Aerohive Quick Installation Guide

for PacketFence version 7.4.0

Aerohive Quick Installation Guide

by Inverse Inc.

Version 7.4.0 - Jan 2018

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About this Guide

This guide has been created in order to help sales engineers, product managers, or network specialists demonstrate the PacketFence capabilities on-site with an existing or potential customer. It can also provide guidelines to setup a proof of concept for a potential PacketFence deployment using the Aerohive equipment.

The instructions are based on version 7.4.0 of the PacketFence Live Image.

Assumptions

- You will need a USB key with a capacity of at least 4GB;
- You will need a laptop or a PC from which the PacketFence Live USB key will run from;
- You will deploy a VLAN enforcement environment according to the customer specifications;
- Your customer will provide the network equipment (switch, cables, etc) to interconnect this PoC setup;
- Aerohive Access Point is loaded with HiveOS with version 6 or later;
- HiveManager with version 6 or later.

Quick Deployment

Step 1: Pre-load

This step is only necessary in the case you don't already have a pre-loaded PacketFence USB key. If you already have one, proceed to step 2, otherwise, follow these quick and simple instructions to pre-load a new USB key with PacketFence.

Note

The following process will remove everything from the USB key so if you currently have stuff on it, make sure to do backups!

Download the PacketFence USB key image

Make sure you have the latest version of the PacketFence USB key image.

Download the application to write the image to the USB key

To write the PacketFence image on a USB key, you'll need to use a third-party application that will provide you with a graphical interface to do so.

Go to https://launchpad.net/win32-image-writer/0.6/0.6/+download/win32diskimager-binary.zip. That will download the necessary application. Once downloaded, extract the zip file.

Write the PacketFence image to the USB key

First, make sure your USB key is plugged into the PC then open up the folder where you extracted the application and double-click the Win32DiskImager.exe file. Once done, simply choose the PacketFence USB image file (unzipped .img file), choose the device on which you want to write and click *Write*.

Step 2: Configure Network and PacketFence

The next step is the network setup and the PacketFence configuration. The following step is usually performed when you arrive at a customer site. Sometimes, you will know the network settings in advance, sometimes not. If you want to save time, you should ask/tell the client what is needed in order to have the demonstration running smoothly. That way, you will be able to preconfigure the PacketFence environment prior arrival.

Preliminary Questions

Here is a quick list of questions to ask to a customer in order to easily configure a PacketFence environment:

1. What is the VLAN ID and subnet to be used for a registration VLAN? (ie. VLAN ID 2, Subnet 192.168.2.0/24)
2. What is the VLAN ID and subnet to be used for an isolation VLAN? (ie. VLAN ID 3, Subnet 192.168.3.0/24)
3. What is the VLAN ID of the production VLAN? (ie. VLAN ID 10)
4. A list of production DHCP server(s) (for rogue DHCP detection)

Steps for the customer

Some steps needs to be taken by the customer for having the network ready. Here is a list of what we think should be ready for a demo:

- 1 TRUNK port to connect the demonstration PC which will run the PacketFence environment. The native VLAN should be a management VLAN that will be used for communication between the equipment and the environment
- 1 TRUNK port to connect the AP

Configuring your PacketFence environment

Simply plug the previously created USB key in one of the demonstration PC USB port. You will have to make sure the PC will boot from the USB key (it is usually a pre-boot option or a setting in the BIOS).

Before booting, make sure the network cable coming from the TRUNK port for the demonstration PC is correctly plugged in the switch and the PC and that the link is up.

Once powered, the PC will boot from the USB key and will automatically get to a graphical user interface with an opened web browser prompting for PacketFence configuration. The configuration process is a five steps process at the end of which, the USB key will be a persistent working PacketFence environment.

Step 1: Enforcement

The first and most important step of the configuration process. This is where you'll choose the enforcement technique; either VLAN (out-of-band), INLINE (in-band) or WebAuth.

The choice(s) made on this step will influence the next step where you'll need to configure the different networks.

Each enforcement mode has its own required interface types that you'll have to configure on step 2.

VLAN enforcement

Step 2: Networks

This step will ask you to statically configure your network interfaces (note that DHCP interfaces configuration is not supported yet).

Depending on the choice(s) made on step 1, you'll have to configure the required types of interface. The web interface will list all currently installed network interfaces on the system. An IP and a netmask will be visible if the network interface is configured (either by DHCP or already manually configured). You can edit those ones, create/delete VLANs on physical interfaces and enable/disable an interface. Note that theses changes are effective on the moment you make them. Persistence will be written only for ENABLED interfaces.

In all time, you'll need to set a Management interface.

Required interface types for inline enforcement:

```
Management
Inline
```

Required interface types for VLAN enforcement:

```
Management
Registration
Isolation
```

Note that you can only set ONE (1) management interface. This one will work for both in the case you choose both modes.

In our customer scenario, you will create two new vlans on the wired interface (will be eth0 most of the time). To do so, click the *Add VLAN* button besides the wired interface for each of the needed vlan:

Here's a sample configuration for both of them:

Registration

```
Virtual LAN ID: 2
IP Address: 192.168.2.1
Netmask: 255.255.255.0
```

Isolation

```
Virtual LAN ID: 3
IP Address: 192.168.3.1
Netmask: 255.255.255.0
```

Don't forget to also edit the physical interface with the correct management network information by clicking the *Edit* button next to it.

According to our customer scenario, you will associate the correct type the each interfaces.

```
eth0: Management
eth0 VLAN 2: Registration
eth0 VLAN 3: Isolation
```

Make sure that those three (3) interfaces are in an Enabled state for the persistence to occur.

We also need to set the Default Gateway which will generally be the gateway of the management network.

Once everything's set, click *Continue* to proceed with the next step.

Step 3: Database Configuration

This step will configure the MySQL server needed by PacketFence. Database and schema will be created as well as the necessary user for operations. Root account will also be secured if necessary (set a password and disallow remote login).

Since Debian based MySQL installations are not "secured", you will need to go through it. That step is fairly simple to accomplish and is a one time deal.

In the root account credentials section, enter root as Username and click *Test*. You'll be prompted for a new root password. Choose a password for the MySQL root user and click *Save*. You can now enter your newly created password in the root account credentials section and click *Test*.

Next section of this step is the PacketFence user account on the MySQL server. Simply leave the default pf username here and choose of a password. This one will automatically be set in the PacketFence configuration where you'll be able to retrieve it in any case. Once the password entered twice, click *Create user*.

Third section will create the database and load the correct schema on it. Simply leave the default and click *Create tables and indexes*.

You should have *Success* beside these three section, click *Continue*.

Step 4: PacketFence Configuration

This step will configure the general options of your PacketFence installation. Theses are needed configurations that will most of the time fits customer specifications.

Almost all of the required information here are self-explanatory. The only one that could be confusing is the DHCP Servers section. In this one, enter a comma-delimited list of all the DHCP Server on the customer network so when PacketFence will see DHCP traffic originating from these IPs, no rogue-dhcp alerts will be triggered.

Click *Continue* once all the fields are completed.

Step 5: Administration

This is the step where you create the administrative user to access the PacketFence Administration Web Interface.

Simply provide the desired username and password, then click *Create user*.

Step 6: Services - Confirmation

The last but not the least. Here, you start the PacketFence server according to the configurations made in the previous steps. If everything goes as expected, you'll be prompted by a window inviting you to continue to the web administration interface.

You'll be able to login to the PacketFence web administration interface with the credentials created in Step 4.

Services status will help you monitor if everything goes as expected. If not, you'll see which service is in trouble and the log output will help you determine the problem that occurs.

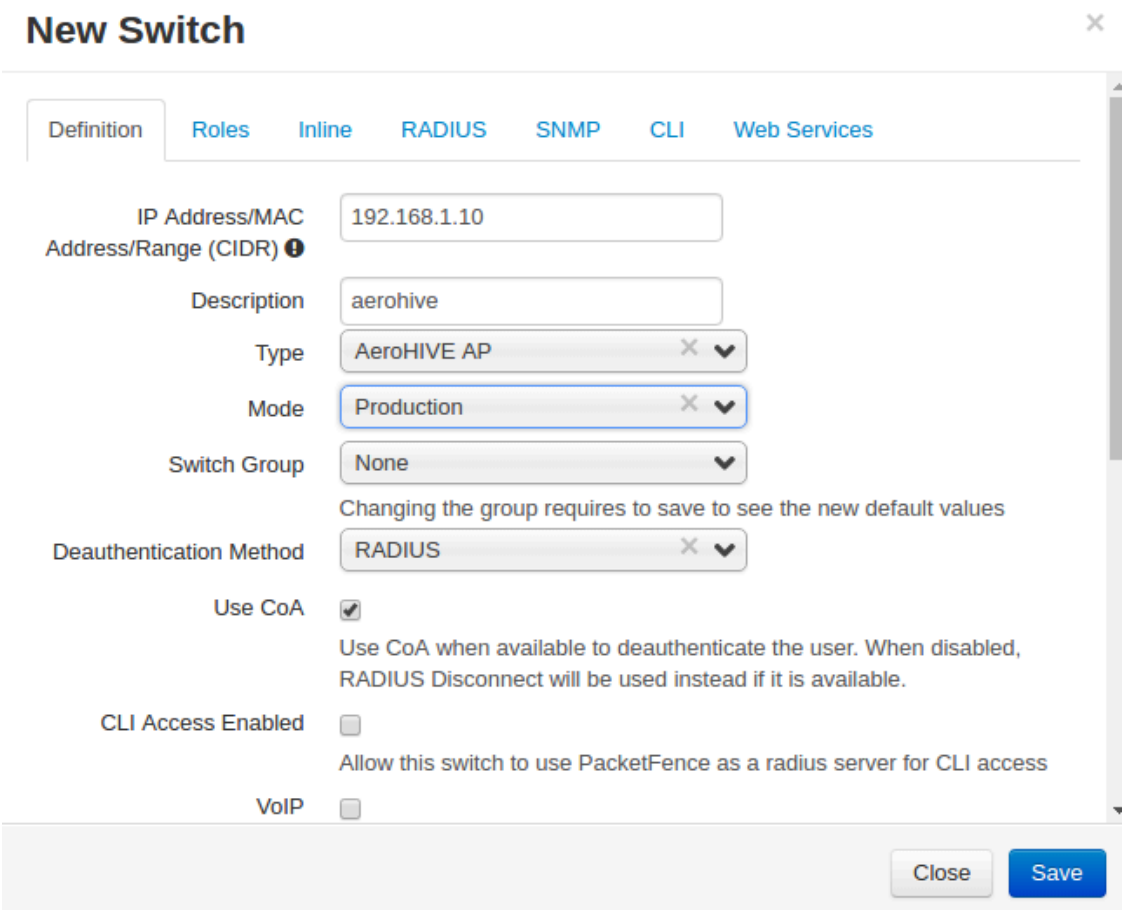
Configuring Aerohive access point in PacketFence

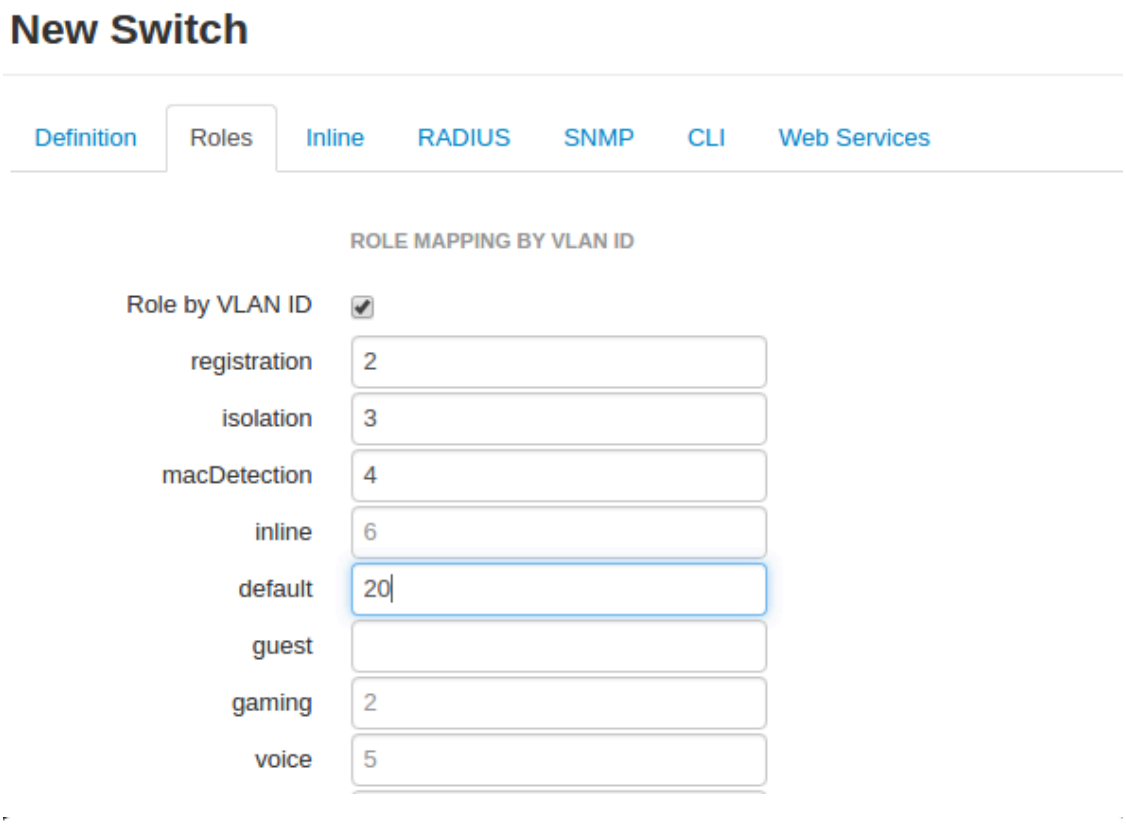
Now that you have a fully functional PacketFence installation, you'll need to add the Aerohive AP to the PacketFence switches database for correct integration.

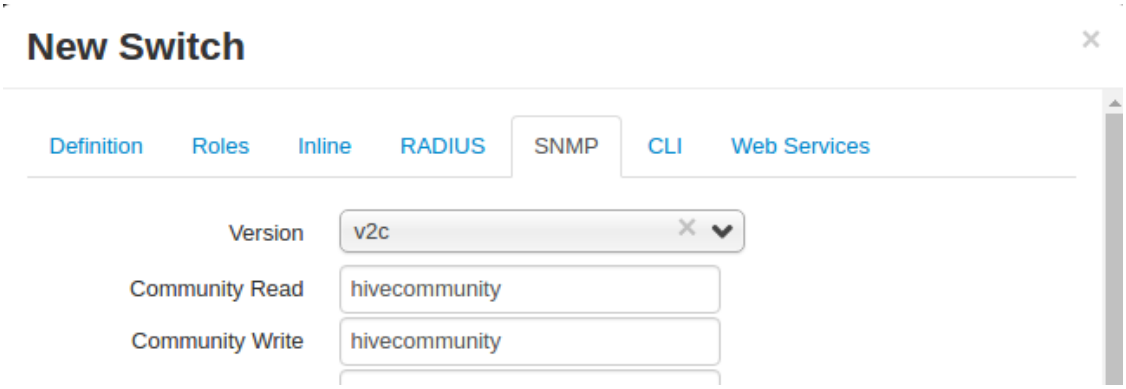
To do so, login to the PacketFence web administration interface if it is not already done. Click on the *Configuration* tab and select the Switches section.

We'll use the clone function to add a new switch (the AeroHive AP) to the PacketFence database. With the mouse pointer, go over the default switch and you'll see a set of icons appearing at the left of it. Click on the second one (a paper sheet with a plus sign).

Configure the switch like the following:


New Switch
Definition
Roles
Inline
RADIUS
SNMP
CLI
Web Services
IP Address/MAC Address/Range (CIDR)
192.168.1.10
Description
aerohive
Type
AeroHIVE AP
Mode
Production
Switch Group
None
Changing the group requires to save to see the new default values
Deauthentication Method
RADIUS
Use CoA
Use CoA when available to deauthenticate the user. When disabled, RADIUS Disconnect will be used instead if it is available.
CLI Access Enabled
Allow this switch to use PacketFence as a radius server for CLI access
VoIP
Close
Save





Modify your RADIUS secret.

Click *Add switch*

The newly added access point should show up in the list.

PacketFence configuration is done. You may now reboot the demonstration PC (leave the USB key in). Once rebooted, the web browser should open in the PacketFence web administration interface.

WebAuth Enforcement

Step 2: Networks

This step will ask you to statically configure your network interfaces (note that DHCP interfaces configuration is not supported yet).

Depending on the choice(s) made on step 1, you'll have to configure the required types of interface. The web interface will list all currently installed network interfaces on the system. An IP and a netmask will be visible if the network interface is configured (either by DHCP or already manually configured). You can edit those ones, create/delete VLANs on physical interfaces and enable/disable an interface. Note that theses changes are effective on the moment you make them. Persistence will be written only for ENABLED interfaces.

In all time, you'll need to set a Management interface.

Required interface types for WebAuth enforcement:

```
portal
```

Note that you can only set ONE (1) management interface. This one will work for both in the case you choose both modes.

As an example we will use the Management interface as our portal interface. You will need to *portal* in the setting *Additional listening daemon(s)*.

According to our customer scenario, you will associate the correct type the each interfaces.

```
eth0: Management
```

Make sure that this interface is in an Enabled state for the persistence to occur.

We also need to set the Default Gateway which will generally be the gateway of the management network.

Once everything's set, click *Continue* to proceed with the next step.

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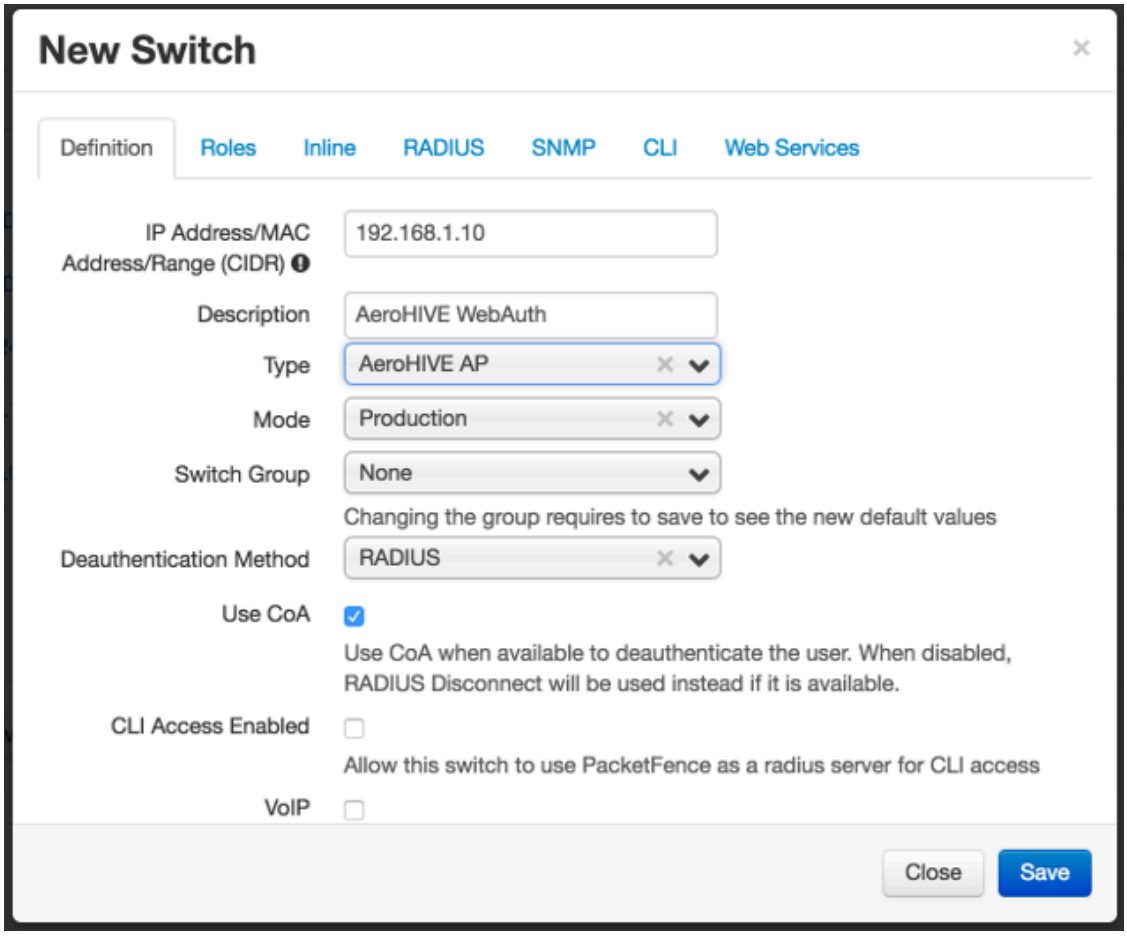
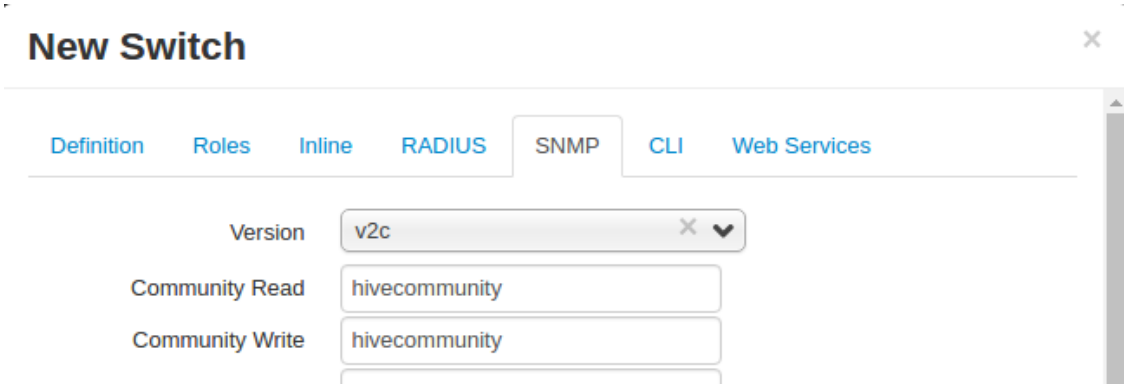
Configure the switch like the following:



The section Roles should be empty while doing webauth.



Under the tab RADIUS, please set your RADIUS secret.

Click *Add switch*

The newly added access point should show up in the list.

PacketFence configuration is done. You may now reboot the demonstration PC (leave the USB key in). Once rebooted, the web browser should open in the PacketFence web administration interface.

Step 3: Configure Aerohive

This section will help you configure your Aerohive AP for integration with PacketFence using the VLAN-based enforcement.

Connect APs and Controller

First thing to do is to connect the HiveManager. Like you saw in Step 2, make sure to connect the AP on the TRUNK port configured for it.

Provision the HiveManager

By default, the HiveManager might be empty, add your AP via its serial number. If necessary update the firmware of the HiveManager and the AP.

Note

Please refer to the *Aerohive Quick Devices Start Guide* to add devices: http://docs.aerohive.com/330000/docs/help/english/documentation/AerohiveDevicesQuickStart.pdf

Note

Please refer to the following guide to learn more about the HiveManager: http://docs.aerohive.com/330000/docs/help/english/documentation/Aerohive_HiveManagerNG_GettingStartedGuide.pdf

VLAN Enforcement

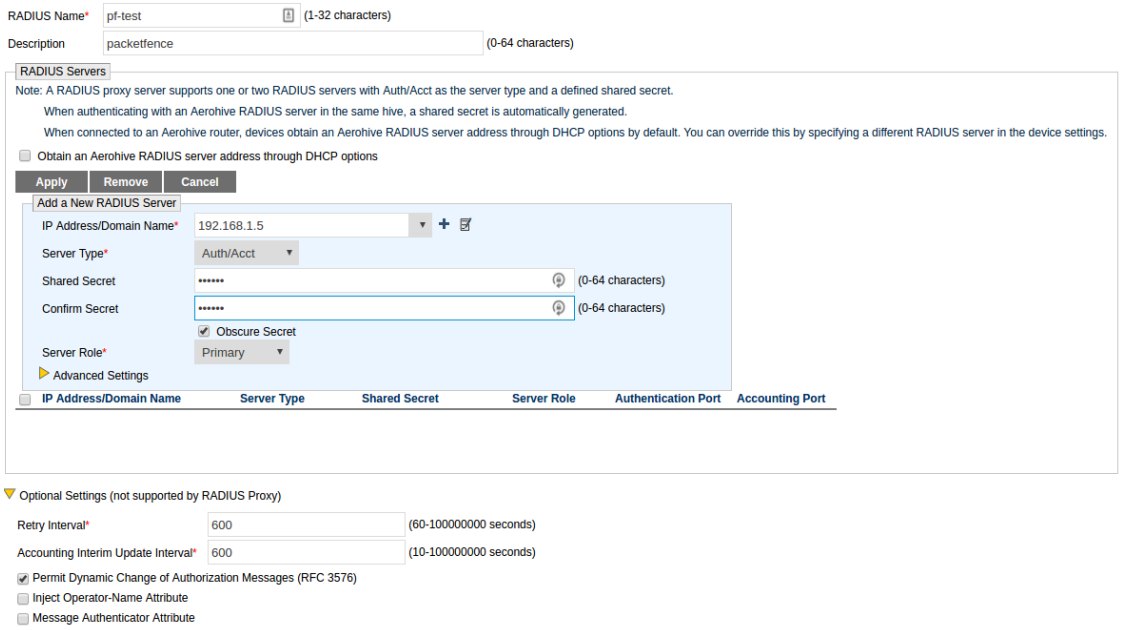
Setup the SSIDs

In this guide, we will configure one open SSID using RADIUS MAC-based filtering and one secured SSID using WPA2 Enterprise.

Login to your HiveManager using the admin credentials. You should see the Dashboard. Click on the *Configure* pane, and follow the following steps.

Configure the AAA Servers

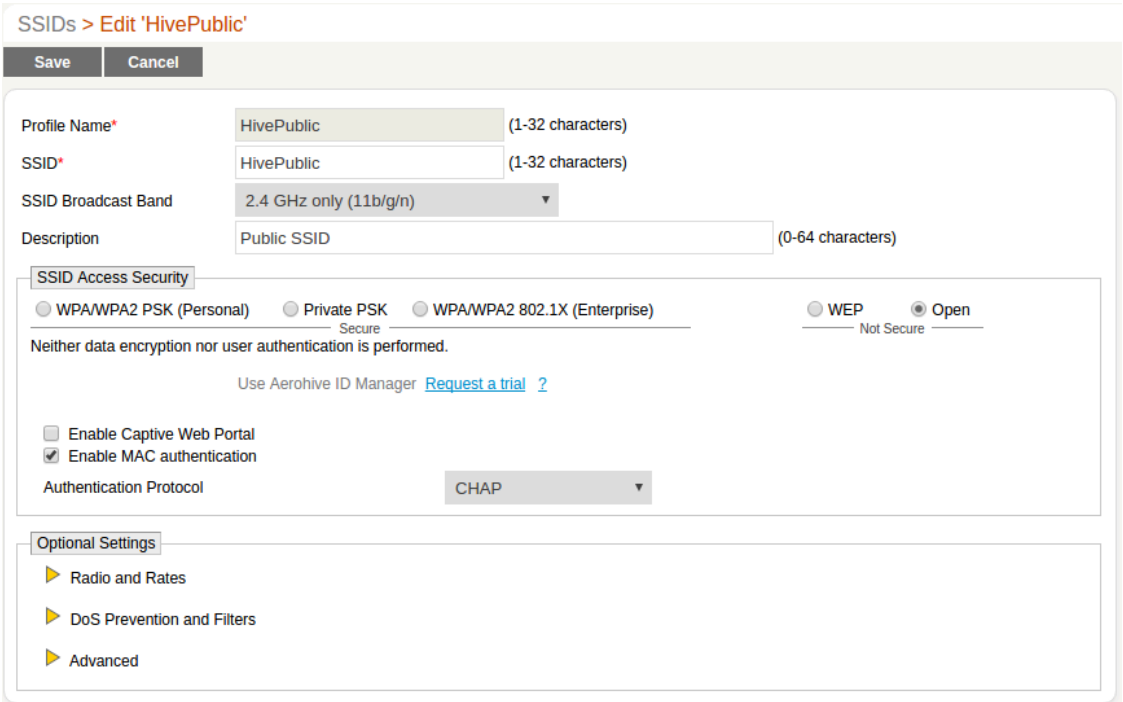
On the left menu, click on *Advanced Configuration*, then *Authentication*, then *AAA Client Settings*. We need to add the PacketFence RADIUS server here. Click on the *New* button, and provide follow this configuration.



Click Ok to save your changes.

Configure the Open SSID

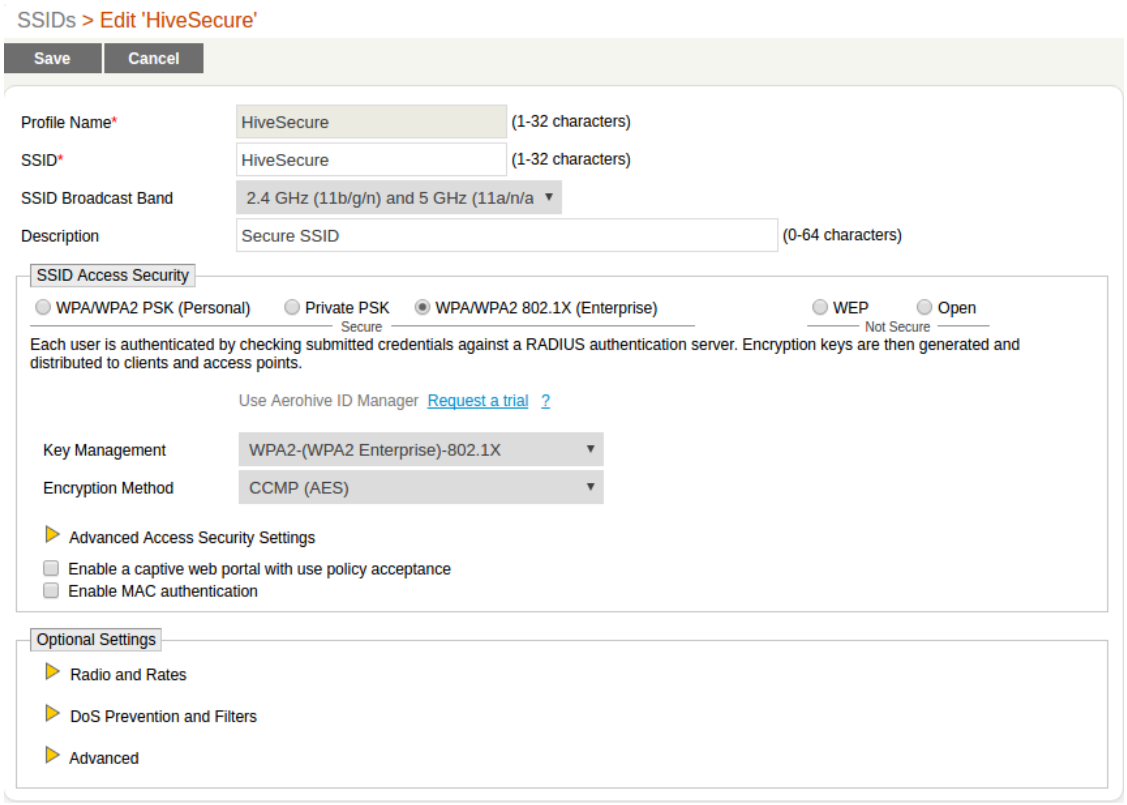
On the left menu, click on *SSIDs*. Click the *New* button, and configure the SSID like in the following screen capture:



Click OK to save the SSID.

Configure the Secure SSID

On the left menu, click on *SSIDs*. Click the *New* button, and configure the SSID like in the following screen capture:

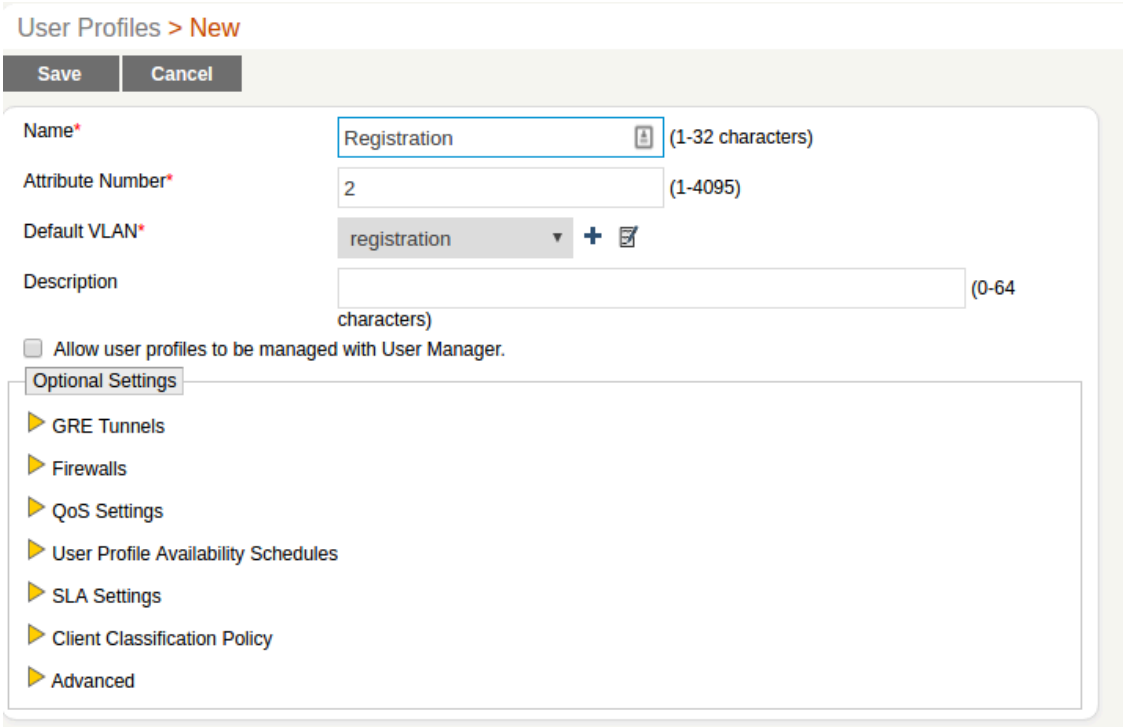


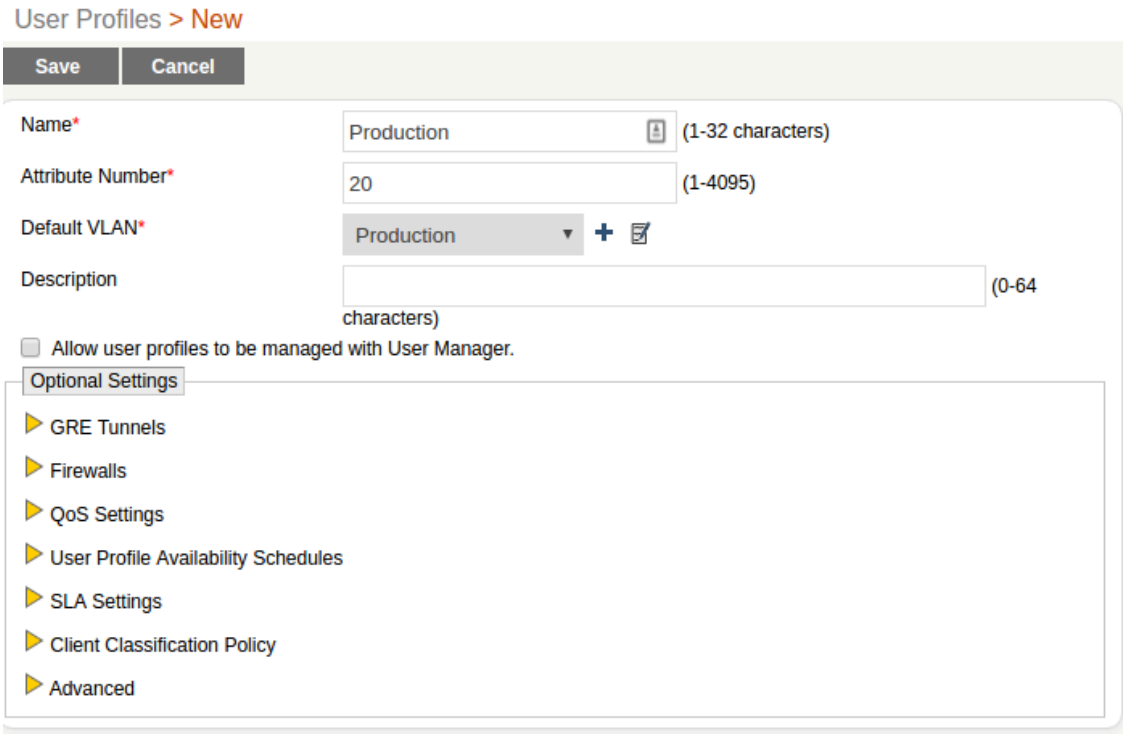
Click OK to save the SSID.

Configure User Profile

You will now need to create user profile matching your VLAN assignments, the "Default VLAN" have been created before to match the desired VLAN number.

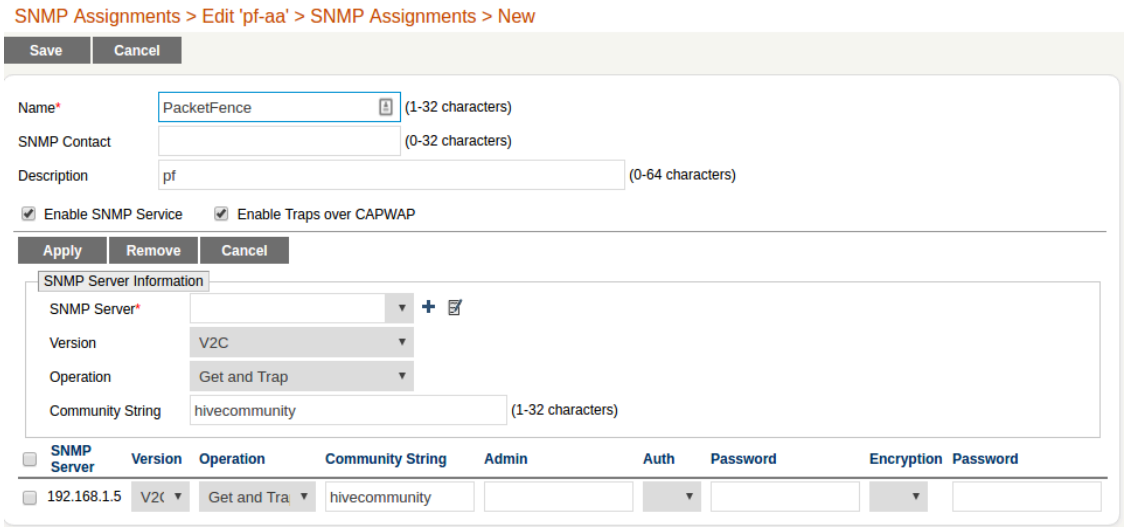
Create user profile as follow:





Configure SNMP

You now need to configure the SNMP to add a valid read community string. Click on the *Configure* pane, and on *Advanced Configuration*, then *Management Policies*, then *SNMP Assignments*. Now click on *New* and follow this configuration.



WebAuth Enforcement

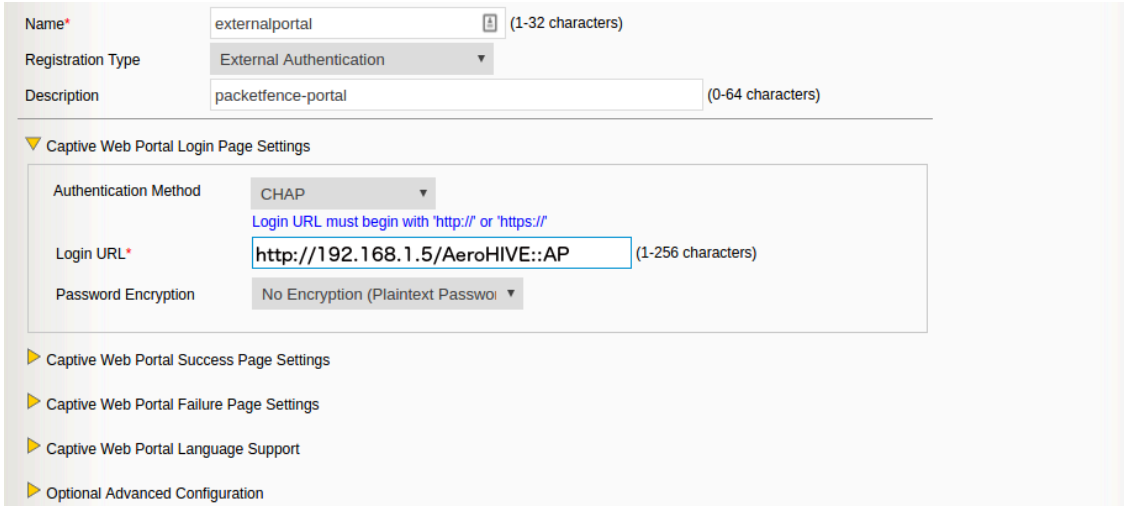
Setup the SSIDs

In this guide, we will configure one open SSID using RADIUS MAC-based filtering and one secured SSID using WPA2 Enterprise.

Login to your HiveManager using the admin credentials. You should see the Dashboard. Click on the *Configure* pane, and follow the following steps.

Configure the External Captive Portal

On the left menu, click on *Advanced Configuration*, then *Authentication*, then *Captive Web Portals*. Click on *New* to create a Captive Portal, configure it as follow:



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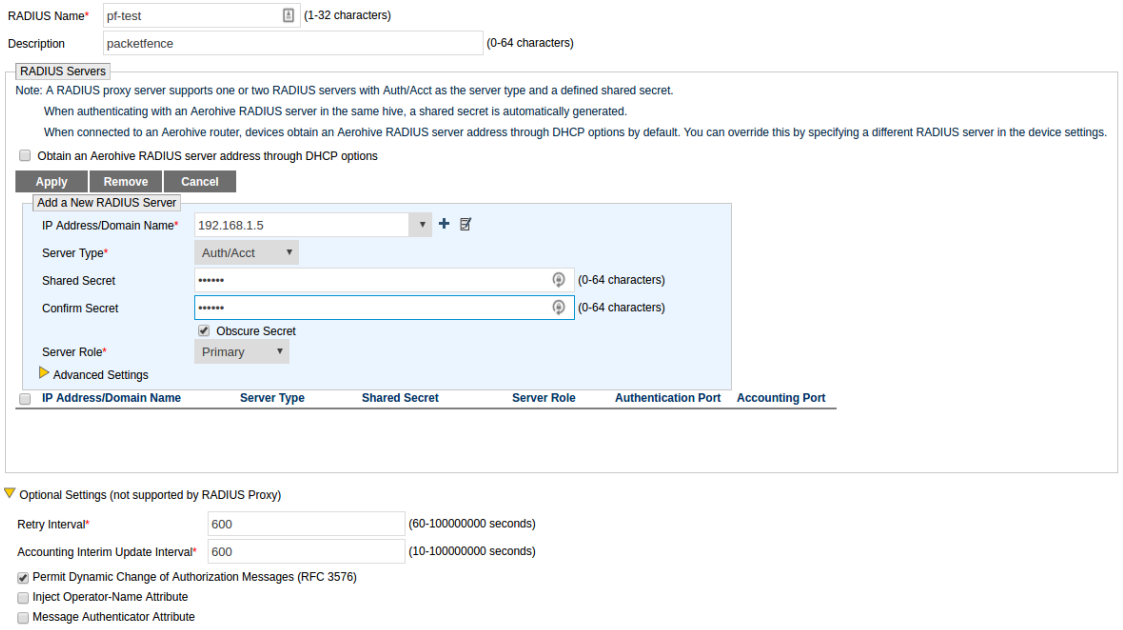
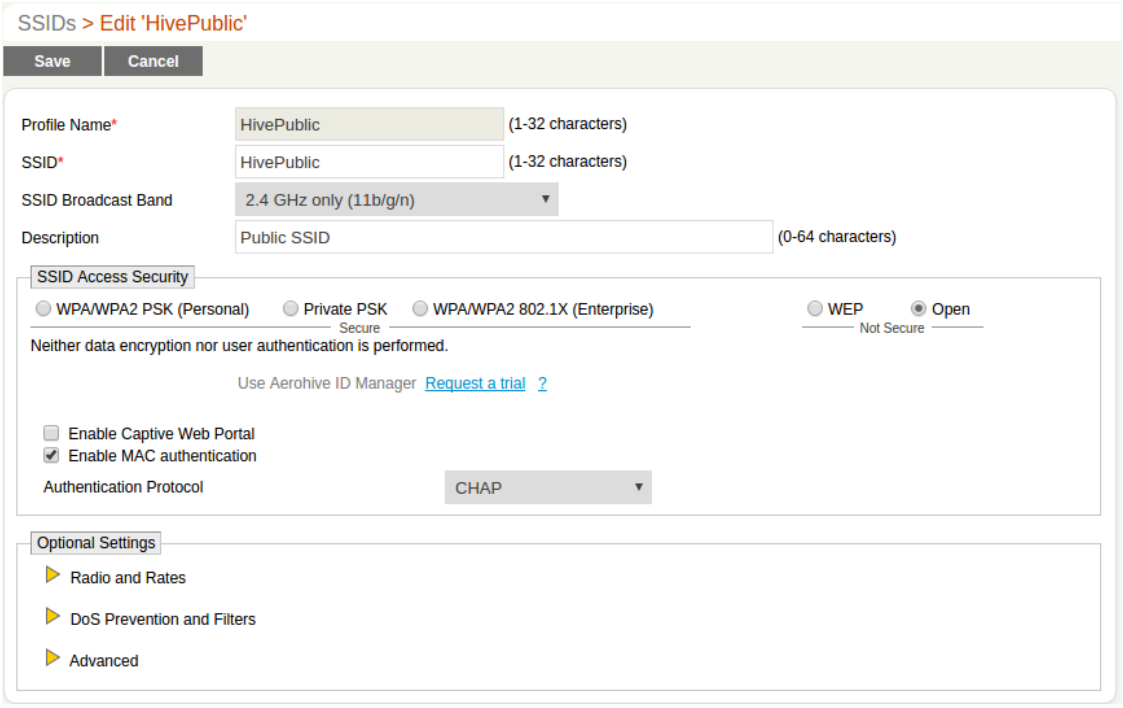
On the left menu, click on *Advanced Configuration*, then *Authentication*, then *AAA Client Settings*. We need to add the PacketFence RADIUS server here. Click on the *New* button, and provide follow this configuration.



Click Ok to save your changes.

Configure the Open SSID

On the left menu, click on *SSIDs*. Click the *New* button, and configure the SSID like in the following screen capture:



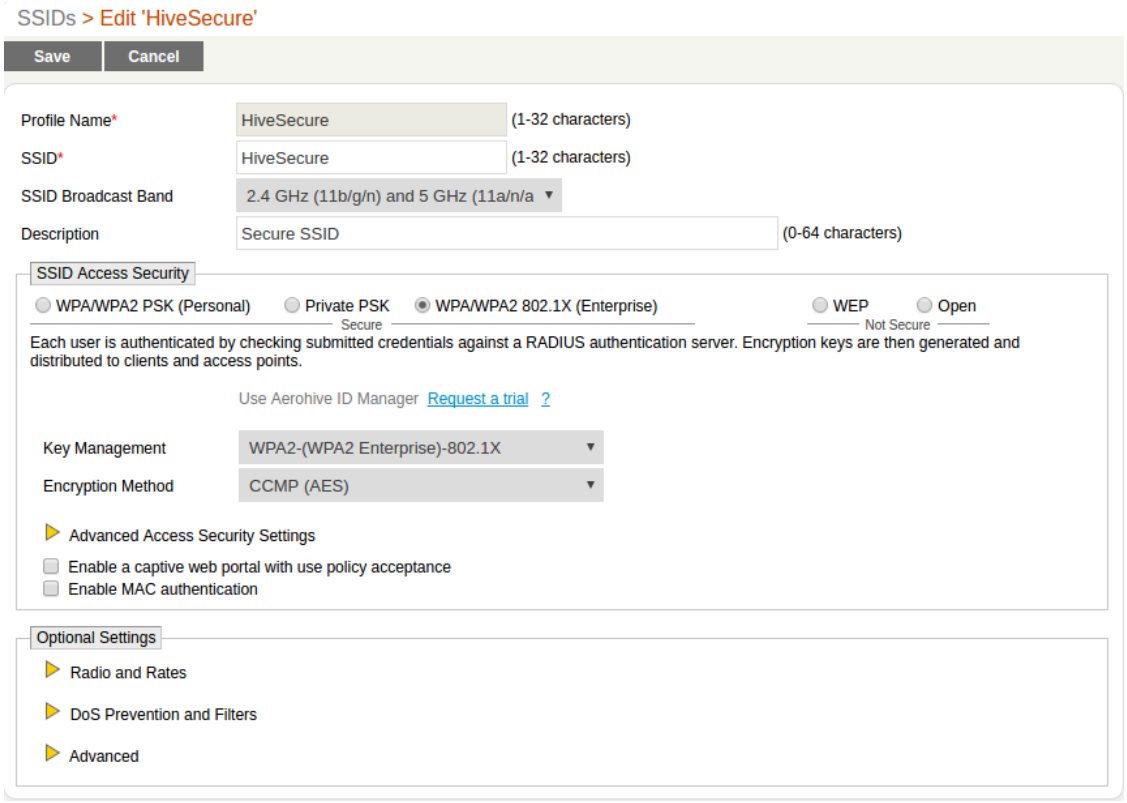
Note

Make sure to select *Enable Captive Web Portal* when using Webauth.

Click OK to save the SSID.

Configure the Secure SSID

On the left menu, click on *SSIDs*. Click the *New* button, and configure the SSID like in the following screen capture:



Note

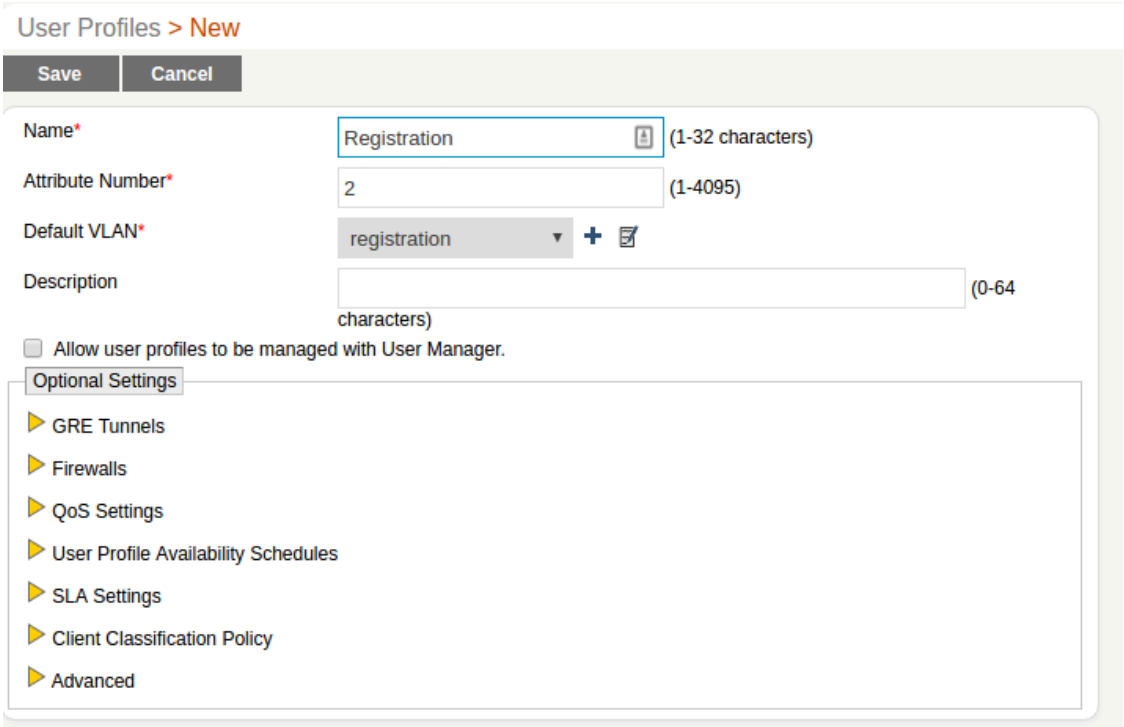
Make sure to select *Enable Captive Web Portal* when using Webauth.

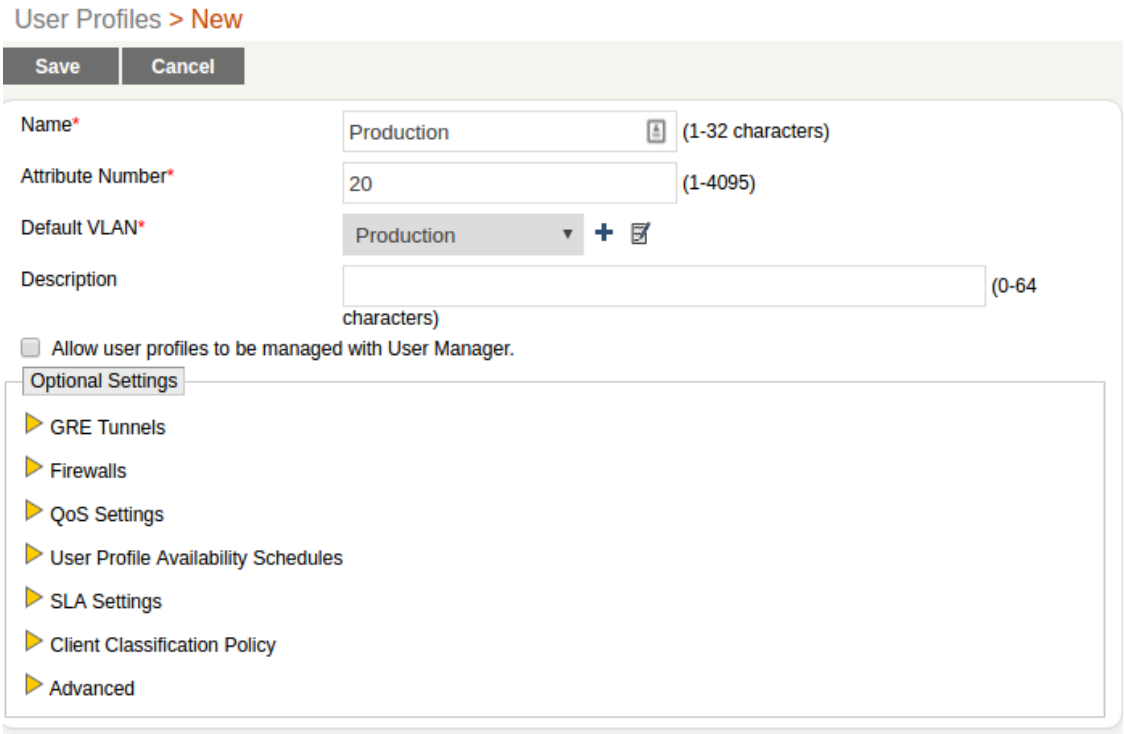
Click OK to save the SSID.

Configure User Profile

You will now need to create user profile matching your VLAN assignments, the "Default VLAN" have been created before to match the desired VLAN number.

Create user profile as follow:





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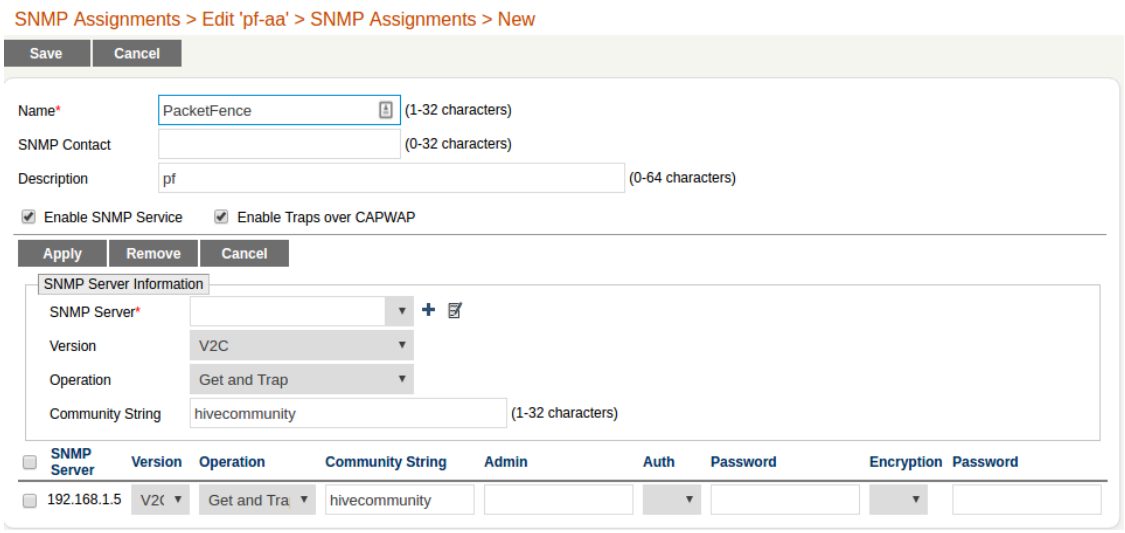

Step 4: Configuration of Windows 7 client for DemoSecure

In `Control Panel\Network and Internet\Manage Wireless Networks`, click on *Add*. Click *Manually create a network profile*

```
Network name: DemoSecure
Security type WPA2-Enterprise
Encryption AES
```

Next, change connection settings. On Security tab, click *Settings*, uncheck Validate server certificate. On the same tab click *Configure* and uncheck Automatically use my Windows logon name and password. Return on the Security tab and click on *Advanced settings*. On 802.1X settings, click on *Specify authentication mode* and select User authentication. On 802.11 settings uncheck Enable Pairwise Master Key (PMK) caching. Validate all the modifications and click on *Close*.

Step 5: Test and Demonstrate

Congratulations, you have everything setup and ready! If your setup is properly configured, you should be able to:

- reach (ping) the controller from the PacketFence environment
- see the DemoOpen, and DemoSecure SSIDs
- login the PacketFence administrative UI (https://management_IP:1443)

- connects a client device on the DemoOpen SSID using demouser/demouser credentials on the captive portal
- connects a client device on the DemoSecure SSID using demouser/demouser credentials in the Windows network login dialog