Cisco NX-OS Licensing Options Guide

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This document contains information related to feature and module-based licensing options for Cisco Nexus switches that run Cisco NX-OS software.

Note: The documentation set for this product strives to use bias-free language. For the purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. Exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation, or language that is used by a referenced third-party product.

The following table lists the changes to this document.

Date	Description
July 17, 2026	• Updated Table 5 for FGLB support on N9164E-NS4-O from Release 10.6(3)F.
July 9, 2026	• Added link to the Licensing hub.
April 27, 2026	• Updated Table 4 for N9348Y12C-SE1switch.
April 16, 2026	• Updated Table 4 for N9164E-NS4-O support from Release 10.6(2n) and Table 2 for Essentials; Table 4 and 7 for N9324C-SE1U and N9348Y2C6D-SE1U switches.
January 21, 2026	• Updated Figure 1 and Tables 4, 5, and 8 for license related to 9100 and FGLB.
December 22, 2025	• Updated Table 4 with new platforms for 10.6x releases.
November 6, 2025	• Replaced My Cisco Entitlements with Cisco License Central.
October 23, 2025	• Updated LRP links in the Traditional Licensing Overview sections.
August 13, 2025	• Updated Figure 1 and Tables 3, 4, 5, and 8 for FGLB license.
July 21, 2025	• Updated Tables 2 for Advantage license. • Updated Tables 4, 5, and 8 and XF3 for 800G fixed platforms.
May 14, 2025	• Updated Table 2 for NX-OS License Package features.
January 30, 2025	• Updated Copyright and Table 4 Headers.
December 20, 2024	• Updated Table 2 for Essentials license.
December 17, 2024	• Updated Table 2 for Advantage License Package.
December 16, 2024	• Updated Table 4 for FEX in NX-OS mode.
June 25, 2024	• Updated the document for Tier-based licenses.
June 11, 2024	• Updated Table 20 to include licensing information for cisco Nexus 3524 and 3548 switches.
April 2, 2024	• Updated Table 2 Essentials to include Micro-segmentation.
February 8, 2024	• Updated Table 4 to include N9K-C93400LD-H1 and N9K-C93108TC-FX3.
January 17, 2024	• Updated Table 2 (Advantage package).
January 10, 2024	• Updated Copyright and Table 7 footnote #12.
November 14, 2023	• Updated Table 4 and 5 and updated the Cisco Nexus 9000 Series Tier-Based Licenses section.
October 31, 2023	• Updated Table 2 (added a foot note) and Table 7 (updated foot note).
August 29, 2023	• Updated Table 4, 6, and 9 for N9K-C9804.
June 28, 2023	• Updated Table 4 to include N9K-C92348GC-X.
May 26, 2023	• Updated the Feature-Based Licenses section.
April 11, 2023	• Updated Table 7.
March 8, 2023	• Updated Tables 4, 6, and 9.
January 20, 2023	• Removed all 7Y PIDs from Table 11.
November 11, 2022	• Updated Table 10 to include NXOS-UPG-L-AD-XF upgrade license. • Updated sub-note 12 under Table 7.
September 23, 2022	• Updated Table 9 to include ACI-SEC-XM
August 19, 2022	• Added support for N9K-C9808. • Updated Tables 4, 6, and 9.
July 28, 2022	• Replaced DCNM with DCNM/NDFC throughout the document.
July 1, 2022	• Updated Add-on Licenses in Table 5. • Removed content related to essentials perpetuals licenses. • Updated Figure 1: Cisco Nexus 9000 and 3000 Series NX-OS Switch License Navigator Infographic • Removed all references to Cisco ONE and non-Cisco ONE.

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Date	Description
	• Updated Table 10 to include platform IDs that support upgrade licenses. • Updated Table 4, 5, and 24 to include N9K-C9348D-GX2A and N9K-C9364D-GX2A.
April 12, 2022	• Updated Table 4 to include N9K-C9332D-GX2B.
August 24, 2021	• First version of the Cisco NX-OS Licensing Options Guide was published.

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Licensing Cisco NX-OS Software Features

Licensing allows you to access specified premium features on your device after you install the appropriate license for that feature. The following table compares licensing support between Cisco Nexus 5000/7000 Series switches and Cisco Nexus 3000/9000 Series switches.

Table 1. Licensing Support for Cisco NX-OS Switches

Licensing Feature	Cisco Nexus 5000 Series Switches	Cisco Nexus 7000 Series Switches	Cisco Nexus 3000 and 9000 Series Switches
Enforcement	Enforced	Enforced, on Cisco NX-OS Release 8.3(2) and earlier 8.3(x) releases. From Cisco NX-OS Release 8.4(1), Honor-based licensing is introduced on Cisco Nexus 7000 Series switches. Enforced, on Cisco NX-OS Release 8.2(3) and earlier 8.x releases. From Cisco NX-OS Release 8.2(4), Honor-based licensing is introduced on Cisco Nexus 7000 Series switches.	Honor-based[1]
Perpetual	Supported	Supported	Supported
Term			
Subscription	Not supported	From Cisco NX-OS Release 8.2(1), subscription-based licensing is available on Cisco Nexus 7000 Series switches.	Supported
Evaluation[2]	Supported	Supported	Not supported
Grace period	Supported	Supported, on Cisco NX-OS Release 8.3(2) and earlier 8.3(x) releases. From Cisco NX-OS Release 8.4(1), Grace period is not supported on Cisco Nexus 7000 Series switches. Supported, on Cisco NX-OS Release 8.2(3) and earlier 8.x releases. From Cisco NX-OS Release 8.2(4), Grace period is not supported on Cisco Nexus 7000 Series switches.	Not applicable

[1] The following warning might display when installing the honor-based license. Please ignore this warning and continue with the install. !!!!!! WARNING: 'LAN_ENTERPRISE_SERVICES_PKG' LICENSE NOT FOUND ON THE SYSTEM !!!!!!. You have tried to enable a licensed feature [ospf] without installing the 'LAN_ENTERPRISE_SERVICES_PKG' license, which has not been found on the system.

[2] Temporary licenses with an expiry date are available for evaluation and lab use purposes. They are strictly not allowed to be used in production. Please use a permanent or subscription license that has been purchased through Cisco for production purposes. Evaluation license is supported with Smart Software License but not with Traditional license in Cisco Nexus 9000 series switches.

Tier-Based Licenses

Tier-based licensing is available for some Cisco Nexus 3000 and 9000 Series switches. This licensing model applies to both Cisco Application Centric Infrastructure (ACI) and NX-OS standalone architectures where these switches can be deployed.

The Release History for Licensing section lists the platforms that support tier-based licensing and the release in which support was introduced.

For the full breakdown of what features are included in each tier (Essentials, Advantage, and Premier), please reference the Cisco DCN Software Subscriptions page.

Tier-based licenses are available as subscription and perpetual consumption models and offer the following benefits:

Subscription–These term-based software licenses are available in 3-year, 5-year, and 7-year terms.

- Consistency across ACI and NX-OS licensing (for Cisco Nexus 9000 Series switches).

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- Tiered licenses are available in DCN Essentials, DCN Advantage, and DCN Premier levels tiers.
- Purchasing a subscription-based license gives you the opportunity to adjust/upgrade the terms of the license (such as moving from Advantage to Premier or 3-year to 5-year.)
- For customers that have a net Total Contract Value (TCV) of more than $100,000, we recommend data-center enrollment for a Cisco Enterprise Agreement. Learn more about Enterprise Agreements to cover your data-center technologies.

Perpetual–This is a nontransferable, fixed-price, traditional licensing model with the right to use covered features for a perpetual term.

Note: DCN Perpetual licenses are not portable between devices.

- The DCN Advantage tier is available as a perpetual license.

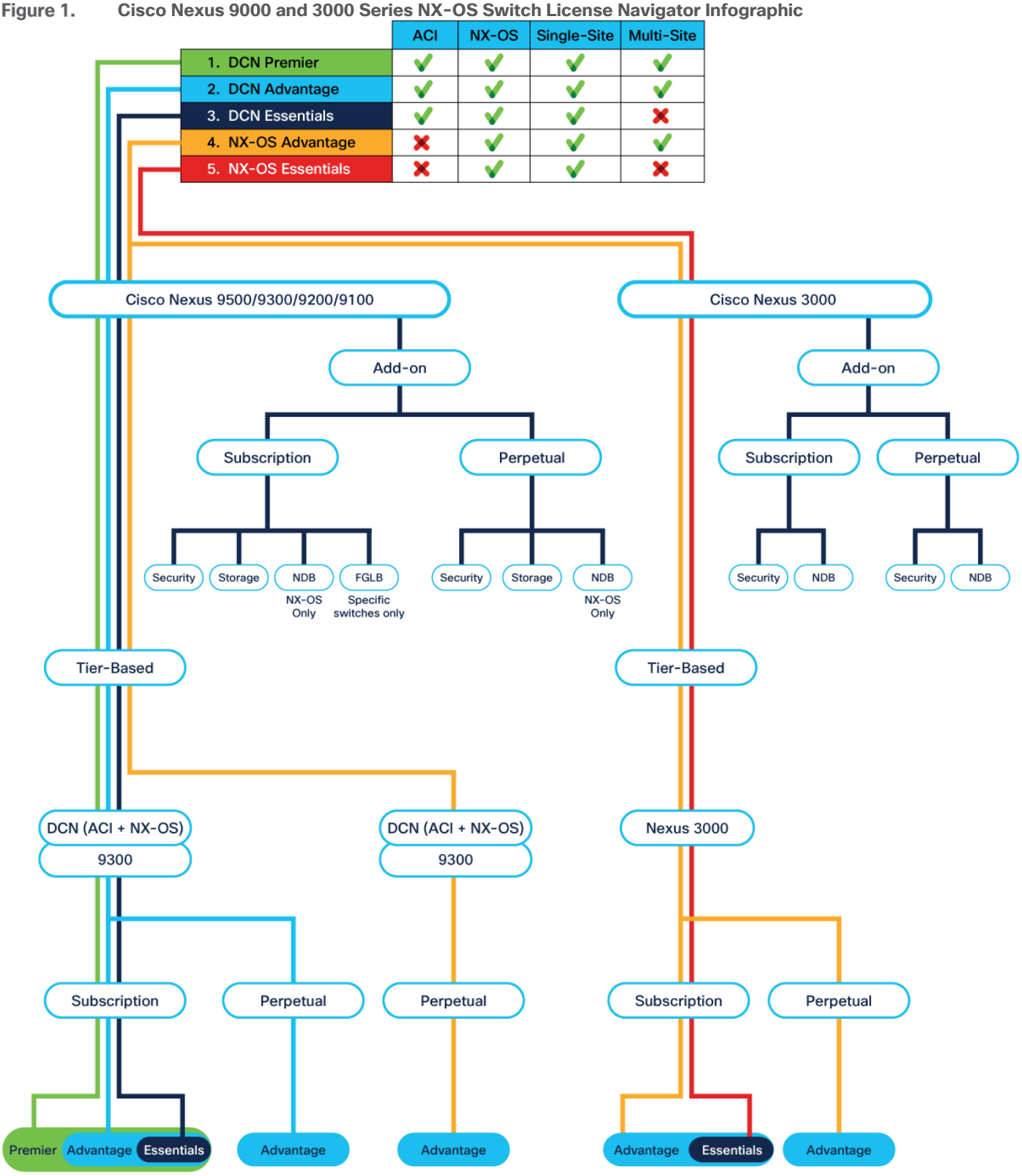
Note: Several add-on licenses are also available, which can be added to either tier or purchased independently.

Along with the infographic below, the Cisco Nexus 9000 and 3000 Series NX-OS Switch License Navigator (https://www.cisco.com/c/dam/en/us/td/docs/Website/datacenter/license/index.html) is available to help you select the appropriate license for your needs.

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Figure 1. Cisco Nexus 9000 and 3000 Series NX-OS Switch License Navigator Infographic



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Table 2. NX-OS License Package features Included in Tier-Based Licenses for Cisco Nexus 9000 and 3000 Series Switches

License Package	Features Included*
Essentials	Routing and Management Switching Features: ■ BGP, EIGRP, GRE, IS-IS, MSDP, OSPF, EPBR [includes ITD and PBR], PIM, SSM, VXLAN BGP EVPN, Microsegmentation, IP Fabric for Media Non-Blocking Multicast, PTP, iCAM, RIP, OFM, NGOAM, and VRRP Switch Analytics: ■ Telemetry (Netflow, sFlow, Analytics)
Advantage	All features included in Essentials package plus the following features: ■ Inter AS Option B, Tenant Routed Multicast, SR-MPLS, Layer 3 EVPN over segment routing (SRv6), MPLS Layer 3 VPN, VXLAN EVPN Multi-site (BGWs), Multicast NAT, RTP Flow Monitoring, and PTP Flow Monitoring ■ Intelligent Packet Flow – Dynamic Load Balancing (DLB), Per-packet Load Balancing, Path based (WCMP+DLB), Policy based, Static Pinning*
Premier	All features included in Essentials and Advantage packages including premier functionality.

* Intelligent Packet Flow feature-set support from NX-OS 10.5.3(F) onwards and tied to the feature “hardware-profile dlb”.

Table 3. NX-OS License Package features Included in Add-On Licenses for Cisco Nexus 9000 and 3000 Series Switches

Add-on License	Features
Security add-on license	MACsec, Secure VXLAN EVPN Multi-Site using CloudSec[4]
Storage add-on license	FCoE, FC, and DCNM/NDFC SAN
SyncE add-on license	Synchronous Ethernet (SyncE) support
NDB add-on license	Nexus Data Broker
Fine Grain Load balancing (FGLB) license*	End-to-end Adaptive Routing, Real-time congestion mitigation, Packet spraying and intelligent load distribution

[4] Beginning with Cisco Nexus Release 9.3(5), Secure VXLAN EVPN Multi-Site using CloudSec is supported only on Cisco Nexus 9300-FX2 platform switches. Beginning with Cisco Nexus Release 10.1(1), Secure VXLAN EVPN Multi-Site using CloudSec is supported on Cisco Nexus 9300-FX3 platform switches.

* Beginning with Cisco NX-OS Release 10.6(1)F Fine Grain Load Balancing (FGLB) license is needed in addition to DCN Advantage License to enable NVIDIA Spectrum-X Adaptive routing on Cisco G200 based platforms and Cisco CloudScale platforms.

Note: Feature support varies by platform and release. See the Nexus Switch Platform Support Matrix to determine which features are supported for your platform.

The following options are available when you order an Essentials or Advantage package:

- Cisco Nexus 9000 Series switches
  - Essentials or Advantage subscription license for DCN (ACI+NX-OS) for 3, 5, or 7 years
  - Advantage perpetual license for DCN (ACI+NX-OS) – not portable between devices
  - Advantage perpetual license for NX-OS – not portable between devices
  - NX-OS upgrade licenses
- Cisco Nexus 3000 Series switches
  - Essentials or Advantage subscription license for NX-OS for 3, 5, or 7 years

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- Advantage perpetual license for NX-OS – not portable between devices

Essentials package is offered as subscription only. Essential perpetual license is no longer sold.

If you install a subscription-based license, you will be notified 90 days before your licensing contract expires.

Note: If the Essentials license expires after the Advantage license is installed, the following message appears: "LIC_LICENSE_EXPIRED: License expired for feature NXOS_ESSENTIALS_XF. Feature will run in honor mode." You can ignore this message because the license is no longer in use.

Cisco Nexus 9000 Series Tier-Based Licenses

The DCN (ACI+NX-OS) Essentials, Advantage, and add-on licenses are supported for Cisco Nexus 9300 platform switches beginning with Cisco NX-OS Release 9.2(3). Beginning with Cisco NX-OS Release 7.0(3)I7(7) and 9.3(2), the ACI Premier licenses are supported for Cisco Nexus 9300 platform switches. These licenses support license migration from Cisco NX-OS to ACI. Any attempt to install these licenses for a prior release will fail.

When you downgrade from Cisco NX-OS Release 9.2(3) to an earlier release, the features that use the DCN (ACI+NX-OS) Essentials, Advantage, and add-on licenses continue to work in honor mode in the downgraded version. In addition, the output of the show license usage command continues to include entries for these unsupported licenses.

Table 4. License Categories and Associated Supported Platforms (Cisco Nexus 9000 Series Switches)

1G Fixed Platform (GF) License	10G/25G/40G/100G Fixed Platform (XF) License	10G/25G/40G/100G /400G Fixed Platform (XF2) License	800G Fixed Platform (XF3) License	4-Slot Modular Platform License	8-Slot, 16-Slot Modular Platform License	8-Slot Centralized Modular Platform License	4-Slot Distributed Modular Platform License	8-Slot Distributed Modular Platform License
N9K-C9348GC-FXP N9K-C92348GC-X N9K-C9348GC-FX3 N9K-C9348GC-FX3PH	N9K-C9332C N9K-C93180YC-EX N9K-C93108TC-EX N9K-C93180LC-EX N9K-C93180YC-FX N9K-C93108TC-FX N9K-C93240YC-FX2 N9K-C93216TC-FX2 N9K-C93360YC-FX2 N9K-C9336C-FX2	N9K-C9364C N9K-C9316D-GX N9K-C93600CD-GX N9K-C9364C-GX N9K-C9332D-GX2B N9K-C9348D-GX2A N9K-C9364D-GX2A N9K-C9332D-H2R	N9364E-SG2-Q N9364E-SG2-O N9164E-NS4-O [Supported from Release 10.6(2n)]	N9K-C9504	N9K-C9508 N9K-C9516	N9K-C9408	N9K-C9804	N9K-C9808

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1G Fixed Platform (GF) License	10G/25G/40G/100G Fixed Platform (XF) License	10G/25G/40G/100G /400G Fixed Platform (XF2) License	800G Fixed Platform (XF3) License	4-Slot Modular Platform License	8-Slot, 16-Slot Modular Platform License	8-Slot Centralized Modular Platform License	4-Slot Distributed Modular Platform License	8-Slot Distributed Modular Platform License
	N9K-C93180YC-EX-24 N9K-C93108TC-EX-24 N9K-C93180YC-FX-24 N9K-C93108TC-FX-24 N9K-C93180YC-FX3S N9K-C93180YC-FX3 N9K-C93108TC-FX3P N9K-C93108TC-FX3 [Supported from 10.4(2)F] N9K-C93400LD-H1 [Supported from 10.4(2)F] N9336C-SE1 [Supported from 10.6(1)F] N9396Y12C-SE1 [Supported from 10.6(2)F] N9396T12C-SE1 [Supported from 10.6(2)F] N9324C-SE1U [Supported from 10.6(2)F] N9348Y2C6D-SE1U [Supported from 10.6(2)F] N9348Y12C-SE1 [Supported from 10.6(3)F]							

Note: The Cisco Nexus 9000 Series switches support static routes, switch virtual interfaces (SVIs), and Hot Standby Router Protocol (HSRP) by default without any license. The N9K FEX running in NX-OS mode also does not require any license. For more information about N9K FEX, see Nexus 9000 Series Switch FEX Support.

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Table 5. PIDs for Subscription Tier-Based Licenses for DCN (ACI+NX-OS) (Cisco Nexus 9000 Series Switches - Fixed Platforms)

License	1G Fixed Platforms (GF)	10G/25G/40G/100G Fixed Platforms (XF)	10G/25G/40G/100G/400G Fixed Platform (XF2)	800G Fixed Platforms (XF3)
Essentials package	C1E1TN9300GF-3Y C1E1TN9300GF-5Y C1E1TN9300GF-7Y	C1E1TN9300XF-3Y C1E1TN9300XF-5Y C1E1TN9300XF-7Y	C1E1TN9300XF2-3Y C1E1TN9300XF2-5Y C1E1TN9300XF2-7Y	C1E1TN9300XF3-3Y C1E1TN9300XF3-5Y C1E1TN9300XF3-7Y C1E1TN9100XF3-3Y C1E1TN9100XF3-5Y C1E1TN9100XF3-7Y
Advantage package	C1A1TN9300GF-3Y C1A1TN9300GF-5Y C1A1TN9300GF-7Y	C1A1TN9300XF-3Y C1A1TN9300XF-5Y C1A1TN9300XF-7Y	C1A1TN9300XF2-3Y C1A1TN9300XF2-5Y C1A1TN9300XF2-7Y	C1A1TN9300XF3-3Y C1A1TN9300XF3-5Y C1A1TN9300XF3-7Y C1A1TN9100XF3-3Y C1A1TN9100XF3-5Y C1A1TN9100XF3-7Y
Premier package	C1P1TN9300GF-3Y C1P1TN9300GF-5Y C1P1TN9300GF-7Y	C1P1TN9300XF-3Y C1P1TN9300XF-5Y C1P1TN9300XF-7Y	C1P1TN9300XF2-3Y C1P1TN9300XF2-5Y C1P1TN9300XF2-7Y	C1P1TN9300XF3-3Y C1P1TN9300XF3-5Y C1P1TN9300XF3-7Y C1P1TN9100XF3-3Y C1P1TN9100XF3-5Y C1P1TN9100XF3-7Y
Add-On Licenses				
NDB	C1-N9K-NDB-3Y C1-N9K-NDB-5Y C1-N9K-NDB-7Y	C1-N9K-NDB-3Y C1-N9K-NDB-5Y C1-N9K-NDB-7Y	C1-N9K-NDB-3Y C1-N9K-NDB-5Y C1-N9K-NDB-7Y	Not supported
Security*	C1-N9K-SEC-XF-3Y C1-N9K-SEC-XF-5Y C1-N9K-SEC-XF-7Y	C1-N9K-SEC-XF-3Y C1-N9K-SEC-XF-5Y C1-N9K-SEC-XF-7Y	C1-N9K-SEC-XF-3Y C1-N9K-SEC-XF-5Y C1-N9K-SEC-XF-7Y*	Not supported
Storage	Not supported	C1-N9K-STRG-XF-3Y C1-N9K-STRG-XF-5Y C1-N9K-STRG-XF-7Y	Not supported	Not supported
Sync-E#	Not supported	C1-N9k-SYNCE-XF-3Y C1-N9k-SYNCE-XF-5Y C1-N9k-SYNCE-XF-7Y	Not supported	Not supported
Fine Grain Load Balancing (FGLB)**	Not supported	-	C1N9K-FGLB-XF2-3Y C1N9K-FGLB-XF2-5Y	C1N9K-FGLB-XF3-3Y C1N9K-FGLB-XF3-5Y

* Cisco Nexus 9300-GX platforms do not support MACSec feature.

*Security add on license is mandatory for N9K-C9348D-GX2A platform. This platform is targeted for use cases that require MACSec on all ports.

Sync-E add-on licenses are applicable only for Cisco Nexus 9300-FX3 platforms.

** FGLB add-on licenses are supported only for Cisco Nexus platforms from NX-OS 10.6(1)F: N9K-C9332D-GX2B, N9K-C9348D-GX2A, N9K-C9364D-GX2A, N9364E-SG2-Q , N9364E-SG2-O.

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** FGLB add-on licenses are supported for Cisco Nexus N9164E-NS4-O (powered by NVIDIA Spectrum-4) from NX-OS 10.6(3)F.

Table 6. PIDs for Subscription Tier-Based Licenses for DCN (ACI+NX-OS) (Cisco Nexus 9000 Series Switches – Modular Platforms)

License	4-Slot Modular Platforms	8- to 16-Slot Modular Platforms	8-Slot Distributed Modular Platforms	8-Slot Centralized Modular Platforms	4-Slot Distributed Modular Platforms
Essentials package	C1E1TN9500M4-3Y C1E1TN9500M4-5Y C1E1TN9500M4-7Y	C1E1TN9500M816-3Y C1E1TN9500M816-5Y C1E1TN9500M816-7Y	C1E1TN9800M8-3Y C1E1TN9800M8-5Y C1E1TN9800M8-7Y	C1E1TN9400CM8-3Y C1E1TN9400CM8-5Y C1E1TN9400CM8-7Y	C1E1TN9800M4-3Y C1E1TN9800M4-5Y C1E1TN9800M4-7Y
Advantage package	C1A1TN9500M4-3Y C1A1TN9500M4-5Y C1A1TN9500M4-7Y	C1A1TN9500M816-3Y C1A1TN9500M816-5Y C1A1TN9500M816-7Y	C1A1TN9800M8-3Y C1A1TN9800M8-5Y C1A1TN9800M8-7Y	C1A1TN9400CM8-3Y C1A1TN9400CM8-5Y C1A1TN9400CM8-7Y	C1A1TN9800M4-3Y C1A1TN9800M4-5Y C1A1TN9800M4-7Y
Premier package[7]	C1P1TN9500M4-3Y C1P1TN9500M4-5Y C1P1TN9500M4-7Y	C1P1TN9500M816-3Y C1P1TN9500M816-5Y C1P1TN9500M816-7Y	C1P1TN9800M8-3Y C1P1TN9800M8-5Y C1P1TN9800M8-7Y	C1P1TN9400CM8-3Y C1P1TN9400CM8-5Y C1P1TN9400CM8-7Y	C1P1TN9800M4-3Y C1P1TN9800M4-5Y C1P1TN9800M4-7Y
Add-On Licenses					
NDB	C1-N9K-NDB-M4-3Y C1-N9K-NDB-M4-5Y C1-N9K-NDB-M4-7Y	C1-N9K-NDB-M816-3Y C1-N9K-NDB-M816-5Y C1-N9K-NDB-M816-7Y			
Security	C1-N9K-SEC-M-3Y C1-N9K-SEC-M-5Y C1-N9K-SEC-M-7Y	C1-N9K-SEC-M-3Y C1-N9K-SEC-M-5Y C1-N9K-SEC-M-7Y	C1-N9k-SEC-M-3Y C1-N9k-SEC-M-5Y C1-N9k-SEC-M-7Y	C1-N9K-SEC-M-3Y C1-N9K-SEC-M-5Y C1-N9K-SEC-M-7Y	C1-N9k-SEC-M-3Y C1-N9k-SEC-M-5Y C1-N9k-SEC-M-7Y
Storage	C1-N9K-STRG-M-3Y C1-N9K-STRG-M-5Y C1-N9K-STRG-M-7Y	C1-N9K-STRG-M-3Y C1-N9K-STRG-M-5Y C1-N9K-STRG-M-7Y			

[7] The ACI Premier license package includes the ACI Essentials and ACI Advantage license packages.

Table 7. PIDs for Perpetual Tier-Based Licenses for DCN (ACI+NX-OS) (Cisco Nexus 9000 Series Switches). DCN perpetual licenses are not portable between devices.

License	1G Fixed Platforms (GF)	10G/25G/40G/100G Fixed Platforms (XF)	Cisco Nexus 9364C and 9300-GX Platforms (XF2)[10][11]
Advantage package	ACI-AD-GF	ACI-AD-XF	ACI-AD-XF2
Add-On Licenses			
Security	ACI-SEC-XF	ACI-SEC-XF	ACI-SEC-XF2
Storage (FC NPV, FCoE NPV, and SAN switching)	Not supported	ACI-STRG[12]	Not supported
SyncE		DCN-SYNCE-XF[13]	

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[10] The licenses for the Cisco Nexus 9364C switch are supported beginning with Cisco NX-OS Release 7.0(3)I7(6). The licenses for the Cisco Nexus 9300-GX switches are supported beginning with Cisco NX-OS Release 9.3(3).

[11] Beginning with Cisco NX-OS Releases 7.0(3)I7(6) and 9.3(1), the -XF2 Essentials and Advantage licenses have priority over the -XF licenses. If an -XF license is installed and features are checked out from this license and then you later install the -XF2 license, the -XF license shows as unused (in the output of the show license usage command), and the features become checked out from the -XF2 license. The Advantage licenses continue to have priority over the Essentials licenses.

[12] The following statements are applicable for ACI-STRG:

- This license includes DCNM/NDFC SAN Advanced and is available for Cisco Nexus 93180YC-FX and 93360YC-FX2 platform switches. ACI-STRG will license only 48 ports of native Fiber Channel ports.
- Beginning with Cisco NX-OS Release 10.3(1)F, FCoE with N9K-C93180YC-FX3 in FEX mode is supported only with N9K-C93180YC-FX switches in NPV mode so the ACI-STRG license is needed for the N9K-C93180YC-FX. No ACI-STRG license is needed for N9K-C93180YC-FX3 running in FEX mode. N9K-C93180YC-FX3 in switch mode does not support FCoE.

[13] SyncE supported by 9300-FX3 and -FX3S Switch starting from Cisco NX-OS Release 9.3(5) onwards.

The NX-OS Essentials, Advantage, and add-on licenses are supported for Cisco Nexus 9000 Series switches beginning with Cisco NX-OS Release 7.0(3)I7(3).

Table 8. PIDs for Perpetual Tier-Based Licenses for NX-OS (Cisco Nexus 9000 Series Switches - Fixed Platforms) . DCN perpetual licenses are not portable between devices.

License	1G Fixed Platforms (GF)	10G/25G/40G/100G Fixed Platforms (XF)	Cisco Nexus 9364C and 9300-GX Platforms (XF2)[13][14]	800G Fixed Platforms (XF3)
Advantage package	NXOS-AD-GF	NXOS-AD-XF	NXOS-AD-XF2	NXOS-AD-XF3 N9100-DCN-AD-XF3
Add-On Licenses				
NDB	NXOS-NDB	NXOS-NDB	NXOS-NDB	Not supported
Security	ACI-SEC-XF [15]	ACI-SEC-XF [16]	ACI-SEC-XF	Not supported
Storage	Not supported	ACI-STRG [17]	Not supported	Not supported

[13] The licenses for the Cisco Nexus 9364C switch are supported beginning with Cisco NX-OS Release 7.0(3)I7(6). The licenses for the Cisco Nexus 9300-GX switches are supported beginning with Cisco NX-OS Release 9.3(3).

[14] Beginning with Cisco NX-OS Releases 7.0(3)I7(6) and 9.3(1), the -XF2 Essentials and Advantage licenses have priority over the -XF licenses. If an -XF license is installed and features are checked out from this license and then you later install the -XF2 license, the -XF license shows as unused (in the output of the **show license usage** command), and the features become checked out from the -XF2 license. The Advantage licenses continue to have priority over the Essentials licenses.

[15] ACI-SEC-XF is required only for supporting the uplink ports on 9348GC-FXP Platform.

[16] ACI-SEC-XF replaces NXOS-SEC-XF. NXOS-SEC-XF is no longer orderable.

[17] This license includes DCNM/NDFC SAN Advanced. NXOS-STRG is no longer orderable.

Table 9. PIDs for Perpetual Tier-Based Licenses for NX-OS (Cisco Nexus 9000 Series Switches - Modular Platforms) . DCN perpetual licenses are not portable between devices.

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License	4-Slot Modular Platforms	8- to 16-Slot Modular Platforms	8-Slot Distributed Modular Platforms	8-Slot Centralized Modular Platforms	4-Slot Distributed Modular Platforms
Advantage package	NXOS-AD-M4	NXOS-AD-M8-16	NXOS-AD-DM8	NXOS-AD-CM8	NXOS-AD-DM4
Add-On Licenses					
NDB	NDB-MODM-SWT-K9	NDB-MODL-SWT-K9			
Security	ACI-SEC-XM	ACI-SEC-XM	ACI-SEC-XM	ACI-SEC-XM	ACI-SEC-XM
Storage	NXOS-STRG-M	NXOS-STRG-M			

You can use the following licenses to upgrade from an NX-OS LAN Enterprise Services license to an NX-OS Essentials or Advantage license.

Table 10. NX-OS Supported Upgrade Licenses (Cisco Nexus 9000 Series Switches)

Upgrade License	Description
NXOS-UPG-L-AD-GF=	NX-OS Upgrade License: LAN to Advantage (1G platforms)
NXOS-UPG-ES-AD-XF=	NX-OS Upgrade License: Essentials to Advantage (10G+ platforms)
NXOS-UPG-L-AD-XF2=	NX-OS Upgrade License: LAN to Advantage (XF2 platforms)
NXOS-UPG-ES-ADXF2=	NX-OS Upgrade License: Essentials to Advantage (XF2 platforms)
NXOS-UPG-L-AD-M4=	NX-OS Upgrade License: LAN to Advantage (modular 4-slot)
NXOS-UPG-ES-AD-M4=	NX-OS Upgrade License: Essentials to Advantage (modular 4-slot)
NXOS-UPG-L-AD-M8=	NX-OS Upgrade License: LAN to Advantage (modular 8- to 16-slot)
NXOS-UPG-ES-AD-M8=	NX-OS Upgrade License: Essentials to Advantage (modular 8- to 16-slot)
NXOS-UPG-L-AD-XF=	NX-OS Upgrade License: LAN to Advantage (10G+ platforms)
NXOS-ACI-UP-AD-GF=	NXOS ADV to ACI ADV Upgrade License (1G Platforms)
NXOS-ACI-UP-AD-XF=	NXOS ADV to ACI ADV Upgrade License (10G+ Platforms)
ACI-UPG-ES-AD-GF=	ACI Upgrade License: Ess To Adv (1G Platforms)
ACI-UPG-B-AD-GF=	ACI Upgrade License: Base To Advantage (1G Platforms)
ACI-UPG-B-AD-XF=	ACI Upgrade License: Base To Advantage (10G+ Platforms)
ACI-UPG-ES-AD-XF=	ACI Upgrade License: Ess to Adv (10G+ Platforms)
ACI-UPG-B-AD-XF2=	ACI Upgrade License: Base To Advantage (XF2 10G+ Platforms)
ACI-UPG-ES-AD-XF2=	ACI Upgrade License: Ess to Adv (XF2 10G+ Platforms)

Cisco Nexus 3000 Series Tier-Based Licenses

The NX-OS Essentials, Advantage, and add-on licenses are supported for some Cisco Nexus 3000 Series switches.

The -XM licenses apply to modular switches, the -XF licenses apply to switches with less than 6.4 Tbps, and the -XF2 licenses apply to switches with more than 6.4 Tbps.

The -XF2 Essentials and Advantage licenses have priority over the -XF licenses. If an -XF license is installed and features are checked out from this license and then you later install the -XF2 license, the -XF license shows as unused (in the output of the **show license usage** command), and the features become checked out from the -XF2 license. The Advantage licenses to have priority over the Essentials licenses.

Table 11. PIDs for Subscription Tier-Based Licenses for NX-OS (Cisco Nexus 3000 Series Switches)

License	PID
Essentials package[18]	N3K-ES-XF-3Y N3K-ES-XF-5Y N3K-ES-XF2-3Y N3K-ES-XF2-5Y

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License	PID
	N3K-ES-XM-3Y N3K-ES-XM-5Y
Advantage package	N3K-AD-XF-3Y N3K-AD-XF-5Y
Add-On Licenses	
NDB	N3K-NDB-3Y N3K-NDB-5Y
Security	N3K-SEC-3Y N3K-SEC-5Y

[18] License support for Cisco Nexus 3400-S switches:

- **N3K-C3408-S**: N3K-ES-XM-3Y and N3K-ES-XM-5Y
- **N3K-C3432D-S**: N3K-ES-XF2-3Y and N3K-ES-XF2-5Y

Table 12. PIDs for Perpetual Tier-Based Licenses for NX-OS (Cisco Nexus 3000 Series Switches). N3K perpetual licenses are not portable between devices.

License	PID
Advantage package	N3K-AD-XF N3K-AD-XF2
Add-On Licenses	
NDB	N3K-NDB
Security	N3K-SEC

Feature-Based Licenses (End of Sale)

Feature-based licenses make features available to the entire physical device. Therefore, you only require one copy of the license for a device. A license only supports the listed features. Licenses may be specific to a particular hardware platform. These are legacy licenses and no longer sold.
Any feature that is not included in a license package is bundled with the Cisco NX-OS software and is provided at no extra charge to you.

Note: For specific implementation of features, see the Release Notes document and configuration guides for the Cisco Nexus 9000 Series switches.

Note: The Cisco Nexus 9000 Series switches support static routes, switch virtual interfaces (SVIs), and Hot Standby Router Protocol (HSRP) 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 the appropriate licenses.

The following table lists the feature-based license packages for the Cisco Nexus 9000 Series (which includes Cisco Nexus 9200, 9300, 9300-EX, 9300-FX/FX2/FX3/FXP, and 9500 switches) in Cisco NX-OS mode.

Note: In the CCW tool, these licenses are described as legacy NX-OS software licenses.

Table 13. Feature-Based Licenses for the Cisco Nexus 9000 Series in Cisco NX-OS Mode

Feature License	Product ID	Feature Name
Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG	N95-LAN1K9 (for Cisco Nexus 9500 Series switches)	• Open Shortest Path First (OSPF) Protocol • Border Gateway Protocol (BGP)

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Feature License	Product ID	Feature Name
	N93-1G-LAN1K9 (for the Cisco Nexus N9K-C9348GC-FXP switch) N93-LAN1K9 (for Cisco Nexus 9200, 9300, 9300-EX, and 9300-FX/FX2 Series switches, except the Cisco Nexus N9K-C9348GC-FXP switch) N93-LAN1K9-XF2 (for the Cisco Nexus 9364C and 9300-GX switches)	• 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) • VRF route leaking • VXLAN BGP EVPN • Non-blocking multicast (NBM) - for the IP fabric for media solution. Note: The IP fabric for media solution also requires the N93-LAN1K9 or N95-LAN1K9 license for multicast.
VPN Fabric License	N95-FAB1K9 N93-FAB1K9	• InterAS option B • Layer 3 EVPN over segment routing MPLS • MPLS Layer 3 VPN • Pervasive Load Balancing (PLB)

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Feature License	Product ID	Feature Name
		• Tenant Routed Multicast • VXLAN EVPN Multi-Site • Enhanced PBR (EPBR)
Network Services Package NETWORK_SERVICES_PKG	N95-SERVICES1K9 N93-SERVICES1K9	• iCAM • Intelligent Traffic Director (ITD) • Non-blocking multicast (NBM) - for the IP fabric for media solution. Note: The IP fabric for media solution also requires the N93-LAN1K9 or N95-LAN1K9 license for multicast. • Smart channel Note: Beginning with Cisco Nexus NX-OS 9.3(5), Catena is no longer available. However, Catena is available with the Essentials license package of earlier release.
FCoE NPV Package FCOE_NPV_PKG	N95-FNPV1K9 N93-FNPV1K9	FCoE NPV Note: The N93-16Y-SSK9 and N93-48Y-SSK9 licenses also support FCoE NPV. If you install one of these licenses (rather than N95-FNPV1K9 or N93-FNPV1K9), the **show license** command does not show FCoE NPV in the output. For more information, see the Cisco Nexus 9000 Series NX-OS

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Feature License	Product ID	Feature Name
		FC-NPV and FCoE-NPV Configuration Guide.
SAN Switching Package SAN_ENTERPRISE_PKG and FC Port Package FC_PORT_ACTIVATION_PKG	N93-16Y-SSK9 (up to 16 ports) N93-48Y-SSK9 (all 48 ports)	SAN switching, FC NPV, or FCoE NPV Note: SAN switching, FC NPV, and FCoE NPV require both the FC_PORT_ACTIVATION_PKG and SAN_ENTERPRISE_PKG licenses. For more information, see the Cisco Nexus 9000 Series NX-OS SAN Switching Configuration Guide and the Cisco Nexus 9000 Series NX-OS FC-NPV and FCoE-NPV Configuration Guide.
Security License	ACI-SEC-XM*** or ACI-SEC-XF**	Macsec Note: Cisco Nexus 9000 Series ToR switches that support this feature require the ACI-SEC-XF** license, and Cisco Nexus 9000 Series EoR switches that support this feature require the ACI-SEC-XM*** license. Secure VXLAN EVPN Multi-Site using CloudSec Note: Secure VXLAN EVPN Multi-Site using CloudSec licensing support is available with the ACI-SEC-XF license. Secure VXLAN EVPN Multi-Site using CloudSec licensing support is not available with the ACI-SEC-XM license.
24 Port License Upgrade Package* NEXUS_24PORTEX_UPGRADE	N9K-EX-24P-UPG=	24-port upgrade license for Cisco Nexus 93108TC-EX-24 and 93180YC-EX-24 switches.
24 Port License Upgrade Package* NEXUS_24PORTFX_UPGRADE	N9K-FX-24P-UPG=	24-port upgrade license for Cisco Nexus 93108TC-FX-24 and 93180YC-FX-24 switches.

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*The 24-port licenses are hardware licenses. They are independent of any Cisco NX-OS or ACI software feature sets or software licenses.

**ACI-SEC-XF replaces NXOS-SEC-XF. NXOS-SEC-XF is no longer orderable.

***ACI-SEC-XM replaces NXOS-SEC-XM. NXOS-SEC-XM is no longer orderable.

The following 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 14. Feature-Based Licenses for the Cisco Nexus 7000 Series

Feature License	Product ID	Feature Name
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) • VXLAN • BGP eVPN Control Plane over VXLAN • ACI WAN Interconnect • Locator/ID Separation Protocol (LISP)
Advanced Services Package LAN_ADVANCED_SERVICES_PKG	N7K-ADV1K9	Virtual Device Contexts (VDCs)
VDC Licenses VDC_LICENSES	N7K-VDC1K9 N77-VDC1K9	For Nexus 7000 Series, a single ADV license provides five non-admin VDCs and one admin VDC. If you require an additional VDC, buy another license (N7K-

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Feature License	Product ID	Feature Name
		VDC1K9) which in turn, provides another four VDCs. For Nexus 7700 Series, a single ADV license provides five non-admin VDCs and one admin VDC. If you require an additional VDC, buy another license (N77-VDC1K9) which in turn, provides another four VDCs.
Transport Services Package LAN_TRANSPORT_SERVICES_PKG	N7K-TRS1K9 N77-TRS1K9	Overlay Transport Virtualization (OTV)
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
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) Intelligent CAM Analytics and Machine Learning (iCAM)
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) ACI WAN Interconnect
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

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

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Table 15. Feature-Based Licenses for the Cisco Nexus 6000 Series

Feature License	Product ID	Feature Name
FabricPath Services Package ENHANCED_LAYER2_PKG	N6001-EL2-SSK9 N6004-EL2-SSK9	FabricPath
FCoE NPV Package FCOE_NPV_PKG	N6K-FNPV-SSK9	FCoE NPV
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG[20] [21]	N6K-BAS1K9	• Unlimited static routes and a maximum of 256 dynamic routes. • Static routes • RIPv2 • OSPFv2 and OSPFv3 • EIGRP Stub • HSRP[22] • VRRP[23] • IGMP v2/v3 • PIMv2 (sparse mode) • VRF Lite • Routed ACL • NAT
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG [24] [25]	N6001-LAN1K9 N6004-LAN1K9	N6001-LAN1K9 / N6004-LAN1K9 (includes the following features in addition to the ones under N6K-BAS1K9 license). • BGP • PBR • Full EIGRP • PIMv2 (all modes) • L3 IS-IS [26] • uRPF • MSDP • Sampled NetFlow • Intelligent Traffic Director (ITD)

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Feature License	Product ID	Feature Name
Network Services Package NETWORK_SERVICES_PKG	N6K-SERVICES1K9[27]	Remote Integrated Services Engine (RISE) Intelligent Traffic Director (ITD)
Storage Protocols Services Package FC_FEATURES_PKG ENTERPRISE_PKG	N6001-16P-SSK9 N6004-4Q-SSK9 N6004-12Q-SSK9 N6K-16P-SSK9[28] N6K-20P-SSK9[29] 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

[20] The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.

[21] Routes above 256 for all protocols are included in the LAN_ENTERPRISE_SERVICES_PKG license.

[22] 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 Cisco 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.

[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] The LAN_BASE_SERVICES_PKG license should be installed in order to use the LAN_ENTERPRISE_SERVICES_PKG license.

[25] Routes above 256 for all the protocols included in the LAN_ENTERPRISE_SERVICES_PKG license.

[26] L3 IS-IS will be available starting with the Cisco NX-OS Release 7.0(1)N1(1).

[27] N6K-SERVICES1K9 is available from Cisco NX-OS Release 7.2(0)N1(1). To use RISE and ITD features with Cisco NX-OS Release 7.1(1)N1(1), use the ENHANCED_LAYER2_PKG license.

[28] These licenses are applicable to Cisco Nexus 6004 20 UP LEM only.

[29] These licenses are applicable to Cisco Nexus 6004 20 UP LEM only.

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

Table 16. Feature-Based Licenses for the Cisco Nexus 5600 Series

Feature License	Product ID	Feature Name
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

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Feature License	Product ID	Feature Name
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG [30]	N56-BAS1K9	Layer 3 Base Services Package Unlimited static routes and maximum of 256 dynamic routes • Static Routes • RIPv2 • OSPFv2 and OSPFv3 • EIGRP Stub • HSRP [31] • VRRP[32] • IGMP v2/v3 • PIMv2 (sparse mode) • VRF Lite • Routed ACL • NAT
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG[3334]	N56-LAN1K9	Layer 3 Enterprise Services Package The N56-LAN1K9 license includes the following features in addition to the ones under the N56-BAS1K9 license. • BGP • PBR • Full EIGRP • PIMv2 (all modes) • L3 IS-IS[35] • uRPF • MSDP • Sampled NetFlow • VxLAN Flood and Learn[36] • VxLAN EVPN[37] • Intelligent Traffic Director (ITD)
Network Services Package NETWORK_SERVICES_PKG	N56-SERVICES1K9[38]	Remote Integrated Services Engine (RISE) Intelligent Traffic Director (ITD)

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Feature License	Product ID	Feature Name
Storage Protocols Services Package FC_FEATURES_PKG ENTERPRISE_PKG	N56-16p-SSK9 N56-12P-SSK9 [39] N5672-72P-SSK9 N56128-128P-SSK9 N56-20P-SSK9 [40] 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

[30] The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.

[31] Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.

[32] Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.

[33] The LAN_BASE_SERVICES_PKG license should be installed in order to use the LAN_ENTERPRISE_SERVICES_PKG license.

[34] Routes above 256 for all the protocols included in the LAN_ENTERPRISE_SERVICES_PKG license.

[35] L3 IS-IS will be available starting with the Cisco NX-OS Release 7.0(1)N1(1).

[36] VXLAN Flood and Learn is supported from Cisco NX-OS Release 7.1(0)N1(1) and requires the LAN_BASE_SERVICES_PKG license and the ENHANCED_LAYER2_PKG license. From 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.

[37] VXLAN EVPN is supported from 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.

[38] N56-SERVICES1K9 is available from Cisco NX-OS Release 7.2(0)N1(1). To use RISE and ITD features with Cisco NX-OS Release 7.1(1)N1(1), use the ENHANCED_LAYER2_PKG license.

[39] This license is applicable to Cisco Nexus 5672UP-16G only.

[40] This license is applicable to Cisco Nexus 5696 20 Port UP LEM only.

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.

The following table lists the feature-based license packages for the Cisco Nexus 5000 Series and Cisco 5500 Series Platform.

Table 17. 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

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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[41]	N55-BAS1K9	Layer 3 Base Services Package Unlimited static routes and a maximum of 256 dynamic routes • Static Routes • RIPv2 • OSPFv2 and OSPFv3 • EIGRP Stub • HSRP [42] • VRRP [43] • IGMP v2/v3 • PIMv2 (sparse mode) • VRF Lite • Routed ACL
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG [44] [45]	N55-LAN1K9	Layer 3 Enterprise Services Package N55-LAN1K9 includes the following features in addition to the ones under the N55-BAS1K9 license. • BGP • PBR • PIMv2 (all modes) • Full EIGRP • uRPF • MSDP • Intelligent Traffic Director (ITD)
Network Services Package NETWORK_SERVICES_PKG	N55-SERVICES1K9[46]	Remote Integrated Services Engine (RISE) Intelligent Traffic Director (ITD)[47]

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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

[41] The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.

[42] Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.

[43] Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.

[44] The LAN_BASE_SERVICES_PKG license should be installed to use the LAN_ENTERPRISE_SERVICES_PKG license.

[45] Routes above 256 for all the protocols are included in the LAN_ENTERPRISE_SERVICES_PKG license.

[46] N55-SERVICES1K9 is available from Cisco NX-OS Release 7.2(0)N1(1). To use RISE and ITD features with the Cisco NX-OS Release 7.1(1)N1(1), use the LAN_ENTERPRISE_SERVICES_PKG license.

[47] Starting NXOS 7.2(0)N1(1), LAN_ENTERPRISE_SERVICES_PKG package does not contain ITD license. You need to install NETWORK_SERVICES_PKG package for ITD.

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

Table 18. 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

The following table lists the feature-based license packages for the Cisco Nexus 3600 platform switches.

Table 19. Feature-Based Licenses for the Cisco Nexus 3600 Platform Switches

Feature License	Product ID	Features
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG	N3K-LAN1K9	• BGP • EIGRP • IS-IS • OSPFv2 and OSPFv3 • PIM • VRF-lite • VXLAN
VPN Fabric License	N3K-FAB1K9	• InterAS option B

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Feature License	Product ID	Features
		• MPLS Layer 3 VPN

The following table lists the feature-based license packages for the Cisco Nexus 3500 Series switches.

Table 20. Feature-Based Licenses for the Cisco Nexus 3500 Series Switches

Feature License	Product ID	Features
24 Port License Package 24P_LIC_PKG PKG	N3548-24P-LIC	24-port license for the Cisco Nexus 3548 Series switch.
24 Port Upgrade License Package 24P_UPG_PKG PKG [48]	N3548-24P-UPG	24-port upgrade license for the Cisco Nexus 3548 Series switch.
Cisco Nexus 3500 Algo Boost License ALGO_BOOST_SERVICES_PKG	N3548-ALGK9	Cisco Nexus 3500 Algo Boost License • Warp Mode • Warp SPAN • Static NAT
Layer 3 Base Services Package LAN_BASE_SERVICES_PKG	N3548-BAS1K9	Layer 3 Base Services Package • EIGRP stub • OSPFv2 (limited routes) • PIMv2 (sparse mode)
Layer 3 Enterprise Services Package LAN1K9_ENT_SERVICES_PKG [49]	N3524-LAN1K9	Layer 3 Enterprise Services Package for Cisco Nexus 3524 Series switches • BGP • PBR • VRF-Lite (IP-VPN) This license requires the Base Services Package.
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG [50]	N3548-LAN1K9	• Layer 3 Enterprise Services Package for Cisco Nexus 3548 Series switches • BGP • PBR • VRF-Lite (IP-VPN) This license requires the Base Services Package.

[48] 24P_LIC_PKG is the default 24-port license for Cisco Nexus 3524 and 3548 platform switches. 24P_UPG_PKG is the additional 24-port upgrade license for Cisco Nexus 3548 platform switches. This is the upgrade license to enable additional 24 ports and it can only be applied to Cisco Nexus 3548 platform switches.

[49] For Cisco NX-OS releases prior to 9.3(3), the BGP feature is checked out from the LAN1K9_ENT_SERVICES_PKG for both Cisco Nexus 3524 and 3548 platform switches.

[50] For Cisco NX-OS releases prior to 9.3(3), the PBR feature is checked out from the LAN_ENTERPRISE_SERVICES_PKG for both Cisco Nexus 3524 and 3548 platform switches.

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Note: After upgrading to Cisco NX-OS Release 7.0(3)I7(7), the **show license usage** command might display license mismatches that do not apply to Cisco Nexus 3500 Series switches. A "License Missing" warning in the comments section may also be displayed. Issue the **clear license sprom** command to recover from this state.

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

Table 21. 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 the Cisco Nexus 3172TQ switches.
16 Port License Upgrade Package 16P_UPG_PKG	N3064T-16T-UPG	16-port upgrade license for Cisco Nexus 3164T switch.
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	• EIGRP stub • OSPFv2 (limited routes) • PIMv2 (sparse mode) Note: Only the Cisco Nexus 3016, 3048, 3064, 3132Q, 3132Q-XL, and 3172 switches require the Layer 3 Base Services Package. The Cisco Nexus 3132C-Z, 3164Q, 31128PQ, 3100-V, 32xx, and 34xx switches require the Layer 3 Enterprise Services Package (rather than the Layer 3 Base Services Package) to support these routing protocols.
Layer 3 Enterprise Services Package LAN_ENTERPRISE_SERVICES_PKG	N3K-LAN1K9 N3K-LAN2K9 (for Cisco Nexus 3264C-E, 3408-S, 3432D-S, and 3464C switches)	• BGP • Policy-Based Routing • Generic routing encapsulation (GRE) tunnels
Hardware Streaming Telemetry Package HW_STREAMING_TELEMETRY_PKG	N3K-STR1K9 (for Cisco Nexus 34180YC switches) N3K-STR2K9 (for the Cisco Nexus 3464C, 3408-S, and 3432D-S switches)	In-band and postcard telemetry Note: This license is available beginning with Cisco NX-OS Release 9.2(3). Any attempt to install this license for a prior release will fail. When you downgrade from Cisco NX-OS Release 9.2(3) to an earlier release, the features that use the hardware streaming telemetry license continue to work in honor mode in the downgraded version. In addition, the output of

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Feature License	Product ID	Features
		the **show license usage** command continues to include entries for these unsupported licenses.

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.

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 22. 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.

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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 23. 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)
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)

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Bundle/Chassis	Product ID	Features
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)

Honor Mode Licensing

Starting from Cisco NX-OS Releases 8.2(4) and 8.4(1), Honor Mode Licensing is supported on Cisco Nexus 7000 Series switches. Honor mode licensing allows you to enable or continue using a feature without having a valid license for that feature. In such a scenario, a syslog is generated once every 7 days until you acquire the required license. An example of such a syslog is given below.

```
%LICMGR-2-LOG_LIC_MISSING_WARNING: A feature that requires LAN_ENTERPRISE_SERVICES_PKG
license is not installed. System supports honor based licensing so feature will
continue to be fully functional. Use 'show license usage <package-name>' to find
features using missing license.
```

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)

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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

Once a license is installed, the license file can be deleted from bootflash as the license is copied to the internal file system. If the internal file system becomes corrupted or a supervisor module is replaced after you have installed a license, the license shows as missing although the feature continues to work. In this case, copy the license file (.lic) into bootflash and reinstall it 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).

Note: Temporary licenses with an expiry date are available for evaluation and lab use purposes. They are strictly not allowed to be used in production. Please use a permanent or subscription license that has been purchased through Cisco for production purposes.

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.

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- 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: The Cisco Nexus 7000 Series switches support grace period on Cisco NX-OS Release 8.2(3) and earlier 8.x releases. From Cisco NX-OS Releases 8.2(4) and 8.4(1), Grace period is not supported on Cisco Nexus 7000 Series switches.

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.

Release History for Licensing

This table lists the release history for this feature.

Table 24. Release History for Licensing

License	Release	Notes
10G/25G/40G/100G Fixed Platform (XF2) License	Cisco Nexus NX-OS Release 10.2(3)F	Introduced for the N9K-C9348D-GX2A and N9K-C9364D-GX2A platform switches
Synchronous Ethernet (SyncE) add-on license	Cisco Nexus NX-OS Release 10.1(2)	Support for the SyncE add-on license.
C1P1TN9500M4-3Y C1P1TN9500M4-5Y C1P1TN9500M816-3Y C1P1TN9500M816-5Y (not ACI)	Cisco Nexus NX-OS Release 9.3(5)	Introduced for the Cisco Nexus 9500 Series switches.
SyncE add-on license	Cisco Nexus NX-OS Release 9.3(5)	Introduced Synchronous Ethernet (SyncE) add-on license for the Cisco Nexus 93180YC-FX3S platform switch.
ACI-SEC-XF license	Cisco Nexus NX-OS Release 9.3(5)	Added support for Secure VXLAN EVPN Multi-Site using CloudSec licensing.

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License	Release	Notes
		Note Secure VXLAN EVPN Multi-Site using CloudSec licensing support is available with the ACI-SEC-XF license. Note For Cisco Nexus NX-OS Release 9.3(5), Secure VXLAN EVPN Multi-Site using CloudSec is supported only on Cisco Nexus 9300-FX2 platform switches,
ACI-STRG, C1-N9K-STRG-XF-3Y, and C1-N9K-STRG-XF-5Y licenses	Cisco Nexus NX-OS Release 9.3(3)	Introduced for the Cisco Nexus 93180YC-FX platform switch.
N3K-STR2K9 license	Cisco Nexus NX-OS Release 9.3(3)	Added support for the Cisco Nexus 3408-S and 3432D-S switches.
N93-LAN1K9-XF2 license	Cisco Nexus NX-OS Release 9.3(3)	Introduced for the Cisco Nexus 9300-GX switches.
NX-OS Advantage license	Cisco Nexus NX-OS Release 9.3(3)	Added support for the Cisco Nexus 3132Q (excluding the 3132Q-40GE), 3172, 3172PQ, 3172TQ, 31128PQ, 3100-V, 3232C, 3264Q, and 3500 switches. Note The Cisco Nexus 3132Q, 3172, 3172PQ, and 3172TQ platform switches support the NX-OS Advantage license only when running in N9K mode. You can view the switch mode using the `show system switch-mode` command.
NXOS-ES-XF2 and NXOS-AD-XF2 licenses	Cisco Nexus NX-OS Release 9.3(3)	Introduced for the Cisco Nexus 9300-GX switches.
NXOS-SEC-XF license	Cisco Nexus NX-OS Release 9.3(3)	Added support for the Cisco Nexus 93216TC-FX2 and 93360YC-FX2 platform switches.
C1P1TN9300GF-3Y C1P1TN9300GF-5Y C1P1TN9300XF-3Y C1P1TN9300XF-5Y C1P1TN9300XF2-3Y C1P1TN9300XF2-5Y	Cisco Nexus NX-OS Release 9.3(2)	Introduced for the Cisco Nexus 9300 Series switches.

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License	Release	Notes
Honor mode syslog in the output of the **show license usage** command	Cisco Nexus NX-OS Release 9.3(1)	Introduced for the Cisco Nexus 3000, 3500, 3600, and 9000 Series switches.
NX-OS Advantage license	Cisco Nexus NX-OS Release 9.3(1)	Introduced for the Cisco Nexus 3132C-Z, 3264C-E, 3636C-R, and 36180YC-R switches.
NX-OS Essentials license	Cisco Nexus NX-OS Release 9.3(1)	Introduced for the Cisco Nexus 3132C-Z, 3132Q (excluding the 3132Q-40GE), 3172, 3172PQ, 3172TQ, 31128PQ, 3100-V, 3232C, 3264C-E, 3264Q, 3464C, 34180YC, 3500, 3636C-R, and 36180YC-R switches.
NX-OS Essentials and Advantage licenses	Cisco Nexus NX-OS Release 9.3(1)	Recommended that the -XF2 licenses be purchased for Cisco Nexus 3000 Series switches and Cisco Nexus 9364C switches.
NXOS-SEC-XF license	Cisco Nexus NX-OS Release 9.3(1)	Added support for the Cisco Nexus 9332C, 9348C-FXP, and 9364C platform switches.
DCN (ACI+NX-OS) Essentials and Advantage license packages and add-on licenses	Cisco Nexus NX-OS Release 9.2(3)	Introduced for the Cisco Nexus 9300 platform switches.
N3K-LAN2K9 license	Cisco Nexus NX-OS Release 9.2(3)	Added support for the Cisco Nexus 3264C-E and 3464C switches.
N3K-STR1K9 license	Cisco Nexus NX-OS Release 9.2(3)	Added support for the Cisco Nexus 34180YC switch.
N3K-STR2K9 license	Cisco Nexus NX-OS Release 9.2(3)	Added support for the Cisco Nexus 3464C switch.
N9K-LIC1-24P, N9K-EX-24P-UPG=, and N9K-FX-24P-UPG= licenses	Cisco Nexus NX-OS Release 9.2(3)	Added these 24-port licenses for the Cisco Nexus 93108TC-EX, 93108TC-FX, 93180YC-EX, and 93180YC-FX switches.
N3K-LAN2K9 license	Cisco Nexus NX-OS Release 9.2(2v)	Added support for the Cisco Nexus 3432D-S switch.
N3K-LAN2K9 license	Cisco Nexus NX-OS Release 9.2(2t)	Added support for the Cisco Nexus 3408-S switch.
NXOS-SEC-XF license	Cisco Nexus NX-OS Release 9.2(1)	Added this license for Cisco Nexus 9000 Series ToR switches that support MACsec.
Honor Mode Licensing	Cisco Nexus NX-OS Release 8.4(1)	Introduced for the Cisco Nexus 7000 Series switches.

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License	Release	Notes
	Cisco Nexus NX-OS Release 8.2(4)	
ENHANCED_LAYER2_PKG license	Cisco NX-OS Release 8.2(1)	iCAM feature is available under the ENHANCED_LAYER2_PKG license on Cisco Nexus 7000 Series switches.
N95-FAB1K9 and N3K-FAB1K9 licenses	Cisco NX-OS Release 7.0(3)F3(3)	Added support for the InterAS option B and MPLS Layer 3 VPN features.
N3K-LAN1K9 license	Cisco NX-OS Release 7.0(3)F3(1)	Added support for the Cisco Nexus 3600 platform switches.
ACI Premier license packages	Cisco Nexus NX-OS Release 7.0(3)I7(7)	Introduced for the Cisco Nexus 9300 Series switches.
NX-OS Essentials and Advantage licenses	Cisco Nexus NX-OS Release 7.0(3)I7(7)	The -XF2 licenses now have priority over the -XF licenses for Cisco Nexus 3000 and 3600 Series switches and Cisco Nexus 9364C switches.
NXOS-ES-XF2, NXOS-AD-XF2, and NXOS-NDB licenses	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(6)	Introduced for the Cisco Nexus 9364C switch.
N93-LAN1K9-XF2 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(6)	Introduced for the Cisco Nexus 9364C switch.
NX-OS Essentials and Advantage license packages and NX-OS upgrade licenses	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(3)	Introduced for the Cisco Nexus 9000 Series switches.
NXOS-SEC-XM license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(2)	Added support for the MACsec feature for Cisco EoR switches.

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License	Release	Notes
FC NPV and FCoE NPV licenses	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(2)	Added support for FC and FCoE NPV.
N95-FAB1K9 and N93-FAB1K9 licenses	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(1)	Added support for the Pervasive Load Balancing, Tenant Routed Multicast, and VXLAN EVPN Multi-Site features.
N93-1G-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(1)	Introduced this license for the Cisco Nexus N9K-C9348GC-FXP switch.
N95-SERVICES1K9 and N93-SERVICES1K9	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(1)	Added support for the iCAM feature.
N3K-FAB1K9, N95-FAB1K9, and N93-FAB1K9 licenses	Cisco Nexus 3000 and 9000 Series NX-OS Release 7.0(3)I6(1)	Added support for the Layer 3 EVPN over segment routing MPLS feature.
N95-SERVICES1K9 and N93-SERVICES1K9 licenses	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I6(1)	Added support for the catena and smart channel features.
N93-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I4(2)	Added support for the non-blocking multicast (NMB) feature on Cisco Nexus 9236C, 9272Q, and 92160YC-X switches.
N3K-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I4(1)	Added support for the Cisco Nexus 3100-V switches.

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License	Release	Notes
N95-FNPV1K9 license and N93-FNPV1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I3(1)	Added these licenses to support FCoE NPV on Cisco Nexus 9500 and 9300 Series switches.
N93-LAN1K9 license	Cisco Nexus 9000 Series NX-OS Release 7.0(3)I3(1)	Added support for the Cisco Nexus 9200 Series switches.
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.

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License	Release	Notes
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.
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.

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License	Release	Notes
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.

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Smart Software Licensing for Cisco Nexus 7000 Series Switches

Smart Software Licensing Overview

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure – you control what users can access. With Smart Licensing you get:

- **Easy Activation:** Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (Product Activation Keys).
- **Unified Management**: Cisco License Central provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License Flexibility**: Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

To use Smart Licensing, you must first set up a Smart Account on Cisco License Central. For a more detailed overview on Cisco Licensing, visit the Licensing Hub.

Traditional Licensing Overview

Traditional licensing at Cisco is a legacy licensing model based on Product Activation Keys (PAK) and Unique Device Identifiers (UDI). On most Cisco NX-OS 7000 Series Switches, capacity needs are assessed prior to obtaining and installing a *.tar* file on switches to retrieve the UDI. Customers place an order for a PAK, and the PAK is emailed to the user. A combination of them. UDI and PAK is used to receive a license file that is installed in the boot directory of the switch to complete the installation of the Cisco NX-OS software.

The License Registration Portal (LRP) is available to help migrate traditional licenses to smart licenses. To access the LRP, obtain training, and manage licenses, refer to How Can I find My Smart Account Assigned Licenses within LRP (License Registration Portal)?.

You can convert the traditional license to a smart license in the following ways:

- Converting a Traditional License to a Smart License
- Converting a Traditional License to a Smart License—CLI Version

Comparing Licensing Models

Two types of licensing models are used for the Cisco Nexus 7000 Series Switches—traditional licensing and Smart Software Licensing.

Table 25. Comparison Between Traditional Licensing and Smart Software Licensing

Description	Traditional Licensing	Smart Software Licensing
License instance node locked to the product instance	Yes	No

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Description	Traditional Licensing	Smart Software Licensing
Product registration upon configuration	No	Yes
Offers tools to report, monitor, own, and consume	No	Yes
Requires Smart Call Home	No	Yes

Guidelines and Limitations for Smart Software Licensing

- You cannot use both traditional licensing and Smart Software Licensing at the same time on the Cisco Nexus 7000 Series Switches.
- Smart Software Licensing is not supported on Cisco N-Port Virtualizer (Cisco NPV) devices.
- Port licenses will be in out-of-compliance state when you move from a traditional license to a Smart Software License.

Smart Accounts and Virtual Accounts

- A Smart account provides you with a single location for all smart-account enabled products and licenses. It assists you in speedy procurement, deployment, and maintenance of your Cisco software.

  If you are requesting a Smart account on behalf of an organization, you must have the authority to represent the requesting organization when creating a Smart account. After submitting the request, the request goes through an approval process before you are provided with access to your Smart account.

  Go to http://software.cisco.com to learn about, set up, and manage a Smart account.
- A virtual account is a subaccount within a Smart account. You can define the virtual account's structure based on organizational layout, business function, geography, or any defined hierarchy. Virtual accounts can be created and maintained only by Smart account administrators.

Smart Software Manager Overview

Smart Software Manager enables the management of software licenses and Smart accounts from a single portal. The interface allows you to activate your product, manage entitlements, renew, and upgrade software. An active Smart account is required to complete the registration process. To access the Smart Software Manager, go to http://www.cisco.com/web/ordering/smart-software-manager/index.html.

You must add the following information in the Smart Software Manager:

- Trusted Unique Identifier—This is the device ID (Secure Unique Device Identifier (SUDI)).
- Organizational Identifier—This is a numerical format to associate a product with a Smart account or Virtual account.
- Licenses consumed—Allows the Smart Software Manager to understand the license type and the level of consumption.

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Smart Call Home Overview

Note: You must configure the DNS client and virtual routing and forwarding (VRF) before using Smart Call Home. For more information, see Configuring DNS Client and Configuring VRFs To Send Messages Using HTTP.

Use the Smart Call Home feature to communicate with the Smart Software Manager. Smart Call Home is enabled automatically when you configure Smart Software Licensing. On Cisco Nexus 7000 Series Switches, Smart Software Licensing is not enabled by default.

The Smart Call Home (SCH) server runs on the Cisco Smart Software Manager (CSSM) satellite by default. You can access this service using the following URL:

https://<CSSM satllite IP>/Transportgateway/services/DeviceRequestHandler

Provide this URL as part of Smart Call Home configuration so that the device registration works with the CSSM satellite. For a sample configuration, see Configuration Examples for Smart Software Licensing.
Smart Call Home creates a CiscoTAC-1 profile. The associated Smart Call Home messages are sent to the Smart Software Manager only after enabling Smart Call Home. For switches in which Smart Software Licensing is enabled by default, Smart Call Home is also enabled by default, along with the associated messages.
To disable Smart Software Licensing, see Disabling Smart Software Licensing.

Smart Software Manager Satellite

Smart Software Manager satellite is a component of Smart Software Licensing and works in conjunction with the Smart Software Manager to manage software licenses. You can intelligently manage product licenses and get near real-time visibility and reports pertaining to the Cisco licenses you purchased and consumed.

If you do not want to manage your installed base using a direct Internet connection, the Smart Software Manager satellite will be installed on your premises to provide a subset of the Smart Software Manager functionality. You can download the satellite application, deploy it, and register it with the Smart Software Manager.

You can perform the following functions using the satellite application on your premises:

- Activate or register a license
- Get visibility to your company's licenses
- Transfer licenses between company entities

To learn more about the Smart Software Manager satellite, go to http://www.cisco.com/go/smartsatellite.

Additional References for Smart Software Licensing

Table 26. Technical Assistance

Description	Link
Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.	http://www.cisco.com/cisco/web/support/index.html

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Description	Link
To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	
License Registration Port (LRP) documentation	https://www.cisco.com/web/fw/tools/swift/xui/html/help.html

Feature History for Smart Software Licensing

Table 27. Feature History

Feature Name	Release	Feature Information
Smart Software Licensing with Satellite	8.4(2)	This feature was introduced.
Converting a Traditional License to a Smart License—CLI Version	8.2(1)	This feature was introduced.
Subscription-based Licensing	8.2(1)	This feature was introduced.
Smart Software Licensing	8.0(1)	Smart Software Licensing is a standardized licensing platform that simplifies the Cisco software experience and helps you understand how Cisco software is used across your network. Smart Software Licensing is the next generation licensing platform for Cisco Nexus 7000 Series Switches. The following commands were introduced in this feature: • feature license smart • license smart deregister • license smart enable • license smart register • license smart renew • show license all • show license status • show license summary • show license tech support • show license udi • show license usage

Smart Software Licensing for Cisco Nexus 3000 and 9000 Series Switches

Smart Software Licensing Overview

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure – you control what users can access. With Smart Licensing you get:

- **Easy Activation**: Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (Product Activation Keys).
- **Unified Management**: Cisco License Central provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License Flexibility**: Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

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To use Smart Licensing, you must first set up a Smart Account on Cisco License Central. For a more detailed overview on Cisco Licensing, visit the Licensing Hub.

Smart Software Manager

The Cisco Smart Software Manager (CSSM) enables the management of software licenses and Smart accounts from a single portal. The interface allows you to activate your product and manage entitlements and prevent license violations, expiry of subscription-based licenses, and out-of-compliance licenses. An active Smart account is required to complete the registration process. To access the Smart Software Manager, go to http://www.cisco.com/web/ordering/smart-software-manager/index.html.

You must add the following information in the Smart Software Manager:

- Trusted Unique Identifier—This is the device ID [Secure Unique Device Identifier (SUDI)].
- Organizational Identifier—This is a numerical format to associate a product with a Smart account or Virtual account.
- Licenses consumed—Allows the Smart Software Manager to understand the license type and the level of consumption.

Smart Software Manager On-Prem

Smart Software Manager On-Prem is a component of Smart Software Licensing and works in conjunction with the Smart Software Manager to manage software licenses. You can intelligently manage product licenses and get near real-time visibility and reports pertaining to the Cisco licenses you purchased and consumed.

If you do not want to manage your installed base using a direct Internet connection, Smart Software Manager On-Prem will be installed on your premises to provide a subset of the Smart Software Manager functionality. You can download the application, deploy it, and register it with the Smart Software Manager.

You can perform the following functions using the application on your premises:

- Activate or register a license.
- Get visibility to your company's licenses.
- Transfer licenses between company entities.

To learn more about Smart Software Manager On-Prem, go to https://www.cisco.com/c/en/us/buy/smart-accounts/software-manager.html.

Smart Accounts and Virtual Accounts

A Smart account provides you with a single location for all smart-account enabled products and licenses. It assists you in speedy procurement, deployment, and maintenance of your Cisco software.

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If you are requesting a Smart account on behalf of an organization, you must have the authority to represent the requesting organization when creating a Smart account. After submitting the request, the request goes through an approval process before you are provided with access to your Smart account.

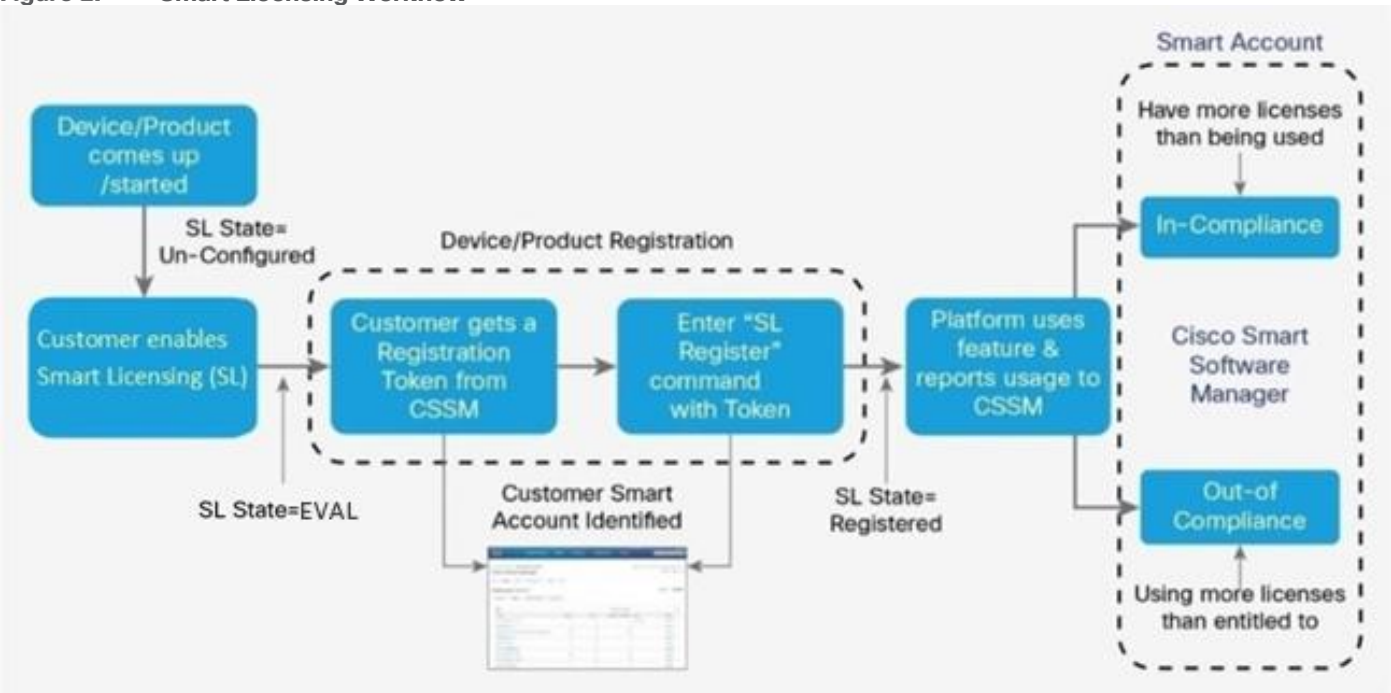
Go to http://software.cisco.com to learn about, set up, and manage a Smart account.

A virtual account is a subaccount within a Smart account. You can define the virtual account's structure based on organizational layout, business function, geography, or any defined hierarchy. Virtual accounts can be created and maintained only by Smart account administrators.

Smart License Workflow and States

The following illustration shows the workflow for Smart licenses:

Figure 2. Smart Licensing Workflow



Smart Software Licensing supports the following license states:

Table 28. Smart License States

State	Description
Unregistered	The Smart license is enabled but not connected to the Cisco Smart Software Manager (CSSM). Before you register the switch with the CSSM, Smart Software Licensing automatically enters the evaluation period. The switch remains in evaluation mode for 90 days.
Registered	The Smart license is enabled and connected to the CSSM.
Authorized	The switch has the required license.

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State	Description
	The CSSM has verified that the reported number of licenses in use do not exceed the total number of licenses purchased for an entitlement. The authorization is valid for 90 days. The switch sends the entitlement request again every 30 days to renew the authorization.
Out of Compliance (OOC)	The switch does not have the required license. The license can be out of compliance for one of the following reasons: • The number of licenses in use exceeds the total number of licenses purchased for an entitlement. • The purchased licenses are subscription-based and have expired.
Authorization Expired	The switch cannot communicate with Cisco for an extended period of time, usually 90 days. The authorization could expire for one of the following reasons: • A network issue prevents the renewal of authorization. • An issue occurs with license compliance.

Smart Call Home Overview

Use the Smart Call Home feature to communicate with the Smart Software Manager. On Cisco Nexus 3000 and 9000 Series switches, Smart Software Licensing and Smart Call Home are not enabled by default.

The Smart Call Home (SCH) server runs on Cisco Smart Software Manager On-Prem by default. You can access this service using the following URL:

https://*CSSM-On-Prem-IP* /Transportgateway/services/DeviceRequestHandler
Provide this URL as part of the Smart Call Home configuration so that the device registration works with CSSM On-Prem. For a sample configuration, see the Configuration Examples for Smart Software Licensing.

Smart Call Home creates a CiscoTAC-1 profile. The associated Smart Call Home messages are sent to the Smart Software Manager only after enabling Smart Call Home.

Note: You must configure the DNS client and virtual routing and forwarding (VRF) before using Smart Call Home. For more information, see Configuring DNS Client and Configuring VRFs to Send Messages.

Traditional Licensing Overview

Traditional licensing at Cisco is a legacy licensing model based on Product Activation Keys (PAKs) and Unique Device Identifiers (UDIs). On most Cisco NX-OS switches, capacity needs are assessed prior to obtaining and installing a *.tar* file on switches to retrieve the UDI. Customers place an order for a PAK, and the PAK is emailed to the user. The UDI and PAK are used to receive a license file that is installed in the boot directory of the switch to complete the installation of the Cisco NX-OS software.

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Note: Traditional license installation via Power On Auto Provisioning (POAP) ends with release 10.2(1).

The License Registration Portal (LRP) is available to help migrate traditional licenses to smart licenses. To access the LRP, obtain training, and manage licenses, go to the following links:

- Introduction to LRP
- How Can I Register a Product Activation Key (PAK) on License Registration Portal (LRP)?
- How to Download Licenses in LRP - Cisco
- How Can I find My Smart Account Assigned Licenses within LRP (License Registration Portal)? - Cisco

Comparing Licensing Models

Two types of licensing models are used for the Cisco Nexus 3000 and 9000 Series Switches: traditional licensing and Smart Software Licensing.

Table 29. Comparison Between Traditional Licensing and Smart Software Licensing

Description	Traditional Licensing	Smart Software Licensing
License instance node locked to the product instance	Yes	No
Product registration upon configuration	No	Yes
Offers tools to report, monitor, own, and consume	No	Yes
Requires Smart Call Home	No	Yes

The licensing mode changes based on the configuration provided. If Smart Software Licensing is enabled, all license requests are passed to the CSSM. If Smart Software Licensing is disabled, all license requests are fulfilled based on the license files installed on the device.

Guidelines and Limitations for Smart Software Licensing

- The **smart license reservation** command is not supported for Nexus 9000, although the command may still be found in old code.
- If the switch has no connectivity to a CSSM server, the **show running** command may get stuck or may take up to 2 minutes to respond. We suggest that the CSSM server is always reachable when smart-licensing is enabled.
- Beginning with Cisco NX-OS Release 9.3(3), all Cisco Nexus 3000 and 9000 Series switches (except the Cisco Nexus 3016 and 3064 platform switches) support Smart Software Licensing.
- You cannot use both traditional licensing and Smart Software Licensing at the same time.
- The FC_PORT_ACTIVATION_PKG license consumes the FC 48 ports entitlement tag regardless of the number of FC ports acquired (Cisco NX-OS 9.3(4) and earlier releases).
- Beginning with Cisco NX-OS Release 9.3(5), when a term license is reserved and its term has expired, the license is still shown as Authorized with the **show license usage** command. In CSSM, alerts will continue and any new licenses from the same pool added to the virtual account are assigned to the reservation.

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- Beginning with Cisco NX-OS Release 9.3(5), disabling and enabling an installed feature when the license is in a “Not Authorized” state, the license no longer appears in the display of the license usage.
- Beginning with Cisco NX-OS Release 9.3(5), the conversion of a traditional license to a Smart License using DLC (Device Led Conversion) on Cisco Nexus 3000 and 9000 Series switches, fails when performing additional subsequent Device Led Conversions.
- Converting a traditional license to a Smart License — DLC fails unless licenses are installed in traditional mode (Cisco NX-OS 9.3(5) and later releases)
- After converting a traditional license to a Smart License — DLC on a (On-Prem) device, the device does not receive a pass/fail response from the On-Prem Server. Manual synchronization of the On-Prem Server to CSSM might be required to get the return response to the device. (Cisco NX-OS 9.3(5) and later releases)
- Beginning with Cisco NX-OS Release 9.3(5), the conversion of a traditional license to a Smart License using DLC (Device Led Conversion) is not supported on Cisco Nexus 3408-S switches.
- License Borrowing — When license borrowing is calculated, compliance is accomplished in the quickest way possible. Typically, this means that license borrowing is from its immediate parent.
- An alternative is considered if no licenses are found to be eligible to be borrowed from the immediate parent. If during a subsequent call, a device is found not be in compliance, a recalculation for optimization is done. The trigger for a completely optimized pool is a device that is potentially receiving OOC.

Additional References for Smart Software Licensing

Table 30. Technical Assistance

Description	Link
License Registration Portal (LRP) documentation	https://www.cisco.com/web/fw/tools/swift/xui/html/help.html
Smart accounts and smart licensing	https://forums.cisco.com/OperationsExchange/s/Training-Details?L1Category=Training&L2Category=CSE_End_Customer&L1CategoryPath=training
Training and resources	https://community.cisco.com/t5/smart-licensing-enterprise/software-on-demand-training-resources-for-customers/ta-p/3639797

Smart Software Licensing using Policy for Cisco Nexus 3000 and 9000 Series Switches (from Cisco NX-OS Release 10.2(1)F onwards)

Software Licensing using Policy (SLP) Overview

Smart Licensing Using Policy (SLP) is an enhanced version of Smart Licensing, the objective of which is to provide a licensing solution that does not interrupt the operations of your network and to enable a compliance relationship to account for the hardware and software licenses you purchase and use.

SLP is supported starting with Cisco NX-OS Release 10.2(1). The primary benefits of this enhanced licensing model are:

Seamless day-0 operations: After a license is ordered, no preliminary steps, such as registration or generation of keys, are required unless you use an export-controlled or enforced license. There are no

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export-controlled or enforced licenses on Cisco Nexus Switches, and product features can be configured on the device right-away.

Consistency in Cisco NX-OS: Devices that run Cisco NX-OS software have a uniform licensing experience.

Visibility and manageability: Tools, telemetry, and product tagging to know what in-use is.

Flexible, time series reporting to remain compliant: Easy reporting options are available, whether you are directly or indirectly connected to Cisco Smart Software Manager (CSSM) or are in an air-gapped network.

To use Smart Licensing, you must first set up a Smart Account on Cisco License Central. For a more detailed overview on Cisco Licensing, visit the Licensing Hub.

For SLP configuration see the Cisco Smart Licensing Using Policy User Guide.

For a more detailed overview on Cisco Licensing, go to cisco.com/go/licensingguide.

Smart Software Manager (CSSM)

Cisco Smart Software Manager (CSSM) is a portal that enables you to manage all your Cisco software licenses from a centralized location. CSSM helps you manage current requirements and review usage trends to plan for future license requirements.

You can access the CSSM Web UI at https://software.cisco.com. Navigate to Manage licenses link.

See the Supported Topologies section to know about the different ways in which you can connect to CSSM

In CSSM you can:

- Create, manage, or view virtual accounts.
- Create and manage Product Instance Registration Tokens.
- Transfer licenses between virtual accounts or view licenses. ▪ Transfer, remove, or view product instances.
- Run reports against your virtual accounts.
- Modify your email notification settings.
- View overall account information.

Cisco Smart License Utility (CSLU)

Cisco Smart License Utility (CSLU) is a reporting utility that provides aggregate licensing workflows. This utility performs the following key functions:

- Collects usage reports from the product instance and uploads these usage reports to the corresponding Smart Account or Virtual Account, online or offline, using files. Similarly, the RUM report ACK is collected online or offline and sent back to the product instance.
- Sends authorization code requests to CSSM and receives authorization codes from CSSM, if applicable.

CSLU can be part of your implementation in the following ways:

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- Install the Windows application to use CSLU as a standalone tool that is connected to CSSM.
- Install the Windows application to use CSLU as a standalone tool that is disconnected from CSSM. With this option, the required aggerated usage information is downloaded to a file and then uploaded to CSSM. This is suited for air-gapped networks.

Smart Software Manager On-Prem

Software Manager On-Prem (SSM On-Prem) is an asset manager, which works in conjunction with CSSM. It enables you to administer products and licenses on your premises instead of having to directly connect to CSSM.

For more information about SSM On-Prem, see Smart Software Manager On-Prem on the Software Download page.

Smart Accounts and Virtual Accounts

A Smart account provides you with a single location for all smart-account enabled products and licenses. It assists you in speedy procurement, deployment, and maintenance of your Cisco software.

If you are requesting a Smart account on behalf of an organization, you must have the authority to represent the requesting organization when creating a Smart account. After submitting the request, the request goes through an approval process before you are provided with access to your Smart account.

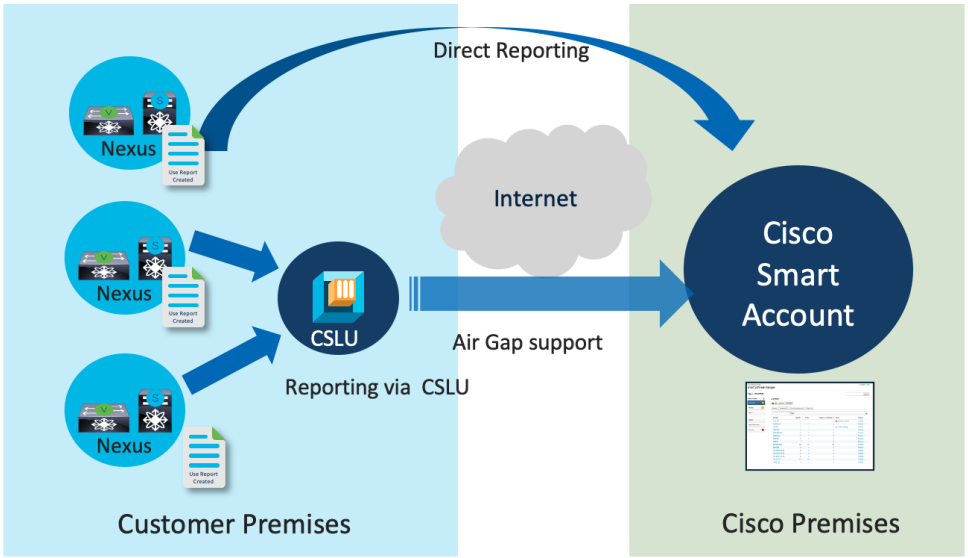
Go to http://software.cisco.com to learn about, set up, and manage a Smart account.

A virtual account is a subaccount within a Smart account. You can define the virtual account's structure based on organizational layout, business function, geography, or any defined hierarchy. Virtual accounts can be created and maintained only by Smart account administrators.

Smart License using Policy Deployment Modes

The following figure illustrates the deployment modes of SLP.

Figure 3. Smart Licensing using Policy deployment modes



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Supported Deployment Topologies for SLP

Smart licensing using policy supports the following deployment topologies. These topologies can be selected by configuring the transport type after the upgrade. The default transport type will depend on the existing setup before migration.

- Product instance connected to CSSM through CSLU. This is the default mode for new deployments and upgrades from PAK based licensing.
- Product instance connected directly to CSSM
- Product instance connected to CSLU and CSLU is not connected to CSSM. This is used for air-gapped networks. Aggregated usage report is downloaded from CSLU and uploaded to CSSM manually.
- No connectivity to CSSM and no CSLU installed. (All communications are in the form of uploaded and downloaded files)
- Connected to CSSM through (connected or disconnected) SSM On-Prem. (Instead of performing license management on cloud using CSSM, customers can do this locally using SSM On-Prem)

SLP Greenfield and Brownfield Deployment Workflow

From NX-OS 10.2.1 onwards, Smart License using Policy is the only supported way to manage licenses on the NX-OS platform.

When you purchase a new device, Cisco recommends providing your Smart Account and Virtual Account (SA/VA) information when placing an order to simplify license management. Cisco will assign all purchases to the respective account. Once devices are delivered, customers can start using them right away and no device registration is required. The devices will periodically report license consumption to CSSM based on set policy. The standard policy is to report once every 365 days or within 90 days of any change in feature consumption.

The following illustration shows the new deployment workflow for Smart license using Policy:

Figure 4. Deployment workflow for SLP

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When you migrate to Smart Licensing using Policy, the product instance will continue to operate without any license changes. License reporting method is set based on the licensing model used before the upgrade.

When you migrate from older version of Smart Licensing (SL) to Smart Licensing using Policy (SLP), devices will continue to use CALL HOME transport type for reporting after the upgrade as well.

When you migrate from PAK based licenses to Smart Licensing using Policy (SLP), by default, device will look for a CSLU in the local environment to report license usage. These transport settings can be changed by running the command license smart transport {cslu | callhome | smart | off}.

For SLP configuration details, see Cisco Smart Licensing Using Policy User Guide, Release10.2(x).

Comparison between PAK-based Licensing and Smart License using Policy (SLP)

Table 31. Comparison: PAK-Based Licensing and SLP

Classic / PAK-based Licensing	Smart Licensing using Policy (SLP)
This is based on Product Activation Keys (PAKs) and Unique Device Identifiers (UDIs).	No activation keys are required. You can consume any software feature and license usage reports are sent to CSSM later based on the reporting policy.
Product Activation Key (PAK) licensing needs manual registration of each device.	Licenses are ready to use without any manual registration.
The capacity and feature needs have to be assessed prior to obtaining the license file. PAK is emailed to you after you place an order.	No prior assessment is required to use SLP.
Licenses are specific to only one device.	Licenses are applicable to multiple devices.
Provides a limited view of the used licenses and you do not know the entire list of your devices, software, services.	Provides a complete view of licenses, devices, software, and services.
The UDI and PAK are used to receive a license file that is installed in the switch to complete the installation of the Cisco NX-OS software and these licenses are associated with a unique device and any change in license consumption requires new PAK files to be generated and installed on the device.	The default policy reports within 90 days of software upgrade or a change in software usage. After that the consumption is reported once every 365 days. Cisco can also set custom policy for customers to change the reporting frequency. Please talk to your Cisco account team to learn more about custom policy.

Comparison between Smart Licensing and Smart License using Policy (SLP)

Table 32. Comparison: Smart Licensing and SLP

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Legacy Smart Licensing	Smart Licensing using Policy (SLP)
New product instances will be in evaluation mode and you are required to immediately register to be compliant.	There is no device registration or evaluation mode. You can consume any feature (license) and usage reports are sent to CSSM later based on the reporting policy. The default policy is to report within 90 days of software upgrade or a change in software usage. After that consumption is reported once every 365 days.
Has rigid reporting requirements.	Has flexible reporting based on the policy.
Has limited deployment options.	Has flexible deployment options.
Has mandatory evaluation mode.	There is no evaluation mode. The compliance is managed on change.
SLR/PLR licenses are meant for offline users.	There is no SLR/PLR license. Licensing is based on policy.

Guidelines and Limitations

- CSLU-initiated communication/pull mode is not supported in Cisco NX-OS Release 10.2(1). Refer to 'Guidelines and Limitations' section in Cisco Smart Licensing Using Policy User Guide for more details.

Additional Documentation

Description	Link
Cisco Smart Licensing Using Policy User Guide	https://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/nx-os/licensing/guide/cisco-nexus-nx-os-smart-licensing-using-policy-user-guide.html

Feature History for Smart Software Licensing using Policy

Feature Name	Release	Feature Information
Smart Licensing using Policy (SLP)	10.2(1)F	This feature was introduced.

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