Implement Catalyst 9800 Wireless LAN Controller Licenses



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Introduction

This document describes the licensing model used on Catalyst 9800 Wireless LAN Controllers (WLCs) collected on Catalyst C9800-CL WLC: 17.2.1 image.

Background information

This article explains the concept of the licensing model used on Catalyst 9800 Wireless LAN Controllers (WLCs).

Screenshots and command outputs are collected on Catalyst 9800-CL WLC with 17.2.1 image.

This article is complementary to the licensing FAQ already present at https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9800-series-wireless-controllers/nb-06-cat9800-ser-wirel-faq-ctp-en.html.

Note: This article does not cover the **Smart Licensing Using Policy (SLUP)**, which was introduced in code version 17.3.2. Questions answered in this article are relevant for Catalyst 9800 WLC versions <17.3.2.

Q: Do I need to license the Catalyst 9800 controller itself?

A: No. Like on older AireOS-based controllers, there is no special license for the Catalyst 9800 controller itself (if no access points are joined to it).

You only need to license the access points that are joined to the controller.

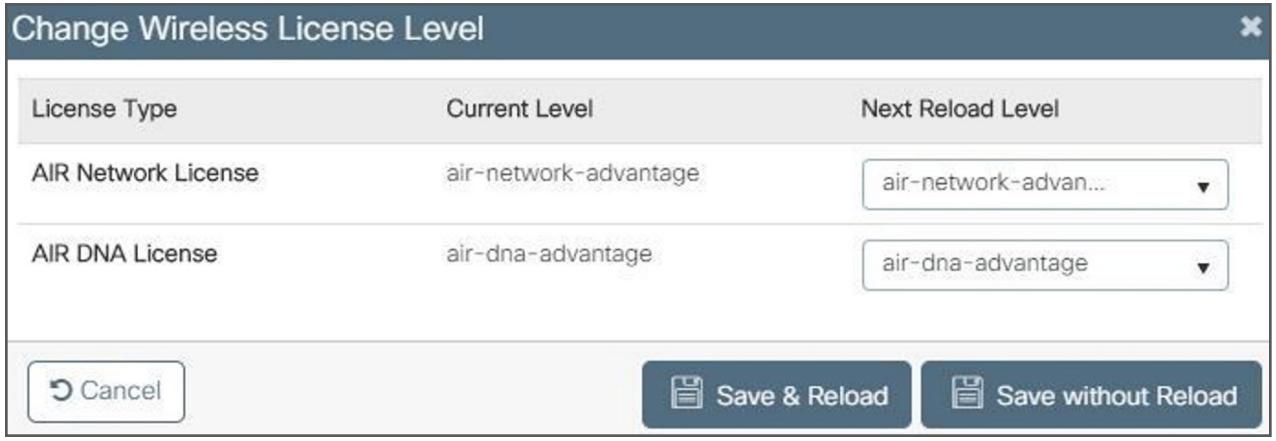
However, it is the controller which communicates with **Cisco Smart Licensing**, and it is the controller that verifies the licensing of all the joined access points.

Q: Which license do I need for access points that are joined to my Catalyst 9800 WLC?

A: Every access point joined to a Catalyst 9800 controller consumes one (1) **AIR Network license** and one (1) **AIR DNA license**.

Once purchased, these licenses show up in your smart account, which can be accessed Here.

Both of these licenses can be configured to be either **Essential** or **Advantage** level. An example of a controller configured with an Advantage-level license is shown below:



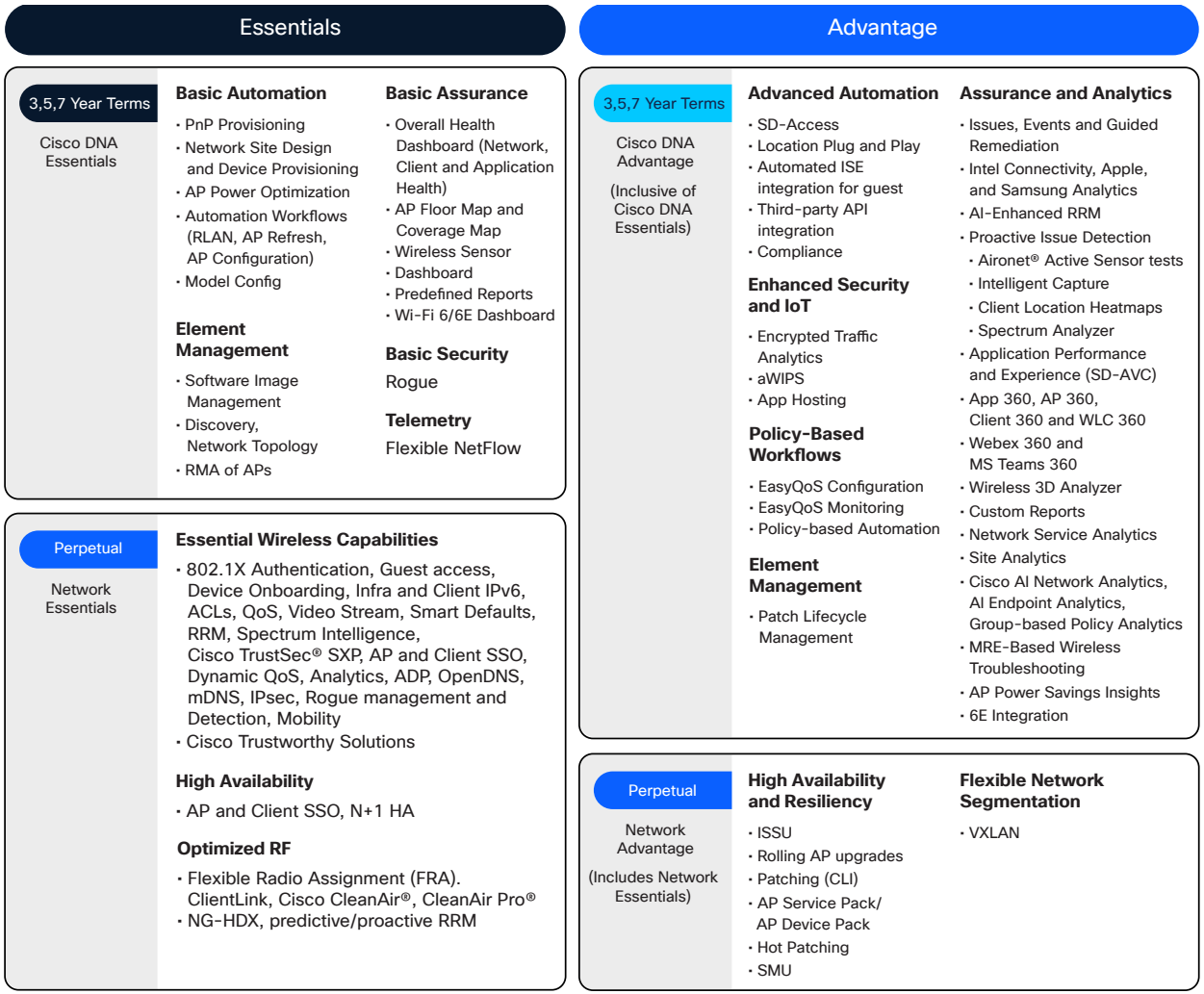
Q: Can I mix different licensing levels for the access points connected to the same Cisco Catalyst 9800 Series Wireless Controller?

A: No. A Catalyst 9800 Series Wireless Controller requires all connected access points to have the same license level because the license level is set up at the controller level.

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Q: Which features are covered by the Advantage and Essential license levels?

A: This image specifies features covered by the Essential and Advantage license levels:



Q: Is a reboot required after a change of license level?

A: Yes

Q: Is it mandatory to license all the access points joined to the Catalyst 9800 WLC?

A: Yes, it is mandatory to license all the access points joined to the Catalyst 9800 Wireless Controller for you to be in license compliance. The access points without a valid license will be out of compliance and Cisco retains the right to conduct audits to check license compliance.

Q: Is there license enforcement on Catalyst 9800 WLC?

A: If improperly licensed, your network will be out of Commercial license compliance. Cisco retains the right to conduct audits for license usage and bill the customer accordingly. Please speak with your sales representative to ensure you have the required licenses to remain compliant.

Q: Is there license enforcement on Catalyst 9800-CL WLC?

A: If a 9800-CL WLC is not connected to a smart licensing service, there is a limit of 50 access points enforced on the device. Once a 9800-CL WLC is connected to a smart licensing service, this restriction disappears. The compliance of the controller is decided based on the licenses available.

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Q: What is an evaluation license and how long does it last?

A: An evaluation license allows you to use all Catalyst 9800 WLC functionalities for 90 days.

When the evaluation period expires, "syslog" messages and notifications appear and ask you to properly license your controller.

These messages do not affect Catalyst 9800 functionalities. When the evaluation expires, it cannot be reset.

Q: Where do I download the .lic license file?

A: There are no licensing files for Catalyst 9800. Catalyst 9800 WLCs rely purely on **Cisco Smart Licensing**, which requires no license file (but does not necessarily require an internet connection either).

Q: How can I get my Catalyst 9800 WLC licensed?

A: There are three ways to get a Catalyst 9800 WLC licensed:

1. Use Cisco Smart Software Manager (CSSM) (controller requires internet connection).
2. Use **Specific License Reservation** (SLR, also known as offline licensing).
3. By using an on-premises satellite server.

Q: How does licensing via Cisco Smart Software Manager satellite work?

A: All versions of on-premises Cisco Smart Software Manager satellite are supported on Catalyst 9800 Cisco IOS® XE releases 16.11 and lower.

For Cisco IOS® XE 16.12 and 17.x releases (and higher), it is mandatory to use Cisco Smart Software Manager **satellite version 8, release 202008** or later.

If you try to use Catalyst 9800 16.12.x or 17.x with any version of satellite before version 8 release 202008, you will get "Cisco bug ID CSCvr54020 - **Licenses show as "PENDING" when using CSSM Satellite**."

Q: How does CSSM licensing work?

A: Licensing Catalyst 9800 WLC with **Cisco Smart Software Manager (CSSM)** requires your controller to have a functional DNS server and access to tools.cisco.com via http and https.

Once configured, your controller establishes a connection with the smart licensing servers and occasionally reports license consumption to the server (every eight (8) hours).

The WLC can be placed behind Network Address Translation (NAT) and is not required to have a public IP address. It is possible to specify which physical interface is used to communicate with the smart licensing servers.

Use of an http(s) proxy is also allowed. As of publication of this article (code release 17.2.1), authenticated proxies are not supported.

Q: How does CSSM licensing work with controllers in High Availability (HA) SSO?

A: The licensing procedure is almost identical to the single controller setup.

Once HA has been established between the two controllers, simply navigate to the licensing page in the web interface and follow the configuration prompt.

All configuration is synchronized between the primary and secondary controller.

Q: How does CSSM licensing work with controllers in N+1 HA?

A: N+1 HA refers to a setup where one WLC has all access points joined to it while the other is on standby. If the main controller goes down or becomes unreachable, all access points join the standby one.

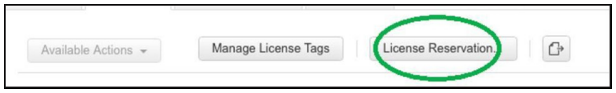
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In this case, simply connect both controllers to the smart licensing servers. If failover happens, the licenses show up on your smart account as “consumed” by the standby controller.

It requires up to eight (8) hours for this change to be reflected.

Q: How do I license my Catalyst 9800 WLC offline without internet access?

A: If access to the internet is not available, a Catalyst 9800 WLC can be licensed offline with Specific License Reservation (SLR).



Q: How does offline licensing work in HA SSO setups?

A: SLR can be done before or after HA is established. You have to spread the total license count between the two controllers.

For example, if the total access point count is 100, reserve 50 licenses for both the primary and the secondary controller.

It is not mandatory for each controller to have exactly one half of the access point licenses (it could be 60%/40% as well).

HA setup is properly licensed as long as both the primary and secondary WLC have at least one access point license. The WLCs then add up their license counts between each other.

Q: How does offline licensing (SLR) work in HA N+1 setups?

A: When N+1 HA runs with SLR, it is required to purchase an additional set of licenses for every access point and reserve them on standby controller.

This means licensing twice the access point count. It is not required to license the N+1 WLC if you keep it just for failover scenarios. The failovers can rely on the evaluation licenses without breaching compliance.

Q: Can I move licenses between two Catalyst 9800 controllers?

A: Yes. One of the benefits of smart licensing is that they can easily be “transferred” from one controller to the other.

In the case of SLR offline licensing, they first need to be removed from one controller and added to the other one.

In the case of CSSM licensing, access point licenses show up in your **Smart Account** as consumed on the other controller once the access points have been moved.

It requires up to eight (8) hours for these changes to be reflected.

Q: What happens if I do not license my Catalyst 9800 WLC?

A: If the controller is not properly licensed, you will not be in license compliance. Cisco retains the right to conduct audits to check licensing compliance. Please speak to your sales representative to ensure you remain compliant.

Q: Is there a difference in licensing on Catalyst 9800-L, and Catalyst 9800-CL?

A: Licensing is identical on Catalyst 9800-L, and Catalyst 9800-CL (this includes Catalyst 9800s that run on Catalyst 9000 switches).

Q: What is the maximum number of access points I can join and license on each Catalyst 9800 model?

A: This table contains the maximum number of supported access points for each Catalyst 9800 WLC model:

WLC model	Max access point count
Catalyst 9800-L	500
Catalyst 9800-CL	6,000

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Q: How long does it take for a license to be "consumed" and show up to be "in use"?

A: License count does not get updated for every **access point join** and **disjoin**. It can take up todep eight (8) hours for the license to be consumed. The eight (8) hour timer is a default setting and cannot be changed.

If the controller has been rebooted or HA has been set up, the first license count report happens one (1) hour later.

If the access point drops from the WLC due to an unstable connection, the license is unlikely to be consumed.

Q: I see an "ASR_1000_AdvEnterprise" and "ASR_1000_AdvIpservices" license on my Catalyst 9800 WLC. Do I really need an ASR router license for my Catalyst 9800 WLC?

A: No. This is caused by two bugs:

- Cisco bug ID CSCvt27421 - Catalyst 9800 - 17.1 - **Cannot remove advipservices license**.
- Cisco bug ID CSCvf53989 - Catalyst 9800-40/80 - Smart licensing summary shows "**ASR_1000_AdvIpservices**".

Bugs are superficial. They have no impact on Catalyst 9800 functionality and have been resolved in 17.2.1 code release.

Q: What is the impact of hardware RMA on the Cisco Catalyst 9800 Series WLC's licensing?

A: There is no impact on licenses due to hardware Return Materials Authorization (RMA). Customers can reconnect their access points to the new wireless controller post-RMA without any licensing impact.

Q: How do I troubleshoot licensing on Catalyst 9800 WLCs?

A: Before you open a case with Cisco Technical Assistance Center (TAC), make sure to perform the five (5) items from this checklist:

1. Verify that the domain tools.cisco.com is resolvable.
2. Verify that tools.cisco.com is reachable via http(s).
3. Collect the output of these show commands:

```
#show license tech support

#show license air entities added

#show license air entities deleted #show license air entities no-change #show license air entities summary #show license air entities bulk

#show license eventlog

#show license usage

#show ap uptime

#show wireless stats ap join summary
```

4. Collect the debugs:

```
#set platform software trace ios chassis active R0 all-modules debug

>> Reproduce the issue

#show logging process ios internal to-file bootflash:license _ debugs.txt
```

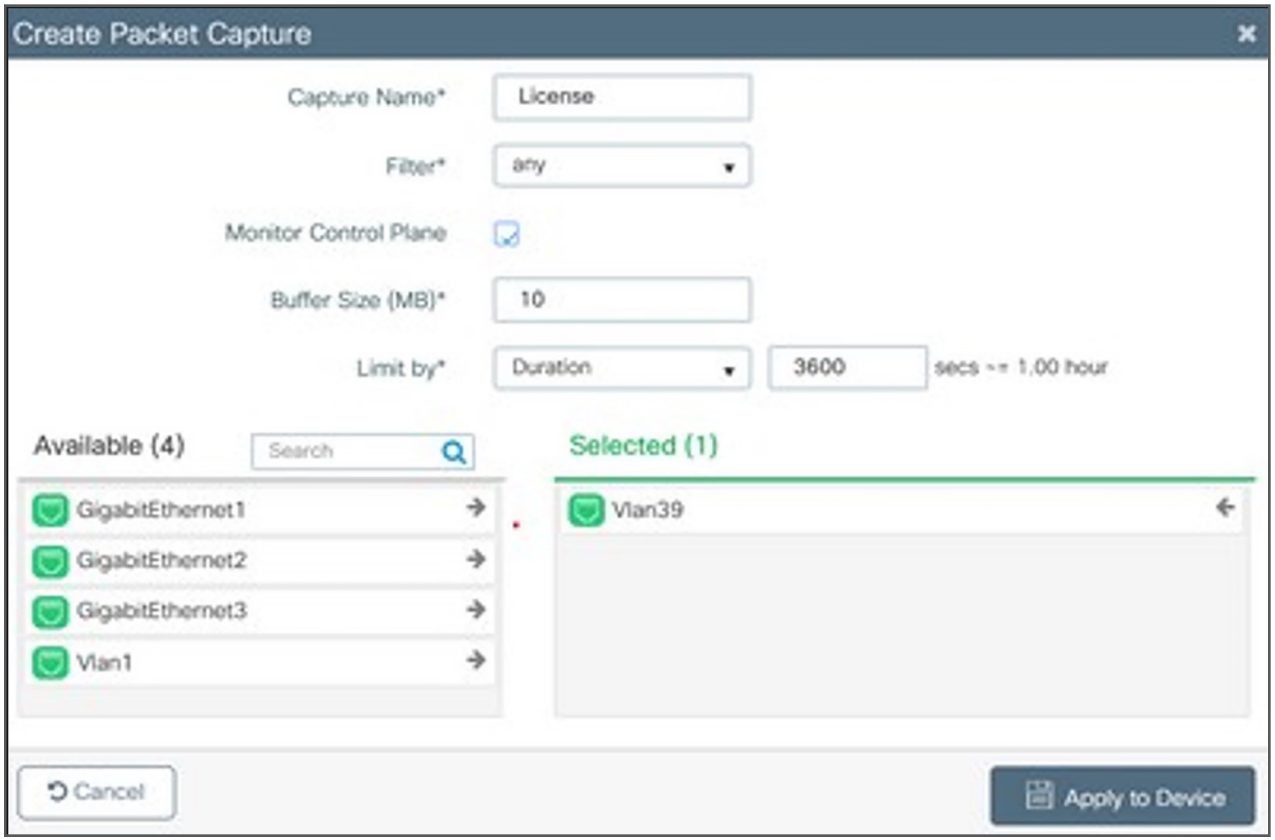
This saves the file named **license_debugs.txt**, which contains the debugs in the bootflash of the Catalyst 9800 WLC. The easiest way to retrieve the **license_debugs.txt** file from WLC is to download with a built-in file browser that can be found under **Administration > Management > File Manager**. Alternatively, you can use any other supported file transfer protocol (e.g., SFTP, FTP, TFTP, etc.).

5. Collect the packet captures on the interface that have been specified to be used for smart licensing.

In the controller web interface, navigate to **Troubleshooting > Packet Captures**, set up the capture on relevant interface, and click **Start**.

The information is possibly encrypted, but it reveals no DNS or reachability issues:

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Q: What is the Cisco Smart Licensing Using Policy?

A: Cisco's Smart Licensing Using Policy is an enhancement to Cisco Smart Licensing that enables a compliance relationship to account for hardware and software licenses that are purchased and in use.

This feature was introduced in Cisco IOS® XE releases Amsterdam-17.3.2.a and Bengaluru-17.4.1 and is enabled by default with these releases.

For details on configuration, refer to the Smart Licensing Using Policy config guide.

Q: Can I configure DNA licensing levels on my Catalyst 9800 WLC?

A: This capability does not exist on the controller. Please reach out to the appropriate business unit representative for carrying out the required changes.

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