vWLC) • Broad range of VNFs from Cisco; open to third-party VNFs • Centralized orchestration with Cisco DNA Center, Cisco Enterprise Services Automation, and Virtual Managed Services (vMS)
Multicore processor options	• Choice of high-performance Intel® Xeon® D-1500 Series or AMD Embedded R-Series SOC RX-421ND processors that can be picked for a specific application workload with room to expand for future growth

Architectural features	Benefits/Description
Form factor	• High-density functionality in a 1-rack-unit and 12-inch-deep appliance with ENCS 5400 Series, or 10-inch-deep appliance with ENCS 5100 Series • Enterprise Network Compute System will have the same 6- to 8-year lifecycle as a traditional ISR, with enterprise-grade components tested for a wide range of environments • Enterprise Network Compute System also offers standard components like our traditional routers, such as mounts and a range of power cables
Hardware offload and acceleration	• Optional hardware offload for VM-to-VM traffic, supported by an Intel XL710 Ethernet Controller • Optional hardware RAID controller for external drive bays
Integrated management controller (ENCS 5400 Series)	• Built-in lights-out server management through the Cisco Integrated Management Controller, which runs on the same dedicated baseboard management controller hardware found in all Cisco UCS® products • This feature provides standalone management consistency with Cisco UCS E-Series blade servers and Cisco UCS C-Series rack servers for both local and remote server monitoring and configuration management
Integrated GE WAN and LAN ports	• 2 to 4 Gigabit Ethernet (GE) WAN or LAN port (dual-mode RJ-45 and SFP) • Built-in 8-port GE LAN switch with PoE capability on ENCS 5400 Series • GE management port for an Intel x86 host
Optional integrated power supply for distribution of PoE (ENCS 5400 Series)	• An optional upgrade to the internal power supply provides inline power (802.3af-compliant PoE or 802.3at-compliant PoE+) to optional integrated switch modules • Supported on the 5412 and 5408 Enterprise Network Compute Systems only
Cisco Network Interface Modules (NIMs) (ENCS 5400 Series)	• Supports traditional WAN interfaces, 4G LTE, and LAN or WAN GE ports; includes the same slot form factor that is available on 4000 Series ISRs • Provides flexibility for a phased transition to a fully Ethernet-based connectivity • NIMs support Online Insertion and Removal (OIR)
Storage	• Multiple storage options, including on-board motherboard storage for smaller requirements, and extensible with external disk bays for larger storage for WAN optimization, local servers, and physical security

Product specifications

Figure 3 shows the front and back of the Cisco 5400 Enterprise Network Compute System platform.

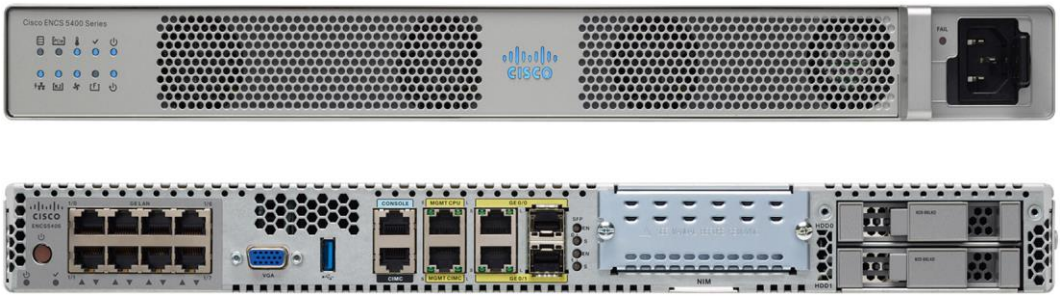

Figure 3.
Cisco 5400 Enterprise Network Compute System – Front And Back

Figure 4 shows the front and back of the Cisco 5100 Enterprise Network Compute System platform.

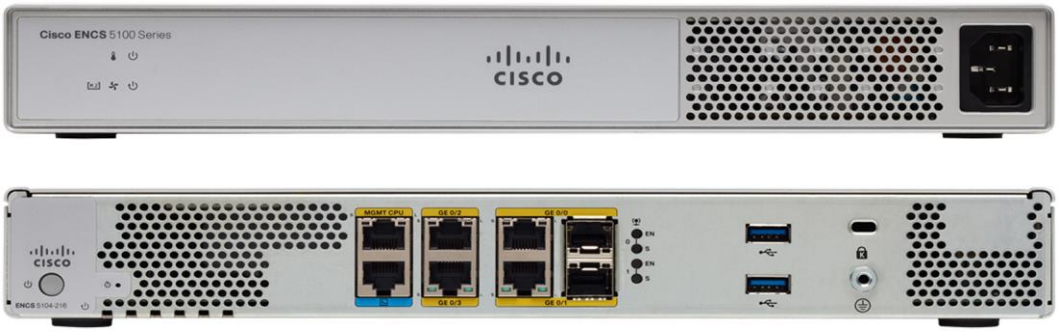

Figure 4.
Cisco 5100 Enterprise Network Compute System – Front and Back

Tables 2, 3 and 4 list the general product specifications for the Cisco 5000 ENCS.

Table 2. Specifications for the Cisco 5000 Enterprise Network Compute System

Technical specifications	Cisco 5400 ENCS	Cisco 5100 ENCS
CPU	Intel Xeon Broadwell DE Processor D-1500 Family ENCS5412: Intel Xeon Processor D-1557 (12-core, 1.5 GHz, and 18 MB L2 cache) ENCS5408: Intel Xeon Processor D-1548 (8-core, 2.0 GHz, and 12 MB L2 cache) ENCS5406: Intel Xeon Processor D-1528 (6-core, 1.9 GHz, and 9 MB L2 cache)	AMD Embedded R-Series SOC RX-421ND ENCS 5104: 4-core, 3.4 GHz, 2 MB L2 cache
DRAM	2 DIMM slots, each with 8, 16, or 32 GB ECC DDR4 RAM 16 GB default single DIMM 64 GB maximum system capacity	2 DIMM slots, each with 16 GB ECC DDR4 RAM 16 GB default single DIMM 32 GB maximum system capacity
Motherboard storage	M.2 SATA – 64 GB (default), 200 GB, and 400 GB options	M.2 SATA – 64 GB (default), 200 GB, and 400 GB options
Disk drives (SFF)	Up to 2 Small Form Factor (SFF): 7200-rpm SATA: 1 TB, 2 TB 10000-rpm SAS SED: 1.2 TB 10000-rpm SAS: 1.8 TB SATA SSD eMLC: 480 GB, 960 GB	Not applicable
RAID options	Optional hardware LSI MegaRAID SAS 3108 Controller	Not applicable
Total onboard WAN or LAN ports	2 GE WAN or LAN port (dual-mode RJ-45 and SFP) Built-in 8-port GE LAN switch with PoE capability GE management port for Intel x86 Host	2 GE WAN or LAN port (dual-mode RJ-45 and SFP) 2 GE WAN or LAN port (RJ-45) GE management port for Intel x86 Host
NIM slots	1	Not applicable
OIR (all I/O modules)	Yes	Not applicable
External USB 2.0 slots	1	2

Technical specifications	Cisco 5400 ENCS	Cisco 5100 ENCS
(type A)		
Serial console port	RJ-45 (up to 115.2 Kbps)	RJ-45 (up to 115.2 Kbps)
Power-supply options	Single, internal: AC and PoE PoE support is available on 5408 and 5412 Enterprise Network Compute System models only	Single, internal: AC
AC input voltage	100 to 240 VAC auto-ranging	100 to 240 VAC auto-ranging
AC input frequency	47 to 63 Hz	50 to 60 Hz
AC input current range, AC power supply (maximum)	3.8 to 1.3A	1.5A
AC input surge current	60A peak and less than 5 arms per half cycle	60A peak and less than 5 arms per half cycle
Typical power (no modules) (Watts)	125W	90W
Maximum power with AC power supply (Watts)	180W (no PoE)	100W
Maximum power with PoE power supply (platform only; Watts)	380W with PoE	100W
Total PoE budget	200W Platform supports Universal PoE (60W maximum per LAN port)	Not applicable
Dimensions (H x W x D)	1.73 x 17.25 x 13.3 in (includes power supply unit and NIM mounts) (4.4 x 43.8 x 33.8 cm)	1.73 x 12.7 x 10 in (4.4 x 32.3 x 25.4 cm)
Shipping box dimensions (H x W x D)	6.8 x 16.1 x 21.5 in (17.3 x 40.9 x 54.6 cm)	4.9 x 18.4 x 13.7 in (12.4 x 47.3 x 34.6 cm)
Rack height	1 Rack Unit (1RU)	1 Rack Unit (1RU)
Rack-mount 19 in. (48.3 cm) EIA	Optional	Optional
Rack-mount 23 in. (58.4 cm) EIA	Optional	Optional
Wall mount	Optional	Optional
Weight	13.0 lb (5.9 kg) without modules or external drives	6.6 lb (3.0 kg)
Airflow	I/O side to bezel side	Bezel to I/O side
Temperature	32° to 104°F	32° to 104°F

Technical specifications	Cisco 5400 ENCS	Cisco 5100 ENCS
	(0° to 40°C)	(0° to 40°C)
Altitude (China)	0–6560 ft. (0–2000 m)	0–6560 ft. (0–2000 m)
Altitude (All worldwide locations except China)	0–10,000 ft. (0–3050 m)	0–10,000 ft. (0–3050 m)
Relative humidity	10% to 90%	10% to 90%
Short-term humidity	5% to 95%, not to exceed 0.024 kg water/kg of dry air	5% to 95%, not to exceed 0.024 kg water/kg of dry air
Acoustics: Sound pressure (typical/maximum)	45.2/61 dBA	29.9/42.8 dBA
Acoustics: Sound power (typical/maximum)	58.2/78.8 dBA	41/54 dBA
Non-operating temperature	-4° to 158°F (-20° to 70°C)	-4° to 158°F (-20° to 70°C)
Non-operating relative humidity	5% to 95%	5% to 95%
Non-operating altitude	-1000 ft (-304 m) to 15,584 ft (4750 m)	-1000 ft (-304 m) to 15,584 ft (4750 m)
Safety	UL 60950-1 CAN/CSA C22.2 No. 60950-1 EN 60950-1 AS/NZS 60950-1 IEC 60950-1	UL 60950-1 CAN/CSA C22.2 No. 60950-1 EN 60950-1 AS/NZS 60950-1 IEC 60950-1
EMC	47 CFR Part 15 KN 32 EN 55032 CISPR 32 EN61000-3-2 EN61000-3-3 EN 300 386 ICES-003 VCCI V3 TCVN 7189 CNS13438 CISPR24	47 CFR Part 15 KN 32 EN 55032 CISPR 32 EN61000-3-2 EN61000-3-3 EN 300 386 ICES-003 VCCI V3 TCVN 7189 CNS13438 CISPR24

Technical specifications	Cisco 5400 ENCS	Cisco 5100 ENCS
	EN55024 KN35 TCVN 7317	EN55024 KN35 TCVN 7317
Telecom	**T1** IC CS-03:2004 TIA-968-B:2009 HKTA 2028:2010 HKTA 2017:2010 HKTA 2015: 2006 G.703:2001 ID0002:2007 IS6100:2004 DSPR Gray Book:2000 DSPR Technical Condition: 2004 **E1** AS/ACIF S016: 2001 AS/ACIF S038: 2001 G.703:2001 TBR 4:1995 TBR 12:1993 TBR 13:1996 RRA 2009-38 (RRL 2005-96) IDA TS DLCN:2011 IDA TS ISDN PRA:2005 IS6100: 2004 PTC 220:2008 **Ethernet** IEEE 802.3 ANSA X3.263	**Ethernet** IEEE 802.3 ANSA X3.263

Table 3. Cisco Integrated Management Controller for the 5400 Enterprise Network Compute System

Feature	Description
Integrated Management Controller	• Integrated Emulex Pilot-3 Board Management Controller (BMC) • IPMI 2.0-compliant for management and control • CLI and web GUI management tool for automated, lights-out management
Software version	• Cisco IMC Version 3.1.3+
Storage	• 8 GB eMMC
Networking	• Front-panel RJ-45 Ethernet management port (10/100/1000 BASE-T) • Shared LAN-On-Motherboard (LOM) support with front-panel GE WAN ports
Display	• Front-panel VGA
USB	• External USB 3.0 Type A
Serial console port	• RJ-45 (up to 115.2 kbps)
KVM	• Integrated virtual Keyboard, Video, and Mouse (KVM) support

Table 4. Specifications for the Cisco 5000 Enterprise Network Compute System service spares

PID	Description
ENCS5104P/K9	ENCS 5104 service spare, 4-core AMD, No DRAM, No SSD
ENCS5406P/K9	ENCS 5406 service spare, 6-core Intel, No RAM, No Disk
ENCS5408P/K9	ENCS 5408 service spare, 8-core Intel, No RAM, No Disk
ENCS5412P/K9	ENCS 5412 service spare, 12-core Intel, No RAM, No Disk

Ordering information

The Cisco 5000 Enterprise Network Compute System is orderable and shipping. Refer to the ordering guide for detailed information on the hardware, software, and support options. To place an order, visit the Cisco Ordering webpage. To download software, visit the Cisco Software Center.

The 5000 Enterprise Network Compute System is included in the standard Cisco Technology Migration Program (TMP). Refer to the guide and contact your local Cisco account representative for program details.

The 5000 Enterprise Network Compute System Integrated Services Routers have a 90-day limited liability warranty.

Cisco and partner services for the branch office

Services from Cisco and our certified partners help you transform the branch-office experience and accelerate business innovation and growth. We have the expertise to create a clear, replicable, optimized branch-office footprint across technologies. Planning and design services align technology with your business goals and can increase deployment efficiency. Technical services help you improve operational efficiency, save money, and mitigate risk. Optimization services help you continuously improve performance and succeed with new technologies. For more information, visit https://www.cisco.com/c/en/us/services/overview.html.

Cisco technical support for the Cisco 5000 Enterprise Network Compute System is available on a one-time or annual contract basis. Support options range from help-desk assistance to proactive, onsite consultation. All support contracts include:

- Major software updates for protocol, security, bandwidth, and feature improvements
- Full access rights to Cisco.com technical libraries for technical assistance, electronic commerce, and product information
- 24-hour daily access to the industry's largest dedicated technical support staff

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For more information

For more information about the Cisco 5000 Enterprise Network Compute System, visit https://www.cisco.com/c/en/us/solutions/enterprise-networks/enterprise-network-functions-virtualization-nfv/index.html or contact your local Cisco account representative.

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