

# How Licensing Works In AOS 8.X

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## Overview:

- ArubaOS 8.x supports centralized Licensing architecture and it is enabled by default.
- Primary and Backup Mobility Master can share a single set of licenses.
- Managed Device(MD) Maintain the license information from Mobility Master(MM) even if it stops communication between them.

## Supported Topology:

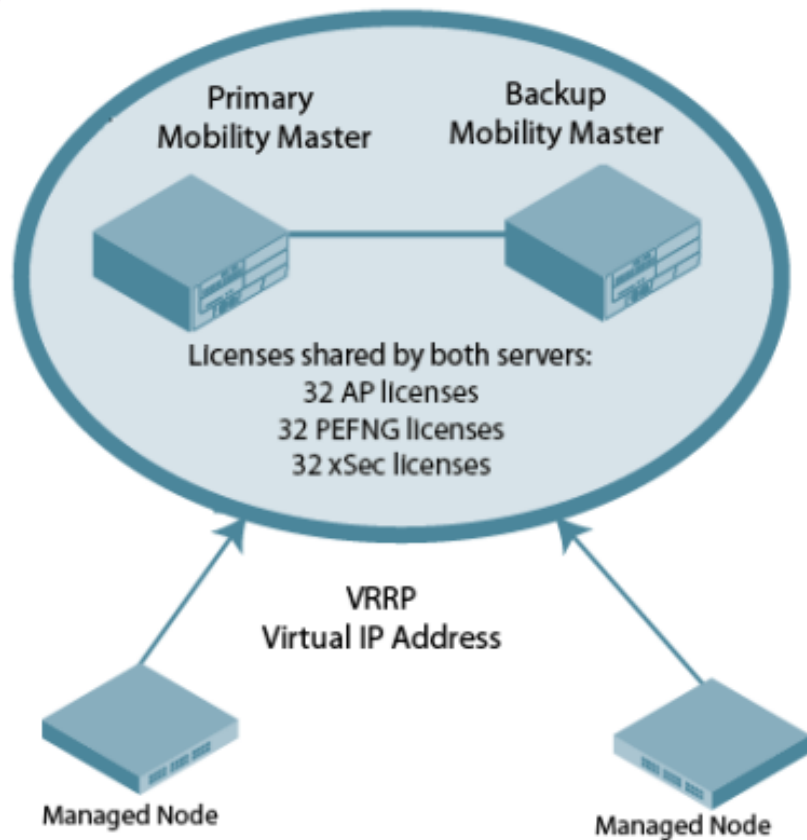
- Mobility Master(MM) acting as licensing server to all associated Managed Device(MD).
- Standalone Controller acting as licensing server to another Standalone Controller.

## Unsupported:

- Mobility Master acts as a licensing server to both its associated MD and stand alone.

# MM Redundancy

- Uses VRRP for Redundancy.
- Shares Single Set of License among them.
- MD connects to MM using the VRRP IP.
- If MM primary is unavailable the MM secondary takes over VRRP IP ownership.
- MD connected to redundant servers use license from the shared pool.



- MM maintains a license database.
- All Sharable licenses for MD are managed through MM.
- All the Sharable licenses must be installed on MM.
- If a controller holds licenses installed before Migration to 8.x is no longer valid.
- Those license key must be regenerated and installed on MM, then map it to the MD.
- When an AP associates to the MD, the MD updates MM. MM recalculates and sends the revised license count to its associated MDs.
- Usage of per AP license from the license pool also consumes 1 PEFNG and 1 RF Protect license count though the feature is not used by the AP.
- It considers platform limit regardless of the license available in the pool.
- It supports multi-version licensing.

# CATEGORIES OF LICENSES

# Sharable License Vs Controller-Specific License (Box License)

- **Sharable License:** These sharable license types can be assigned to a licensing pool and used by any device within a group of managed devices.
- **Example:** AP, ACR, PEF, RF Protect, VMC, MM and WebCC
- **Controller-Specific License:** A non-sharable licenses is generated using a controller serial number, and can only be used by the individual controller for which it was generated. It is also termed as Box License.
- **Example:** PEFV

# Evaluation Licences Vs Permanent Licences

## **Permanent License:**

- A permanent license permanently enables the desired software module on a specific Aruba controller.
- You obtain permanent licenses through the sales order process only.
- Permanent software license keys are sent to you via email.

## **Evaluation License:**

- An evaluation license allows you to evaluate the unrestricted functionality of a software module on a specific controller for 90 days (in three 30-day increments).
- Evaluation licenses are added to Mobility Master and made sharable within a licensing pool.
- An expired evaluation license will remain in the license database until the controller is reset using the command `write erase all`, where all license keys are removed.
- An expired evaluation license has no impact on the normal operation of the controller, but it is kept in the license database to prevent abuse.



### When an evaluation period expires:

- The controller automatically backs up the startup configuration and reboots itself at midnight (according to the system clock).
- All permanent licenses are unaffected. The expired evaluation license feature is no longer available and is displayed as Expired in the WebUI

# Perpetual Licences vs Subscription Licences

## **Perpetual Licenses:**

- A perpetual license is a purchased license that has no end date; once installed, it does not expire. Most purchased licenses are perpetual licenses.

## **Subscription Licenses:**

- The Web Content and Classification (WebCC) license is a subscription license that enables WebCC features only for the duration of the subscription (1,3,5,7 or 10 years).

# TYPES OF LICENSE AND USAGE

### 1. AP License:

- An AP license is required for each operational LAN-connected, mesh, or remote AP that is advertising at least one BSSID (virtual-AP).
- **Usage Basis:** Per AP

### 2. ACR License:

- This license enables ArubaOS Advanced Cryptography (ACR) features. A license is required for each active client termination using Suite-B algorithms or protocols.
- **Usage Basis:** Per Client Session

### 3. PEF License:

- One operational AP using one or more Policy Enforcement Firewall (PEF) features, such as intelligent application identification, policy-based traffic management and controls, or stateful user firewalls.
- **Usage Basis:** Per AP

#### 4. PEFV License: (Alias Box License)

- The PEFV license allows a network administrator to apply firewall policies to clients using a VPN to connect to the controller. This license is mandatory for the Aruba VIA VPN client, but optional for all other VPN clients. The PEFV license is purchased as a single license that enables the functionality up to the full user capacity of the controller.
- **Usage Basis:** Per Controller

#### 5. RFProtect License:

- An RFProtect (RFP) license is required for each operational AP using one or more RF Protect features, such as spectrum analysis and Wireless Intrusion Protection (WIP).
- **Usage Basis:** Per AP

#### 6. MM License:

- Starting with ArubaOS 8.0.1, the MM license is required to terminate devices (controllers or APs) on Mobility Master. If the Mobility Master does not have sufficient MM licenses and an AP fails to obtain a license, that AP can get an IP address and connect to its controller, but will not broadcast an SSID.
- **Usage Basis:** Associated device (Per Controller/Per AP)

## 7. VMC License:

- Starting with ArubaOS 8.0.1, the VMC license is a sharable license required to terminate APs on a virtual controller(MD). In ArubaOS 8.0.0, the VMC-TACT and VMC-TACT8 licenses are non-sharable licenses that must be installed on a virtual machine before you can install ArubaOS as a controller on that VM.
- **Usage Basis:** Per AP

## 8. WebCC License: (Alias Subscription License)

- The Web Content Classification (WebCC) license is a subscription based, per-AP license that supports Web content classification features on an AP for the duration of the subscription period (up to 10 years per license).
- **Usage Basis:** Per AP

# LICENSE SERVER FAILOVER BEHAVIOURS

**The following sections describe failover behaviours:**

- **Mobility Master Fails Over to a Backup Mobility Master**
- **Mobility Master Must be Replaced**
- **Mobility Master is Unreachable**
- **A Managed Device is Unreachable**
- **An AP Fails Over to Another Licensing Client**



## **Mobility Master Fails Over to a Backup Mobility Master:**

- If Primary MM fails, Secondary MM retains the shared license until Secondary MM reboots.
- If Primary MM is unavailable and Secondary MM reboots before the Primary MM is available then the MD retains the license for 30 days.
- The MD retains the license for 30 days if primary and Backup MM is unavailable.

## **Mobility Master needs to be replaced:**

- If the MM needs to be replaced, the license keys must be regenerated and installed on the new Mobility Master.
- In Redundancy topology, need not to reinstall the license key.
- The replaced MM will sync with the secondary/backup MM and update its license database.

## **Mobility Master unreachable to MD:**

- Exchanges periodic heartbeats between MM and MD(every 30 seconds).
- If consecutive heartbeat misses the MD marks MM as down.
- MD uses license from MM for 30 days.
- If MM is not reachable for the complete 30 days by MD, it removes all the shared license received.
- Post 30 days of MM unreachable the existing APs are functional until they are rebooted.
- The new APs trying to connect to MD will not be active due to insufficient license.

## **MD unreachable to MM:**

- Exchanges periodic heartbeats between MM and MD(every 30 seconds).
- If consecutive heartbeat misses the MM marks MD as down.
- MM adds license of the MD back to the license pool.

## **AP Failover to another License Client(MD):**

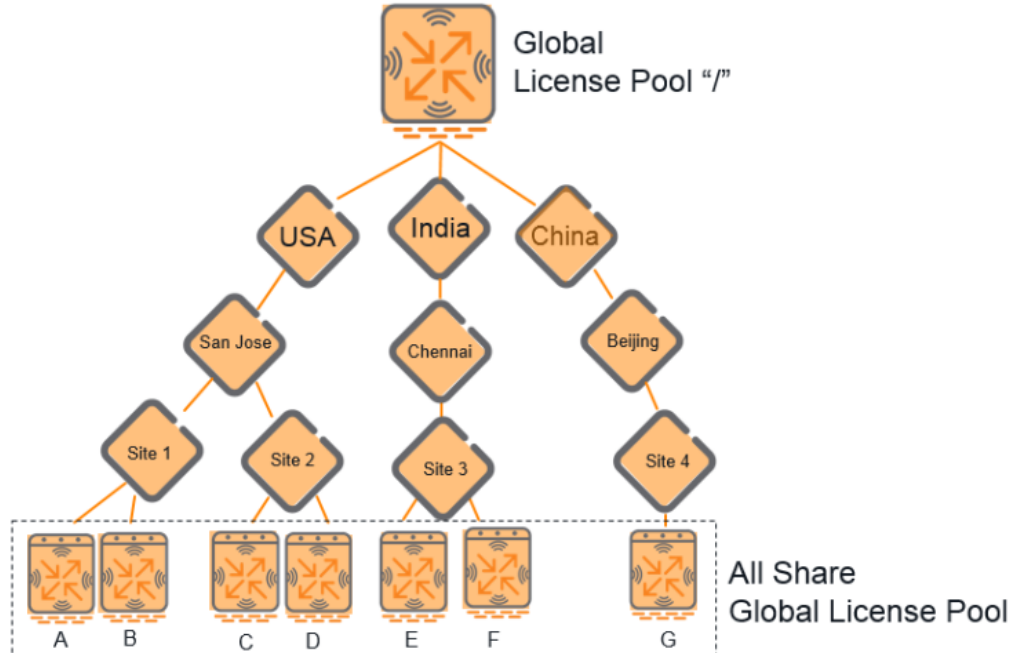
- AP fails over from MD 1 to another MD 2 the AP will be active even if the MD 2 do not have sufficient license until the respective AP reboots.
- If no sufficient license on MD 2 and the AP moved from MD 1 to MD 2 reboots, then the AP will be down due to insufficient license.

# LICENSE POOL

# Licensing Pool Topologies:

- Allows us to configure Customized Licensing pools.
- MD share all the sharable license from the Global pool on MM.

## Global Pool:



## Example:

- 100 Sharable license installed on the Mobility Master(MM). (AP License for Example)
- All the license are now available for MD from the Global License Pool “/” in MM.
- Assume US Domain uses 25 AP License, India uses 35 AP License and China uses 15 AP license.
- The remaining license in the Global Pool is 25.

US	25
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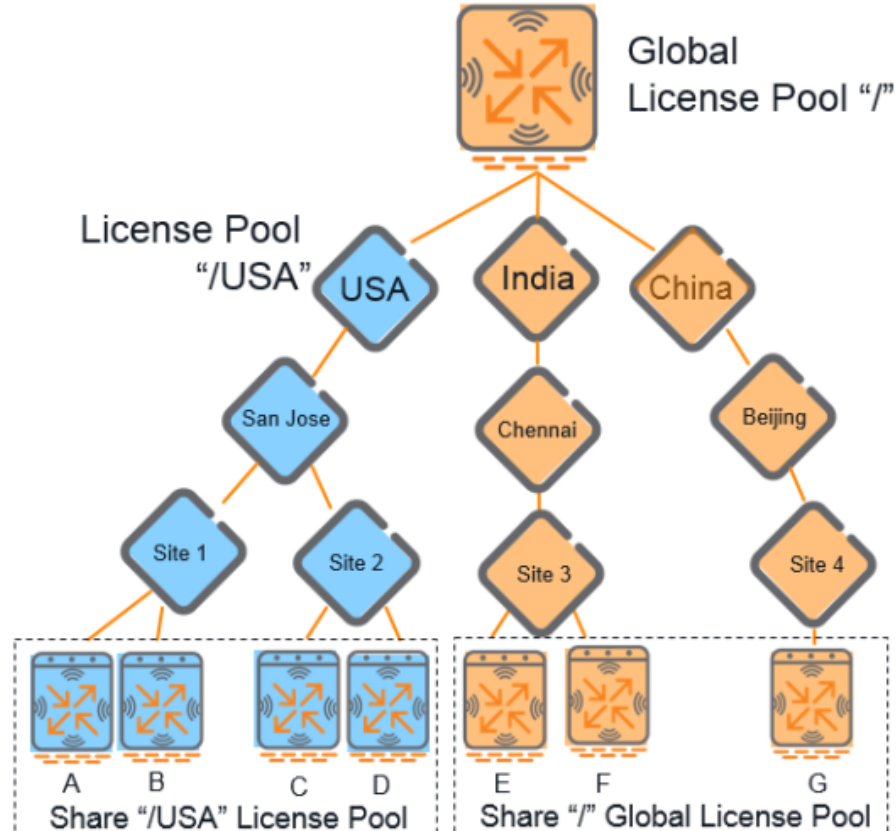
India	35
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China	15
-------	----

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Total:	75

- Global Pool 100 – Used License 75 = 25 Remaining License

# Global & Custom Pools:

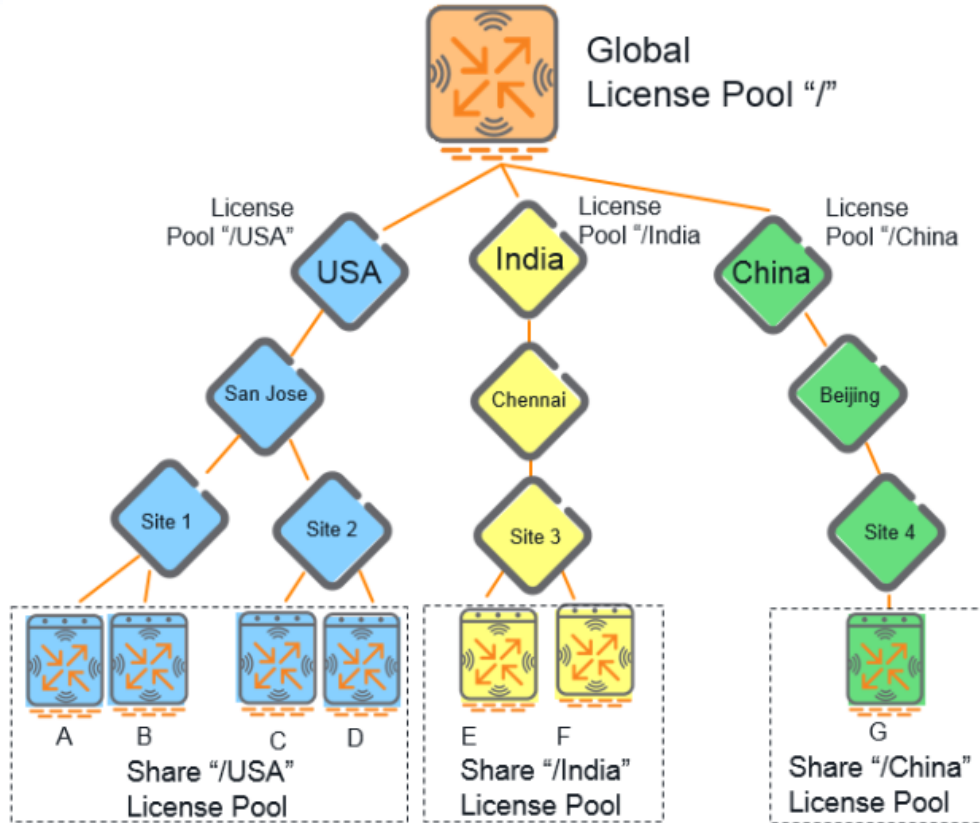


- A custom licensing pool USA is created (/USA).
- Assume 40 license is allocated to USA pool.
- Then the remaining license in the Global pool(/) is  $(100-40) = 60$  License.
- The USA associated MD can use only the allocated 40 license and can not exceed the count though there are license available in the Global pool.
- The rest domains India & China can use the rest 60 license from the Global license pool.

Pool Name	AP Licenses from Mobility Master
/(Global pool)	60
/USA	40



# All Custom Pools:



- Created custom License pool for each configuration node.
  - USA Pool (/USA) 40
  - India Pool (/India) 35
  - China Pool (China) 25
- Now none of the MDs are associated to the Global License pool.
- There a 0 license left in the Global Pool (/).

Pool Name	AP Licenses from Mobility Master
/ (Global pool)	0
/USA	40
/India	35
/China	25

# GENERATING LICENSE KEY

- From 8.x all the shareable & subscription license can be installed only on the MM.
- The box license can be either installed directly to MD(CLI) or installed to MD through MM.
- Licenses cannot be added directly to a managed device(MD) via the managed device's WebUI.

### **How to get the Licenses:**

- HPE Aruba licensing Web site <https://hpe.com/networking/support>
  - License Registration ID (From sales account manager or authorized reseller)
  - Auto-generated ArubaOS passphrase for Mobility Master
  - Auto-generated ArubaOS passphrase for any managed device (MD) installed on a server VM (virtual controller)
  - Serial numbers of physical controllers.
- From AOS: 8.0.1, VM serial number is not required to generate a Mobility Master (VMM) or virtual mobility controller (VMC) license.

### **Additional Information:**

- In ArubaOS 8.0.0 VMM & VMC requires a serial number.
- This serial number is obtained from reseller.
- It is configured via the command “product serial-number <serial-number>”.

- The Passphrase is generated using UUID parameter which is supposed to be unique for each VM device.
- It is used to avoid using the same license for different VMM and VMC.
- Each virtual machine is automatically assigned a universally unique identifier (UUID).
- The UUID is a 128-bit integer. The 16 bytes of this value are separated by spaces, except for a dash between the eighth and ninth hexadecimal pairs.
  - A sample UUID looks like this:
  - 56 4d ef 2d 3f d4 14 e2-2e 04 c5 34 3a ec ee 65

- To identify MM Passphrase/ Serial Number

- (Maniraj-Aruba-MM) [mynode] #cd /mm
- (Maniraj-Aruba-MM) [mm] #**show license passphrase**
- MM6FCB559-Yxc3r30/-9xM9Oj8y-5V/1GpgI-7WWmoIkU
- (Maniraj-Aruba-MM) [mm] #**show inventory**
- Mgmt Port HW MAC Addr : 00:0C:29:FC:B5:59
- HW MAC Addr : 00:0C:29:FC:B5:63
- Product key# : **MM6FCB559**
- Activate license : Not Applicable
- Active device type : MM
- (Maniraj-Aruba-MM) [mm] #

## **VMM (Virtual Mobility Master):**

- LIC-MM-VA-xx should be installed on VMM. (Per Device)
- LIC-MC-VA-xx should be installed on VMC if it is an MD. (Per AP)
- LIC-MM-VA-xx will be consumed by both MDs and APs
  - e.g. LIC-MM-VA-500 can support say 10 MDs and 490 APs. So total 500 devices.
- LIC-MC-VA-xx will be consumed by Aps on VMC.

## **Standalone VMC (Virtual Mobility Controller):**

- LIC-MC-VA-xx should be installed on standalone VMC.
- MCM (Mobility Controller Master/72xx-MC) and standalone 7xxx
- On MCM i.e. legacy master and standalone 7xxx controllers, MM/MC licenses are not required.
- VMC is not supported on MCM.

### **Note:**

- LIC-MM-VA-xx stands for license-mobility master-virtual appliance-xx
- LIC-MC-VA-xx stands for license-mobility controller-virtual appliance-xx

# VMC device types to be supported

Device type	MIN-RAM	MIN-CPU	AP supported	User's supported
VMC_32	4	3	32	512
VMC_50	6	4	50	800
VMC_250	6	5	250	4000
VMC_1K	8	6	1000	16000



# VMM device types to be supported

Device type	MIN-RAM	MIN-CPU	Devices supported
MM_500	8	6	500
MM_1K	12	8	1000
MM_5K	16	10	5000
MM_10K	28	16	10000

## **My Networking Portal(Public Facing):**

- [www.hpe.com/networking/support](http://www.hpe.com/networking/support)
- [www.hpe.com/networking/mynetworking](http://www.hpe.com/networking/mynetworking)

## **Internal Sites:**

### **HPE License Acquisition Portal:**

- <https://hpn-app.houston.hpe.com/LicenseAcquisition/Default.aspx>

### **HPE Customer Look UP Portal:**

- <https://hpn-app.houston.hpe.com/CustomerLookup/>

# LICENSE TRANSFER FROM 6.X TO 8.X



## My Networking

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Welcome Jerrod Howard    Company: HPE Aruba

United States-English

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### Software

Software/updates include:

- Openly available software
- Software entitled with product purchase
- Export restricted software
- Software entitled by an active CarePack

### Contract or CarePack Software Updates

For software updates entitled via Contracts or CarePacks not found in the MyNetworking portal.

### MyProfile

[Edit profile](#)  
[Manage communication](#)  
[Manage users](#)  
[Create company](#)

Add a new company and assign an administrator for the company

### Licenses

[Register license](#)

My license status:

[View licenses](#)  
[View my orders](#)  
[View available Registration IDs](#)  
[Export licenses](#)

Manage licenses:

[Transfer licenses to new platform](#)  
[Uninstall licenses](#)  
[Transfer assets](#)  
[Consolidate AirWave license](#)

### Support tools

[Airheads Community](#)  
[HPE Community](#)

[Open/View Support Case](#)  
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### Networking support search tool

Find support links such as software, manuals for HPE Networking products.

[My Subscriptions](#)  
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[Register products](#)  
[HPE Networking Support Web Guide](#)

## Transfer licenses to new platform

### My Licenses

- Register license
- Transfer licenses to new platform
- Uninstall licenses
- View licenses
- Consolidate AirWave License
- Export licenses
- View available registration IDs
- Transfer assets
- View my orders
- Decode Certificate ID/Activation Key (AOS only)
- Import ClearPass Subscriptions
- Update ClearPass SubscriptionName
- Retrieve My VMC Serial Numbers
- Resolving PDF Viewing Issues

Product name

Install ID/Device SN

Status

**Search**

Search

Reset

Show customer notes

Default View

Prod #	Prod name	Serial #	Reference	Act date	Exp date	Inact Date	Status	Select
JW495AAE	Aruba PEF VI A Lic for 7005 Cntrlr E-LTU	CP001235...	CP0012353...	16-Nov-2016	Never expires	--	Active	<input type="checkbox"/>
JY028AAE	Aruba Cntrlr Web Cont Cla ss 1y Sub E-S TU	CP001235...	CP0012353...	16-Nov-2016	16-Nov-2017	--	Active	<input type="checkbox"/>
JW474AAE	Aruba Cntrlr P er AP RFProte ct Lic E-LTU	CP001235...	CP0012353...	16-Nov-2016	Never expires	--	Active	<input type="checkbox"/>
JW472AAE	Aruba Cntrlr P er AP Capacit y Lic E-LTU	CP001235...	CP0012353...	16-Nov-2016	Never expires	--	Active	<input type="checkbox"/>
JW473AAE	Aruba Cntrlr P er AP PEF Lic E-LTU	CP001235...	CP0012353...	16-Nov-2016	Never expires	--	Active	<input type="checkbox"/>

First Previous 1 Next Last

Page 1 of 1 (rows 1 - 5 of 5)

Display 10 row(s) per page

## Transfer licenses to new platform

### My Licenses

- [Register license](#)
- [Transfer licenses to new platform](#)
- [Uninstall licenses](#)
- [View licenses](#)
- [Consolidate AirWave License](#)
- [Export licenses](#)
- [View available registration IDs](#)
- [Transfer assets](#)
- [View my orders](#)
- [Decode Certificate ID/Activation Key \(AOS only\)](#)
- [Import ClearPass Subscriptions](#)
- [Update ClearPass SubscriptionName](#)
- [Retrieve My VMC Serial Numbers](#)
- [Resolving PDF Viewing Issues](#)

**Product number :** JW495AAE **Status :** Active  
**Product name :** Aruba PEF VIA Lic for 7005 Cntrlr E-LTU  
**Base product number :** JW634A  
**Base product name :** Aruba 7005 (US) 16 AP Branch Cntrlr  
**Registration ID :** Q4P9976-T2Y4XJ8-YW92FDD-T3PKGRV  
**Hardware serial number :** CP0012353ARB  
**Hardware or Install ID :** CP0012353ARB  
**Usage type :** Dev – HP  
**Quantity :** 1  
**License key :** M/mjLXpK-AXY5Ccrg-q0R4HK7e-mGNvSWJO-mfdr1obd-q+0  
**Activation date :** 16-Nov-2016 **Inactivation date :** --  
**Expiration date :** --  
Your license is actively in use.  
**Created date :** 16-Nov-2016 **Created by :** Jerrod.Howard@hpe.com  
**Modified date :** 16-Nov-2016 **Modified by :** Jerrod.Howard@hpe.com  
**Transferred :** No  
**Friendly name :** 7005 Lab  
**Customer notes (optional) :** 7005 Lab  
**Email address :**

To send a copy of the license registration details and license key/file, enter the email address(es) (comma or semi-colon separated) and click the send email button.

[Previous](#)

[Next](#)

## Transfer licenses to new platform

### My Licenses

[Register license](#)

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[Uninstall licenses](#)

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[SubscriptionName](#)

[Retrieve My VMC Serial Numbers](#)

[Resolving PDF Viewing Issues](#)

### 1 Target Serial Number 2 Confirmation

Please enter the serial number and new PassPhrase for the license transfer

AOS Controller Type

Virtual Mobility Master

PassPhrase

MMD9DCFFD-p08PCKUq+B8fhB8F-TtEFIMVX-pPfrP6zP

<input type="checkbox"/>	Product Name	Base serial number	Qty	Friendly name	Customer notes
<input type="checkbox"/>	Aruba PEF VIA Lic for 7005 Cntrr E-LTU	CP0012353ARB	1	7005 Lab	7005 Lab
<input checked="" type="checkbox"/>	Aruba Cntrr Web Cont Class 1y Sub E-STU	CP0012353ARB	16	7005 Lab	7005 Lab
<input checked="" type="checkbox"/>	Aruba Cntrr Per AP PEF Lic E-LTU	CP0012353ARB	16	7005 Lab	7005 Lab
<input checked="" type="checkbox"/>	Aruba Cntrr Per AP RFPProtect Lic E-LTU	CP0012353ARB	16	7005 Lab	7005 Lab
<input checked="" type="checkbox"/>	Aruba Cntrr Per AP Capacity Lic E-LTU	CP0012353ARB	16	7005 Lab	7005 Lab

Previous

Transfer

## Transfer licenses to new platform

## My Licenses

[Register license](#)[Transfer licenses to new platform](#)[Uninstall licenses](#)[View licenses](#)[Consolidate AirWave License](#)[Export licenses](#)[View available registration IDs](#)[Transfer assets](#)[View my orders](#)[Decode Certificate ID/Activation Key \(AOS only\)](#)[Import ClearPass Subscriptions](#)[Update ClearPass](#)[SubscriptionName](#)[Retrieve My VMC Serial Numbers](#)[Resolving PDF Viewing Issues](#)

## 1 TargetSerial/Passphrase 2 Confirmation

✔ License transfer is complete.

To send a copy of the license registration confirmation details, enter one or more email addresses, separated by a comma or semi-colon.

Send license confirmation to

Comments

## License details

From	To
<b>License Key:</b> Not Available <b>Order No/Reg ID/Certificate ID:</b> T8B3RCF-C2PVCVC-RC23YR8-MBXXJH2 <b>Product number:</b> JW473AAE <b>Product name:</b> Aruba Cntr Per AP PEF Lic E-LTU <b>Pass Phrase:</b> CP0012353ARB <b>Status:</b> Transferred <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> Never expires <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab	<b>License Key:</b> 8zH4GU-VJ39gdO-L7E0hngu-0tChCnV7-mJSXmQE-MfC/PSFR-bds3uFXT-jSbwh3L-AX5RXJ7I-1U1M <b>Order No/Reg ID/Certificate ID:</b> T8B3RCF-C2PVCVC-RC23YR8-MBXXJH2 <b>Product number:</b> JW473AAE <b>Product name:</b> Aruba Cntr Per AP PEF Lic E-LTU <b>Pass Phrase:</b> MMD9DCFFD-p08PCKUq-+B8fh8BF-TIEFIMVX-pPthP6zP <b>Status:</b> Active <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> Never expires <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab

From	To
<b>License Key:</b> Not Available <b>Order No/Reg ID/Certificate ID:</b> 28GVQ09-GQQHGTX-RVJ447R-23876KT <b>Product number:</b> JW472AAE <b>Product name:</b> Aruba Cntr Per AP Capacity Lic E-LTU <b>Pass Phrase:</b> CP0012353ARB <b>Status:</b> Transferred <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> Never expires <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab	<b>License Key:</b> mCbJUVNf-m3LQKd8z-Sig7PIL-1KwXF82-PghLHV5-cJCuTcWq-xMqlwPS-ikYqSGz-CPdrgz5D-5xU <b>Order No/Reg ID/Certificate ID:</b> 28GVQ09-GQQHGTX-RVJ447R-23876KT <b>Product number:</b> JW472AAE <b>Product name:</b> Aruba Cntr Per AP Capacity Lic E-LTU <b>Pass Phrase:</b> MMD9DCFFD-p08PCKUq-+B8fh8BF-TIEFIMVX-pPthP6zP <b>Status:</b> Active <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> Never expires <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab

From	To
<b>License Key:</b> Not Available <b>Order No/Reg ID/Certificate ID:</b> F73DPWG-PVJ7T2K-3Dh9R2S-YX6FVhV <b>Product number:</b> JW474AAE <b>Product name:</b> Aruba Cntr Per AP RFPProtect Lic E-LTU <b>Pass Phrase:</b> CP0012353ARB <b>Status:</b> Transferred <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> Never expires <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab	<b>License Key:</b> uLCaVtOM-GVCR7BR-Cc+q05Z2-0suI7J6f-CbWx71Rz-Hg2P+1Rf-8uge54i3-chKrtUQV-WODOkUy-yAw <b>Order No/Reg ID/Certificate ID:</b> F73DPWG-PVJ7T2K-3Dh9R2S-YX6FVhV <b>Product number:</b> JW474AAE <b>Product name:</b> Aruba Cntr Per AP RFPProtect Lic E-LTU <b>Pass Phrase:</b> MMD9DCFFD-p08PCKUq-+B8fh8BF-TIEFIMVX-pPthP6zP <b>Status:</b> Active <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> Never expires <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab

From	To
<b>License Key:</b> Not Available <b>Order No/Reg ID/Certificate ID:</b> M8D3D9B-YKT7C47-XDh9R2S-883HW-HX <b>Product number:</b> JY028AAE <b>Product name:</b> Aruba Cntr Web Cont Class 1y Sub E-STU <b>Pass Phrase:</b> CP0012353ARB <b>Status:</b> Transferred <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> 16-Nov-2017 <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab	<b>License Key:</b> XC06ydsJ-vH7Lrtai-uLQq09-Q52YOMx-8nD+3e06-uOggOnzy-rzK0U50-Ajv00Dg-X0Xcc28-J4c <b>Order No/Reg ID/Certificate ID:</b> M8D3D9B-YKT7C47-XDh9R2S-883HW-HX <b>Product number:</b> JY028AAE <b>Product name:</b> Aruba Cntr Web Cont Class 1y Sub E-STU <b>Pass Phrase:</b> MMD9DCFFD-p08PCKUq-+B8fh8BF-TIEFIMVX-pPthP6zP <b>Status:</b> Active <b>Activation date:</b> 16-Nov-2016 <b>Expiration date:</b> 16-Nov-2017 <b>Friendly name:</b> 7005 Lab <b>Customer notes:</b> 7005 Lab



# INSTALLATION OF LICENSE

# Installing the License

WebUI:

The screenshot shows the Mobility Master WebUI interface. The left sidebar contains a navigation menu with 'Mobility Master' selected. The main content area is divided into 'Configuration' and 'System' sections. The 'Licensing' tab is active, displaying a table of licenses. A red box highlights the 'Mobility Master Licenses' tab, and a red circle with a plus sign is located at the bottom left of the table.

Usage	Mobility Master Licenses	Controller Licenses
KEY	FEATURE	COUNT
J6kL3BzQ-jLSyTL+/-ByJl+Bpc-lvsEDKkd-kQV6VQ3r-XA/aZ5QT-Yy...	PEFNG	32
z0nFTS4c-rUkHnyRJ-qHjtdPK-GXdL2UCL-UcyGGnuw-YxzkCJS3...	AP	32
WRMIRsMO-h3qbtQCg-bXUGQ06r-yy6I91EM-wITG3upv-RvikZT...	MM	32
YnUvN6cV-XG4p+ssF-+tUU3/HZ-bUvIBMYe-16pT+F7r-15xwzZR...	RFP	32
...	...	...

## Install Licenses

To install new licenses you will need:

- ✓ The Serial Number of this Mobility Master: MM6FCB559
- ✓ The License Key for each service you wish to activate
- ✓ License Passphrase: MM6FCB559-Yxc3r30/-9xM9Oj8y-5V/1Gpgl-7WWmolKU

Obtain License Keys from <https://licensing.arubanetworks.com>

Enter the license keys in the text box below, one key per line.

Cancel

OK



Please make sure to enable the feature bit to have the license take effect.

OK

# Enabling Sharable License

← **Mobility Master** >

- Mobility Master**
  - Maniraj-Aruba-MM
  - Managed Network (1)
    - Mani-Banglore (1)
      - Maniraj-Aruba-MD

**Configuration**

- Roles & Policies
- Authentication
- Services
- Interfaces
- Controllers

**System**

- General
- Admin
- Airwave
- Licensing**
- Certificates
- SNMP
- Logging
- Profiles
- Whitelist
- More

Usage	Mobility Master Licenses	Controller Licenses	AP	PEF	RF Protect	ACR	WebCC	MM	VMC
<b>Global License Pool</b>			0/32	0/32	0/32	0/0	0/32	1/32	0/32
Mani-Banglore			0	0	0	0	0	0	0

**Usage for Global License Pool**

	AP	PEF	RF Protect	ACR	WebCC	MM	VMC
Feature Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Scope	Per-AP	Per-AP	Per-AP	Per-Session	Per-AP	Per-Device	Per-Device
Pool Size	32	32	32	0	32	32	32
Expired Licenses	0	0	0	0	0	0	0
Actual Pool Size	32	32	32	0	32	32	32
Licenses Used	0	0	0	0	0	1	0
Licenses Remaining Available	32	32	32	0	32	31	32

**Expired/Expiring Licenses for Global Pool**

KEY	FEATURE	COUNT	USED	TYPE	EXPIRATION	STATUS
J6kL3BzQ-jLSyTL+/-ByJl+BPC-lvsEDKk...	PEFNG	32	0	Eval	Feb 16 2017	Expires in 26 days
z0nFTS4c-rUkHnyRJ-qHjtdPK-GXdL...	AP	32	0	Eval	Feb 16 2017	Expires in 26 days
WRMIRsMO-h3qbtQCg-bXUGQ06r-y...	MM	32	0	Eval	Feb 16 2017	Expires in 26 days
YnUvN6cV-XG4p+ssF--tUJ3/HZ-bUvL...	RFP	32	0	Eval	Feb 16 2017	Expires in 26 days
DnFg4EUB-n0cwgjl-AE8qt08E-k02q...	VMC	32	0	Eval	Feb 16 2017	Expires in 26 days

## From CLI:

```
(Maniraj-Aruba-MM) [mynode] (config) #cd /mm
Maniraj-Aruba-MM) [mm] (config) #license-pool-profile-root
(Maniraj-Aruba-MM) ^[mm] (License root(/) pool profile) #
acr-license-enable          enable ACR feature
no                           Delete Command
pefng-licenses-enable       enable PEFNG feature
rfp-license-enable           enable RFP feature
webcc-license-enable         enable WebCC feature
xsc-license-enable           enable XSEC feature
(Maniraj-Aruba-MM) ^[mm] (License root(/) pool profile) #
```

# Installing License on Standalone

← Mobility Controller >

Mobility Controller

Maniraj-Aruba-VMC

Dashboard

Configuration

WLANs

Roles & Policies

Access Points

AP Groups

Authentication

Services

Interfaces

System

Tasks

Diagnostics

Maintenance

General

Admin

Airwave

CPSEC

Licensing

Certificates

SNMP

Logging

Profiles

Whitelist

More

Connect to external license server:

Usage

Usage Summary	Usage by This Controller		Usage by Other Controller		
	AP	PEF	RF Protect	ACR	WebCC
Feature Enabled	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scope	Per-AP	Per-AP	Per-AP	Per-Session	Per-AP
Licenses Installed	32	32	32	0	32
Expired Licenses	0	0	0	0	0
Active Licenses	32	32	32	0	32
Licenses Used	0	0	0	0	0
Licenses Remaining Available	32	32	32	0	32

> Inventory

# Standalone pointing to external server

← Mobility Controller >

Mobility Controller  
Maniraj-Aruba-VMC

Dashboard

**Configuration**

- WLANs
- Roles & Policies
- Access Points
- AP Groups
- Authentication
- Services
- Interfaces

**System**

- Tasks
- Diagnostics
- Maintenance

General Admin Airwave CPSEC **Licensing** Certificates SNMP

Connect to external license server:  IP address:

▼ Usage

▶ Inventory





Can't configure license server-ip when license root pool profile is configured. Please delete license-pool-profile-root first.

OK

# Adding Device Specific License From MM to MD

- MM can remotely adding an MD's box license to MD when MD's console access is blocked from configuration during zero touch provisioning.
- MM remotely installs box license on MD by specifying the MD's IP address and the license key.
- MM CLI infrastructure internally sends license installation request to the specified MD's IP address.
- MD processes the request and installs the license as if the command were issued on MD.
- MD finally sends the CLI response to MM with proper CLI execution results.
- We don't support remote license "delete" action command due to security reason.

← Mobility Master >

Mobility Master

Maniraj-Aruba-MM

Managed Network (1)

Mani-Banglore (1)

Maniraj-Aruba-MD

Configuration

Roles & Policies

Authentication

Services

Interfaces

Controllers

System

General Admin Airwave **Licensing** Certificates SNMP Logging Profiles

Usage Mobility Master Licenses **Controller Licenses**

Mani-Banglore

Maniraj-Aruba-MD

Maniraj-Aruba-MD Licenses

FEATURE	KEY
+	

← Mobility Master >

Mobility Master

Maniraj-Aruba-MM

Managed Network (1)

Mani-Banglore (1)

Maniraj-Aruba-MD

Configuration

Roles & Policies

Authentication

Services

Interfaces

Controllers

System

Install Licenses

To install new licenses you will need:

- ✓ The License Key for each service you wish to activate

Obtain License Keys from <https://licensing.arubanetworks.com>

Enter the license keys in the text box below, one key per line.

sNX9W3zt-sg96+vGw-smbRhK62-0yqgU58e-pmMf4ZIG-BkU

Cancel

OK

## Through CLI:

### Syntax:

- (Mobility Master) [mynode] #license remote ip-addr <ip of MD> add <License Key>

### Example:

- (Mobility Master) [mynode] #**license remote ip-addr** 10.16.10.33 **add** dZISoMMz-1ZsTr0DR-5bTBubyp-mDhDm7hQ-ZLibcbqp-xc7mOZJG-C4Qt/UgJ-DKts3b6H-AJmbd5PL-

(Maniraj-Aruba-MD) #Show log system 50

```
Jan 20 22:20:04 :399838: <3893> <WARN> |cfgm| handleLicenseMessage: State(READY:UPDATE SUCCESSFUL:CFGID-1:PEND-1:INITCFGID:1)
FD=26:Received License Update

Jan 20 22:20:04 :399838: <3893> <WARN> |cfgm| handleLicenseMessage: State(READY:UPDATE SUCCESSFUL:CFGID-1:PEND-1:INITCFGID:1)
FD=26:Moving out of activation state for License update.

Jan 20 22:20:04 :399838: <3893> <WARN> |cfgm| handleLicenseMessage: State(READY:UPDATE REQUIRED:CFGID-1:PEND-1:INITCFGID:1)
FD=26:License triggered config request sent

Jan 20 22:20:11 :399838: <3893> <WARN> |cfgm| Updating MM license limits limits:32

Jan 20 22:20:11 :399838: <3934> <WARN> |licensemgr| __license_send_fp_update sending update with PEFNG disabled

Jan 20 22:20:11 :399838: <3934> <WARN> |licensemgr| __license_send_fp_update 193 FEATURE_PEF_VPN is set

Jan 20 22:20:11 :399838: <3934> <WARN> |licensemgr| __license_send_fp_update sending update with RFP disabled

Jan 20 22:20:11 :399838: <3934> <WARN> |licensemgr| __license_send_fp_update sending update with XSEC disabled

Jan 20 22:20:11 :399838: <3893> <WARN> |cfgm| handleLicenseMessage: State(READY:UPDATE REQUIRED:CFGID--1:PEND-1:INITCFGID:1)
FD=26:Received License Update

Jan 20 22:20:11 :399838: <3893> <WARN> |cfgm| handleLicenseMessage: State(READY:UPDATE REQUIRED:CFGID--1:PEND-1:INITCFGID:1)
FD=26:License triggered config request sent

Jan 20 22:20:13 :334023: <3963> <ERRS> |profmgr| Config update for config node:/sc, cmd:user any sys-svc-telnet deny , error:
Failed to update configuration to application

Jan 20 22:20:15 :399838: <3893> <WARN> |cfgm| Saving config bitmap with PEF_VPN(3)(off)
```

# Subscription License(WebCC)

- In 6.5, We introduced WebCC subscription license but upon license expiry WebCC feature continue to work without any impact.
- In 6.5.1, The WebCC license enforcement will now affect the functionality and disallow the support of cloud lookup for Web Content classification.
- It is the same functionality in 8.x.
- WebCC license come with 1,3,5,7 or 10 years subscription.
- Subscription time starts from the time the license key is generated from the licensing Web site.
- The WebCC license usage is minimum active AP count received from STM and available WebCC license count.
- After License expires, grace period of 120 days is provided.
- Subscription licenses cannot be renewed.
- Licensemgr sends the WebCC license limits to apps. If a license expires the new limits are published accordingly.
- WebCC license enforcement will be done by WebCC App.
- From licensmgr publishes the apps an additional field for license which will be used to determine if WebCC license enforcement needs to be applied.

## **Enforcement Triggers:**

- When AP's UP are more than WebCC licenses limit in controller.
- When WebCC license expires.

## **Note:**

- WebCC classification works with only controller cache when enforcement triggers.
- In Centralized license enabled case, The Cloud updates will be disabled in all the nodes.



## When AP's License usage is greater than WebCC license.

```
(Maniraj-Aruba-MM) ^[mm] #show license-usage client
```

```
License Clients License Usage for pool /
```

```
-----
```

Hostname Lic.	IP Address Last update (secs. ago)	Mac addr	AP Lic.	PEF Lic.	RF Protect Lic.	xSec Lic.	ACR Lic.	WebCC Lic.	MM Lic.	VMC
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---
Maniraj-Aruba-MM 10	10.17.164.179	00:0c:29:fc:b5:63	2	0	0	0	0	1	0	0
Maniraj-Aruba-MD 21	10.17.169.151	00:1a:1e:00:b7:a8	0	0	0	0	0	0	1	0
<b>TOTAL</b>			<b>2</b>	0	0	0	0	<b>1</b>	1	0

```
Total no. of clients: 2
```

```
(Maniraj-Aruba-MM) ^[mm] #show web-cc status
```

```
Web Content Classification Status
```

```
-----
```

```
Service                               Status
```

```
-----
```

```
Web Content Classification enabled : Yes
```

```
DNS/Name Server configured : Yes
```

```
URL Cloud lookup server reachable : Yes
```

```
Cloud lookup/update available : No
```

- **When AP's License usage is equal to WebCC license.(We install an additional WebCC license to match AP license)**

```
Maniraj-Aruba-MM) ^[mm] # show license
```

```
291a2Kb2-tDLp7tZT-DxAmSs+S-nfwGEz00-CMORopJX-bpk 2017-01-18 Never E Access Points: 2
WleN0hke-5P+jxmu9-QsPFcNwB-FDGpTg49-q18U5Ros-a1I 2017-01-18 2018-01-18 (2017-04-18) ES WebCC: 1
AWgsgyQ1-ot05CZ7k-incbKLe/-x6Zlycnd-Qpwcc2VO-zc8 2017-01-19 2018-01-19 (2019-04-19) ES WebCC: 1
```

```
Maniraj-Aruba-MM) ^[mm] #show license-usage client
```

```
License Clients License Usage for pool /
```

```
-----
Hostname          IP Address      Mac addr          AP Lic.  PEF Lic.  RF Protect Lic.  xSec Lic.  ACR Lic.  WebCC Lic.  MM Lic.  VMC
Lic. Last update (secs. ago)
-----
-----
Maniraj-Aruba-MM 10.17.164.179  00:0c:29:fc:b5:63 2         0         0                0         0         2         0         0
10
Maniraj-Aruba-MD 10.17.169.151  00:1a:1e:00:b7:a8 0         0         0                0         0         0         1         0
21
TOTAL              2             0             0                0         0         2             1         0
Total no. of clients: 2
```

```
(Maniraj-Aruba-MM) ^[mm] #show web-cc status
```

```
Web Content Classification Status
```

```
-----
```

```
Service                               Status
```

```
-----
```

```
Web Content Classification enabled : Yes
```

```
DNS/Name Server configured : Yes
```

```
URL Cloud lookup server reachable : Yes
```

```
Cloud lookup/update available : Yes
```

- **When WebCC license Expires**

```
Maniraj-Aruba-MM) ^[mm] # show license
```

```
291a2Kb2-tDLp7tZT-DxAmSs+S-nfwGEz00-CMORopJX-bpk 2017-01-18 Never E Access Points: 2
DxAmSs+S-5P+jxmu9-QsPfcNwB-FDGpTg49-x6Zlycnd-ali 2016-01-18 Expired (Expired) S WebCC: 1
AWgsgyQ1-otO5CZ7k-incbKLe/-x6Zlycnd-Qpwcc2VO-zc8 2017-01-19 2018-01-19 (2019-04-19) ES WebCC: 1
```

```
(Maniraj-Aruba-MM) ^[mm] #show license-usage client
```

```
License Clients License Usage for pool /
```

```
-----
Hostname          IP Address      Mac addr          AP Lic.  PEF Lic.  RF Protect Lic.  xSec Lic.  ACR Lic.  WebCC Lic.  MM Lic.  VMC
Lic. Last update (secs. ago)
-----
-----
Maniraj-Aruba-MM  10.17.164.179  00:0c:29:fc:b5:63  2        0         0                0         0         1         0         0
10
Maniraj-Aruba-MD  10.17.169.151  00:1a:1e:00:b7:a8  0        0         0                0         0         0         1         0
21
TOTAL                2            0            0                0         0         1            1         0
Total no. of clients: 2
```

```
(Maniraj-Aruba-MM) ^[mm] #show web-cc status
```

```
Web Content Classification Status
```

```
-----
```

```
Service                               Status
```

```
-----
```

```
Web Content Classification enabled : Yes
```

```
DNS/Name Server configured : Yes
```

```
URL Cloud lookup server reachable : Yes
```

```
Cloud lookup/update available : No
```

# CREATING LICENSE POOL

Mobility Master

Maniraj-Aruba-MM

Managed Network (1)

Mani-Banglore (1)

Maniraj-Aruba-MD

Configuration

Roles & Policies

Authentication

Services

Interfaces

Controllers

System

General Admin Airwave **Licensing** Certificates SNMP Logging Profiles Whitelist More

Usage	Mobility Master Licenses		Controller Licenses				
	AP	PEF	RF Protect	ACR	WebCC	MM	VMC
Global License Pool	0/32	0/32	0/32	0/0	0/32	1/32	0/32
Mani-Banglore	0	0	0	0	0	0	0
Maniraj-Aruba-MD	0	0	0	0	0	1	0

License Pool For

Enable local license pool:

	AP	PEF	RF Protect	ACR	WebCC	MM	VMC
Scope	Per-AP	Per-AP	Per-AP	Per-Sess...	Per-AP	Per-Device	Per-Device
Allocated Licenses	0	0	0	0	0	0	0



### Allocate Licenses

LICENSE TYPE	LICENSE KEY	EXPIRATION DATE	TOTAL	AVAILABLE	ALLOCATE TO THIS POOL
Eval	z0nFTS4c-rUkHnyRJ-qHpJtdPK...	2017-02-16 11:52:11	32	32	<input type="text" value="12"/>
Totals			32	32	12

Cancel

OK

#### License Pool For

Enable local license pool:

	AP	PEF	RF Protect	ACR	WebCC	MM	VMC
Scope	Per-AP	Per-AP	Per-AP	Per-Sess...	Per-AP	Per-Device	Per-Device
Allocated Licenses	12	0	0	0	0	0	0

← Mobility Master >

Mobility Master

Maniraj-Aruba-MM

Managed Network (1)

Mani-Banglore (1)

Maniraj-Aruba-MD

Configuration

Roles & Policies

Authentication

Services

Interfaces

Controllers

System

General Admin Airwave **Licensing** Certificates SNMP Logging Profiles White

Usage	Mobility Master Licenses	Controller Licenses			
		AP	PEF	RF Protect	ACR
⊖ Global License Pool		0/32	0/32	0/32	0/0
⊖ Mani-Banglore		0	0	0	0
⊖ Maniraj-Aruba-MD		0	0	0	0

License Pool For

Enable local license pool:

	AP	PEF	RF Protect	ACR	WebCC	MM	VMC
Scope	Per-AP	Per-AP	Per-AP	Per-Sess...	Per-AP	Per-Device	Per-Device
Allocated Licenses	12	12	12	0	12	0	0

# After Applying Changes

← Mobility Master >

## Mobility Master

Maniraj-Aruba-MM

Managed Network (1)

Mani-Banglore (1)

Maniraj-Aruba-MD

## Configuration

Roles & Policies

Authentication

Services

Interfaces

Controllers

## System

General Admin Airwave **Licensing** Certificates SNMP Logging Profiles Whitelist More

Usage	Mobility Master Licenses	Controller Licenses						
		AP	PEF	RF Protect	ACR	WebCC	MM	VMC
⊖ Global License Pool		0/20	0/20	0/20	0/0	0/20	0/32	0/32
⊖ Mani-Banglore License Pool		0/12	0/12	0/12	0/0	0/12	1/0	0/0
Maniraj-Aruba-MD		0	0	0	0	0	1	0

## Eval License:

```
(Maniraj-Aruba-MM) [mm] (config) #license-pool-profile "/md/Mani-Banglore"
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") #ap-licenses eval key "z0nFTS4c-rUkHnyRJ-qHpJtdPK-GXdL2UCL-UcyGGnuw-YxzkCJS3-jvbmSxL+-cbzSFZlj-MNAEvYz/-NEQ" 12
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") # pefng-licenses eval key "J6kL3BzQ-jLSyTL+/-ByJi+Bpc-lvsEDKkd-kQV6VQ3r-XA/az5QT-YyOQH4Xz-I4ZcLHxp-e4DQ96Z9-5G8" 12
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") # rfp-licenses eval key "YnUvN6cV-XG4p+ssF-+tUU3/HZ-bUvIBMYe-16pT+F7r-15xwzZRg-NSK2GM1Q-P+DuYd/m-KerLxXDC-jWg" 12
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") # webcc-licenses eval key "jGgl+NLl-MVifMjVq-JMVpusWw-xL4O9seI-PPQUQ2Yv-HHDKLBV0-kkmarJTn-1yUE91Sa-eK+rZETx-I18" 12
```

## Permanent License:

```
(Maniraj-Aruba-MM) [mm] (config) #license-pool-profile "/md/Mani-Banglore"
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") #ap-licenses 12
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") # pefng-licenses 12
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") # rfp-licenses 12
```

```
(Maniraj-Aruba-MM) [mm] (License pool profile "/md/Mani-Banglore") # webcc-licenses 12
```

# Useful Commands

## On License Server:

- `Show license debug`
- `Show license aggregate`
- `Show license server-table`
- `Show license-usage client`
- `Show license keys`
- `Show license platform-limits`
- `Show license-pool-profile <profile>`
- `Show license-pool-profile-root`
- `Show license heartbeat stats`
- `Show master-redundancy`
- `Show license key xxx pool-associations`

## On License Client:

- Show license debug
- Show license client-table
- Show license-usage ap/user/client
- Show license platform-limits

### **Logging:**

```
logging level debugging system process licensemgr
```

### **Other Useful Commands:**

```
show web-cc status
```

```
show log system all | include licensemgr
```

```
show log errorlog all | include licensemgr
```

```
show snmp trap-list | include License
```

```
show snmp trap-queue | include license
```

THANK YOU FOR YOUR TIME 😊!