

Cisco IOS XR Software Flexible Consumption Model

Contents

Cisco IOS XR Software overview	3
Flexible Consumption Model	3
Benefits	4
Ordering information	7
Warranty	12
Service and support	12
Cisco Capital	13
For more information	13

Cisco IOS XR Software overview

Cisco® service provider routing products are powered by our industry-leading, carrier-class, 64-bit version of Cisco IOS® XR Software, designed on operational efficiency, optimized utilization, and service agility (Cisco [Evolved Programmable Network](#)). IOS XR is a carrier-class operating system that offers rich features such as Pre-boot eXecution Environment (iPXE) boot, auto provisioning, native support for third-party application hosting, machine-to-machine interface, telemetry, and flexible software package delivery.

Flexible Consumption Model

Service providers desire a simple and flexible consumption model that gives them the capability to purchase software capacity as needed. When installing high-density line cards, Service providers usually do not use the full line-card capacity from day one. Traditional commercial offers typically recognize the value of products sold at full capacity. Service provider customers prefer strategic partners who can provide commercial offers permitting them to pay incrementally to expand capacity as demand for their consumer and business services rise. They want investment protection with portability of software across hardware resources to meet demand across any one of their markets. Service providers want software license pools that are portable across the corporation to shift capacity to markets in demand. Pay-as-you-grow commercial offers that permit service providers to pool software licenses benefit them by lowering initial investments required to incubate new services, and then reduces their costs as demand grows organically. Having this ability to add capacity where needed helps address some of the uncertainty of launching a new service offering.

Cisco designed the new IOS XR Flexible Consumption Model to specifically address customer outcomes and help customers rapidly deploy innovative new network solutions. The Flexible Consumption Model leverages the carrier-class IOS XR Software to offer customers the ability to:

- **Reduce upfront capital** - Customers can achieve significant initial cost savings when deploying new hardware equipment coupled with the built-in ability to add capacity as needed based on end user demand to better align with customer's business outcomes. The Software Innovation Access (SIA) feature upgrade Product IDs (PIDs) also help defer the payment of software value for the initial purchase, while reducing the payment for a next-gen hardware purchase with portability.
- **Simplify operations** – Two software suites are offered for a full range of features via the Essentials Software Suite and Advanced Software Suite.
- **Utilize capital efficiently** - Customers can efficiently share licenses network-wide with license pooling.
- **Protect investment** - Major investment protection on current software purchases allow customers to scale to next-generation hardware to meet capacity growth over time.

Benefits

Table 1. Benefits of the Flexible Consumption Model

Benefit	Description
Reduce upfront capital	<ul style="list-style-type: none"> The Flexible Consumption Model offers a built-in “pay-as-you-grow” structure that lowers initial start-up costs with the ability to add more capacity overtime as needed. SIA feature upgrade PIDs help defer payment of software value for the initial purchase, while also reducing the payment for a next-gen hardware purchase with portability.
Simplify operations	<ul style="list-style-type: none"> Two software suites, Essentials Software and Advanced Software, simplify license management while still providing the carrier-class IOS XR Software feature set.
Utilize capital efficiently	<ul style="list-style-type: none"> Software Right-To-Use (RTU) license pooling allows any Flexible Consumption Model node in the network to claim and use available licenses, making it easy to add capacity to the network. This solution eliminates “stranded capacity” as a customer can use any available capacity wherever needed in the Flexible Consumption Model network.
Protect your investment	<ul style="list-style-type: none"> Software RTU portability provides investment protection to move to next-generation hardware when a customer is ready.

The Cisco Flexible Consumption Model is comprised of three main parts as shown in the figure below. The hardware is the first component in the model shown at the bottom of the figure and represents the intrinsic value of hardware. The second component, the software component, rides on top of the hardware and involves two simple software suites, Essentials Software and Advanced Software, with a common license suite across an entire product family. These software suites also include foundation right-to-manage automation licenses for Cisco Evolved Programmable Network Manager (EPNM), Cisco WAN Automation Engine (WAE), and Cisco Network Services Orchestrator (NSO) to help customers deploy scalable networks. This model was created to provide the software solution at the overall network level as opposed to just a single router.

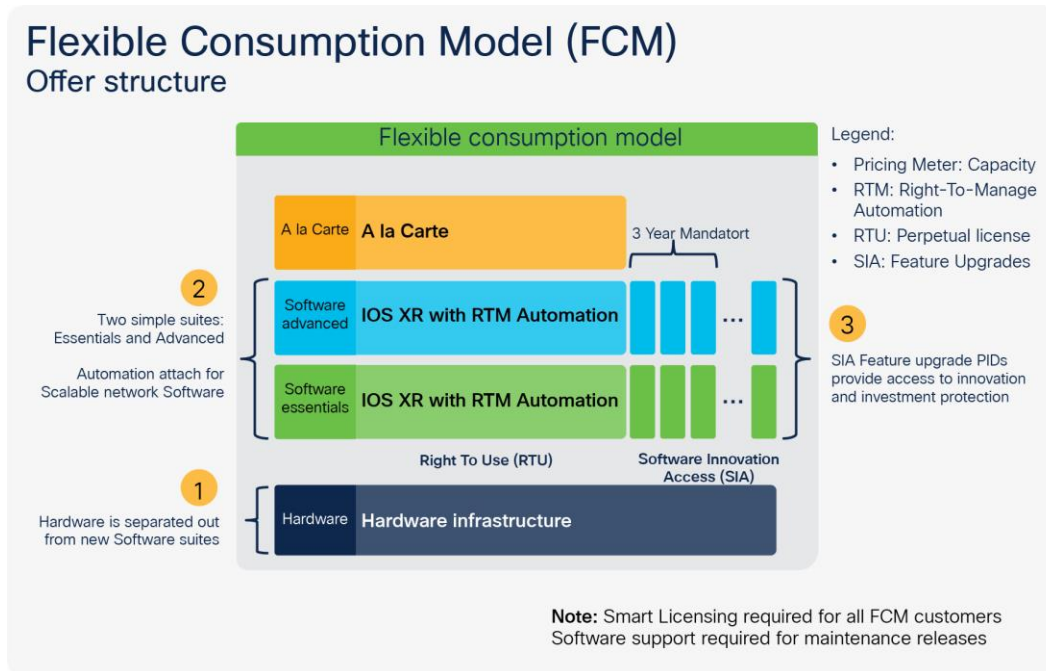


Figure 1. Cisco Flexible Consumption Model

The third part of the Flexible Consumption Model is the Software Innovation Access (SIA) feature upgrade Product IDs (PIDs). Traditionally, software licenses are perpetual and attached to specific hardware with no ability for license pooling or portability. With the Flexible Consumption Model, the software layer is broken out into a perpetual software RTU license component and ongoing SIA feature upgrade PIDs. The software RTU license represents the initial value provided by the software. The SIA feature upgrade PIDs help defer the payment of software value for the initial purchase, while reducing the payment for a next-gen hardware purchase with portability. The perpetual software licenses have the flexibility of being shared across the network from a common license pool or ported to a next-generation router.

The perpetual software RTU license is not attached to a specific router, but rather to the overall Flexible Consumption Model network. The SIA feature upgrade PIDs represent the ongoing value provided by software with feature upgrades and the portability of the software RTU to next-generation routers. There is also an "a la carte" category for specialized platform specific features (i.e., Broadband Networking Gateway (BNG) on the Cisco ASR 9000 Series and Dense Wave Division Multiplexing (DWDM) on the Cisco NCS 5500 Series).

The Flexible Consumption Model is comprised of two software suites. The Essentials software suite is for basic transport applications, while the Advanced software suite is for enhanced applications and network resiliency. The Essentials software suite is required for active ports in the system and is a per-100-Gb capacity license (e.g., for the Cisco Network Convergence System (NCS) 5500 Series, Cisco NCS 560 Series, and Cisco Aggregation Services Router (ASR) 9000 Series 3rd/4th Generation high-density Ethernet Line Cards) and per-10-Gb capacity license (e.g., Cisco NCS 540 Series). The Essentials software suite includes an essentials level of right to manage for the automation tools, including EPNM, WAE, and NSO Automation, to manage the overall network. On top of the Essentials software suite license, customers may also require the Advanced software suite when one or more of the Advanced software suite features are used (e.g., layer 2 Advanced services, layer 3 VPN services, and Peering). Advanced software also includes Traffic Engineering, Media Access Control Security (MACSec), Service-layer Application Programming Interface (SL-API), and Broadband Networking Gateway (BNG) enablement. The BNG feature is supported only on the Cisco ASR 9000 Series and requires a separate "a la carte" BNG subscriber license.

Simple, Flexible Software Suite

Contents of suites

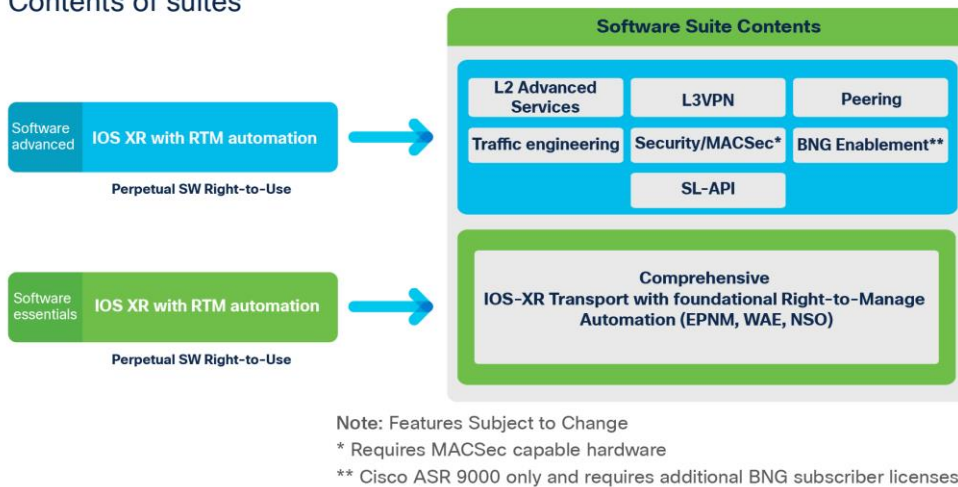


Figure 2. Simple and flexible software suites

Figure 3 lists feature details in the Essentials and Advanced software suites. The Essentials SW suite includes basic transport features including: routing, basic layer 2 interface support, management, Quality of Service (QoS), Ethernet, basic High Availability (HA), security, and timing.

The advanced software suite is used on top of the Essentials software suite and includes the following features: L2 Advanced services, L3VPN services, Peering, Traffic Engineering, Security/MACSec, Service-layer API, and Broadband Networking Gateway (BNG) Enablement. Note that the BNG feature requires both the Advanced SW suite as well as the BNG subscriber a la carte license.

SP Routing flexible consumption feature licenses

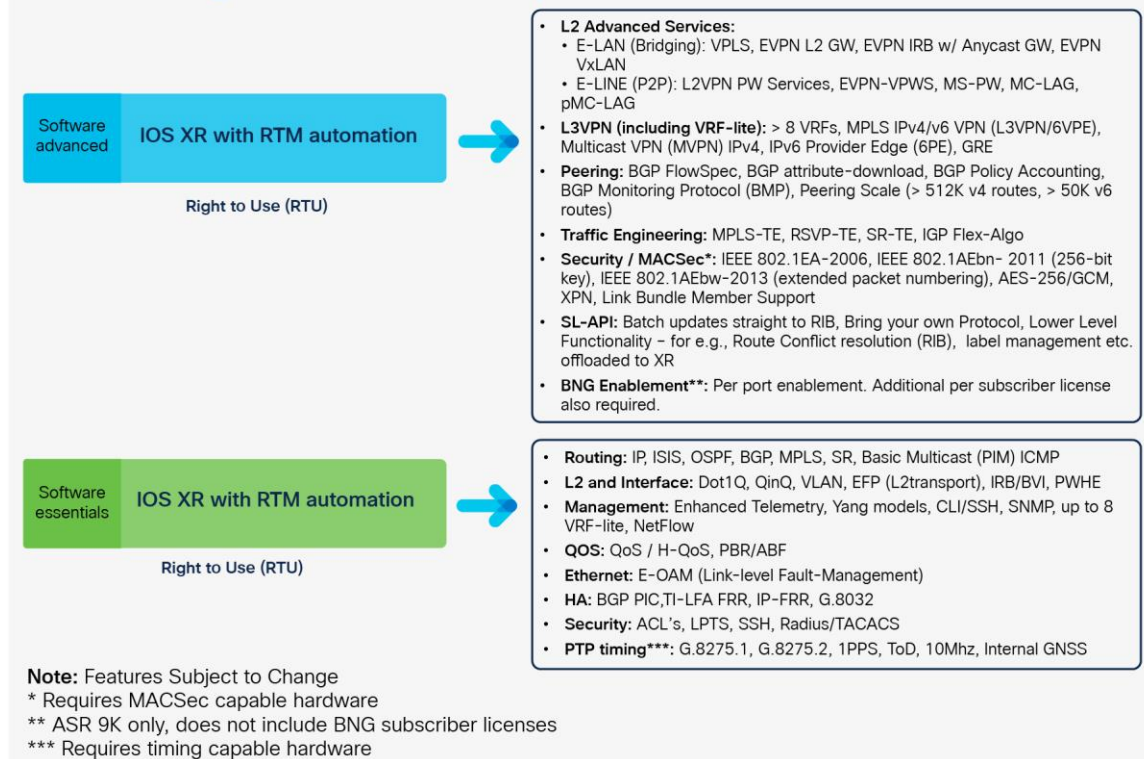


Figure 3.
Flexible Consumption Feature Licenses

To help Cisco Flexible Consumption Model customers build a scalable network, the foundation right-to-manage licenses for EPNM, WAE, and NSO Automation tools are included in the Essentials software suite. This level of support provides key automation benefits, including inventory and discovery, topology views, and “what-if” traffic planning scenarios. Additional enhanced applications are also available for use on top of the foundational right-to-manage licenses, expanding the network automation tools in areas such as multi-domain discovery, closed loop automation, and health insights.

Modernized Operations and Management

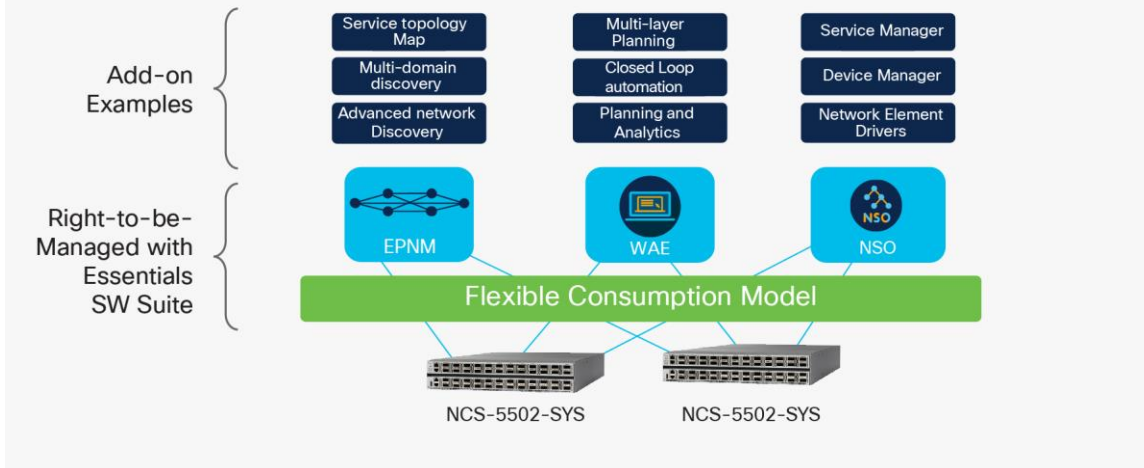


Figure 4. Automation tools

Ordering information

The Flexible Consumption Model is available on the following platforms: Cisco ASR 9000 Series 3rd and 4th Generation high-density services edge Ethernet Line Cards, NCS 5500 core and aggregation platforms, and NCS 540 and NCS 560 access platforms. The following tables show the product IDs for the Flexible Consumption Model versions of the software licenses, systems, and line cards.

Table 2. ASR 9000 Flexible Consumption Model software licenses

Product ID (PID)	Description
ESS-ED-100G-RTU1	Essentials Software RTU License (per 100G) for Edge
ESS-ED-100G-SIA3	Essentials SIA per 100G Subscription for 3 years
ESS-ED-100G-SIA4	Essentials SIA per 100G Subscription for 4 years
ESS-ED-100G-SIA5	Essentials SIA per 100G Subscription for 5 years
ADV-ED-100G-RTU1	Advanced Software RTU License (per 100G) for Edge
ADV-ED-100G-SIA3	Advanced SIA per 100G Subscription for 3 years
ADV-ED-100G-SIA4	Advanced SIA per 100G Subscription for 4 years
ADV-ED-100G-SIA5	Advanced SIA per 100G Subscription for 5 years
ASR9K-SW-FC	ASR 9000 Series "Spare" Software Licenses (RTU + SIA)

Table 3. ASR 9000 Flexible Consumption Model line cards

Product ID (PID)	Description	100G Essentials Licenses To Start
4th Generation Hardware		
A9K-16X100GE-FC	ASR 9000 16x100GE Transport Line Card for Flexible Consumption	6 out of 16
A99-16X100GE-X-FC	ASR 9000 7-Fabric 16x100GE Service Edge Line Card for Flexible Consumption	6 out of 16
A99-32X100GE-FC	ASR 9900 32x100GE Transport Line Card for Flexible Consumption	13 out of 32
3rd Generation Hardware		
A9K-4X100GE-FC	ASR 9000 4x100GE line card for Flexible Consumption	2 out of 4
A99-8X100GE-FC	ASR 9000 7 Fabric 8x100GE line card for Flexible Consumption	3 out of 8
A9K-8X100GE-FC	ASR 9000 8x100GE line card for Flexible Consumption	3 out of 8
A99-12X100GE-FC	ASR 9000 12x100GE QSFP28 based line card for Flexible Consumption	5 out of 12

Table 4. NCS 5500 Flexible Consumption Model software licenses

Product ID (PID)	Description
ESS-100G-RTU-1	Core and Aggregation Essentials SW RTU per 100 Gb
ESS-100G-SIA-3	Core and Aggregation Essentials SW Innovation Access per 100 Gb 3-year
ESS-100G-SIA-4	Core and Aggregation Essentials SW Innovation Access per 100 Gb 4-year
ESS-100G-SIA-5	Core and Aggregation Essentials SW Innovation Access per 100 Gb 5-year
ADV-100G-RTU-1	Core and Aggregation Advanced SW RTU per 100 Gb
ADV-100G-SIA-3	Core and Aggregation Advanced SW Innovation Access per 100 Gb 3-year
ADV-100G-SIA-4	Core and Aggregation Advanced SW Innovation Access per 100 Gb 4-year
ADV-100G-SIA-5	Core and Aggregation Advanced SW Innovation Access per 100 Gb 5-year
NCS-5500-FC-SW	NCS 5500 Series "Spare" Software Licenses (RTU + SIA)
NC55-100G-DWDMLIC	DWDM per 100G SW license

Table 5. NCS 5500 Flexible Consumption Model systems and line cards

Product ID (PID)	Description	100G Essentials Licenses To Start
NCS-5501-SYS	NCS-5501 Base System HW for Flexible Consumption	3 out of 11
NCS-5501-SE-SYS	NCS-5501 SE System HW for Flexible Consumption	4 out of 11
NCS-5502-SYS	NCS-5502 Base System HW for Flexible Consumption	19 out of 48
NCS-5502-SE-SYS	NCS-5502 SE System HW for Flexible Consumption	19 out of 48
NCS-55A1-24H-SYS	NCS-55A1-24H-SYS Base System HW for Flexible Consumption	10 out of 24
NCS-55A1-36H-SYS	NCS-55A1-36H-SYS Base System HW for Flexible Consumption	15 out of 36
NCS-55A1-36HS-SYS	NCS-55A1-36HS-SYS SE System HW for Flexible Consumption	15 out of 36
NCS-55A2-MOD-SYS	NCS-55A2-MOD-SYS Flexible Consumption Model NCS 55A2 Fixed 24X10G + 16X25G and MPA chassis (MPAs are optional)	5 out of 14
NCS-55A2-MODH-SYS	NCS-55A2-MODH-SYS Flexible Consumption Model NCS 55A2 hardened fixed 24X10G + 16X25G and MPA chassis (MPAs are optional)	5 out of 14
NCS-55A2-MODX-SYS	NCS-55A2-MODH-SYS Flexible Consumption Model NCS 55A2 Temperature Hardened and Conformal Coated Fixed 24X10G + 16X25G and MPA Chassis (MPAs are optional)	5 out of 14
NCS-55A2-MODS-SYS	Flexible Consumption Model NCS 55A2 SE Fixed 24X10G + 16X25G and MPA Chassis (MPAs are optional)	5 out of 14
NCS-55A2MODSH-SYS	NCS-55A2-MOD-SYS Flexible Consumption Model "SE" Version NCS 55A2 Fixed 24X10G + 16X25G and MPA Temperature hardened and Conformal Coated Chassis (MPAs are optional)	5 out of 14
NCS-55A1-48Q6-SYS	Bifrost Flexible Consumption Model 48X25G + 6x100G Chassis (MPAs are optional)	7 out of 18
NCS-5504-SYS	NCS-5504 Base System HW for Flexible Consumption	Based on line cards
NCS-5508-SYS	NCS-5508 Base System HW for Flexible Consumption	Based on line cards
NCS-5516-SYS	NCS-5516 Base System HW for Flexible Consumption	Based on line cards
NC-55-36X100G	NC55-36X100G Base Line Card HW for Flexible Consumption	15 out of 36
NC-55-36X100GA-SE	NC55-36X100G SE Line Card HW for Flexible Consumption	15 out of 36
NC-55-36X100G-S	NC55-36X100G-S Base MACSec Line Card HW Flexible Consumption	15 out of 36
NC-55-24X100G-SE	NC55-24X100G SE Line Card HW for Flexible Consumption	10 out of 24
NC-55-18H18F	NC55-18x100G + 18x40G Base Line Card HW for Flexible Consumption	12 out of 26

Product ID (PID)	Description	100G Essentials Licenses To Start
NC-55-24H12F-SE	NC55-24x100G + 12x40G SE Line Card HW for Flexible Consumption	12 out of 29
NC-55-6X2H-DWDM-S	NC55-6X2H-DWDM Line Card HW Flexible Consumption (minimum of 4 DWDM licenses)	4 out of 12
NC-55-MOD-A	NC-55-MOD-A Flexible Consumption Model NCS 5500 Modular Base Line Card (requires minimum of 1 MPA)	5 out of 10
NC-55-MOD-A-SE	NC-55-MOD-A-SE Flexible Consumption Model NCS 5500 Modular "SE" Line Card (requires minimum of 1 MPA)	5 out of 10
NC55-MPA-12T-S	NCS 5500 12X10G Modular Port Adapter (MPA)	
NC55-MPA-1TH2H-S	NCS 5500 1X200G CFP2 + 2X100G QSFP28 Modular Port Adapter (MPA)	
NC55-MPA-2TH-S	NCS 5500 2X200G CFP2 Modular Port Adapter (MPA)	
NC55-MPA-4H-S	NCS 5500 4X100G QSFP28 Modular Port Adapter (MPA)	
NC55-MPA-4H-HD-S	NCS 5500 4X100G QSFP28 Temp-hardened Modular Port Adapter (MPA)	

Table 6. NCS 540 (Fixed) Flexible Consumption Model software licenses

Product ID (PID)	Description
ESS-AC-10G-RTU-1	Access Network Essentials SW RTU per 10 Gb
ESS-AC-10G-SIA-3	Access Network Essentials SW Innovation Access per 10 Gb 3-year
ESS-AC-10G-SIA-4	Access Network Essentials SW Innovation Access per 10 Gb 4-year
ESS-AC-10G-SIA-5	Access Network Essentials SW Innovation Access per 10 Gb 5-year
ADV-AC-10G-RTU-1	Access Network Advanced SW RTU per 10 Gb
ADV-AC-10G-SIA-3	Access Network Advanced SW Innovation Access per 10 Gb 3-year
ADV-AC-10G-SIA-4	Access Network Advanced SW Innovation Access per 10 Gb 4-year
ADV-AC-10G-SIA-5	Access Network Advanced SW Innovation Access per 10 Gb 5-year
N540-24Z8Q2C-FC-SW	NCS 540 Series "Spare" Software Licenses (RTU + SIA)

Table 7. NCS 540 (Fixed) Flexible Consumption Model systems

Product ID (PID)	Description	10G Essentials Licenses To Start
N540-ACC-SYS	NCS540 24x1/10G SFP+, 8x1/10/25G SFP+/SFP28, 2x100G QSFP28	9 out of 64
N540X-ACC-SYS	NCS540 CC 24x1/10G,8x1/10/25G SFP+/SFP28, 2x100G QSFP28	9 out of 64
N540-24Z8Q2C-SYS	NCS 540 System Flexible Consumption	16 out of 65
N540-12Z20G-SYS-A	NCS540 20x1G+12x10G AC	8 out of 16
N540-12Z20G-SYS-D	NCS540 20x1G+12x10G DC	8 out of 16
N540X-12Z16G-SYS-A	NCS540 12x1G SFP + 4x1G Cu + 12x10G AC	8 out of 16
N540X-12Z16G-SYS-D	NCS540 12x1G SFP + 4x1G Cu + 12x10G DC	8 out of 16
N540-28Z4C-SYS-A	NCS540 28x10G + 4x100G AC	16 out of 64
N540-28Z4C-SYS-D	NCS 540 28x10G + 4x100G DC	16 out of 64
N540X-16Z4G8Q2C-A	NCS 540 16x10G+4x1G Cu+8x25G+2x100G AC	16 out of 60
N540X-16Z4G8Q2C-D	NCS540 16x10G+4x1G Cu+8x25G+2x100G DC	16 out of 60

Table 8. NCS 560 (Modular) Flexible Consumption Model software licenses

Product ID (PID)	Description
ESS-AC-100G-RTU-1	Access Network Essentials SW RTU per 100 Gb
ESS-AC-100G-SIA-3	Access Network Essentials SW Innovation Access per 100 Gb 3-year
ESS-AC-100G-SIA-4	Access Network Essentials SW Innovation Access per 100 Gb 4-year
ESS-AC-100G-SIA-5	Access Network Essentials SW Innovation Access per 100 Gb 5-year
ADV-AC-100G-RTU-1	Access Network Advanced SW RTU per 100 Gb
ADV-AC-100G-SIA-3	Access Network Advanced SW Innovation Access per 100 Gb 3-year
ADV-AC-100G-SIA-4	Access Network Advanced SW Innovation Access per 100 Gb 4-year
ADV-AC-100G-SIA-5	Access Network Advanced SW Innovation Access per 100 Gb 5-year
N560-FC-SW	NCS 560 Series "Spare" Software Licenses (RTU)

Table 9. NCS 560 (Modular) Flexible Consumption Model systems and cards

Product ID (PID)	Description	100G Essentials Licenses To Start
N560-7-SYS-E	N560 7RU HW. Flex. Consumption for RSP4-E.	4 out of 8
N560-7-SYS	N560 7RU HW. Flex. Consumption for RSP4.	4 out of 8
N560-4-SYS-E	N560 4RU HW. Flex. Consumption for RSP4-E.	2 out of 8
N560-4-SYS	N560 4RU HW. Flex. Consumption for RSP4.	2 out of 8
N560-IMA-2C	NCS 560 2x100G Interface Module, QSFP28	
A900-IMA-8Z	ASR 900 8x10G Interface Module, SFP+	
A900-IMA-8CS1Z	ASR 900 8/16 x 1G + 1 x 10G Interface Module, SFP/CSFP + SFP+	

Note: All IOS XR Flexible Consumption Model products require Smart Licensing

Warranty

The Cisco NCS 5500 Series has a 1-year limited hardware warranty. The warranty includes hardware replacement with a 10-day turnaround from receipt of a Return Materials Authorization (RMA).

Service and support

Cisco offers a range of services to support the Flexible Consumption Model to help accelerate your success in deploying and optimizing the Cisco NCS 540 Series, Cisco NCS 560 Series, Cisco NCS 5500 Series, and ASR 9000 Series. These innovative Cisco Services offerings are delivered through a unique combination of people, processes, tools, and partners, and they are focused on helping you increase operating efficiency and improve your data center network.

Cisco Advanced Services uses an architecture-led approach to help you align your data center infrastructure with your business goals and achieve long-term value.

Cisco Software Support offers award-winning technical support coverage and maintenance releases for the Essentials and Advanced Software Suites, helping to keep your systems and your business running smoothly. Software Support is a required purchase with the SIA feature upgrade licenses.

Cisco SP Base provides device-level support and helps reduce downtime with fast, expert technical support and flexible hardware coverage provided by the Cisco Technical Assistance Center (TAC). With this service, you can take advantage of the Cisco Smart Call Home service, which offers proactive diagnostics and real-time alerts on your Cisco NCS 5500 Series.

Spanning the entire network lifecycle, Cisco Services offerings help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

For information on services for the Flexible Consumption Model systems and software licenses, contact your Cisco sales representative. For an overview of all offers, visit [Cisco Services for Service Providers](#).

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. [Learn more](#).

For more information

For more info about the ASR 9000 Series, visit [Cisco ASR 9000 Series](#) website.

For more information about the Cisco NCS 5500 Series, visit [Cisco Network Convergence System 5500 Series](#) website.

For more info about the NCS 540 Series, visit [Cisco NCS 540 Series](#) website.

For more info about the NCS 560 Series, visit [Cisco NCS 560 Series](#) website.

For more info about Cisco Network Services Orchestrator, visit [Cisco NSO](#) website.

For more info about Cisco WAN Automation Engine (WAE), visit [Cisco WAE](#) website.

For more info about Cisco Evolved Programmable Network Manager, visit [Cisco EPN Manager](#) website.

Americas Headquarters

Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters

Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters

Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at <https://www.cisco.com/go/offices>.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <https://www.cisco.com/go/trademarks>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)