Licensing Cisco NX-OS Software Features

This publication contains information related to licensing types, options, procedures, installation, and management for the Cisco NX-OS software.

Note Cisco Data Center Network Manager (DCNM) is a graphical user interface that you can use to manage your data center infrastructure. See the *Cisco DCNM Installation and Licensing Guide* for details about installing and licensing Cisco DCNM.

Information About Licensing

Licensing allows you to access specified premium features on the device after you install the appropriate license for that feature.

Feature-Based Licenses

Feature-based licenses make features available to the entire physical device, so you only need one copy of the license for a device. Each license only supports the listed features. Licenses may be specific to a particular hardware platform.

Any feature not included in a license package is bundled with the Cisco NX-OS software and is provided at no extra charge to you.

Note The Cisco Nexus 9200, 9300, and 9500 Series switches support static routes, switch virtual interfaces (SVIs), Hot Standby Router Protocol (HSRP), and Routing Information Protocol (RIP) by default (without any license).

The licenses are independent of each other. If you want to use features that are covered by different licenses, you must install all appropriate licenses.

This table lists the feature-based license packages for the Cisco Nexus 9000 Series, which includes Cisco Nexus 9500 switches and Cisco Nexus 9300 switches, in Cisco NX-OS mode.

Table 1: Feature-Based Licenses for the Cisco Nexus 9000 Series in Cisco NX-OS Mode

Feature License	Product ID	Features
Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG	N95-LAN1K9 N93-LAN1K9	• Open Shortest Path First (OSPF) Protocol • Border Gateway Protocol (BGP) • Intermediate System-to-Intermediate System (IS-IS) Protocol (Layer 3 only) • Protocol Independent Multicast (PIM), which includes sparse mode, bidirectional mode, and Source-Specific Multicast (SSM) mode • Multicast Source Discovery Protocol (MSDP) • Policy-Based Routing • Generic routing encapsulation (GRE) tunnels • Enhanced Interior Gateway Routing Protocol (EIGRP) • VXLAN • BGP eVPN control plane **Note** For the specific implementation of these features, see the release notes and configuration guides for the Cisco Nexus 9000 Series switches.
Network Services Package NETWORK_SERVICES_PKG	N95-SERVICES1K9 N93-SERVICES1K9	Intelligent Traffic Director (ITD)
FCoE NPV	N95-FNPV-K9 N93-FNPV-K9	FCoE NPV

This table lists the feature-based license packages for the Cisco Nexus 7000 Series, which includes Cisco Nexus 7000 switches and Cisco Nexus 7700 switches.

Table 2: Feature-Based Licenses for the Cisco Nexus 7000 Series

Feature License	Product ID	Features
Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG	N7K-LAN1K9 N77-LAN1K9	• Open Shortest Path First (OSPF) Protocol • Border Gateway Protocol (BGP) • Intermediate System-to-Intermediate System (IS-IS) Protocol (Layer 3 only) • Protocol Independent Multicast (PIM) which includes sparse mode, bidirectional mode, and source-specific mode (SSM) • Multicast Source Discovery Protocol (MSDP) • Policy-Based Routing • Generic routing encapsulation (GRE) tunnels • Enhanced Interior Gateway Routing Protocol (EIGRP)
Advanced Services Package LAN_ADVANCED_SERVICES_PKG	N7K-ADV1K9	• Virtual device contexts (VDCs)
VDC Licenses VDC_LICENSES	N7K-VDC1K9 N77-VDC1K9	• Increments four VDC licenses that allow the Cisco Nexus 7000 Series Supervisor 2 Enhanced module to support eight VDCs
Transport Services Package LAN_TRANSPORT_SERVICES_PKG	N7K-TRS1K9 N77-TRS1K9	• Overlay Transport Virtualization (OTV) • Locator/ID Separation Protocol (LISP)
Scalable Services Package SCALABLE_SERVICES_PKG	N7K-C7004-XL N7K-C7009-XL N7K-C7010-XL N7K-C7018-XL	A single license per system enables all XL-capable I/O modules to operate in XL mode. The license increases the performance of the following features: • IPv4 routes • IPv6 routes • ACL entries

Feature License	Product ID	Features
Enhanced Layer 2 Package ENHANCED_LAYER2_PKG	N7K-EL21K9 N77-EL21K9	• FabricPath support on the F Series module • Remote Integrated Service Engine (RISE) • Intelligent Traffic Director (ITD)
MPLS Services Package MPLS_PKG	N7K-MPLS1K9 N77-MPLS1K9	• Multiprotocol Label Switching (MPLS) • Layer 3 Virtual Private Network (VPN) • Layer 2 Ethernet over MPLS (EoMPLS) • Layer 2 Virtual Private LAN Services (VPLS)
Storage Enterprise Package STORAGE-ENT	N7K-SAN1K9 N77-SAN1K9	• Inter-VSAN routing (IVR) over Fibre Channel and FCoE IVR Network Address Translation (NAT) over Fibre Channel • VSAN-based Access Control • Fabric Binding for open systems

Note Starting with Cisco NX-OS Release 6.1, Cisco TrustSec (CTS) does not require a feature license. CTS is included with the Cisco NX-OS software.

This table lists the feature-based license packages for the Cisco Nexus 6000 Series switches.

Table 3: Feature-Based Licenses for the Cisco Nexus 6000 Series

Feature License	Product ID	Features
FabricPath Services Package ENHANCED_LAYER2_PKG	N6001-EL2-SSK9 N6004-EL2-SSK9	FabricPath
FCoE NPV Package FCOE_NPV_PKG	N6K-FNPV-SSK9	FCoE NPV

Feature License	Product ID	Features
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG [1] [2]	N6K-BAS1K9	Unlimited static routes and maximum of 256 dynamic routes. • Static routes • RIPv2 • OSPFv2 and OSPFv3 • EIGRP Stub • HSRP [3] • VRRP [4] • IGMP v2/v3 • PIMv2 (sparse mode) • VRF Lite • routed ACL • NAT
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG [5] [6]	N6001-LAN1K9 N6004-LAN1K9	N6001-LAN1K9 / N6004-LAN1K9 includes below features in addition to the ones under N6K-BAS1K9 license. • BGP • PBR • Full EIGRP • PIMv2 (all modes) • L3 IS-IS [7] • uRPF • MSDP • Sampled Netflow
Network Services Package NETWORK_SERVICES_PKG	N6K-SERVICES1K9[8]	Remote Integrated Services Engine (RISE) Intelligent Traffic Director (ITD)

Feature License	Product ID	Features
Storage Protocols Services Package FC_FEATURES_PKG ENTERPRISE_PKG	N6001-16P-SSK9 N6004-4Q-SSK9 N6004-12Q-SSK9 N6K-16P-SSK9[9] N6K-20P-SSK9[10] N6001-64P-SSK9 N6004-96Q-SSK9	• Native Fibre Channel • FCoE • FC NPV • FC Port Security • Fabric Binding • Fibre Channel Security Protocol (FC-SP) authentication
VM-FEX Package	N6K-VMFEXK9	VM-FEX

1 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.
2 Routes above 256 for all protocols are included in the LAN_ENTERPRISE_SERVICES_PKG license.
3 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
When you configure HSRP in a virtual port channel (vPC) on the Nexus 6000 platform without installing the LAN_BASE_SERVICES_PKG license, it sends an HSRP hello message to the link local multicast address and enables the Active-Active state.
4 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
5 The LAN_BASE_SERVICES_PKG license needs to be installed in order to use the LAN_ENTERPRISE_SERVICES_PKG license.
6 Routes above 256 for all protocols included in the LAN_ENTERPRISE_SERVICES_PKG license.
7 L3 IS-IS will be available starting with the 7.0(1) N1 (1) software release.
8 N6K-SERVICES1K9 is available starting with Cisco NX-OS Release 7.2(0)N1(1). If you need to use RISE and ITD features with the Cisco NX-OS Release 7.1(1)N1(1), please use the ENHANCED_LAYER2_PKG license.
9 These licenses are applicable to the Nexus 6004 20 UP LEM only.
10 These licenses are applicable to the Nexus 6004 20 UP LEM only.

This table lists the feature-based license packages for the Cisco Nexus 5600 Series switches.

Table 4: Feature-Based Licenses for the Cisco Nexus 5600 Series

Feature License	Product ID	Features
FabricPath Services Package ENHANCED_LAYER2_PKG	N5672-EL2-SSK9 N56128-EL2-SSK9 N5696-EL2-SSK9 N5624Q-EL2-SSK9 N5648Q-EL2-SSK9	FabricPath
FCoE NPV Package FCOE_NPV_PKG	N56-FNPV-SSK9	FCoE NPV

Feature License	Product ID	Features
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG [11]	N56-BAS1K9	Unlimited static routes and maximum of 256 dynamic routes. • Static routes • RIPv2 • OSPFv2 and OSPFv3 • EIGRP Stub • HSRP [12] • VRRP[13] • IGMP v2/v3 • PIMv2 (sparse mode) • VRF Lite • routed ACL • NAT
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG[14][15]	N56-LAN1K9	N56-LAN1K9 license includes below features in addition to the ones under N56-BAS1K9 license. • BGP • PBR • Full EIGRP • PIMv2 (all modes) • L3 IS-IS[16] • uRPF • MSDP • Sampled Netflow • VxLAN Flood and Learn[17] • VxLAN EVPN[18]
Network Services Package NETWORK_SERVICES_PKG	N56-SERVICES1K9[19]	Remote Integrated Services Engine (RISE) Intelligent Traffic Director (ITD)

Feature License	Product ID	Features
Storage Protocols Services Package FC_FEATURES_PKG ENTERPRISE_PKG	N56-16p-SSK9 N56-12P-SSK9[20] N5672-72P-SSK9 N56128-128P-SSK9 N56-20P-SSK9[21] N56-12Q-SSK9 N56-4Q-SSK9 N56-48Q-SSK9	• Native Fibre Channel • FCoE • NPV • FC Port Security • Fabric Binding • Fibre Channel Security Protocol (FC-SP) authentication
VM-FEX Package	N56-VMFEX9	VM-FEX

11 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.
12 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
13 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
14 The LAN_BASE_SERVICES_PKG license needs to be installed in order to use the LAN_ENTERPRISE_SERVICES_PKG license.
15 Routes above 256 for all protocols included in the LAN_ENTERPRISE_SERVICES_PKG license.
16 L3 IS-IS will be available starting with the 7.0(1) N1 (1) software release.
17 VXLAN Flood and Learn is supported starting with Cisco NX-OS Release 7.1(0)N1(1) and requires the LAN_BASE_SERVICES_PKG license and the ENHANCED_LAYER2_PKG license. Starting with Cisco NX-OS Release 7.2(1)N1(1), VXLAN Flood and Learn will require the LAN_BASE_SERVICES_PKG license and the LAN_ENTERPRISE_SERVICES_PKG license only.
18 VXLAN EVPN is supported starting with Cisco NX-OS Release 7.3(0)N1(1) and will require the LAN_BASE_SERVICES_PKG license and the LAN_ENTERPRISE_SERVICES_PKG license.
19 N56-SERVICES1K9 is available starting with Cisco NX-OS Release 7.2(0)N1(1). If you need to use RISE and ITD features with the Cisco NX-OS Release 7.1(1)N1(1), please use the ENHANCED_LAYER2_PKG license.
20 This license is applicable to the Nexus 5672UP-16G only.
21 This license is applicable to the Nexus 5696 20 Port UP LEM only.

This table lists the feature-based license packages for the Cisco Nexus 5000 and 5500 Series switches.

Note The prefix of the Product ID number indicates the platform for which the license applies. For example, N5548 indicates that the license is for the Cisco Nexus 5548 switch only, and N5K indicates that the license is for all Cisco Nexus 5000 Series switches.

Table 5: Feature-Based Licenses for the Cisco Nexus 5000 and Nexus 5500 Series

Feature License	Product ID	Features
FabricPath Services Package ENHANCED_LAYER2_PKG	N5548-EL2-SSK9 N5596-EL2-SSK9	FabricPath

Feature License	Product ID	Features
FCoE NPV Package FCOE_NPV_PKG	N5010-FNPV-SSK9 N5020-FNPV-SSK9 N5548-FNPV--SSK9 N5596-FNPV-SSK9	FCoE NPV
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG [22]	N55-BAS1K9	Unlimited static routes and maximum of 256 dynamic routes. • Static routes • RIPv2 • OSPFv2 and OSPFv3 • EIGRP Stub • HSRP [23] • VRRP [24] • IGMP v2/v3 • PIMv2 (sparse mode) • VRF Lite • Routed ACL
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG [25][26]	N55-LAN1K9	N55-LAN1K9 includes below features in addition to the ones under N55-BAS1K9 license. • BGP • PBR • PIMv2 (all modes) • Full EIGRP • L3 IS-IS[27] • uRPF • MSDP
Network Services Package NETWORK_SERVICES_PKG	N55-SERVICES1K9[28]	Remote Integrated Services Engine (RISE) Intelligent Traffic Director (ITD)

Feature License	Product ID	Features
Storage Protocols Services Package FC_FEATURES_PKG ENTERPRISE_PKG	N5010-SSK9 N5020-SSK9 N55-8P-SSK9 N55-48P-SSK9	• Native Fibre Channel • FCoE • NPV • FC Port Security • Fabric Binding • Fibre Channel Security Protocol (FC-SP) authentication
VM-FEX Package	N55-VMFEXK9	VM-FEX

22 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.
23 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
24 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
25 The LAN_BASE_SERVICES_PKG license needs to be installed in order to use the LAN_ENTERPRISE_SERVICES_PKG license.
26 Routes above 256 for all protocols included in the LAN_ENTERPRISE_SERVICES_PKG license.
27 L3 IS-IS will be available starting with the 7.0(1) N1 (1) software release.
28 N55-SERVICES1K9 is available starting with Cisco NX-OS Release 7.2(0)N1(1). If you need to use RISE and ITD features with the Cisco NX-OS Release 7.1(1)N1(1), please use the ENHANCED_LAYER2_PKG license.

This table lists the feature-based license packages for the Cisco Nexus 4000 Series.

Table 6: Feature-Based Licenses for the Cisco Nexus 4000 Series

Feature License	Product ID	Features
Basic Storage Services Package BASIC_STORAGE_SERVICES_PKG	N4K-4005I-SSK9	FIP snooping feature

This table lists the feature-based license packages for the Cisco Nexus 3000 Series.

Table 7: Feature-Based Licenses for the Cisco Nexus 3500 Series

Feature License	Product ID	Features
24 Port License Package 24P_LIC_PKG	N3548-24P-LIC	24-port license for Cisco Nexus 3548 Series switch.
24 Port Upgrade License Package 24P_UPG_PKG	N3548-24P-UPG	24-port upgrade license for Cisco Nexus 3548 Series switch.

Feature License	Product ID	Features
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG	N3548-BAS1K9	• Static routing • RIPv2 • EIGRP stub • OSPFv2 (limited routes) • PIMv2 (sparse mode)
Cisco Nexus 3500 Algo Boost License ALGO_BOOST_SERVICES_PKG	N3548-ALGK9	• Warp Mode • Warp SPAN • Static NAT
Layer 3 Enterprise Services Package LAN1K9_ENT_SERVICES_PKG	N3548-LAN1K9	• OSPF (unlimited routes) • BGP and VRF-lite (IP-VPN) **Note** Requires Base Services Package.
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG	N3548-LAN1K9	• OSPF (unlimited routes) • BGP and VRF-lite (IP-VPN) **Note** Requires Base Services Package.

This table lists the feature-based license packages for the Cisco Nexus 3000 Series.

Table 8: Feature-Based Licenses for the Cisco Nexus 3000 Series

Feature License	Product ID	Features
16 Port License Upgrade Package 16P_UPG_PKG	N3K-16T-UPG	16-port upgrade license for Cisco Nexus 3172TQ switches. This is the upgrade license to enable 16 ports and it can only be applied to N3K-C3172TQ-32T.
32 Port License Package 32P_LIC_PKG	N3K-32X-LIC	Default 32-port license for Cisco Nexus 3172TQ switches.
16 Port License Upgrade Package 16P_UPG_PKG	N3064T-16T-UPG	16-port upgrade license for Cisco Nexus 3164T switch.

Feature License	Product ID	Features
32 Port License Package 32P_LIC_PKG	N3064T-32T-LIC	32-port license for Cisco Nexus 3164T switch.
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG	N3K-BAS1K9	• Static routing • RIPv2 • EIGRP stub • OSPFv2 (limited routes) • PIMv2 (sparse mode) **Note** The Cisco Nexus 3164Q, 31128PQ, 3232C, and 3264Q switches and the Cisco Nexus 3100 Series switches in N9K mode run Cisco Nexus 9000 Series software and follow the Cisco Nexus 9000 license model. Therefore, these switches require the Layer 3 Enterprise Services Package (rather than the Layer 3 Base Services Package) to support routing protocols.

Feature License	Product ID	Features
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG	N3K-LAN1K9	• OSPF (unlimited routes) • EIGRP (unlimited routes) • BGP • Policy-Based Routing (not supported on the Cisco Nexus 3232C and 3264Q switches) • Generic routing encapsulation (GRE) tunnels • Protocol Independent Multicast (PIM) Source-Specific Multicast (SSM) mode • VXLAN (not supported on the Cisco Nexus 3232C and 3264Q switches) • BGP eVPN control plane (Cisco Nexus 3164Q and 31128PQ only) **Note** The Layer 3 Base Services Package license is a prerequisite for the Layer 3 Enterprise Services Package license on all Cisco Nexus 3000 Series switches except the Cisco Nexus 3164Q, 31128PQ, 3232C, and 3264Q switches and the Cisco Nexus 3100 Series switches in N9K mode.

Module-based Licenses

Module-based licenses make features available to one module on the physical device, so you need one copy of the license for each module that you want to enable the features on. Each license only supports the listed features. Licenses may be specific to a particular hardware platform or module.

Note Any feature not included in a license package is bundled with the Cisco NX-OS software and is provided at no extra charge to you.

This table lists the module license packages for the Cisco Nexus 7000 Series, which includes Cisco Nexus 7000 switches and Cisco Nexus 7700 switches.

Table 9: Module-Based Licenses for the Cisco Nexus 7000 Series

Module License	Product ID	Features
FCoE Services Package (FCOE_PKG)	N7K-FCOE-F132XP=	• Fibre Channel over Ethernet (FCoE) **Note** You do not need the Advanced Services Package to enable the storage VDC required for FCoE.
FCoE F2-Series (FCoE_F2)	N7K-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 48-port 10G SFP+ (F2)
	N77-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 Enhanced F2E Series 48 Port 10G (SFP+)
FCoE F3-Series (FCoE_F3)	N7K-FCOE-F312FQ	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 F3 Series 12-port 40-Gigabit Ethernet QSFP+ module
	N7K-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 F3 Series 48-port 10-Gigabit Ethernet SFP+ module
	N77-FCOE-F324FQ	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 F3 Series 24-port 40-Gigabit Ethernet QSFP+ module
	N77-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 F3 Series 48-port 10-Gigabit Ethernet SFP+ module

Note The licenses are independent of each other. If you want to use features that are covered by different licenses, you must install all appropriate licenses. For example, if you want to use EIGRP and VDCs on the Cisco Nexus 7000 Series, you must install both the Enterprise Services Package license and the Advanced Services Package license.

Related Topics

Associating a License with a Module, on page 30

Bundle/Chassis-based Licenses

Bundle/Chassis-based licensing makes the Fibre Channel over Ethernet (FCoE) feature available for all supported line card modules such as F2 and F3 for that particular chassis. with max counts supported by that chassis.

Note Bundle/Chassis-based licensing is not supported for the Cisco Nexus 7000 series.

This table lists the bundle/chassis-based licenses for the Cisco Nexus 7700 Series.

Table 10: Bundle/Chassis-Based Licenses for the Cisco Nexus 7700 Series

Bundle/Chassis	Product ID	Features
N7706-FCOE-10G=	N77-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 4 modules)
	N77-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 4 modules)
N7710-FCOE-10G=	N77-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 8 modules)
	N77-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 8 modules)
N7718-FCOE-10G=	N77-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7718 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 16 modules)
	N77-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7718 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 16 modules)
N7706-FCOE-40G=	N77-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 4 modules)
	N77-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 4 modules)
	N77-FCOE-F324FQ	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F3 Series 24-port 40-Gigabit Ethernet QSFP+ Module (Maximum of 4 modules)

Bundle/Chassis	Product ID	Features
N7710-FCOE-40G=	N77-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 8 modules)
	N77-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 8 modules)
	N77-FCOE-F324FQ	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F3 Series 24-port 40-Gigabit Ethernet QSFP+ Module (Maximum of 8 modules)
N7718-FCOE-40G=	N77-FCOE-F248XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7718 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 16 modules)
	N77-FCOE-F348XP	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7718 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 16 modules)
	N77-FCOE-F324FQ	Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7718 F3 Series 24-port 40-Gigabit Ethernet QSFP+ Module (Maximum of 16 modules)

Licensing Terminology

The following terms are used in this document:

Licensed feature

Permission to use a particular feature through a license file, a hardware object, or a legal contract. This permission is limited to the number of users, number of instances, time span, and the implemented device.

Licensed application

A software feature that requires a license to be used.

License enforcement

A mechanism that prevents a feature from being used without first obtaining a license.

Node-locked license

A license that can only be used on a particular device using the device's unique host ID.

Host IDs

A unique chassis serial number that is specific to each device.

Software license claim certificate

A document entitling its rightful owner to use licensed features on one device as described in that document.

Product Authorization Key (PAK)

The PAK allows you to obtain a license key from one of the sites listed in the software license claim certificate document. After registering at the specified website, you will receive your license key file and installation instructions through e-mail.

License key file

A device-specific unique file that specifies the licensed features. Each file contains digital signatures to prevent tampering and modification. License keys are required to use a licensed feature. License keys are enforced within a specified time span.

Missing license

If the bootflash has been corrupted or a supervisor module replaced after you have installed a license, that license shows as missing. The feature still works. You should reinstall the license as soon as possible.

Evaluation license

A temporary license. Evaluation licenses are time bound (valid for a specified number of days) and are tied to a host ID (device serial number).

Permanent license

A license that is not time bound is called a permanent license.

Grace period

The amount of time the features in a license package can continue functioning without a license.

Support

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Licensing Virtualization Support

On the Cisco Nexus 7000 Series, you install and manage licenses on the physical device in the default virtual device context (VDC 1). Licenses apply to features in all VDCs and Virtual Routing and Forwarding instances (VRFs) on the physical device. You do not need to obtain a separate license for each VDC or VRF. For more information on VDCs, see the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide*.

Licensing High Availability

As with other Cisco NX-OS features, the licensing feature also maintains the following high-availability standards:

- Installing any license in the device is a nondisruptive process.

- Installing a license automatically saves a copy of permanent licenses to the chassis.
- If you have enabled the grace period feature, enabling a licensed feature that does not have a license key starts a counter on the grace period. You then have 120 days to install the appropriate license keys, disable the use of that feature, or disable the grace period feature. If at the end of the 120-day grace period the device does not have a valid license key for the feature, the Cisco NX-OS software automatically disables the feature and removes the configuration from the device.

Note The Cisco Nexus 9000 Series and Cisco Nexus 3000 Series do not support the grace period feature.

Note Some licenses, for example Cisco TrustSec for the Cisco Nexus 7000 Series or Layer 3 Enterprise Services for the Cisco Nexus 5000 Series, do not have a grace period.

Devices with dual supervisors have the following additional high-availability features:

- The license software runs on both supervisor modules and provides failover protection.
- The license key file is mirrored on both supervisor modules. Even if both supervisor modules fail, the license file continues to function from the version that is available on the chassis.

License Installation

You can either obtain a factory-installed license (only applies to new device orders) or perform a manual license installation of the license (applies to existing devices in your network).

Obtaining a Factory-Installed License

You can obtain factory-installed licenses for a new Cisco NX-OS device.

Procedure

Step 1 Contact your reseller or Cisco representative and request this service.

Note If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Your device is shipped with the required licenses installed in the system.

Step 2 Start using the device and the licensed features.

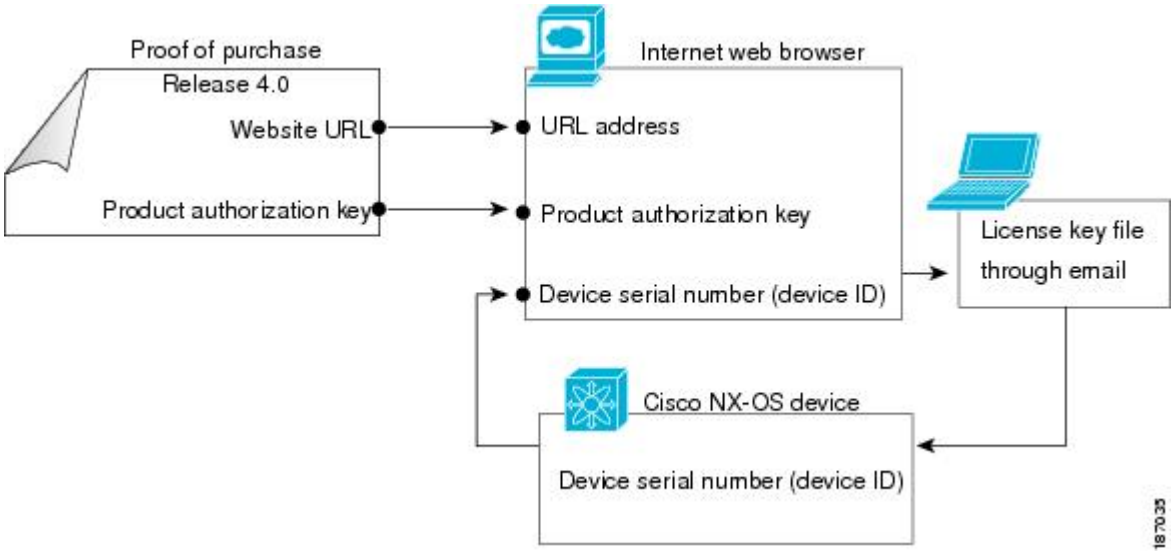
Performing a Manual Installation

If you have existing devices or if you wish to install the licenses on your own, you must first obtain the license key file and then install that file in the device.

Note All licenses for the Cisco Nexus 5000 Series and the Cisco Nexus 4000 Series are factory-installed. Manual installation is not required.

This figure shows how to obtain a license key file.

Figure 1: Obtaining a License Key File



Obtaining the License Key File

You can obtain new or updated license key files.

Procedure

	Command or Action	Purpose

Step 1	Obtain the serial number for your device by entering the **show license host-id** command. The host ID is also referred to as the device serial number.	`switch# show license host-id`
		`License hostid: VDH=FOX064317SQ`
		Tip Use the entire ID that appears after the equal sign (=). In this example, the host ID is FOX064317SQ.

Step 2	Obtain your software license claim certificate document. If you cannot locate your software license claim certificate, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html	
Step 3	Locate the product authorization key (PAK) from the software license claim certificate document.	
Step 4	Locate the website URL from the software license claim certificate document. You can access the Product License Registration website from this URL: https://tools.cisco.com/SWIFT/LicensingUI/Home	
Step 5	Follow the instructions on the Product License Registration website to register the license for your device.	The license key file is sent to you by e-mail and is digitally signed to only authorize use on the requested device. The requested features are also enabled once the Cisco NX-OS software on the specified device accesses the license key file. **Caution** Do not make any modifications to the license key file. It will alter the digital signature and render the license invalid. A license is permanent. If you do not have a license, the grace period for using a feature starts from the first time you start using a feature offered by a license. **Note** Cisco TrustSec for the Cisco Nexus 7000 Series and Layer 3 Enterprise for the Cisco Nexus 5000 Series do not have a grace period. You must obtain an Advanced Services license to use Cisco TrustSec.

	Command or Action	Purpose
Step 6	For the Cisco Nexus 9000 Series switches, Cisco Nexus 3164Q switches, and Cisco Nexus 31128PQ switches, use the **copy licenses** command to save your license file to one of three locations—the bootflash: directory, the usb1: device, or the usb2: device. For the Cisco Nexus 7000 Series, use the **copy licenses** command from the default VDC to save your license file to one of four locations—the bootflash: directory, the slot0: device, the usb1: device, or the usb2: device. For all other platforms, use the **copy licenses** command to save your license file to one of two locations—the bootflash: directory or the volatile: directory.	**Note** Only users with the network-admin role can copy licenses on Cisco NX-OS devices. For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

Related Topics

Backing Up Licenses, on page 23
Configuring the Grace Period Feature, on page 27

Installing the License Key File

You can install the license to enable features on your device.

Tip If you need to install multiple licenses in any device, be sure to provide unique filenames for each license key file.

Note If you have a single supervisor module on your Cisco NX-OS device and you replace the supervisor module, you must reinstall the license key file.

If you are currently running with a grace period license to avoid service disruptions when you install your permanent license, do not disable the grace period by using the **no license grace-period** command. Instead, just install your new license. The license manager will automatically transition from grace licensing to the installed license.

Procedure

Step 1 Log into the device through the console port of the active supervisor.

Step 2 Perform the installation by using the **install license** command on the active supervisor module from the device console.

```
switch# install license bootflash:license_file.lic
```

```
Installing license ..done
```

Note If you provide a target name for the license key file, the file is installed with the specified name. Otherwise, the filename specified in the license key file is used to install the license.

Step 3 (Optional) Back up the license key file.

Step 4 Exit the device console and open a new terminal session to view all license files installed on the device using the **show license** command.

Note If the license meets all guidelines when the **install license** command is used, all features and modules continue functioning as configured.

You can use the **show license brief** command to display a list of license files installed on the device.

You can use the **show license file** command to display information about a specific license file installed on the device.

Related Topics

Feature-Based Licenses , on page 2
Module-based Licenses, on page 14
Backing Up Licenses, on page 23

Backing Up Licenses

If the configuration or bootflash memory on your device becomes corrupted, you might need to reinstall your license. You can do a reinstallation from a backed up copy of the license key file. If you do not have a license key file, you can create a copy of the license key file from your installed license.

Note If you have a single supervisor module on your Cisco NX-OS device and you replace the supervisor module, you must reinstall the license key file. You cannot reinstall the license key file from the backed-up copy.

Caution If you erase any existing licenses installed on your device, you can reinstall them only by using the **install license** command using the license key file.

Note Only users with the network-admin role can back up licenses on Cisco NX-OS devices. On the Cisco Nexus 7000 Series, licenses must be backed up from the default VDC (VDC 1). For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

Backing Up the License Key File

You can back up your license key file to a remote server or to an external device by using the **copy** command.

This example shows how to save a license key file to a remote server:

```
switch# copy bootflash:license_file.lic tftp://10.10.1.1//license_file.lic
```

Some Cisco NX-OS platforms support external flash devices. This example shows how to save a license key file to an external Flash device:

```
switch# copy bootflash:license_file.lic slot0:license_file.lic
```

Backing Up an Installed License

You can back up your license key file to a remote server or to an external device by using the **copy** command.

This example saves all licenses installed on your device to a .tar file and copies it to a remote UNIX-based server:

```
switch# copy licenses bootflash:Enterprise.tar
Backing up license done
switch# copy bootflash:Enterprise.tar tftp://10.10.1.1//Enterprise.tar
```

You can uncompress the .tar file on the remote UNIX-based server to create one or more backup license key files, depending on how many licenses you have installed. You can also extract the license files on your Cisco NX-OS device by using the **tar extract** command.

This example shows how to extract license files from a .tar file:

```
switch# tar extract bootflash:Enterprise.tar
```

Enabling Licensed Features

You might have to enable a licensed feature to configure it. To enable a licensed feature, use the **feature** *feature-name* command in global configuration mode. For example, you can enable the BGP feature as follows:

```
switch# configure terminal
switch(config)# feature bgp
```

Identifying License Features in Use

Use the **show license usage** [*package-name*] command to identify all of the active features.

```
switch# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                 Count
--------------------------------------------------------------------------------
LAN_ENTERPRISE_SERVICES_PKG   Yes   -   In use Never       -
--------------------------------------------------------------------------------


switch# show license usage LAN_ENTERPRISE_SERVICES_PKG
Application
-----------
bgp
msdp
ospf
-----------
```

Uninstalling Licenses

You can only uninstall a permanent license that is not in use. If you try to delete a permanent license that is currently being used, the software rejects the request and issues an error message.

When you enable a Cisco NX-OS software feature, it can activate a license grace period. Uninstalling an unused license causes the grace period to come into effect. The grace period is counted from the first use of the feature without a license and is reset when a valid license file is installed.

Note Only users with the network-admin role can uninstall licenses on Cisco NX-OS devices. For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

Note Permanent licenses cannot be uninstalled if they are currently being used. Features turned on by permanent licenses must be disabled before that license is uninstalled.

Tip If you are using an evaluation license and would like to install a new permanent license, you can do so without service disruption and before the evaluation license expires. Removing an evaluation license immediately triggers a grace period without service disruption.

Caution You must disable the features that are related to the feature before uninstalling a license. The delete procedure fails if the license is in use.

Procedure

Step 1 Save your running configuration to a remote server by using the **copy** command.

```
switch# copy running-config tftp://server/path/filename
```

Step 2 Display a list of all installed license key files and identify the file to be uninstalled by using the **show license brief** command. In this example, the file to be uninstalled is the Enterprise.lic file.

Step 3 Disable the features provided by the license to be uninstalled. Use the **show license usage** *package-name* command to view the enabled features for a specified package.

Step 4 Uninstall the Enterprise.lic file by using the **clear license** *filename* command, where *filename* is the name of the installed license key file.

```
switch# clear license Enterprise.lic
Clearing license Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
```

Step 5 Continue uninstalling the license by entering **y** for yes.

```
Do you want to continue? (y/n) y
Clearing license ..done
```

The Enterprise.lic license key file is now uninstalled.

Updating Licenses

If your license is time bound, you must obtain and install an updated license. Contact technical support to request an updated license.

For the Cisco Nexus 7000 Series, you can update the license only from the default VDC (VDC 1).

Note If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Note Only users with the network-admin role can update licenses on Cisco NX-OS devices. For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

Procedure

Step 1 Obtain the updated license file.

Step 2 Save your running configuration to a remote server by using the **copy** command.

Step 3 Verify the name of the file to be updated by using the **show license brief** command.

```
switch# show license brief
Enterprise1.lic
```

Step 4 Update the license file by using the **update license** {**bootflash:** | **slot0:** | **usb0:** | **usb1:**}*new-license-filename old-license-filename* command.

```
switch# update license bootflash:Enterprise2.lic Enterprise1.lic
```

Step 5 Continue with the license update by entering **y** (yes is the default).

```
Do you want to continue? (y/n) y
Updating license ..done
switch#
```

The Enterprise1.lic license key file is now updated.

Step 6 (Optional) Enable licensed features, if necessary, by using the **feature** *feature-name* command in global configuration mode. For example, you can enable the BGP feature as follows:

```
switch# configure terminal
switch(config)# feature bgp
switch#
```

Related Topics

Feature-Based Licenses , on page 2
Module-based Licenses, on page 14
Obtaining the License Key File , on page 20

Configuring the Grace Period Feature

The grace period feature allows you to use licensed features that do not have a license key. By default, the license period feature is disabled. While the grace period feature is disabled, users cannot accidentally enable licensed features.

Note The Cisco Nexus 9000 Series and Cisco Nexus 3000 Series do not support the grace period feature.

For the Cisco Nexus 7000 Series, you can enable and disable the grace period only from the default VDC (VDC 1).

Note Only users with the network-admin role can enable the grace period on Cisco NX-OS devices. For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

Grace Period Alerts

The Cisco NX-OS software gives you a 120-day grace period. This grace period starts or continues when you are evaluating a feature for which you have not installed a license.

The grace period stops if you disable a feature that you are evaluating, but if you enable that feature again without a valid license, the grace period countdown continues where it left off.

Note To avoid service disruptions when you install the permanent license, do not disable the grace period by using the **no license grace-period** command. Instead, just install your new license. The license manager will automatically transition from grace licensing to the installed license.

Once the license manager is using your installed license, the grace period alerts will cease.

The grace period operates across all features in a license package. License packages can contain several features. If you disable a feature during the grace period and there are other features in that license package that are still enabled, the countdown does not stop for that license package. To suspend the grace period countdown for a license package, you must disable every feature in that license package.

The Cisco NX-OS license counter keeps track of all licenses on a device. If you are evaluating a feature and the grace period has started, you will receive console messages, SNMP traps, system messages, and Call Home messages on a daily basis. The frequency of these messages become hourly during the last seven days of the grace period.

In addition to the grace period alerts, Cisco NX-OS will display a banner at login in the last 15 days of the grace period:

```
NOTICE: NX-OS LICENSED FEATURES NEED ATTENTION

--------------------------------------------------------------------------------
Feature                      Ins  Lic   Status Expiry Date Comments
                                Count
--------------------------------------------------------------------------------
LAN_ENTERPRISE_SERVICES_PKG   No    -   In use             Grace 14D 6H
--------------------------------------------------------------------------------
**** WARNING: License(s) about to expire. When license(s) expire,
all licensed conditional features will be disabled ****
```

During the last seven days of the grace period, the banner will include a prompt which you must dismiss before you can complete login:

```
NOTICE: NX-OS LICENSED FEATURES NEED ATTENTION

--------------------------------------------------------------------------------
Feature                      Ins  Lic   Status Expiry Date Comments
                                Count
--------------------------------------------------------------------------------
LAN_ENTERPRISE_SERVICES_PKG   No    -   In use             Grace 3D 23H
--------------------------------------------------------------------------------
**** WARNING: License(s) about to expire. When license(s) expire,
all licensed conditional features will be disabled ****

CISCO TAC must be contacted asap for required licenses to prevent imminent
downtime/service disruption.
Please press Enter to confirm you understand this risk and wish to continue: [ENTER]
```

For example, if you enabled a licensed feature on January 30, you will receive grace period ending messages as follows:

- Daily alerts from January 30 to May 21. Starting from May 15, Cisco NX-OS would display the banner at login.
- Hourly alerts from May 22 to May 30. The login banner would require you to dismiss its prompt before you can complete login.

On May 31, the grace period ends, and the licensed feature is automatically disabled. You will not be allowed to use the licensed feature until you purchase a valid license.

Note You cannot modify the frequency of the grace period messages.

Caution After the final seven days of the grace period, the feature is turned off and your network traffic may be disrupted. Any future upgrade to Cisco NX-OS will enforce license requirements and the 120-day grace period.

Use the **show license usage** command to display grace period information for a device.

Enabling the License Grace Period

Enable the grace period feature by using the **license grace-period** command:

```
switch# configure terminal
switch(config)# license grace-period
```

Related Topics

Feature-Based Licenses , on page 2
Module-based Licenses, on page 14

Disabling the License Grace Period

To disable the grace period, you must disable all features that use the license grace period. Otherwise, the Cisco NX-OS software rejects the request and issues an error message.

Note To avoid service disruptions, you should not disable the grace period before you install a permanent license.

Procedure

Step 1 Display the licenses using the grace period by using the **show license usage** command.

```
switch# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                 Count
--------------------------------------------------------------------------------
LAN_ADVANCED_SERVICES_PKG     Yes   -   In use Never       -
LAN_ENTERPRISE_SERVICES_PKG   No    -   In use             Grace 119D 22H
--------------------------------------------------------------------------------
```

Step 2 Disable the features provided by the license using the grace period. Display the enabled features for a specified package by using the **show license usage** *package-name* command.

Step 3 Disable the grace period.

```
switch# configure terminal
switch(config)# no license grace-period
```

Associating a License with a Module

You must associate a module-based license with a module to enable the licensed features on that module.

Before You Begin

- Ensure you have installed the correct license.
- Ensure you are in the correct VDC.
- Ensure you have met all required prerequisites for the feature. See the appropriate feature documentation for details.

Procedure

	Command or Action	Purpose
Step 1	**license fcoe module** *module-number* **Example:** `switch(config)# license fcoe module 2`	Associates the module-based license with the module.

License Transfers Between Devices

A license is specific to the physical device for which it is issued and is not valid on any other physical device. If you need to transfer a license from one physical device to another, contact your customer service representative.

Note If you have a single supervisor module on your Cisco NX-OS device and you replace the supervisor module, you must reinstall the license key file.

If you are evaluating a license when you replace the supervisor module, the grace period of the license is usually set to 120 days. On a dual supervisor system, the grace period of the license will be overwritten from the existing active supervisor module to the new standby supervisor module.

Note If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Verifying the License Configuration

To display the license configuration information, perform one of the following tasks:

Command	Purpose
show license [**brief**]	Displays information for all installed license files.
show license feature package mapping	Displays information about features available in installed license packages. **Note** The Cisco Nexus 9000 Series and the Cisco Nexus 3164Q switches do not support this command.
show license file	Displays information for a specific license file.
show license host-id	Displays the host ID for the physical device.
show license usage [*license-package*]	Displays the usage information for installed licenses.

Additional References

This section includes additional information related to licensing the Cisco NX-OS software.

Table 11: Applicable MIBs

MIBs	MIBs Link
• CISCO-LICENSE_MGR-MIB	To locate and download MIBs, go to the following URL: ftp://ftp.cisco.com/pub/mibs/supportlists/

Feature History for Licensing

This table lists the release history for this feature.

Table 12: Feature History for Licensing

Feature Name	Release	Feature Information
FCoE NPV	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I3(1)	Added support for Cisco Nexus 9000 Series NX-OS Release 7.0(3)I3(1).

Feature Name	Release	Feature Information
N3K-LAN1K9 license	Cisco Nexus 3232C and 3264Q NX-OS Release 7.0(3)IX1(2)	Added support for the Cisco Nexus 3232C and 3264Q switches.
N3172T-32T-LIC, N3172T-16T-UPG	Cisco Nexus 3000 Series NX-OS Release 7.0(3)I2(1)	N3172T-32T-LIC is the default 32-port license for Cisco Nexus 3172TQ switches. N3172T-16T-UPG is the 16-port upgrade license for Cisco Nexus 3172TQ switches. This is the upgrade license to enable 16 ports and it can only be applied to N3K-C3172TQ-32T.
N3K-LAN1K9 license	Cisco Nexus 3000 Series NX-OS Release 7.0(3)I2(1)	Added support for the Cisco Nexus 31128PQ switch and the Cisco Nexus 3100 Series switches in N9K mode.
N95-LAN1K9 and N93-LAN1K9 licenses	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I2(1)	Added support for PIM bidirectional mode and Source-Specific Multicast (SSM) mode.
N6K-SERVICES1K9, N56-SERVICES1K9, and N55-SERVICES1K9	Cisco Nexus 5500, 5600, and 6000 Series NX-OS Release 7.2(0)N1(1)	Added these licenses to support the Intelligent Traffic Director (ITD) and Remote Integrated Services Engine (RISE) on the Cisco Nexus 5500, 5600 and 6000 Series switches.
N95-SERVICES1K9 license and N93-SERVICES1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I1(2)	Added these licenses to support the Intelligent Traffic Director (ITD) on the Cisco Nexus 9500 and 9300 Series switches.
N95-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I1(2)	Added VXLAN and BGP eVPN control plane support for the Cisco Nexus 9500 Series switches.
FCoE F3 Series	Cisco Nexus 7000 Series NX-OS Release 7.2(0)D1(1)	Added licenses for FCoE on F3 Series modules.
MPLS	Cisco Nexus 7000 Series NX-OS Release 7.2(0)D1(1)	Added license for MPLS on Cisco Nexus 7700 switches.
N93-LAN1K9 license and N3K-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I1(1)	Added support for the BGP eVPN control plane for the Cisco Nexus 9300 Series switches and the Cisco Nexus 3164Q switch.
N95-LAN1K9 license, N93-LAN1K9 license, and N3K-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 6.1(2)I3(1)	Added support for policy-based routing.

Feature Name	Release	Feature Information
N3K-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 6.1(2)I2(2a)	Added support for the Cisco Nexus 3164Q switch.
N93-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 6.1(2)I2(1)	Added the license for the Cisco Nexus 9300 Series switches.
N95-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 6.1(2)I1(1)	Added the license for the Cisco Nexus 9500 Series switches.
All licenses	Cisco Nexus 6000 Switch NX-OS Release 6.0(2)N1(1)	Added all licenses for the new Cisco Nexus 6000 Series platform.
N77-LAN1K9 license N77-VDC1K9 license N77-EL21K9 license N77-SAN1K9 license	Cisco Nexus 7000 Series NX-OS Release 6.2(2)	Added licenses for the Cisco Nexus 7718 switch and the Cisco Nexus 7710 switch.
Layer 3 Base Services Package	Cisco Nexus 3548 Switch NX-OS Release 5.0(3)A1(1)	Added the Cisco Nexus 3548 Layer 3 Base License.
Layer 3 Enterprise Services Package	Cisco Nexus 3548 Switch NX-OS Release 5.0(3)A1(1)	Added the Cisco Nexus 3548 Layer 3 Enterprise License.
Static NAT, Warp Mode, Warp SPAN	Cisco Nexus 3548 Switch NX-OS Release 5.0(3)A1(1)	Added the new 3500 Algo Boost License.
N7K-C7004-XL license	Cisco Nexus 7000 Series NX-OS Release 6.1(2)	Added the Cisco Nexus 7004 Scalable Feature License.
VDC and FCoE F2 Series	Cisco Nexus 7000 Series NX-OS Release 6.1(1)	Added licenses for VDCs and FCoE on F2 Series modules. Removed Cisco TrustSec from the Advanced Services Package.
MPLS, LISP, and FCoE	Cisco Nexus 7000 Series NX-OS Release 5.2(1)	Added licenses for the MPLS, LISP, and FCoE features.
Grace period	Cisco Nexus 7000 Series NX-OS Release 4.2(1)	Automatic checkpoints are created for configured licensed features when the grace period expires.