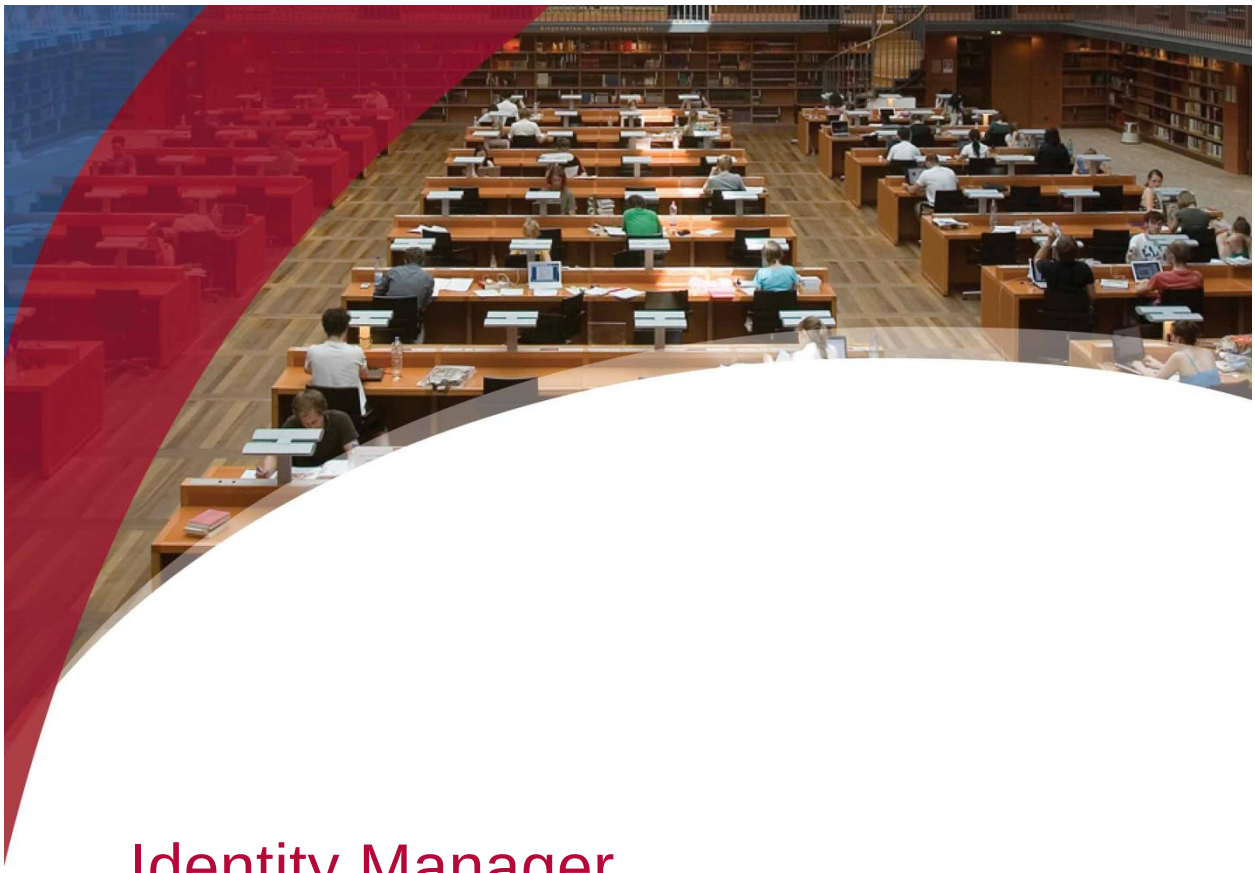
Meru Networks®
Powering the All-Wireless Enterprise™



Identity Manager Deployment Guide

June 2013

Contents

For use by Meru Networks authorized partners and customers.

Introduction

The “bring your own device” (BYOD) phenomenon is a result of more people acquiring personal mobile devices. As people expect to stay connected wherever they are, they are asking whether they can bring personal mobile devices to the workplace. As more people bring their devices to work, IT managers are dealing with new security and bandwidth issues with their networks. With the increase in mobile devices in the workplace, companies must have a strong management policy with minimal overhead on IT resources and a network able to handle the client density.

Developing a strong management policy includes automatically controlling device access and introducing security by providing interface-to-NAC solutions. Guest users at organizations are now increasingly requiring online access to perform their work. Management applications should be fast and easy enough to provide quick network access to allow guests to be more productive.

Single users with multiple devices who access your WLAN require tremendous RF resources. To provide quality service, the APs must be able to handle heavy usage from many different types of Wi-Fi client devices. Meru’s unique single-channel architecture helps maximize the available RF-spectrum consumption and can also effectively use channel layers to address high density areas as required.

Meru Identity Manager is a complete provisioning, management, and reporting system that provides temporary network access for visitors, contractors, consultants, or customers. Identity Manager works alongside wireless controllers, LAN switches, NAC systems, firewalls, and other network enforcement devices to provide secure network access.

Identity Manager allows any user with appropriate privileges to easily create temporary guest accounts and sponsor guests. Identity Manager performs full authentication of sponsors, the users who create guest accounts, and allows sponsors to provide account details to the guest by printout, email, or SMS. The entire experience, from user-account creation to guest network access, is stored for audit and reporting. Identity Manager provides vital guest network access accounting by consolidating the entire audit trail from guest account creation to guest use of the account so that reports can be generated with a central management interface.

This guide provides information about the following:

- Integrating Identity Manager with Meru controllers
- Deploying Smart Connect to provide network access:
    - Secure private network access using WPA2-Enterprise security with 802.1X authentication
    - Secure guest access using WPA2-PSK

- Providing secure access for users with wired clients
- Configuring role-based access for corporate and personal devices
- Configuring Identity Manager for paid access subscription for guest users in hotspots
- Captive Portal Customization examples in Identity Manager

You should have basic knowledge about Identity Manager concepts, such as sponsors, guests, guest portals, and Smart Connect. You should also know how to configure a Meru controller using System Director. For more information, see the *Meru Identity Manager User Guide* and the *Meru System Director Configuration Guide*.

What's New in this Guide

The following use cases were added:

- Use Case 5: Providing Guest Access Paid Subscription Systems for Wi-Fi Hotspots
- Use Case 6: Basic Customization of a Guest Portal Using Default Tools
- Use Case 7: Advanced Customization of Guest Portals by Importing a New Theme

What's Changed in this Guide

The following lists changes in this guide:

- The guide is based on System Director Release 6.0 and Identity Manager Version 13.6.

  If you are using an earlier Identity Manager version, see the previous version of the Identity Manager Deployment Guide, which is based on Identity Manager Version 11.12. Note that Identity Manager screen captures might differ, depending on which version of Identity Manager you are using.

- The Identity Manager HTTP Redirection Process topic was updated to reflect System Director Release 6.0 and Identity Manager Version 13.6.

- In Use Case 1: Providing Enterprise Security in BYOD Environments, an Active Directory server was added to the network environment to provide authentication for corporate users.

  Note: To implement Use Case 1 with an Active Directory server, you must use Identity Manager Version 13.2 or later.

Installing Identity Manager on VMware Platforms

You can install Identity Manager on the following VMware platforms:

- ESX 3.5
- ESX 3.5i
- ESX 4.x
- ESX 4.xi
- ESX 5.xi
- Server 1.0 or later
- Microsoft Hyper V on Windows 2008 or later
- Workstation 5.0 or later
- Fusion 2.0 or later

Note: Workstation and Fusion versions are supported only for evaluation or demonstration purposes.

For more information, see the *Meru Identity Manager User Guide*.

Identity Manager HTTP Redirection Process

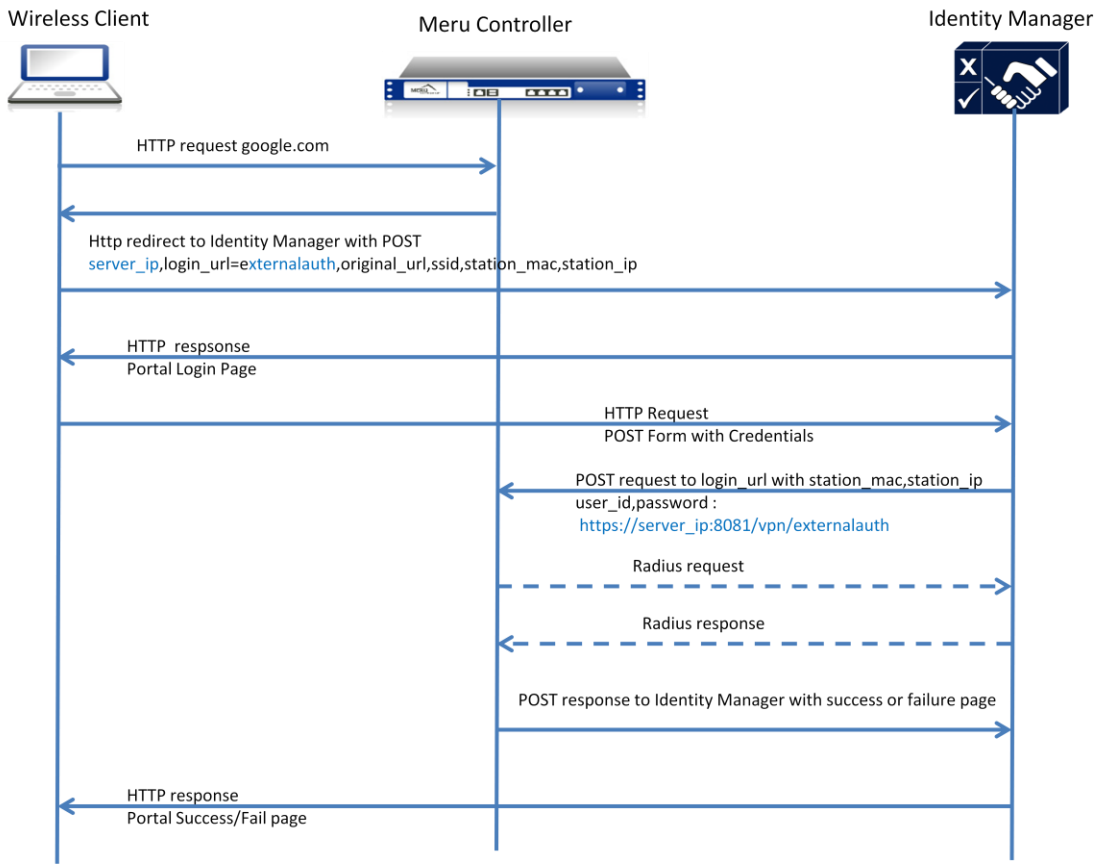
In a network environment using Identity Manager Version 13.6 and System Director Release 6.0, the HTTP redirection process depends on whether APs are connected in tunneled or bridged mode.

The following must be configured on the controller, regardless of whether the APs are in tunneled or bridged mode:

- In the security profile, the Captive Portal Authentication method must be specified as External.
- The external URL pointing to Identity Manager must be configured in the Captive Portal configuration page.
- RADIUS profiles for authentication and accounting pointing to Identity Manager must be configured in the Captive Portal configuration page.
- QoS rules to allow pre-authentication traffic to the Identity Manager IP address must be added on the controller.

Figure 1 shows the Identity Manager HTTP redirection for stations in tunneled mode.

Figure 1: Identity Manager Redirection in Tunneled Mode



The controller redirects any HTTP/HTTPS traffic from unauthenticated stations for the Identity Manager-configured ESS profile to the external Identity Manager URL. The controller redirects with a POST request to the Identity Manager URL, along with following parameters:

- server_ip: Controller IP address, which Identity Manager uses for authentication.
- login_url: URL that Identity Manager uses when contacting the controller for authentication. It creates a complete URL as follows: https://*server_ip*:8081/vpn/*login_url*
- original_url: Original URL requested by the station.
- ssid: SSID of the station that is currently connected.
- station_mac: MAC address of the station.
- station_ip: IP address of the station.

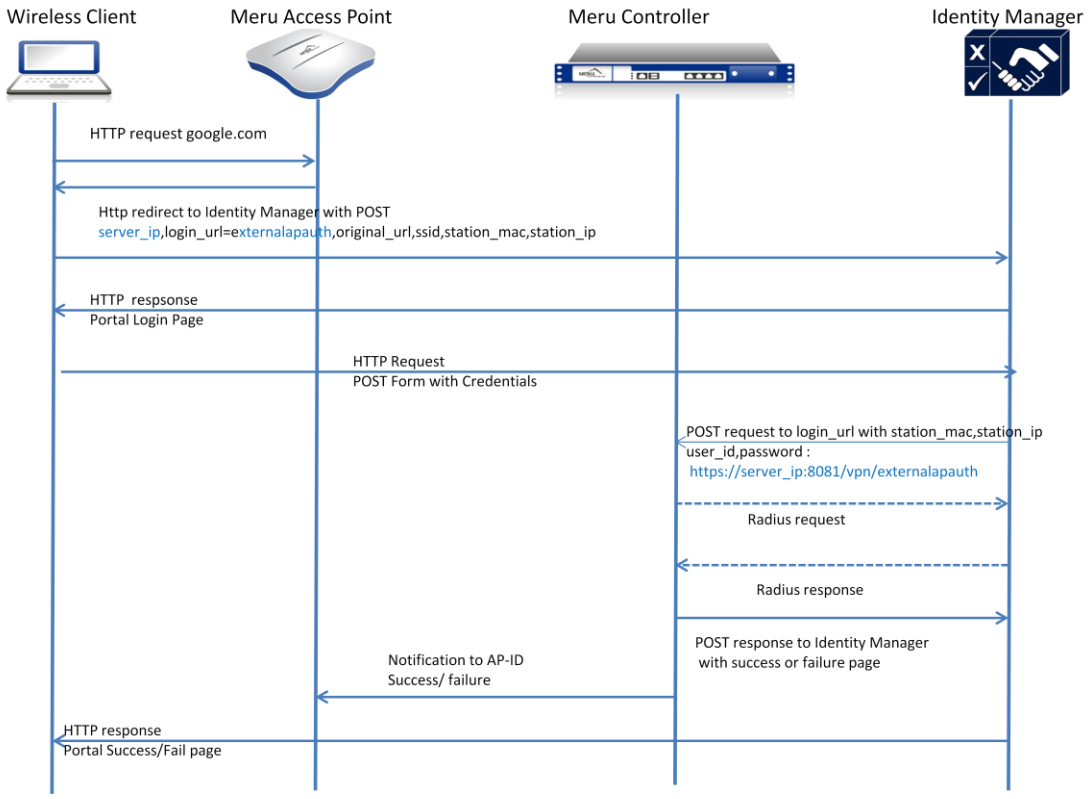
After receiving the redirect POST request from a client, Identity Manager serves the login pages to stations. After the station provides login credentials, Identity Manager will POST the login credentials, along with station_mac and station_ip to the login_url.

Identity Manager ignores any HTTPS certificate-related errors when contacting the controller for authentication based on HTTPS POST. After receiving the authentication request from Identity Manager with HTTPS POST, the controller authenticates the credentials based on station_mac and station_ip.

Authentication results are sent back to Identity Manager as a POST response as Success/Failure HTML pages. Based on the HTTPS response, Identity Manager serves its own success/failure pages to the client. If the client authentication is successful, Identity Manager redirects the station to original_url, and the controller allows all traffic from that client.

Figure 2 shows the Identity Manager HTTP redirection process for stations connected in bridged mode.

Figure 2: Identity Manager Redirection in Bridged Mode



APs redirect any HTTP/HTTPS traffic from unauthenticated stations for an Identity Manager-configured ESS profile to external Identity Manager URL. The AP redirects with a POST request to the Identity Manager URL, along with following parameters:

- server_ip: Controller IP address, which Identity Manager uses for authentication purposes.
- login_url: URL that Identity Manager uses when contacting the controller for authentication. It creates a complete URL as follows: https://*server_ip*:8081/vpn/*login_url*
- original_url: Original URL requested by the station.

- ssid: SSID of the station that is currently connected.
- station_mac: MAC address of the station.
- station_ip: IP address of the station.
- apid: AP ID where station is connected.

After receiving the redirect POST request from a client, Identity Manager serves the login pages to stations. After the station provides login credentials, Identity Manager will POST the login credentials, along with station_mac, station_ip and apid to the login_url.

Identity Manager ignores any HTTPS certificate-related errors while contacting controller for authentication based on HTTPS POST. After receiving authentication request from Identity Manager via HTTPS POST, the controller authenticates the credentials based on the station MAC address and IP address.

Authentication results are sent back to Identity Manager as a POST response as Success/Failure HTML pages. If authentication is successful, the controller updates the AP (based on apid) about the station's authentication state.

Based on HTTPS response, Identity Manager serves its own success/failure pages to the client. If the client authentication is successful, Identity Manager redirects the station to original_url, and the AP allows all traffic from that client.

Integrating Identity Manager with System Director

You can configure Identity Manager to work seamlessly with System Director. This guide is based on System Director Release 6.0 and Identity Manager Version 13.6.

Configuring System Director

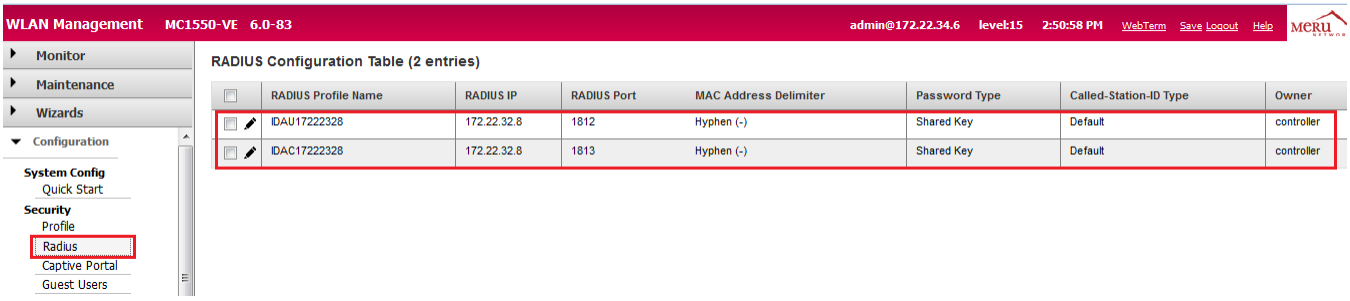
Before configuring Identity Manager, you must perform the following configuration tasks on the controller:

- Creating RADIUS Profiles
- Mapping the RADIUS Profile to the Captive Portal and Configuring the External Captive Portal URL
- Configuring QoS Rules
- Creating a Security Profile
- Creating an ESS Profile
- Verifying Firewall Filters

Creating RADIUS Profiles

For authentication and accounting of guest users, you must create RADIUS profiles on the controller, referencing the IP address of Identity Manager on ports 1812 and 1813 or 1645 and 1646. As shown in Figure 3, RADIUS profiles that reference ports 1812 and 1813 are created.

Figure 3: RADIUS Profiles



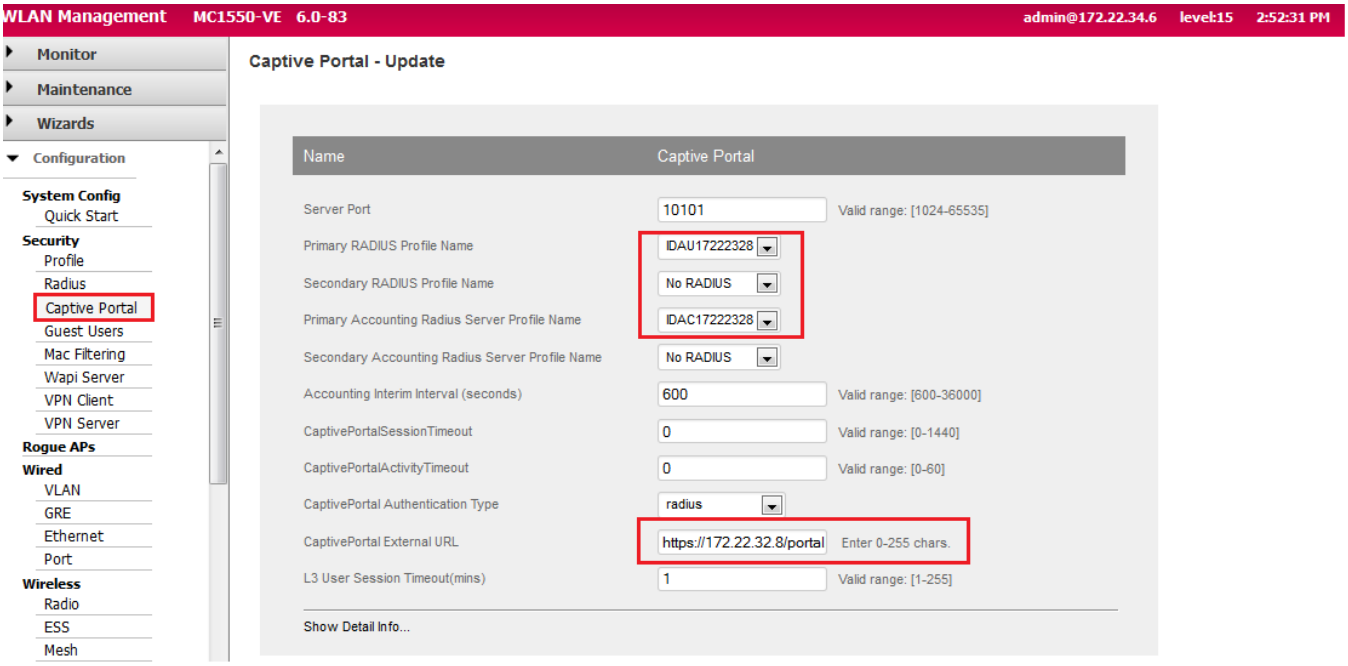
Mapping the RADIUS Profile to the Captive Portal and Configuring the External Captive Portal URL

As shown in Figure 4, you must map RADIUS profiles to the Captive Portal for authentication and accounting. The Captive Portal External URL must be specified in the following format:

```
https://Identity_Manager_address/portal/controller_address?MeruInitialRedirect
```

The IP address or DNS name can be used as the Identity Manager and controller address.

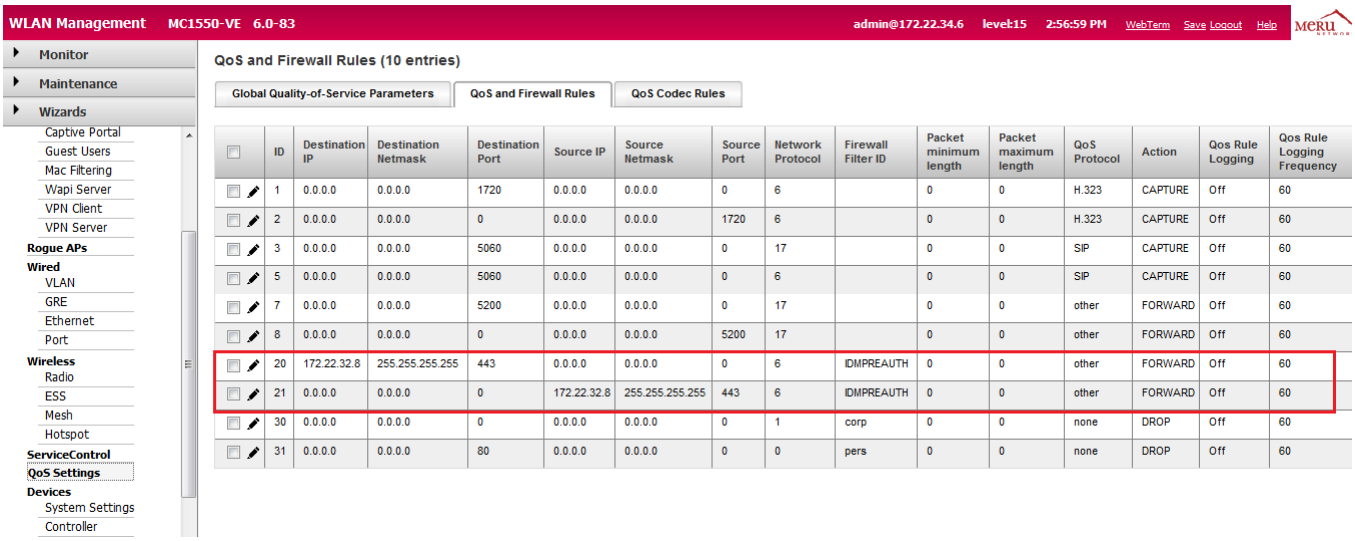
Figure 4: Captive Portal - Update Page



Configuring QoS Rules

To allow pre-authentication traffic to Identity Manager, you must create QoS rules using System Director. As shown in Figure 5, allow traffic on port 443 to and from the Identity Manager IP address with the same firewall Filter-ID (string) mapped to each rule.

Figure 5: QoS and Firewall Rules Page

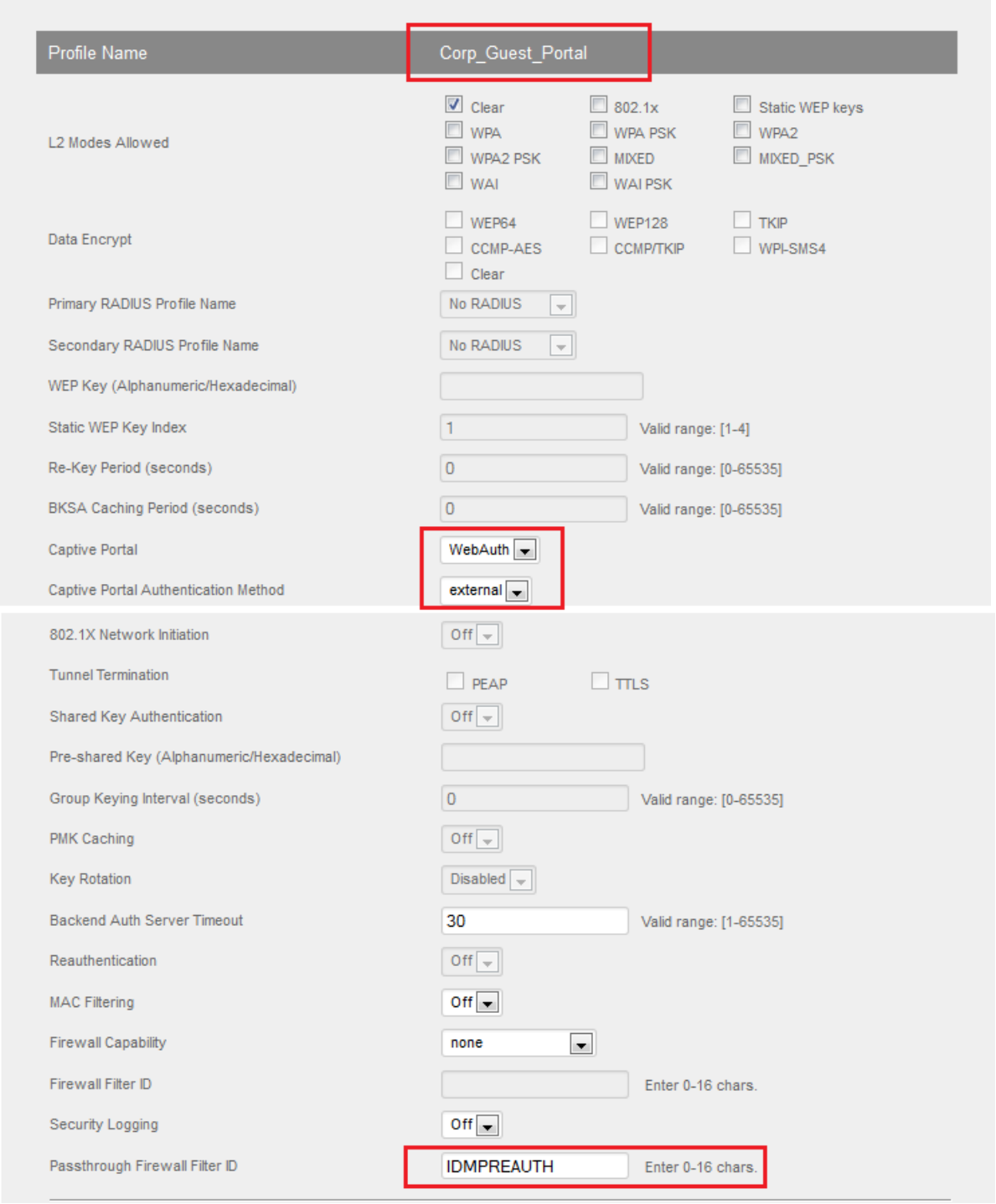


ID	Destination IP	Destination Netmask	Destination Port	Source IP	Source Netmask	Source Port	Network Protocol	Firewall Filter ID	Packet minimum length	Packet maximum length	QoS Protocol	Action	Qos Rule Logging	Qos Rule Logging Frequency
1	0.0.0.0	0.0.0.0	1720	0.0.0.0	0.0.0.0	0	6		0	0	H.323	CAPTURE	Off	60
2	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	1720	6		0	0	H.323	CAPTURE	Off	60
3	0.0.0.0	0.0.0.0	5060	0.0.0.0	0.0.0.0	0	17		0	0	SIP	CAPTURE	Off	60
5	0.0.0.0	0.0.0.0	5060	0.0.0.0	0.0.0.0	0	6		0	0	SIP	CAPTURE	Off	60
7	0.0.0.0	0.0.0.0	5200	0.0.0.0	0.0.0.0	0	17		0	0	other	FORWARD	Off	60
8	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	5200	17		0	0	other	FORWARD	Off	60
20	172.22.32.8	255.255.255.255	443	0.0.0.0	0.0.0.0	0	6	IDMPREAUTH	0	0	other	FORWARD	Off	60
21	0.0.0.0	0.0.0.0	0	172.22.32.8	255.255.255.255	443	6	IDMPREAUTH	0	0	other	FORWARD	Off	60
30	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	0	1	corp	0	0	none	DROP	Off	60
31	0.0.0.0	0.0.0.0	80	0.0.0.0	0.0.0.0	0	0	pers	0	0	none	DROP	Off	60

Creating a Security Profile

As shown in Figure 6, you create a security profile named Corp_Guest_Portal, with Web-Auth enabled and the Captive Portal method of authentication specified as external. The firewall Filter ID that was created in Configuring QoS Rules must be mapped to the security profile.

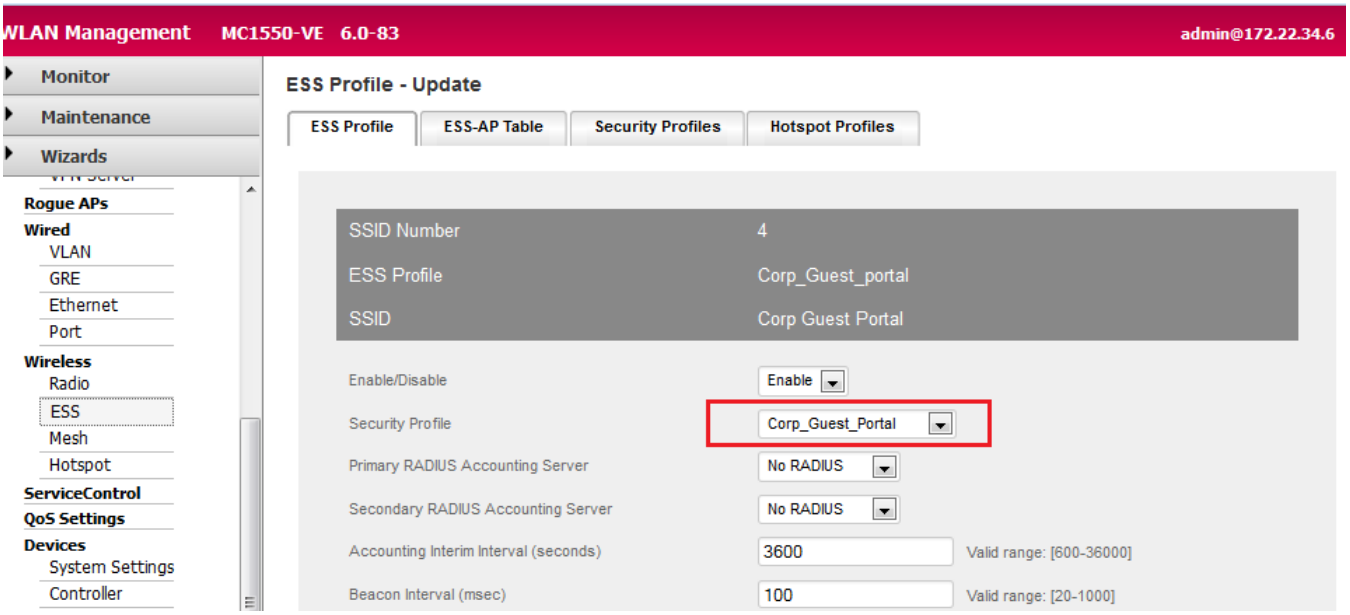
Figure 6: Creating a Security Profile



Creating an ESS Profile

You must create an ESS profile named Corp_Guest_portal for guest access. As shown in Figure 7, map the security profile to the ESS profile.

Figure 7: ESS Profile - Update Page



Verifying Firewall Filters

To verify whether the firewall filters you created are filtering traffic correctly, use a client to connect to your guest network, and use a Web browser to access Identity Manager. After you enter the IP address of Identity Manager in a Web browser, if the browser is redirected to the Identity Manager Login page, the firewall filters are working correctly.

If the browser is not redirected to Identity Manager, check the following:

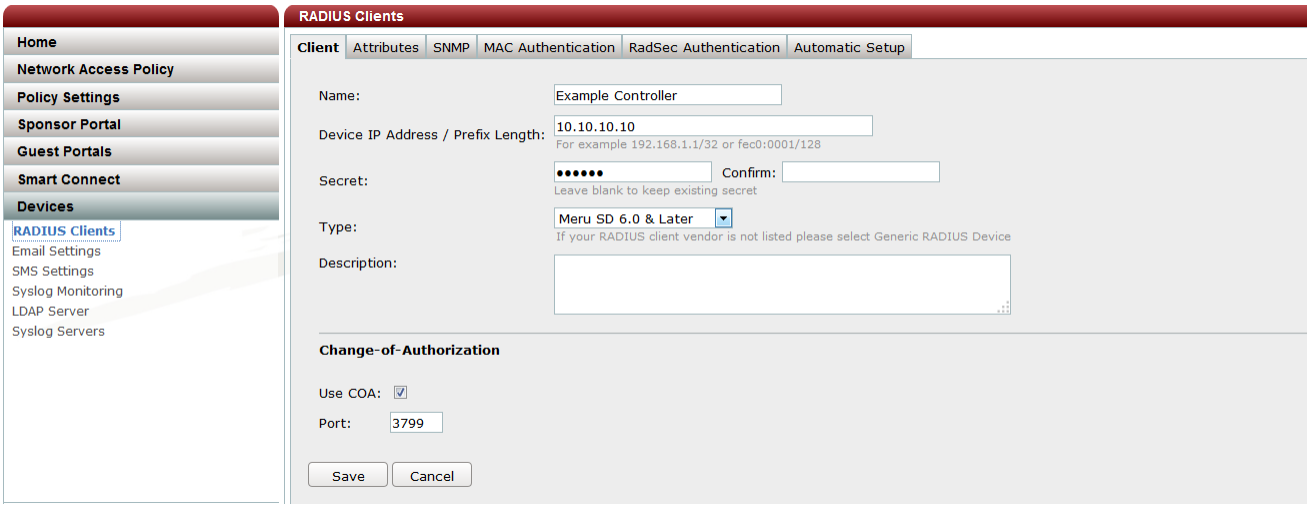
- On the controller, verify that the QoS rules are configured correctly:
  - Make sure that the appropriate Match check boxes have been selected in the QoS rules.
  - The filter IDs specified in the security profile match the filter IDs in the QoS rules.
- If the QoS rules are configured correctly, temporarily enable security logging in the security profile and check the logs. After you have finished troubleshooting, disable security logging in the security profile.

If you are using a DNS server in your network and have the Identity Manager IP address mapped to a server name (for example, idm), you can enter https://idm rather than the IP address in the Web browser.

Configuring Identity Manager

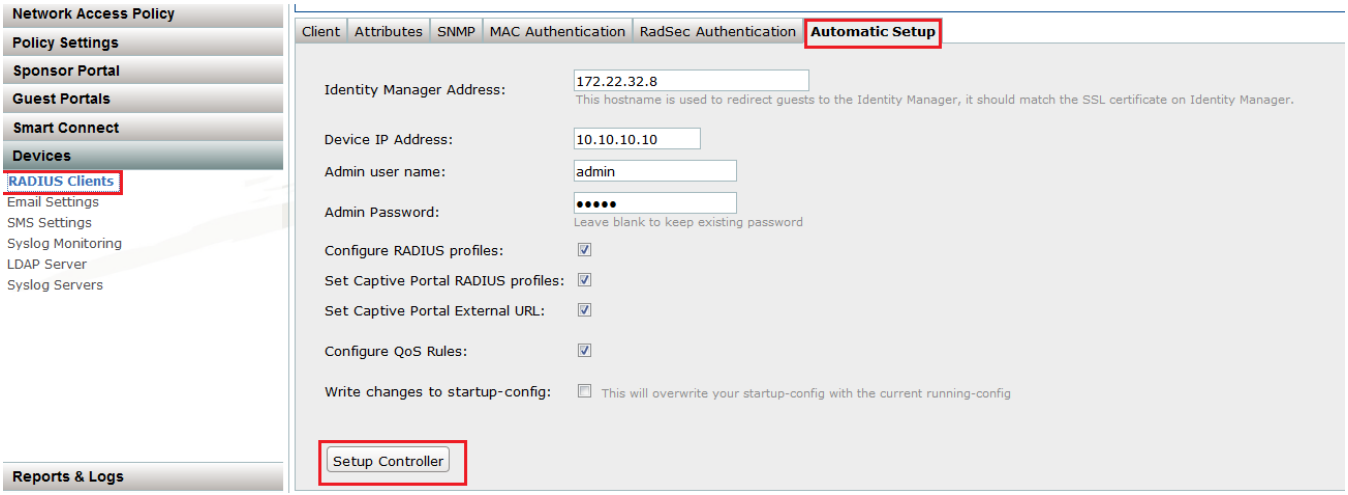
In Identity Manager, you must add controllers as RADIUS clients for captive portal authentication. An example of adding a controller as a RADIUS client is shown in Figure 8.

Figure 8: RADIUS Client Tab



Captive Portal and RADIUS-specific configuration that needs to be configured on the controller can be automatically pushed from Identity Manager, as shown in Figure 9.

Figure 9: RADIUS Client Automatic Setup

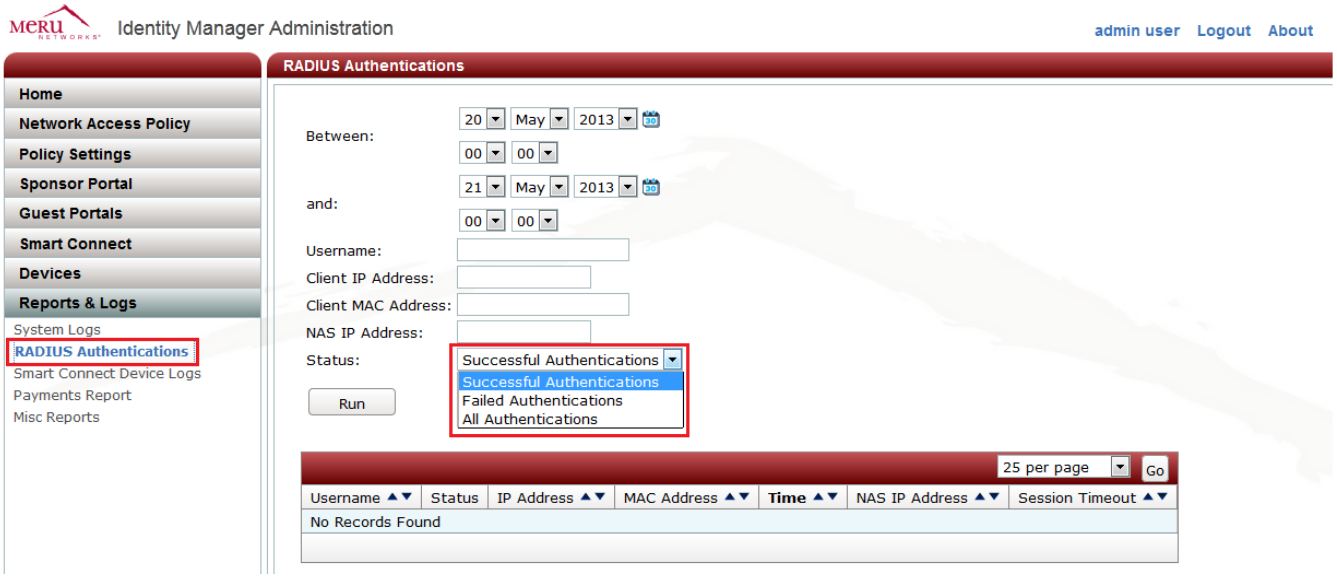


Verifying Authentication for the Captive Portal

To verify authentication for the Captive Portal, use a client to connect to the guest network. Open a Web browser window, and try to access any Web site. After being redirected to a login page, provide a user's credentials to see if authentication is successful. There are several ways in Identity Manager to verify if the authentication is successful or not.

To review successful and failed authentications, select **Reports & Logs > RADIUS Authentications**, as shown in Figure 10.

Figure 10: RADIUS Authentications Page



For advanced troubleshooting, change the log settings to log errors, notices, informational and debug messages for RADIUS User Authentication logs:

1. In the Identity Manager Administration Interface, select **Server > System Logs**.
2. Click the **Log Settings** tab.
3. In the Admin Authentication and RADIUS User Authentication lists, select **Errors, Notices and Info**.
4. Click **Save**.

After changing the logging levels, select **Devices > RADIUS Clients**, and click the **Restart RADIUS in Debug** button.

After attempting authentication again, review the RADIUS log:

1. In the Identity Manager Administration Interface, select **Server > System Logs**, and click the **Support Logs** tab.
2. For the RADIUS log, click the **View** link.

   On the Windows platform, the log is easier to read if you open it in WordPad.
3. Look for the following messages in the RADIUS log:
   - Incorrect shared secret messages
   - Messages stating that a guest account was not found or is in a restricted period.

If there are no messages about RADIUS authentication in the RADIUS log, verify that the RADIUS configuration on the controller is correct (correct RADIUS server IP address and port). Also see if there is a firewall between the controller and Identity Manager. Make sure that ports 1812 and 1813 (1645 and 1646) are open for RADIUS.

Deployment Examples

This guide presents seven use cases, which illustrate how you can use Identity Manager to manage guest access to your wired or wireless networks. You can also use Identity Manager to manage network access for your employees' personal and corporate devices. You can use Identity Manager Version 11.12 or later for all use cases, except for Use Case 1, which requires Identity Manager Version 13.2 or later.

- Use Case 1: Providing Enterprise Security in BYOD Environments
- Use Case 2: Providing Secure Guest Access
- Use Case 3: Configuring Captive Portal for Wired Clients
- Use Case 4: Configuring Role-Based Access Control for Personal and Corporate Devices
- Use Case 5: Providing Guest Access Paid Subscription Systems for Wi-Fi Hotspots
- Use Case 6: Basic Customization of a Guest Portal Using Default Tools
- Use Case 7: Advanced Customization of Guest Portals by Importing a New Theme

Use Case 1 and Use Case 2 use the same network environment. The other use cases use different network scenarios with different IP addresses.

Use Case 1: Providing Enterprise Security in BYOD Environments

As enterprises increasingly become "bring your own device" environments, you must be prepared to provide secure access to your wireless network. The challenge in allowing employees or students to bring their own devices is ensuring that they meet industry best practices and corporate policies for security. How do you configure hundreds or thousands of devices for 802.1X authentication and strong encryption without configuring each device individually?

In this use case, you use Smart Connect to configure tablets, smartphones, and other devices to use WPA2-Enterprise security with 802.1X authentication. Identity Manager is also integrated with the corporate Active Directory server for user authentication. This use case applies to network administrators who must allow various network devices to connect to the wireless network. This use case illustrates the process of self-provisioning for users with Windows XP laptops to connect to the 802.1 X-enabled networks. The same use case applies to all users, regardless of the type of end device. Smart Connect and Identity Manager automatically detect the type of device connecting to the network and correctly configure the device for secure network access.

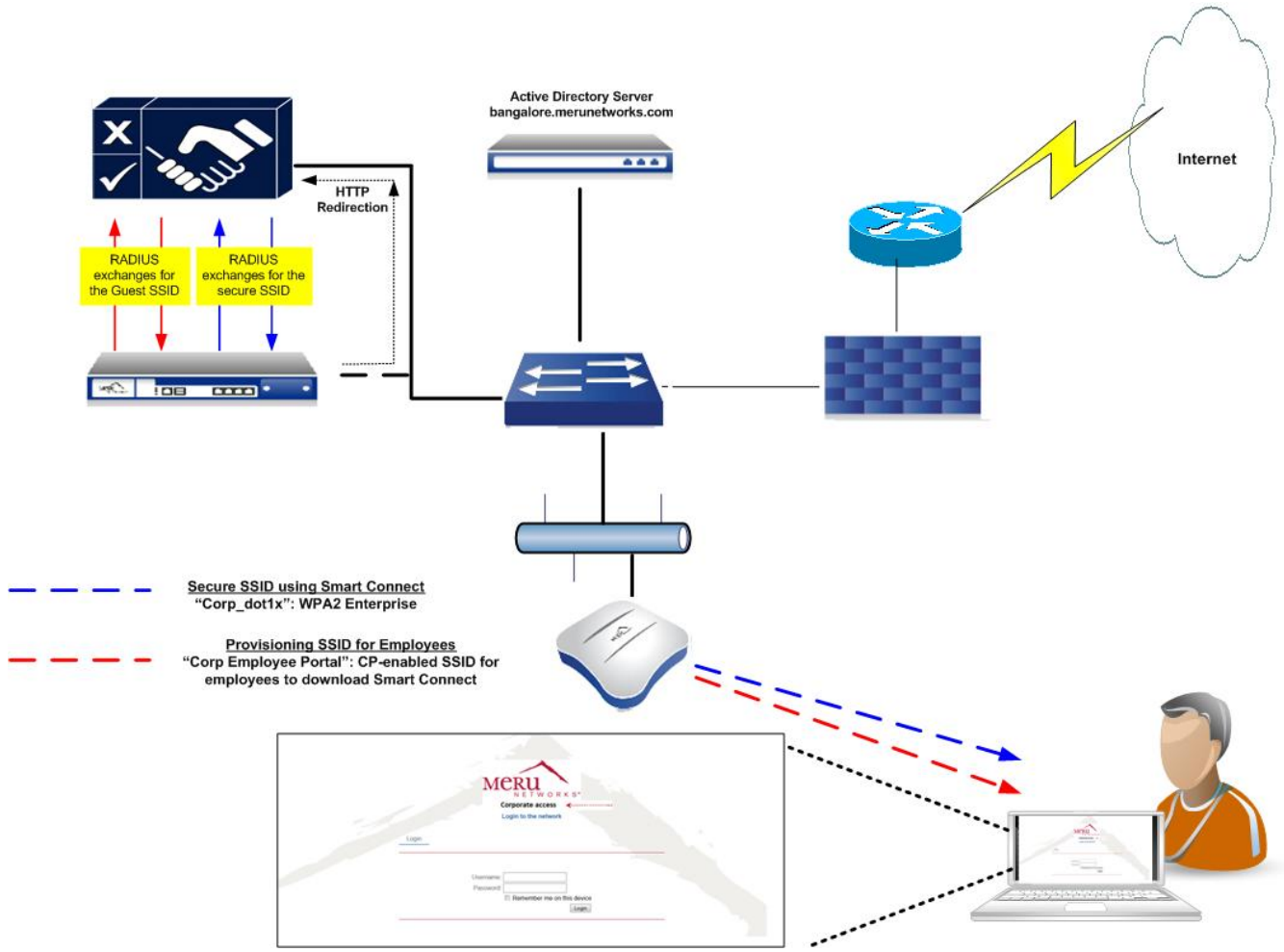
Users initially connect to the provisioning network and are successfully authenticated. They can then download the Smart Connect client. After the client is installed, users are automatically configured and connected to the secure 802.1X-enabled network. Subsequent access to the network is seamless and transparent to the end user on the secure private network.

Note

To implement this use case with an Active Directory server for user authentication, you must use Identity Manager Version 13.2 or later.

Figure 11 shows the network diagram for Use Case 1.

Figure 11: Use Case 1 Network Diagram



You need to perform the following tasks for this use case:

- Controller Configuration Tasks
- Creating Authorization Profiles
- Create an Authentication Policy for an External Active Directory Server
- Creating a Smart Connect Profile for 802.1X Clients
- Creating a Smart Connect Policy
- Enabling Smart Connect on the Employee Provisioning Portal
- Installing the Smart Connect Plug-In on Windows Clients

Controller Configuration Tasks

For information about how to create and manage ESS and security profiles, see the *Meru System Director Configuration Guide*.

You need to perform the following tasks on the controller (see Figure 12, Figure 13, Figure 14, and Figure 15):

- Create RADIUS profiles.
- Create two security profiles: one with WPA2 enterprise security and the other with captive portal enabled.
- Create two ESS profiles. One ESS profile (Corp Employee Portal) is for the provisioning network, and the other is the ESSID with 802.1x security (Corp_dot1x).
- Map the security profiles to the ESSIDs. In this use case, employees use ESSID “Corp Employee Portal” to access portal page and download the Smart Connect plug-in for the WPA2-enabled ESS “Corp_dot1x.”

Figure 12: Provisioning ESS Profile

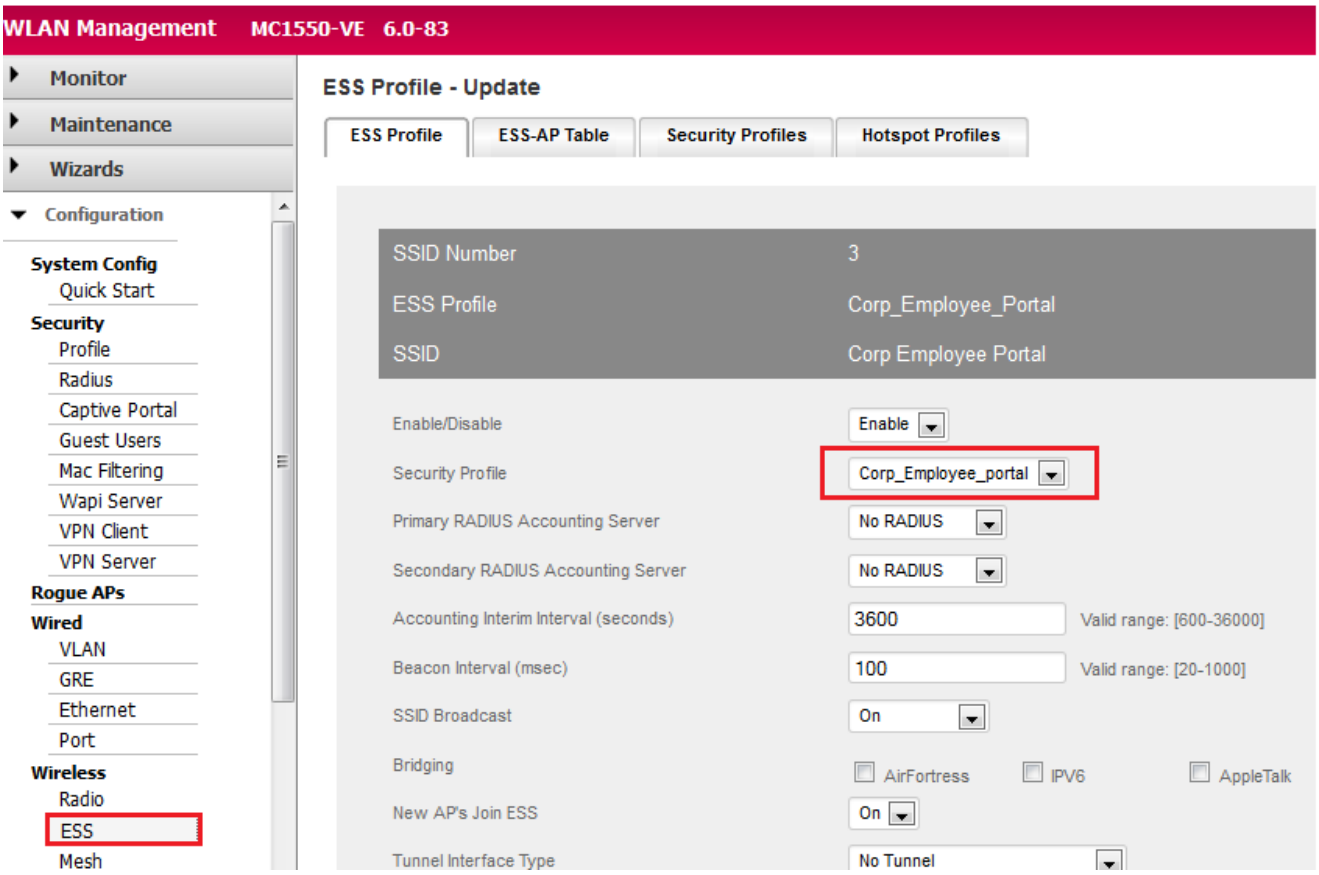


Figure 13: Security Profile Mapped to Provisioning ESS Profile

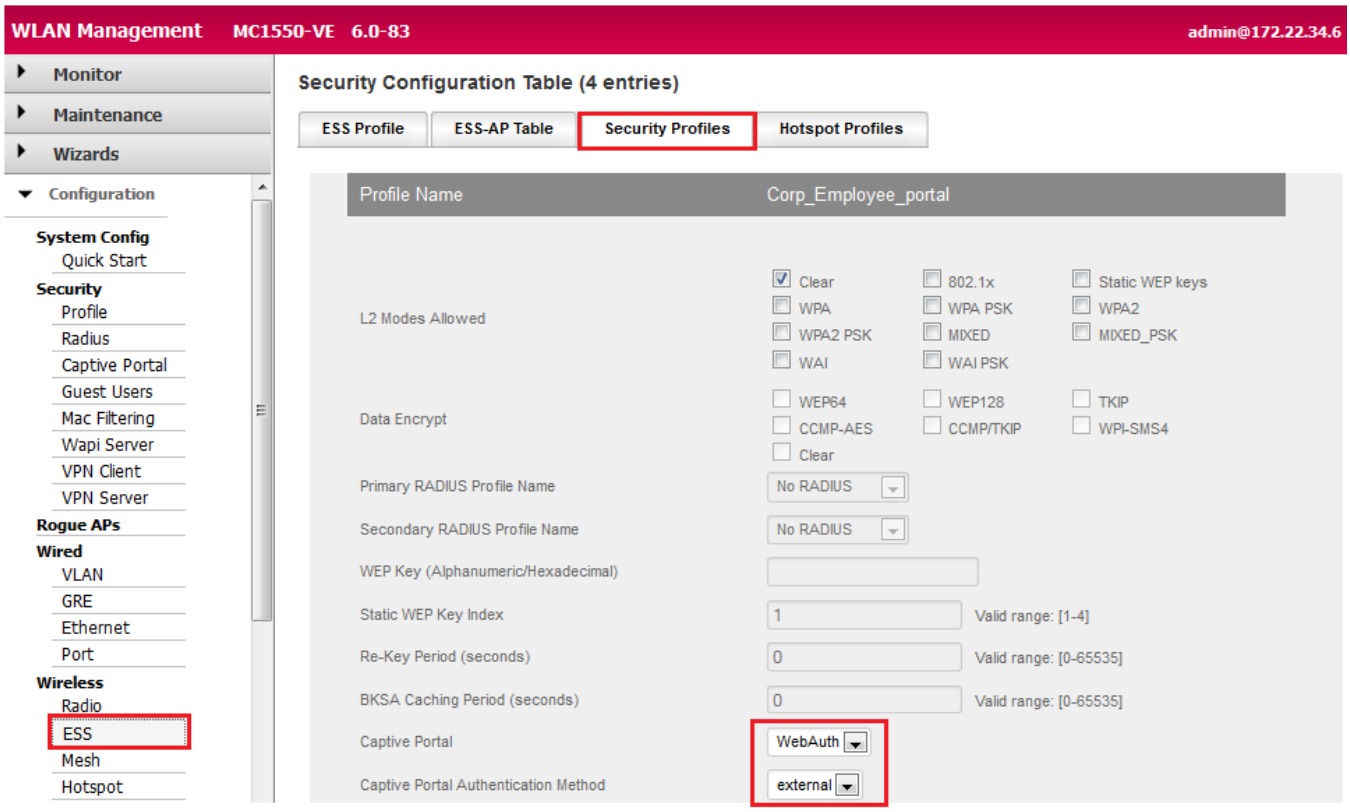


Figure 14: WPA2-Enabled ESSID

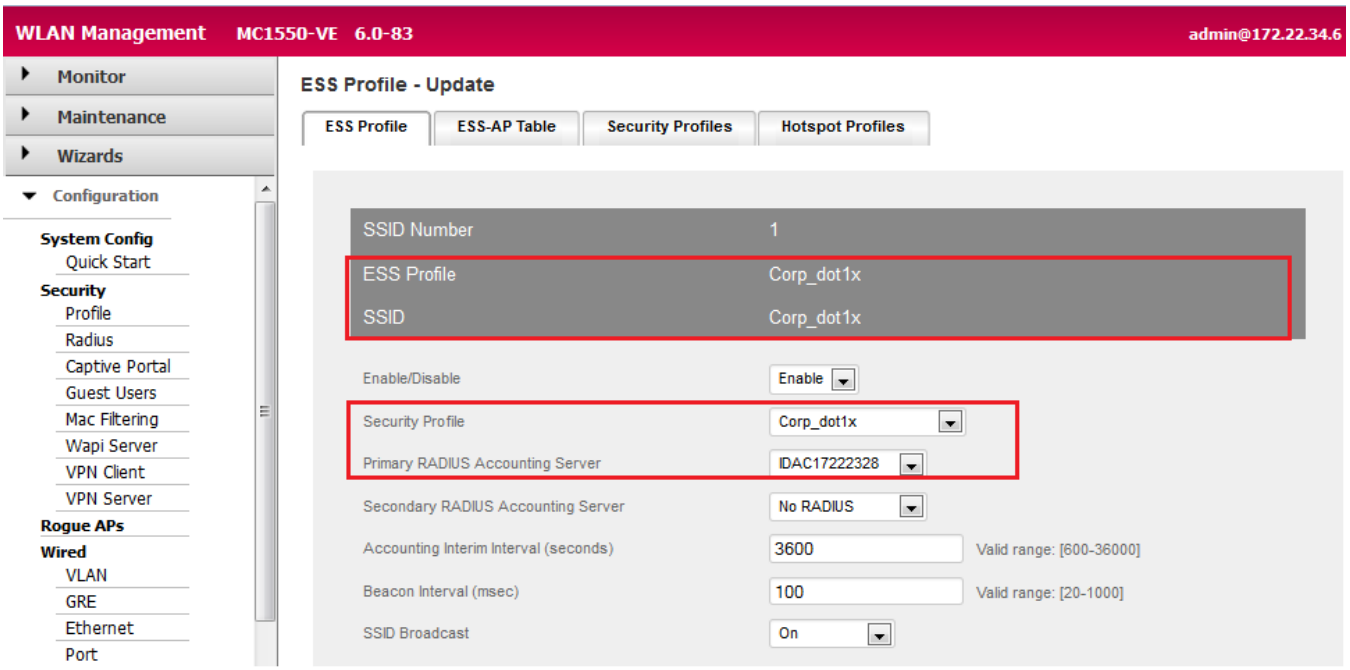
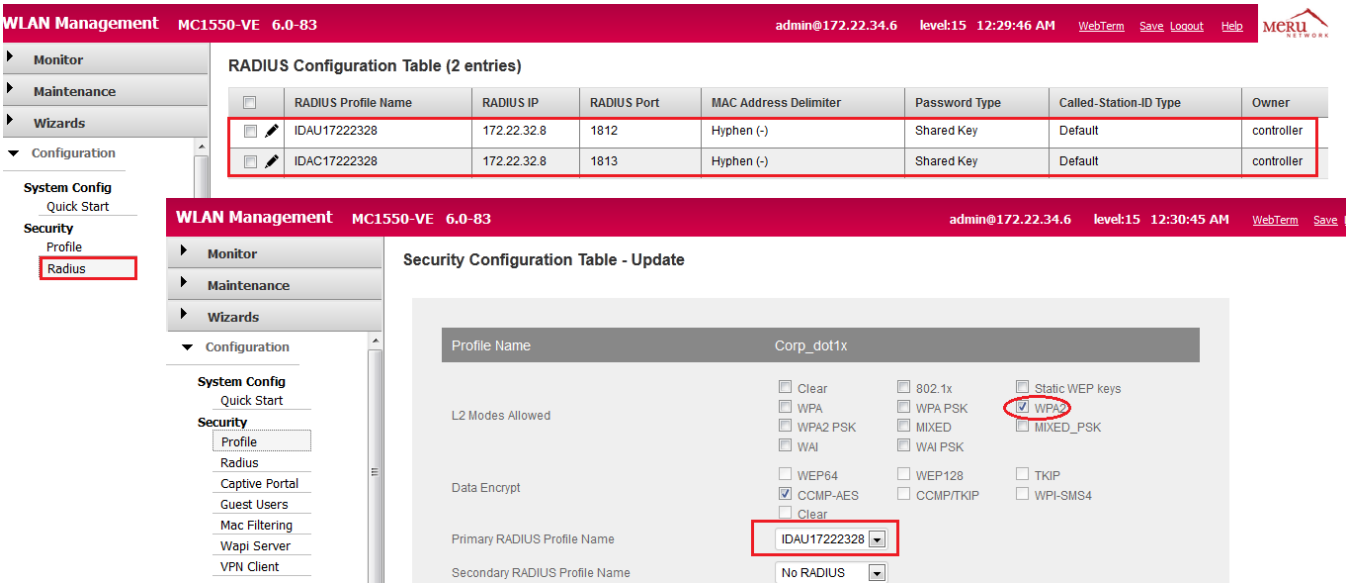


Figure 15: Security and RADIUS Profiles Mapped to ESS Profile



Creating Authorization Profiles

In Identity Manager, you need to create an authorization profile for the corporate users. This profile, which is named “corporate users,” allows Identity Manager to differentiate between corporate employees and visitors or guest users who access the same wireless infrastructure. (See Figure 16.)

Figure 16: Authorization Profiles Page

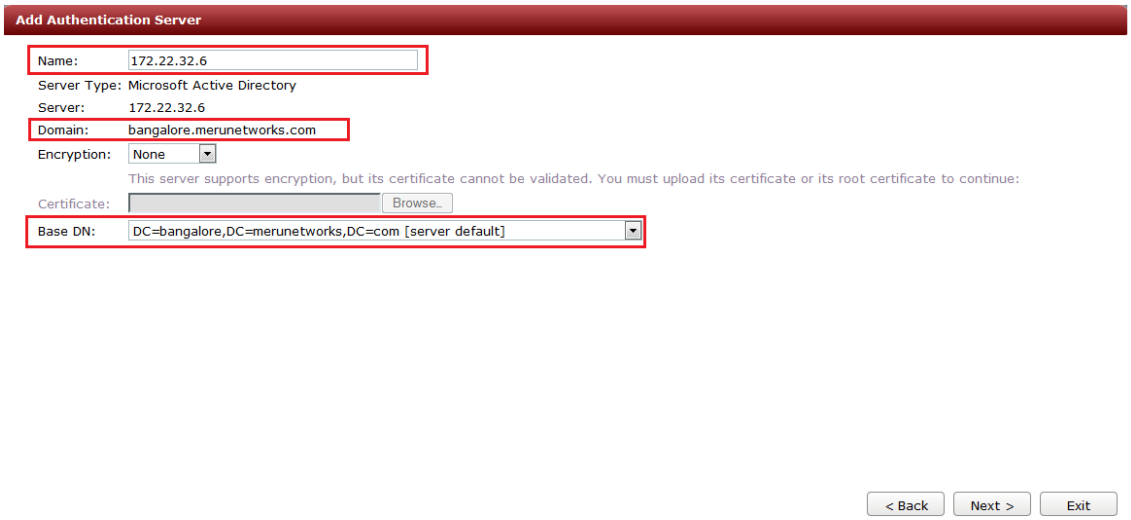
Create an Authentication Policy for an External Active Directory Server

Create an authentication policy for Identity Manager to authenticate employees using the corporate Microsoft Active Directory server database. In this use case, Identity Manager performs the RADIUS aspect; the user credentials are queried from the Active Directory server for every authentication request that comes in to Identity Manager.

To create an authentication policy:

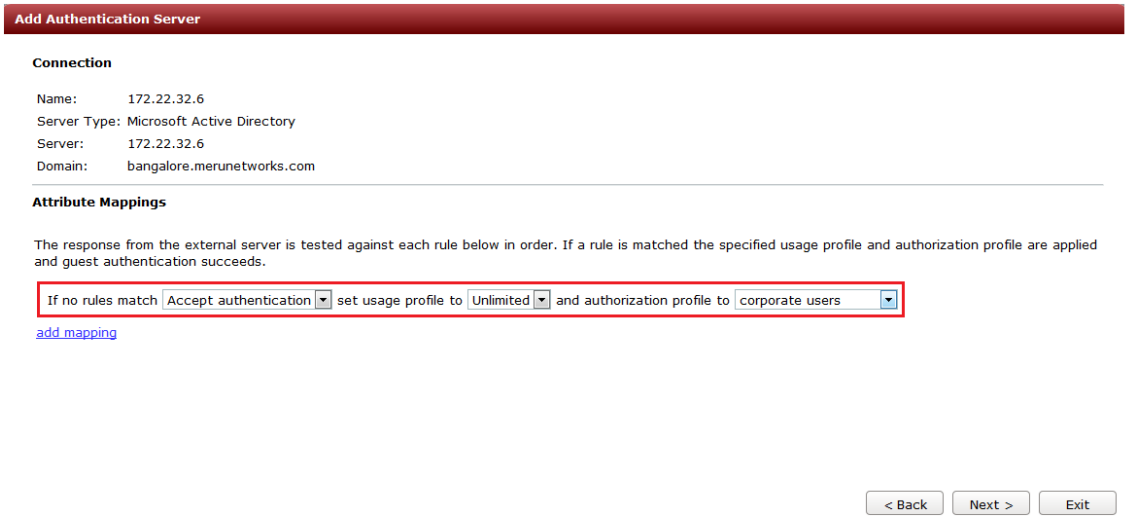
1. Fill in the basic information. Figure 17 shows the information used in his use case.

Figure 17: Adding an Active Directory Server



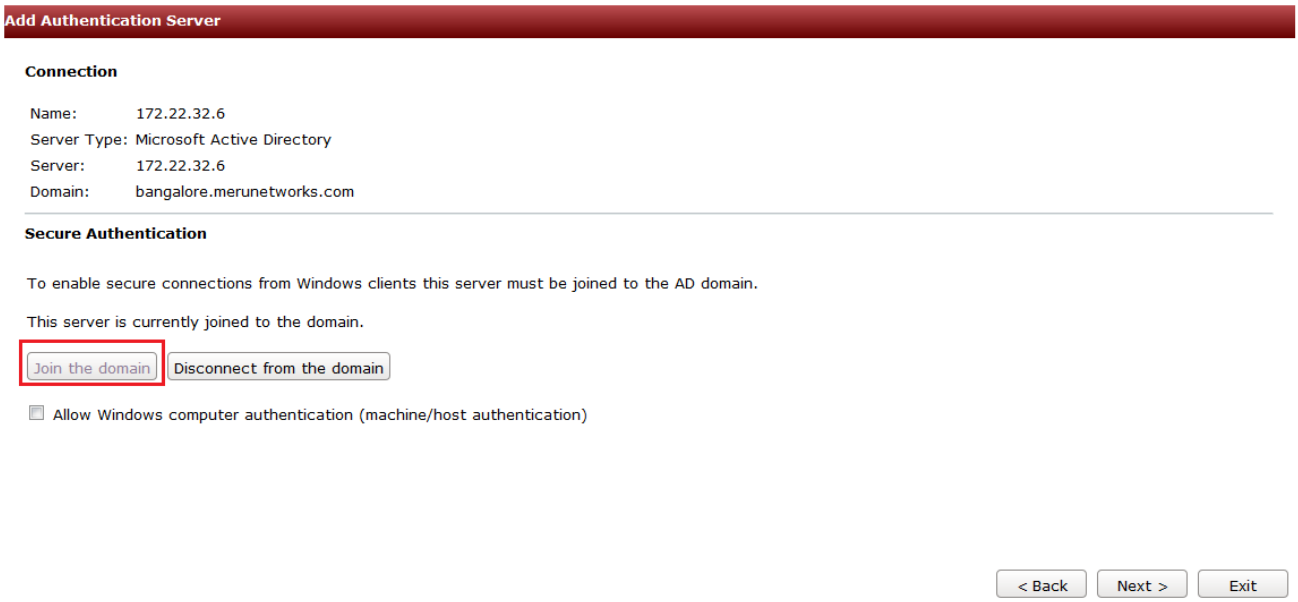
2. Create an attribute mapping to put users in the appropriate authorization profile, which is “corporate users” in this example (shown in Figure 18).

Figure 18: Attribute Mappings



3. Make sure that Identity Manager joins the domain that Active Directory server represents, as shown in Figure 19.

Figure 19: Identity Manager Joins Active Directory Domain



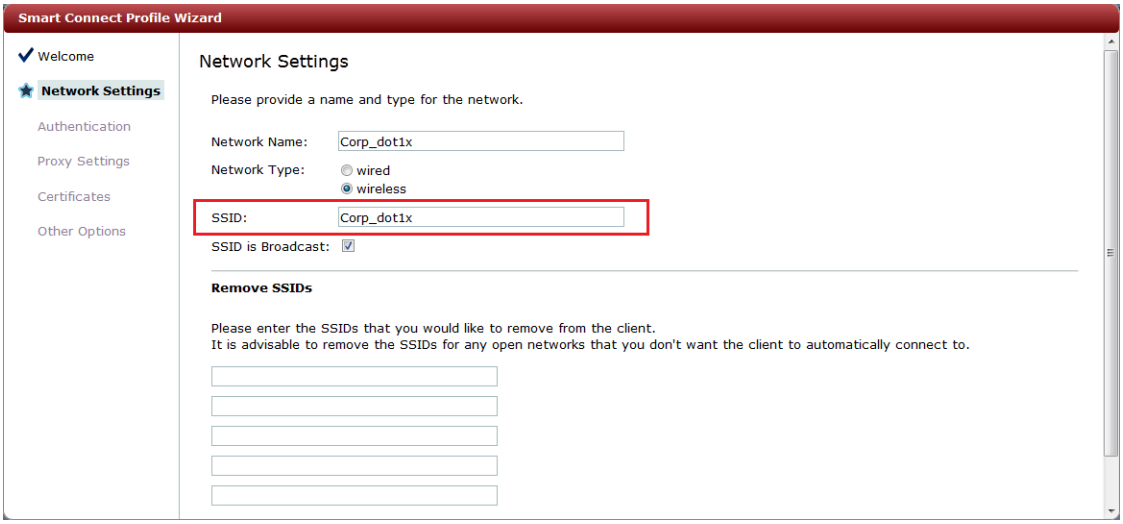
Creating a Smart Connect Profile for 802.1X Clients

You now need to create a Smart Connect profile. For this use case, you create a Smart Connect profile named “Corp_dot1x,” which uses WPA2 enterprise security. Clients using 802.1X use this profile to connect to an SSID named “Corp_dot1x.”

To create a Smart Connect profile:

1. Fill in the appropriate information on the Network Settings page, as shown in Figure 20.

Figure 20: Network Settings Page

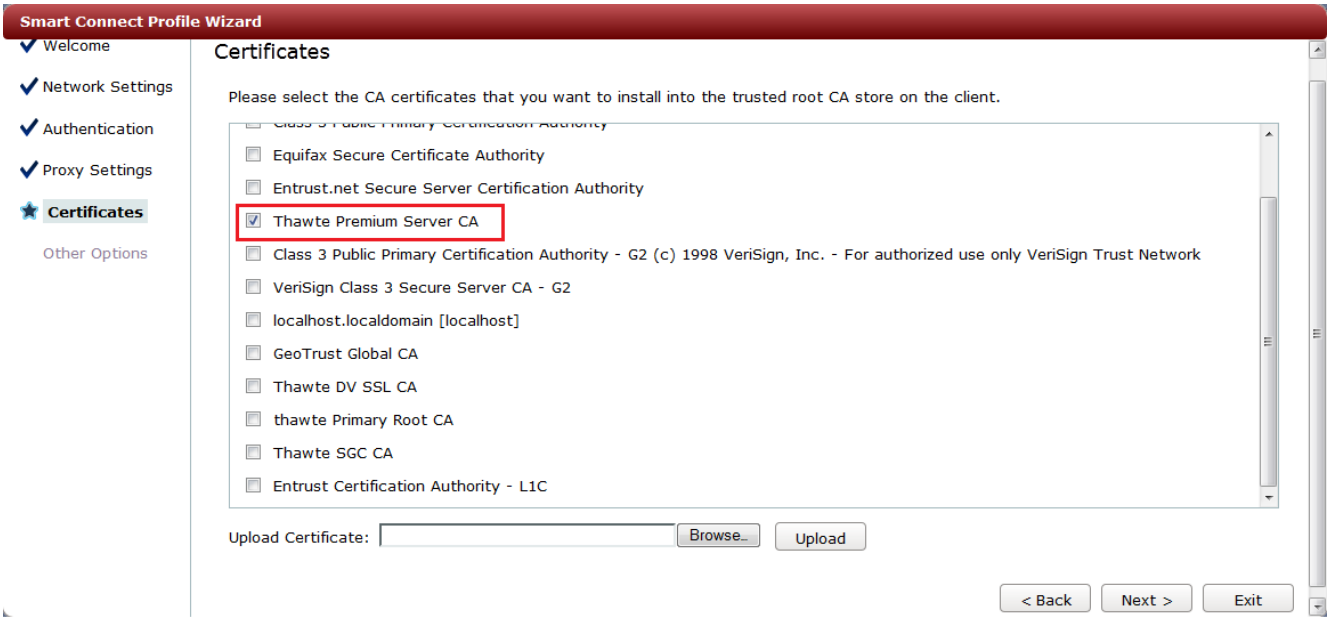


2. Select **WPA/WPA2 Enterprise** as the authentication type, and leave the username format as is, as shown in Figure 21.

Figure 21: Authentication Page

3. Select any of the default certificates. If an organizational certificate must be used, upload it to Identity Manager and select that certificate for the authentication. In this example, select **Thawte Premium Server CA**, as shown in Figure 22.

Figure 22: Certificates Page

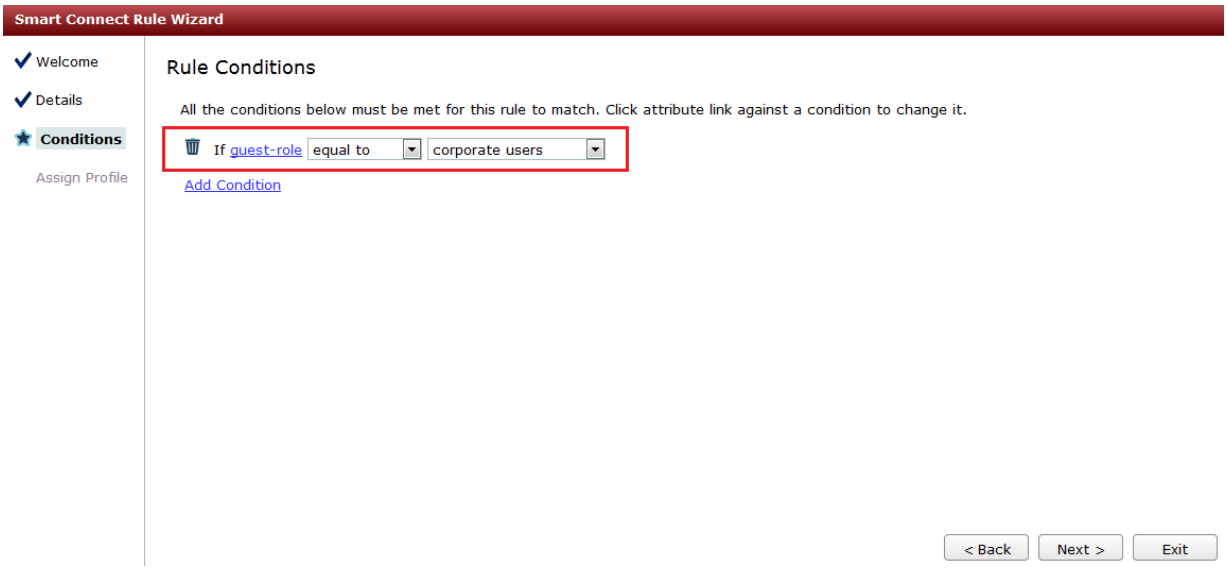


Creating a Smart Connect Policy

Smart Connect policies are required to create rules that map authorization profiles (guest roles) to the appropriate Smart Connect profiles. You can have multiple Smart Connect profiles with different security methods, which can be assigned to different sets of users.

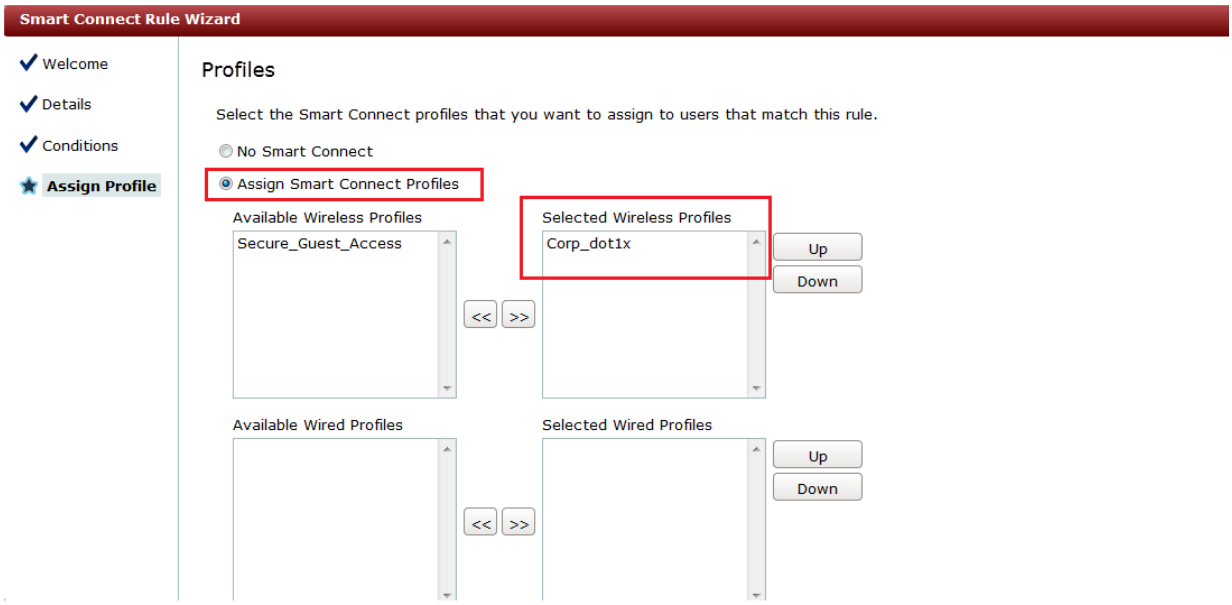
1. Create a rule to match the guest role (authorization profile) to “corporate users,” as shown in Figure 23.

Figure 23: Rule Conditions Page



2. Add a condition to assign “Corp_dot1x” Smart Connect profile to users who belong to guest role “corporate users,” as shown in Figure 24.

Figure 24: Profiles Page



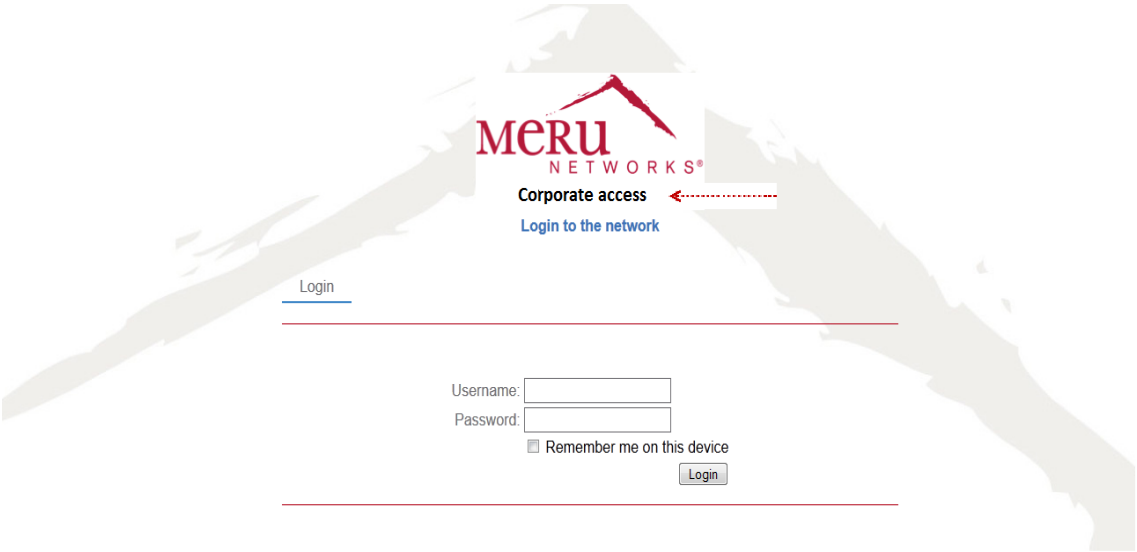
Enabling Smart Connect on the Employee Provisioning Portal

You need to create the employee provisioning portal and enable Smart Connect for the portal. In this use case, users who connect to the ESSID named “Corp Employee Portal” are directed to the employee provisioning portal. After the user is authenticated, the Smart Connect plug-in is available to download from the authentication success page.

To create the provisioning portal and enable Smart Connect:

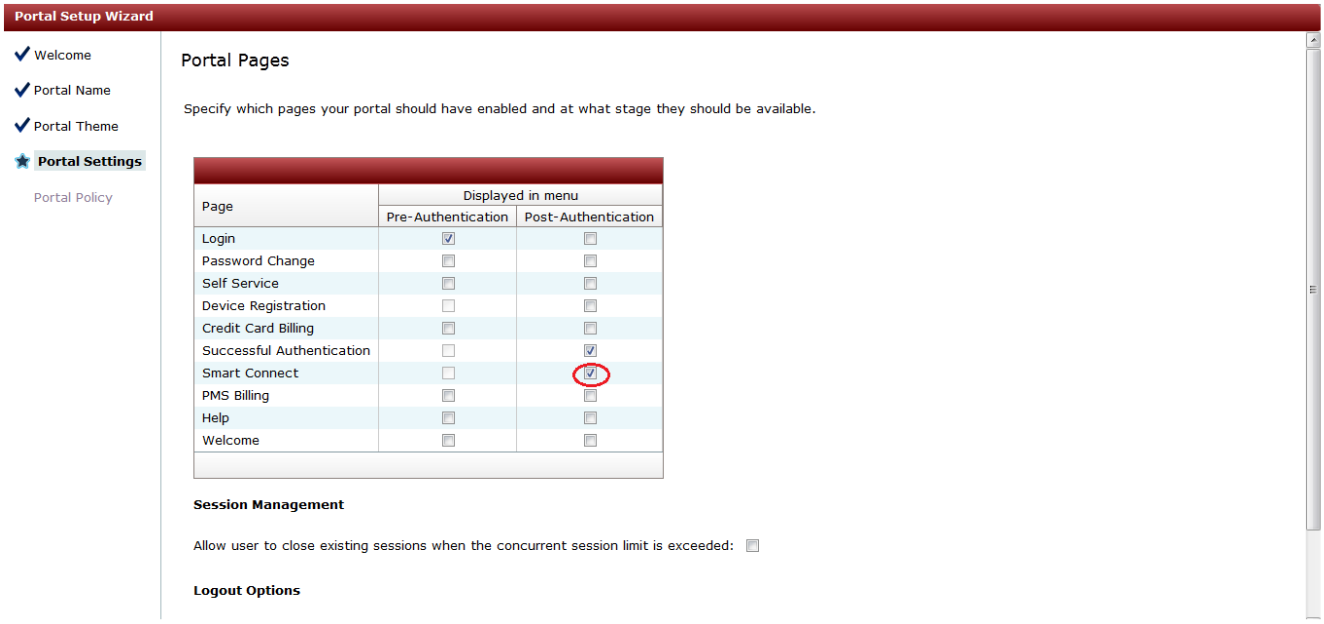
1. Fill in the appropriate information for the initial portal page.
2. Edit the portal theme and change the theme as required. In this example, the same login theme is used, but the logo is modified to identify that the portal is to be used only by corporate employees (shown in Figure 25).

Figure 25: Portal with Modified Logo



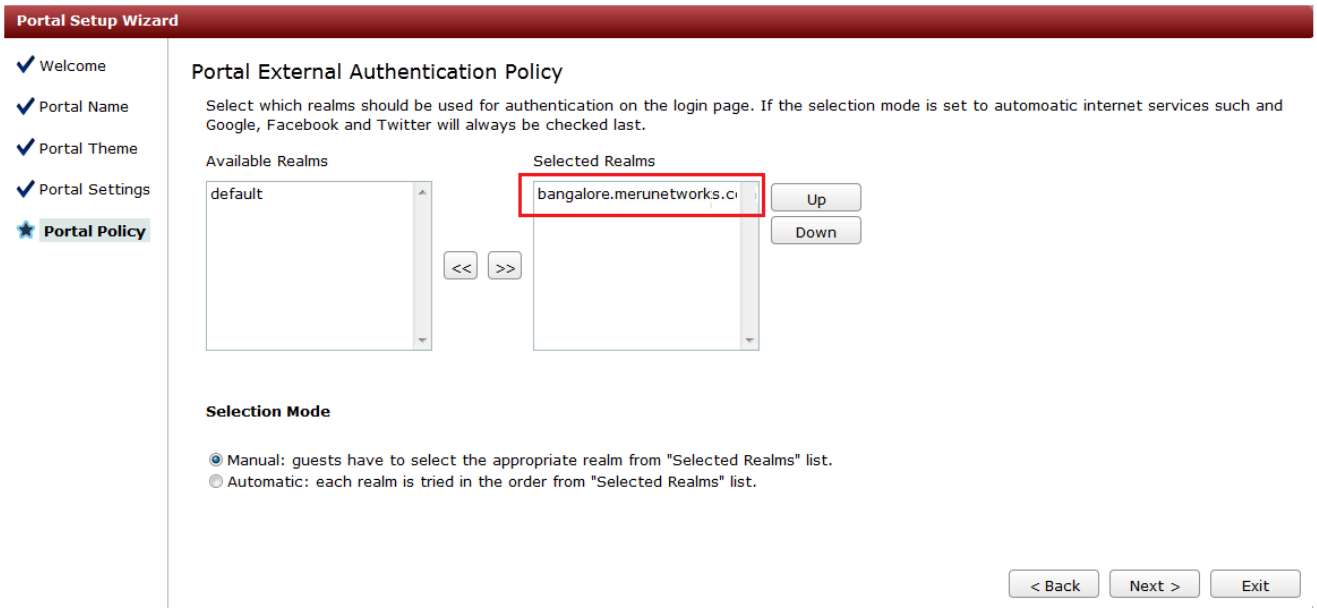
3. To enable Smart Connect, select the Smart Connect check box in the Post-Authentication column, as shown in Figure 26.

Figure 26: Enabling Smart Connect for the Employee Provisioning Portal



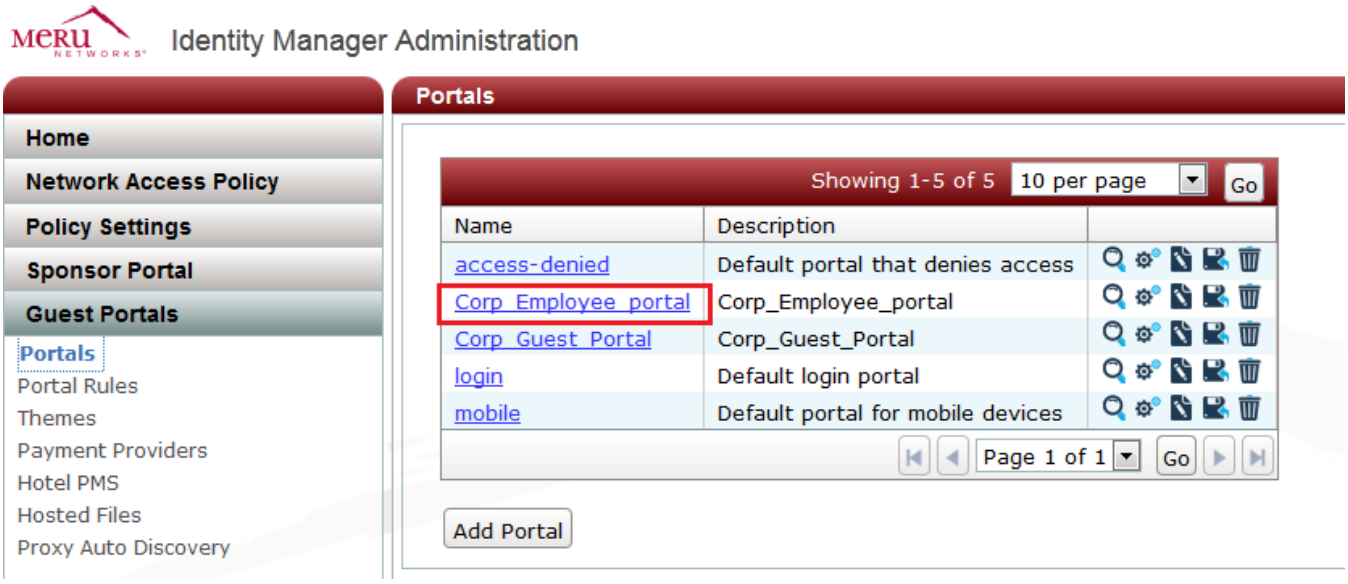
4. Add the realm (Active Directory domain) to the portal, as shown in Figure 27. By selecting only the corporate realm, users need to provide only the username and password (and not the full domain).

Figure 27: Adding the Realm to the Portal



After filling out the portal wizard pages, the portal appears in the list of portals, as shown in Figure 28.

Figure 28: Employee Provisioning Portal



Installing the Smart Connect Plug-In on Windows Clients

This example shows how a corporate employee uses a Windows laptop to connect to the self-provisioning network (Corp Employee Portal) to download and install Smart Connect and connect automatically to the secure WPA2 ESSID (Corp_dot1x).

To following describes how to install Smart Connect on Windows clients:

1. Using the Windows client, connect to the provisioning network.
2. Open a Web browser window. The browser is redirected to the Captive Portal page. See Figure 29.
3. Provide authentication credentials. See Figure 30.
4. If authentication is successful (see Figure 31), a page with network encryption options appears. Two options are available:
   - Downloading the Smart Connect profile so that the device can establish secure encrypted network access.
   - Continue to access the network with an unencrypted network. (The Smart Connect profile is not installed, and the user remains connected to the provisioning network.)
5. Click the Smart Connect button to start the download process.

Note

The button or link that the user clicks varies, depending on the page the Identity Manager administrator has configured to present to users.

6. Click the download button to download the Smart Connect plug-in. If a Java browser plug-in is installed on the client device, the Smart Connect plug-in download process starts automatically.

> **Note** The button or link that the user clicks varies, depending on the page the Identity Manager administrator has configured to present to users.

7. Depending on the browser used, click **Save** or **Run** to download the plug-in. After the plug-in is downloaded, it is automatically started. The user credentials are automatically shown. See Figure 32.
8. Click **Start**. Progress of the plug-in configuration is shown.
9. Click **Connect**. The client is disconnected from the provisioning network and connected to the secure ESSID with the security parameters configured in the Smart Connect profile, as shown in Figure 33.
10. Click **Close**.

Figure 29: Connecting to Employee Portal and Getting Redirected

Figure 30: Providing Corporate User Credentials

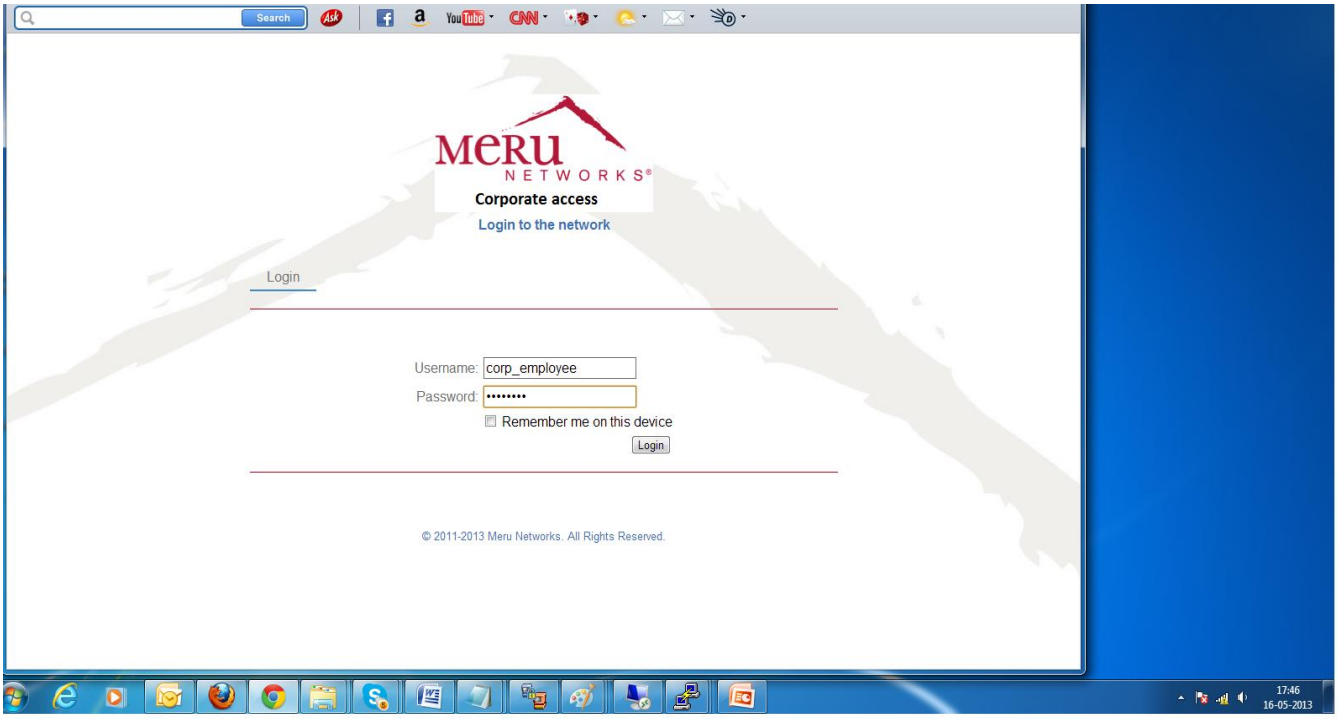


Figure 31: Successful Authentication Page

Figure 32: Installing Smart Connect

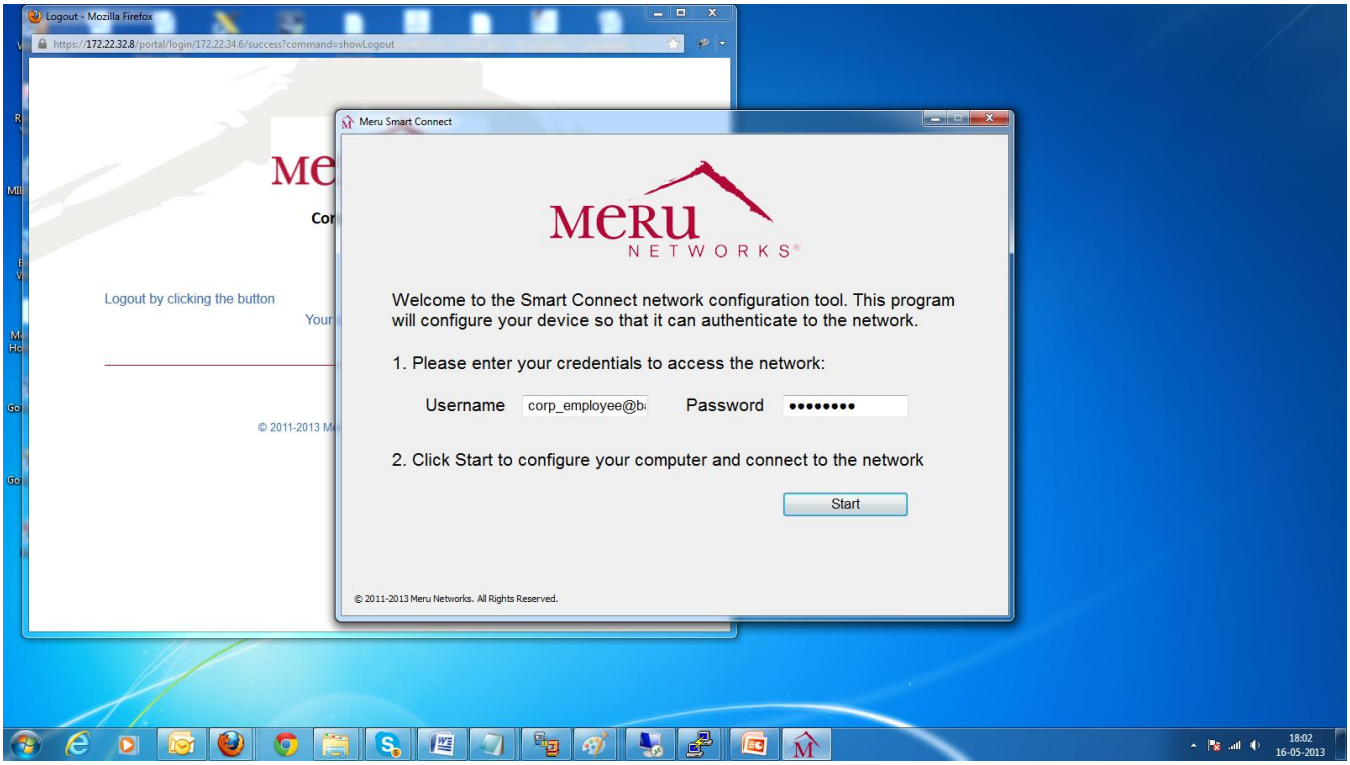


Figure 32: Installing Smart Connect (Continued)

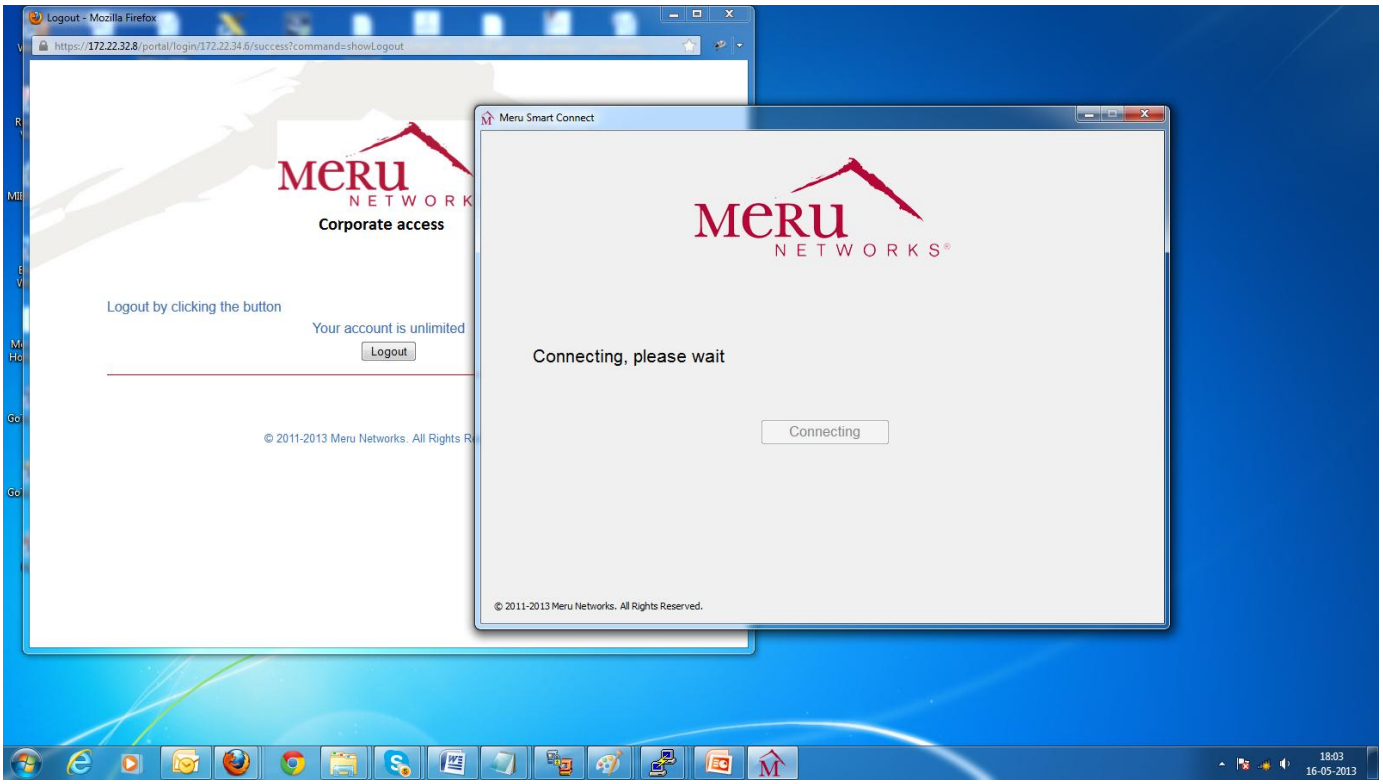
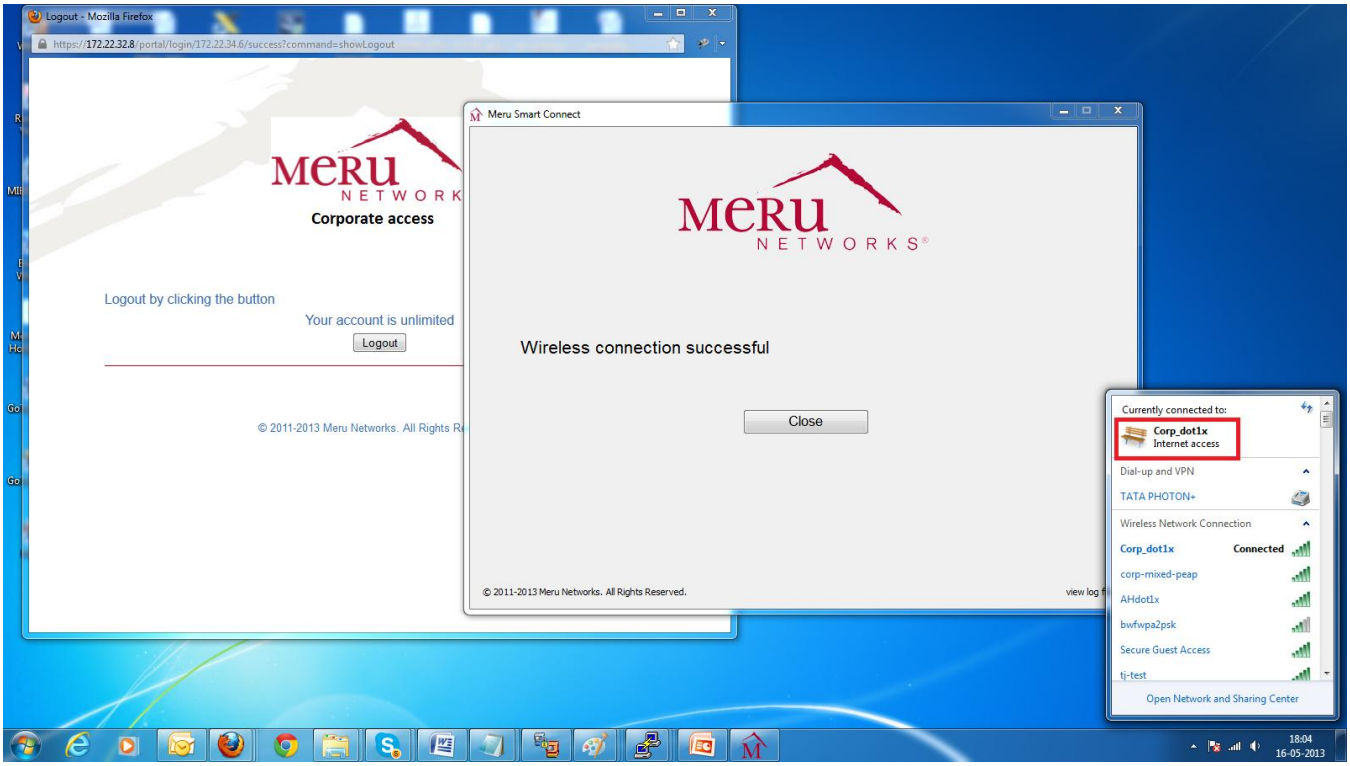


Figure 33: Automatically Connecting to WPA2-Enabled ESSID



Use Case 2: Providing Secure Guest Access

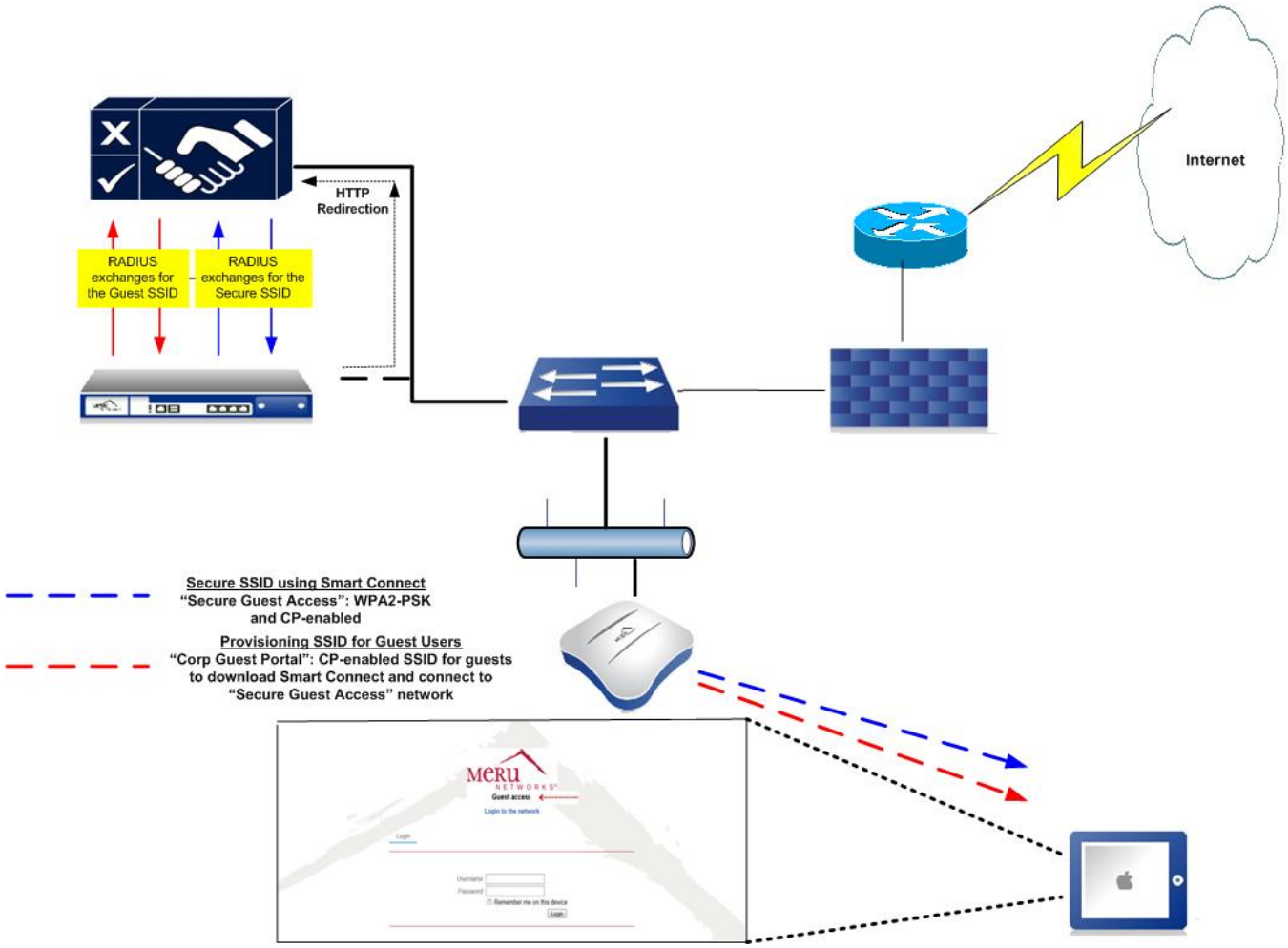
A common security concern about guest networks using Captive Portal authentication is that data sent over the wireless network are not encrypted, making the network and users vulnerable to attacks. Using WPA2-PSK to encrypt data offers increased security, but configuring the pre-shared key for each device that connects to your network can be challenging.

This use case applies to network administrators who must enable network devices to connect to the secure wireless network for guest access. This use case illustrates the process of self-provisioning of users with Apple iPad devices to connect to the WPA2-PSK-enabled network. The same use case applies to all users, regardless of the type of end device. Smart Connect and Identity Manager automatically detect the type of device connecting to the network and correctly configure the device for secure network access.

After users initially connect to the provisioning network and are successfully authenticated using guest credentials, they can download and install the Smart Connect profile, which automatically configures and connects to the secure guest wireless network. On subsequent visits, users are authenticated using the Captive Portal and connected to the secure guest network with the assurance that all their data and transactions are securely encrypted.

Figure 34 shows the network diagram for Use Case 2.

Figure 34: Use Case 2 Network Diagram



You perform the following configuration tasks for this use case:

- Controller Configuration Tasks
- Creating an Authorization Profile for Guest Users
- Create a Smart Connect Profile
- Create a Smart Connect Policy
- Creating a Guest Portal
- Creating a Portal Rule
- Installing the Smart Connect Profile on iPad Clients

Controller Configuration Tasks

This use case uses the same network environment as Use Case 1 to provide secure network access for guest users in that network. When configuring secure network access for guest users, you can optionally perform additional configuration tasks to control access for the guest users.

Before configuring Smart Connect with Identity Manager, perform the following tasks on the controller:

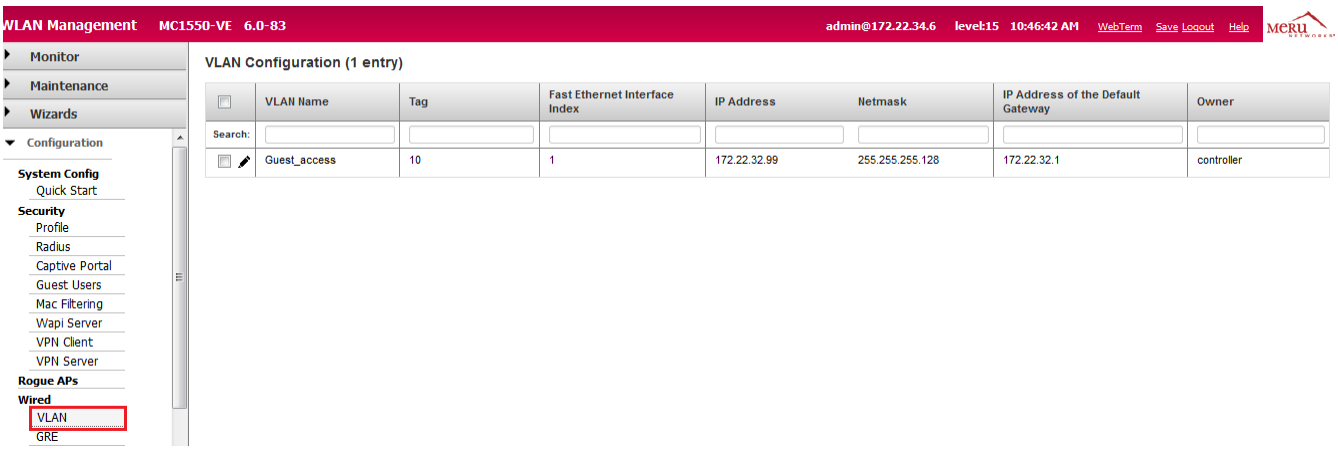
- Create a VLAN for the guest users/network. This VLAN IP address range is used to redirect guest users to the corporate guest portal, rather than the employee provisioning portal, which was configured in Use Case 1.
- Create an ESS profile with a WebAuth-enabled security profile mapped to it.
- Create a secure ESS profile with WPA2-PSK and WebAuth-enabled security profile mapped to it.
- (Optional) Create another VLAN and map it to the WPA2-PSK enabled secure SSID. You can also create a third portal for guest users who connect to the Secure SSID, based on the IP address range of the VLAN to allow additional access control for guest users.

  After a guest user connects to the secure SSID, there is no way for you or other administrators to control access for the guests without enabling Captive Portal. Without enabling Captive Portal, guest users who have downloaded the Smart Connect client used to connect to the secure network can access that network as long as they are within range of the network.

Creating a VLAN for Guest Users

In this use case, you need to create a VLAN for guest users called Guest_access, as shown in Figure 35.

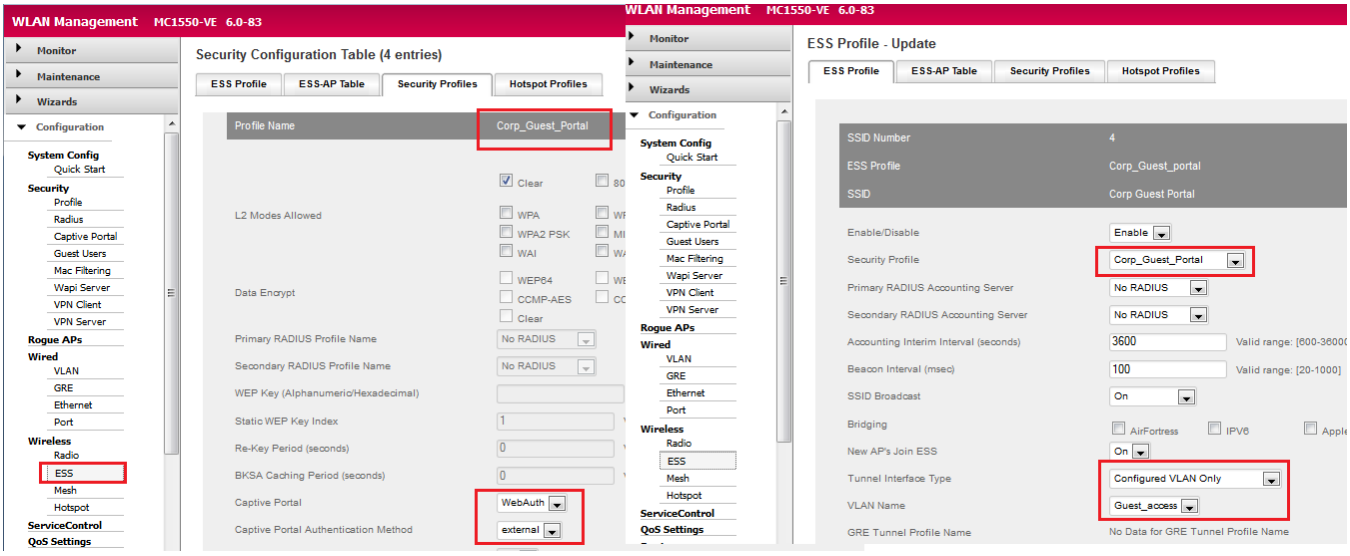
Figure 35: Creating a VLAN



Creating a WebAuth-Enabled Security Profile

Create a WebAuth-enabled security profile and map it to an ESS profile (Corp Guest Portal), which is the provisioning network. (See Figure 36.)

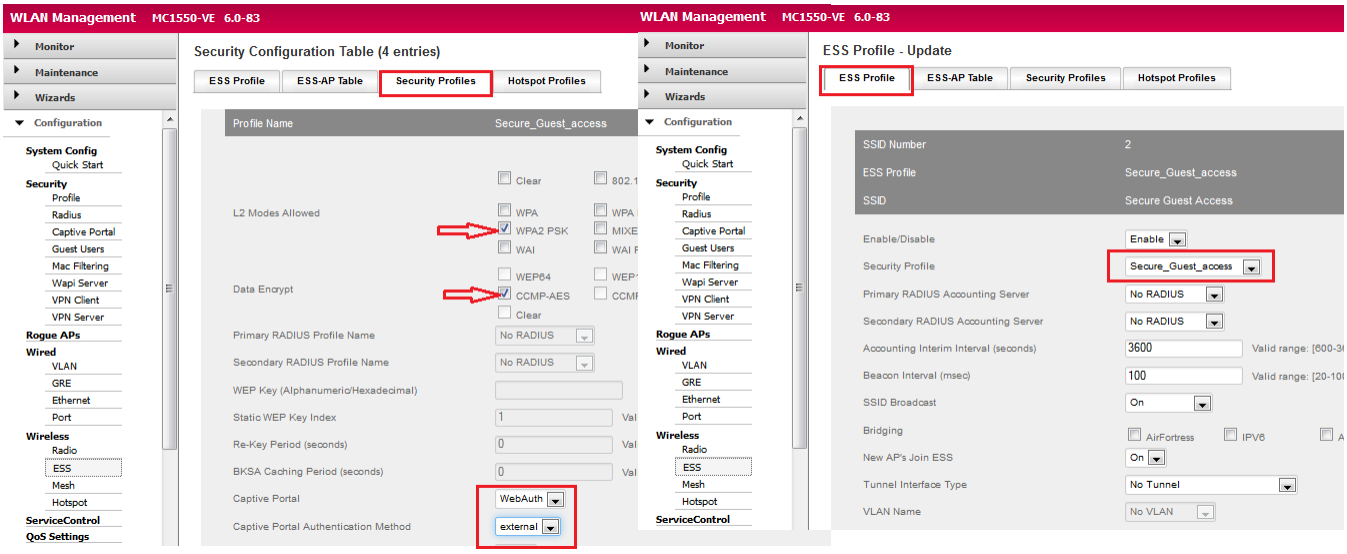
Figure 36: Creating a WebAuth-Enabled Security Profile



Creating a WPA2-PSK-Enabled Security Profile

Create a WPA2-PSK enabled security profile and map to an ESS profile (Secure Guest Access), which is a secure network for guest users. (See Figure 37.)

Figure 37: Creating a WPA2-PSK-Enabled Security Profile

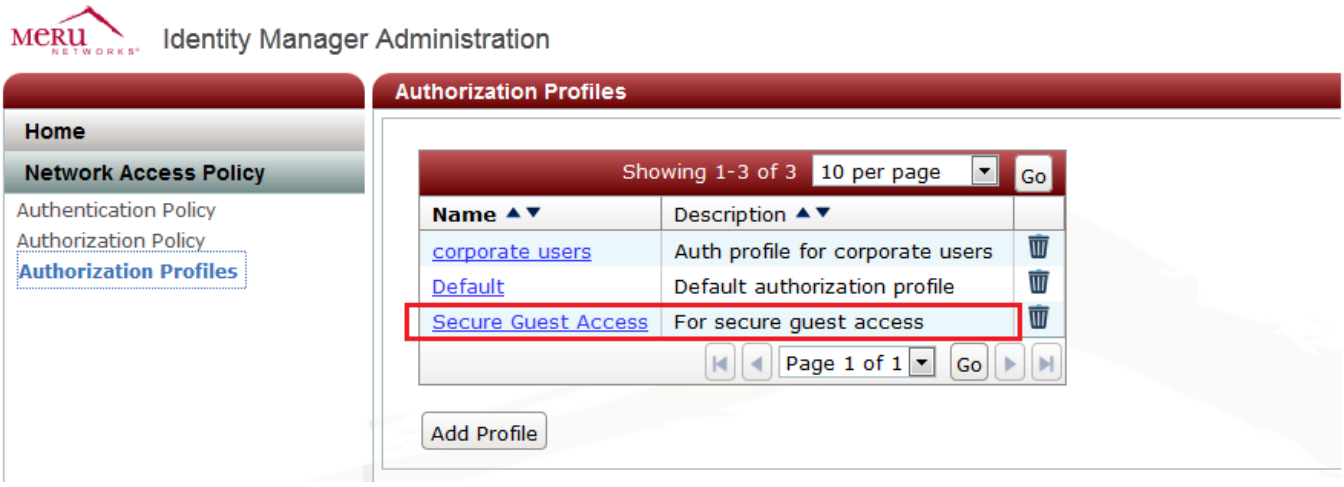


For information about how to create and manage VLANs, ESS profiles, and security profiles, see the *Meru System Director Configuration Guide*.

Creating an Authorization Profile for Guest Users

In this use case, you need to create an authorization profile (guest role) named Secure Guest Access for the users who connects to the provisioning network, as shown in Figure 38.

Figure 38: Creating Authorization Profile for Guest Users



Create a Smart Connect Profile

You need to create a Smart Connect profile with authentication enabled. In this use case, the Smart Connect profile is named Secure_Guest_Access, as shown in Figure 39 and is configured with WPA2-PSK as the authentication method, as shown in Figure 40.

Figure 39: Creating a Smart Connect Profile

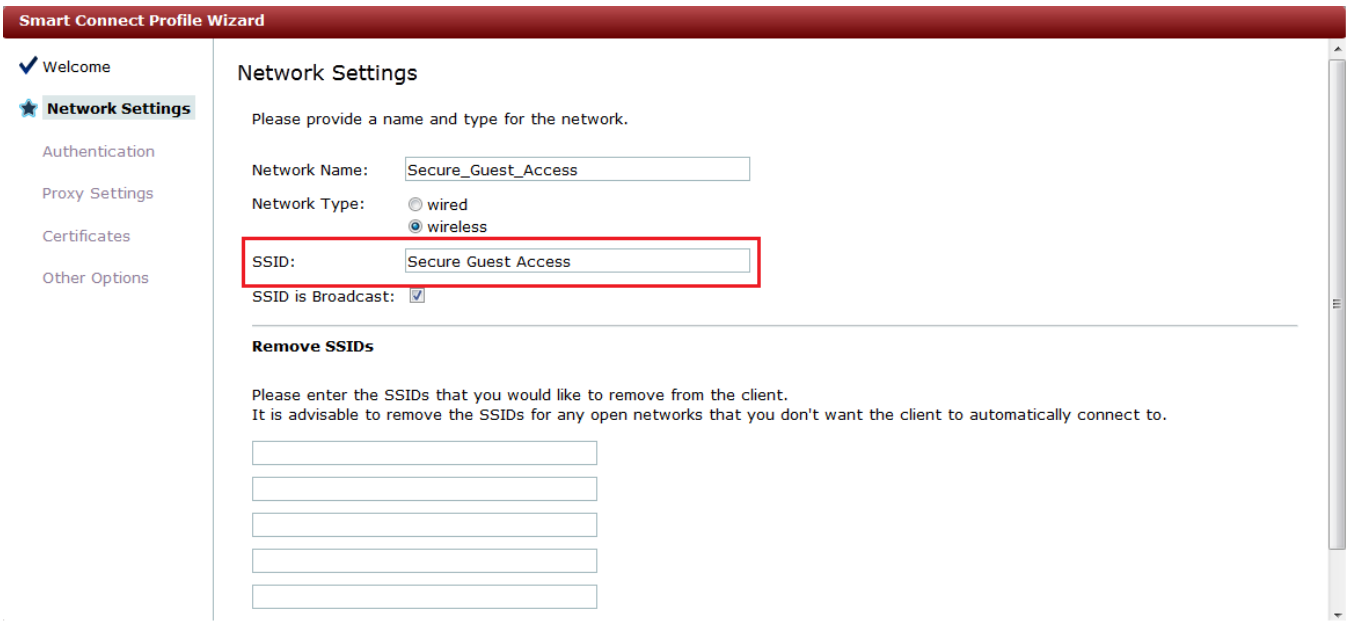
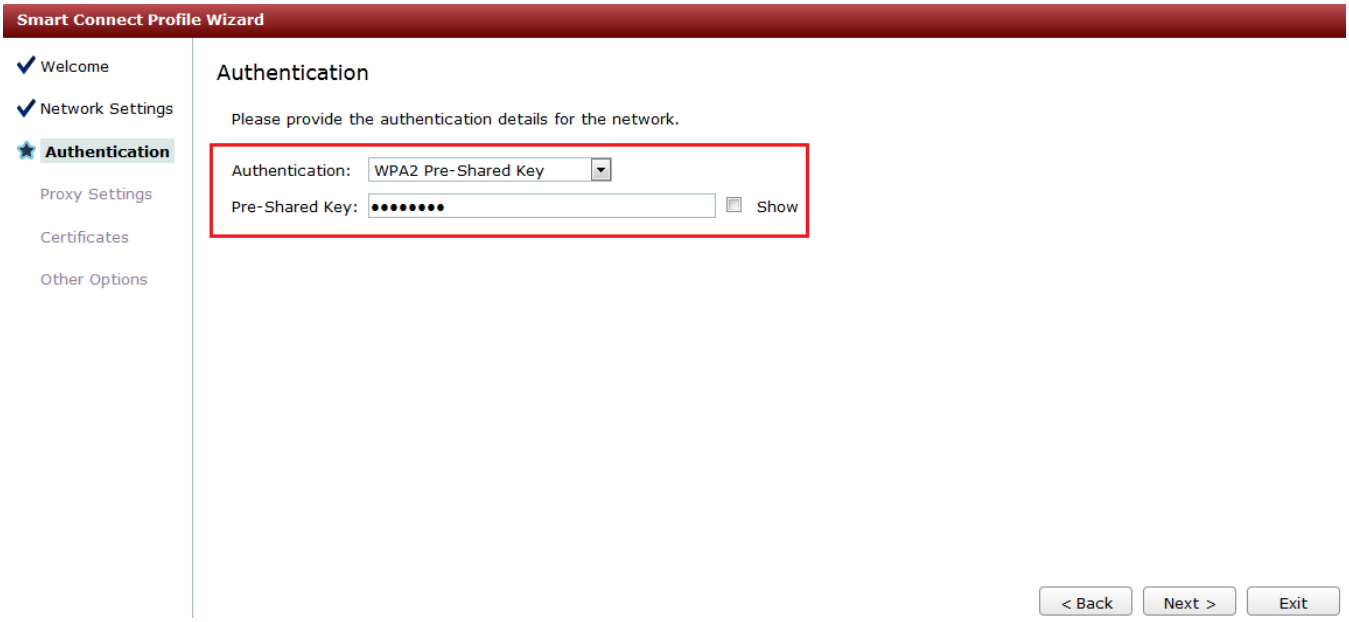


Figure 40: Specifying WPA2-PSK



Creating a Smart Connect Policy

A Smart Connect policy is required to provide users with different Smart Connect profiles. In this use case, all guest users who are part of the “Secure Guest Access” authorization profile are assigned the WPA2-PSK-enabled Smart Connect profile. (See Figure 41 and Figure 42.)

Figure 41: Creating a Rule for Authorization Profile

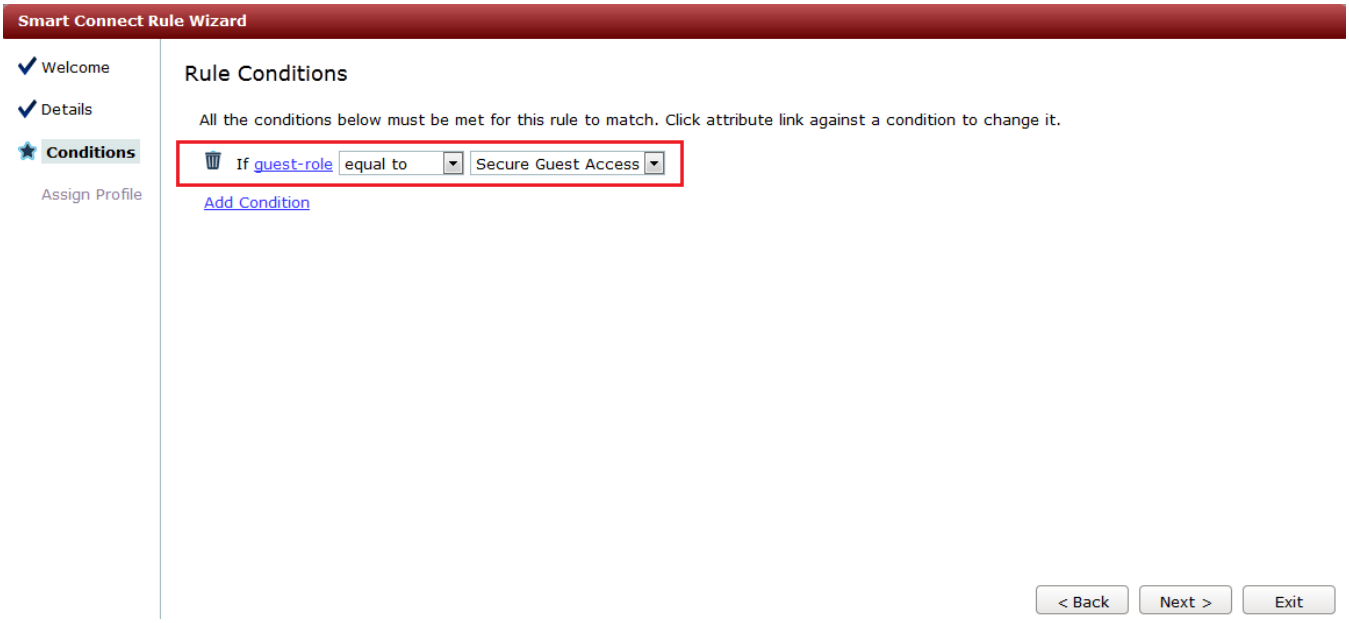
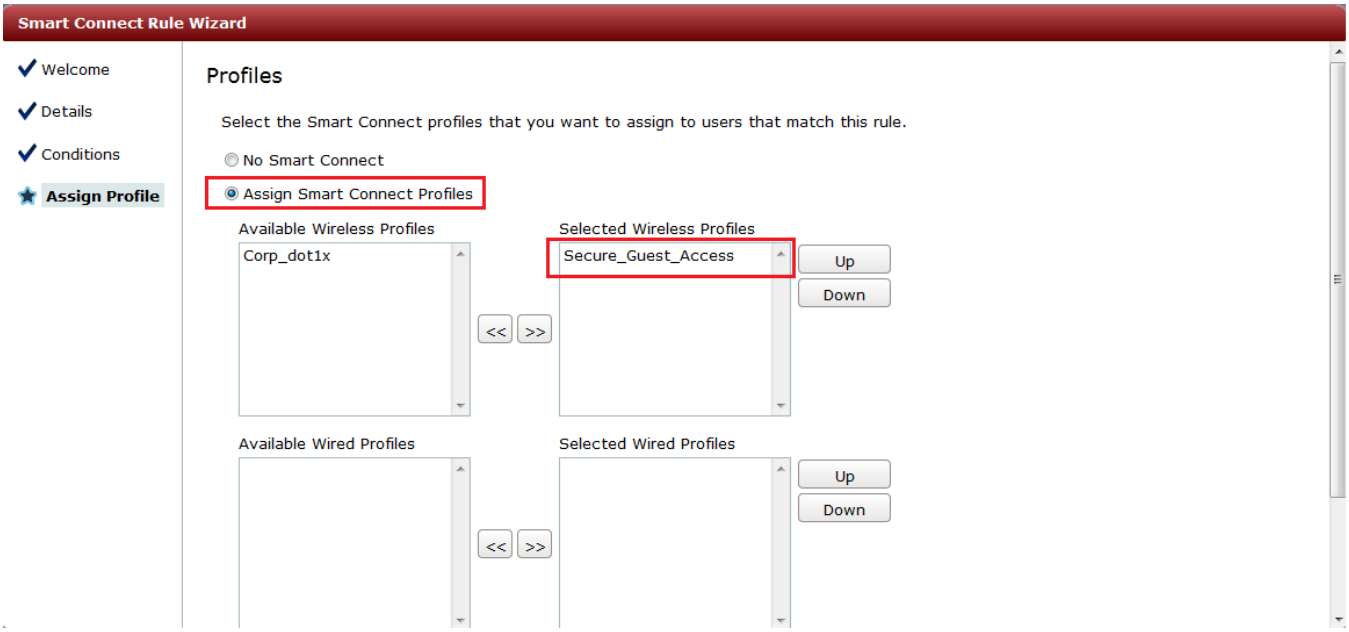


Figure 42: Assigning Smart Connect Wireless Profiles



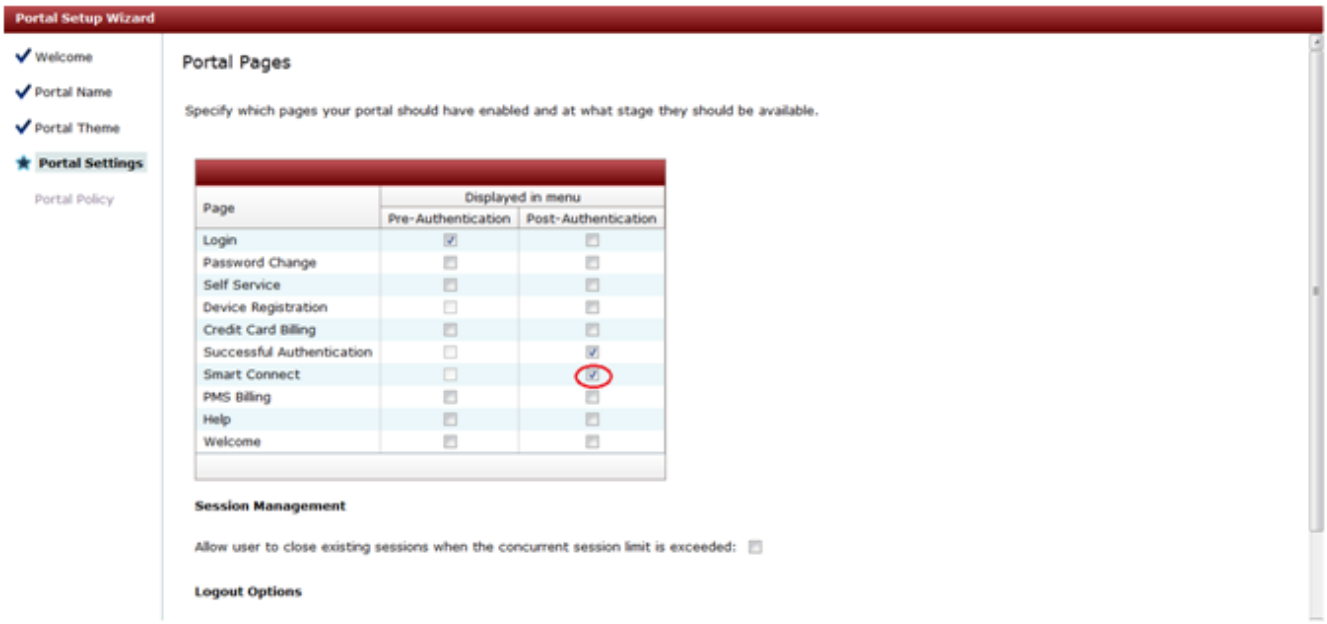
Creating a Guest Portal

You need to create a guest portal for which the login page and Smart Connect are enabled. The user device that initially connected to the “Corp Guest Portal” ESSID is now in the “Guest_access” VLAN (172.22.32.0/25) and is redirected to the new portal. This portal login page authenticates the user so that the client and Smart Connect can be downloaded to securely access the guest network using WPA2-PSK (Secure Guest Access).

Edit the portal page and change the logo for the guest portal, which is used for guest access. Users who connect to “Corp Guest Portal” are redirected to the page shown in Figure 43. Figure 44 shows how to enable Smart Connect for the portal.

Figure 43: Guest Access Portal

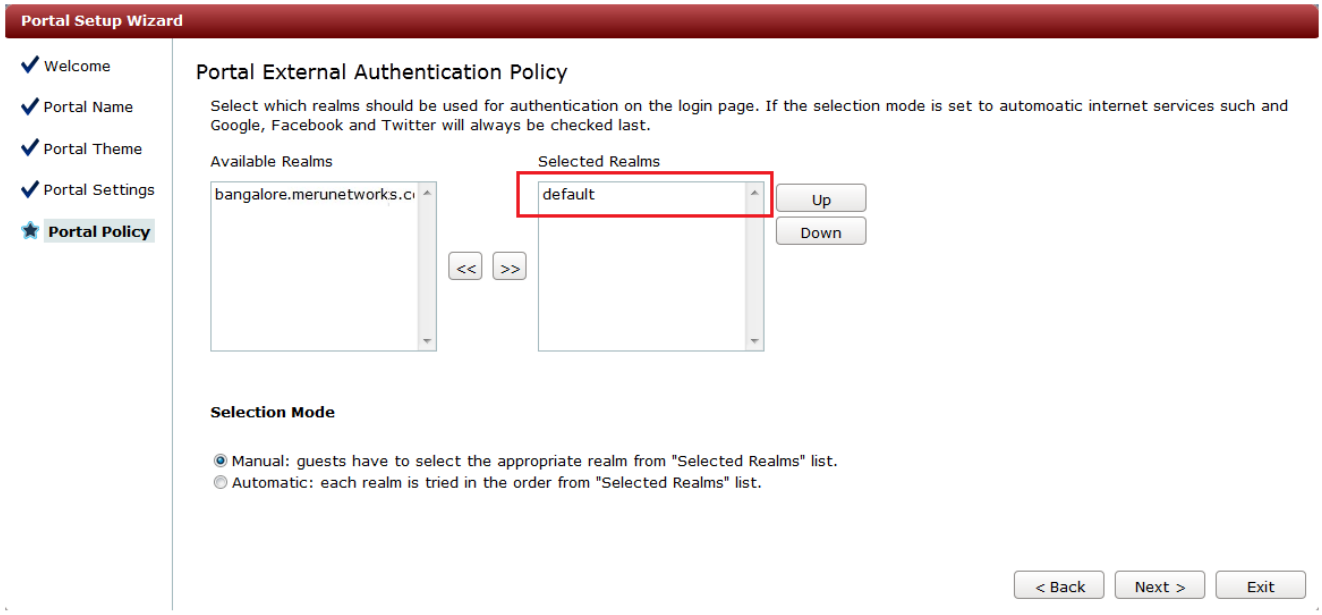
Figure 44: Enabling Smart Connect for the Guest Portal



Specifying the Default Realm

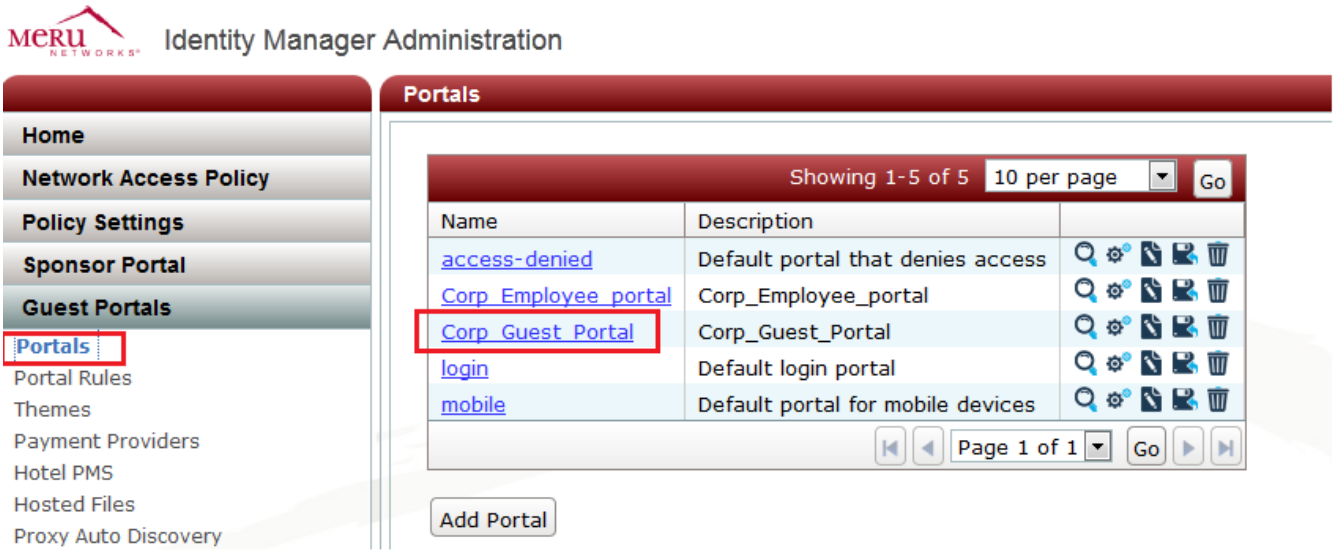
In this use case, you specify the default realm for the guest portal because the guest users who connect to the portal are not users that are defined in the realm for Active Directory users (bangalore.merunetworks.com from Use Case 1). See Figure 45.

Figure 45: Specifying the Default Realm



After making and saving the guest portal changes, the Corp_Guest_Portal that you created appears in the list of portals, as shown in Figure 46.

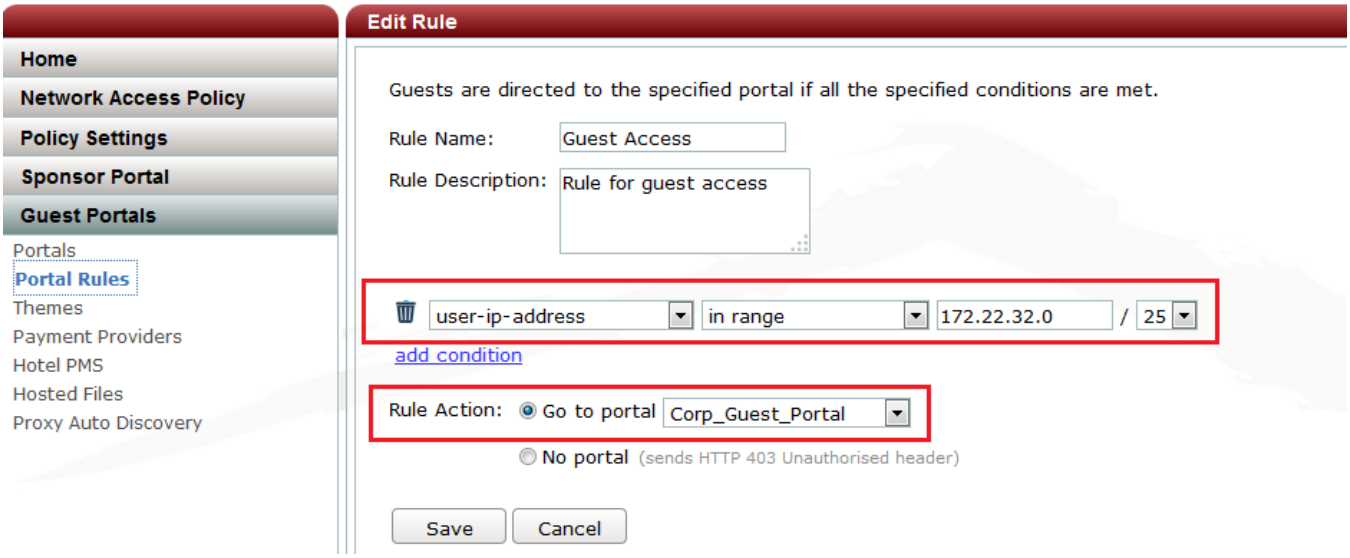
Figure 46: List of Portals



Creating a Portal Rule

You need to create a portal rule that directs client devices to the portal that you created in Creating a Guest Portal. In this use case, this rule directs client devices in the 172.22.32.0/25 network to the "Corp Guest Portal," which allows users to provide authentication credentials to use the secure guest network (Secure Guest Access), as shown in Figure 47.

Figure 47: Edit Rule Page



Installing the Smart Connect Profile on iPad Clients

After you have configured Smart Connect, users can install the Smart Connect profile so that they can connect to your network with the authentication and encryption parameters that you set.

When users access your provisioning network for the first time, they are redirected to the Captive Portal page. After successfully providing login credentials, they have the option to download the Smart Connect profile or continue guest access using the provisioning network (user data and transactions are not encrypted).

The Smart Connect profile installation procedure is illustrated in the following procedure for iPad devices. The general installation procedure is the same for other network devices.

1. Establish a connection to the provisioning network (Corp Guest Portal), and provide user credentials in the guest login page. See Figure 48.
2. After successfully logging in, the option to download Smart Connect is provided. See Figure 49.
3. Install the Smart Connect profile. See Figure 50.

After the Smart Connect profile is installed, the device is initially connected to the secure guest network (“Secure Guest Access”), as shown in Figure 51. The Web browser is again redirected to a Captive Portal page in which the user must provide the same authentication credentials. Enabling WebAuth in the secure ESSID is an optional step; however, without captive portal authentication, administrators cannot control or account for user activity in the secure network using WPA2-PSK. When the user subsequently tries to connect to this network, authentication is required only once.

Note

If the iPad device has an ESSID configured as a known network, the iPad device might automatically connect to the known network if the signal strength for that network is stronger than the network specified by the Smart Connect profile.

Figure 48: Guest Login Page

Figure 49: Successful Authentication Page

Figure 50: Installing Smart Connect Profile

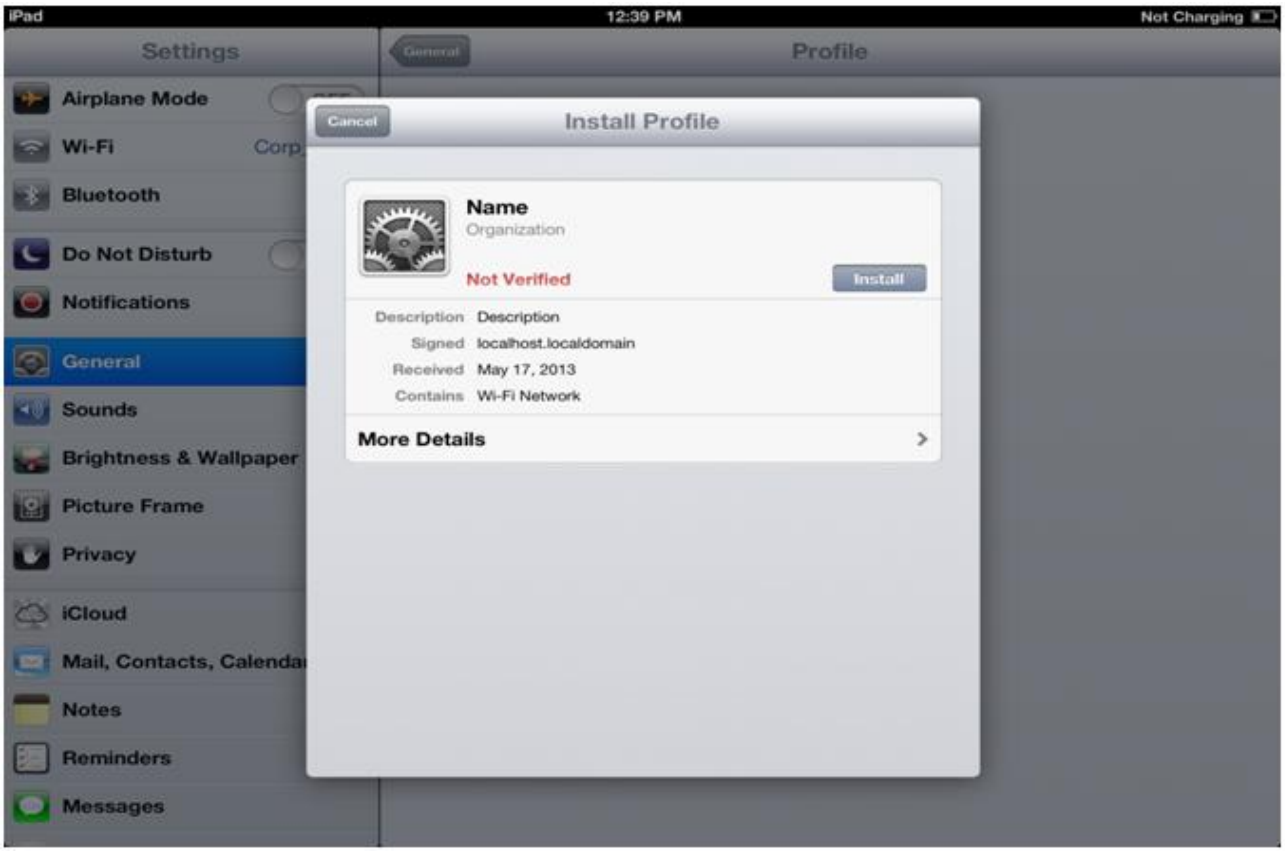
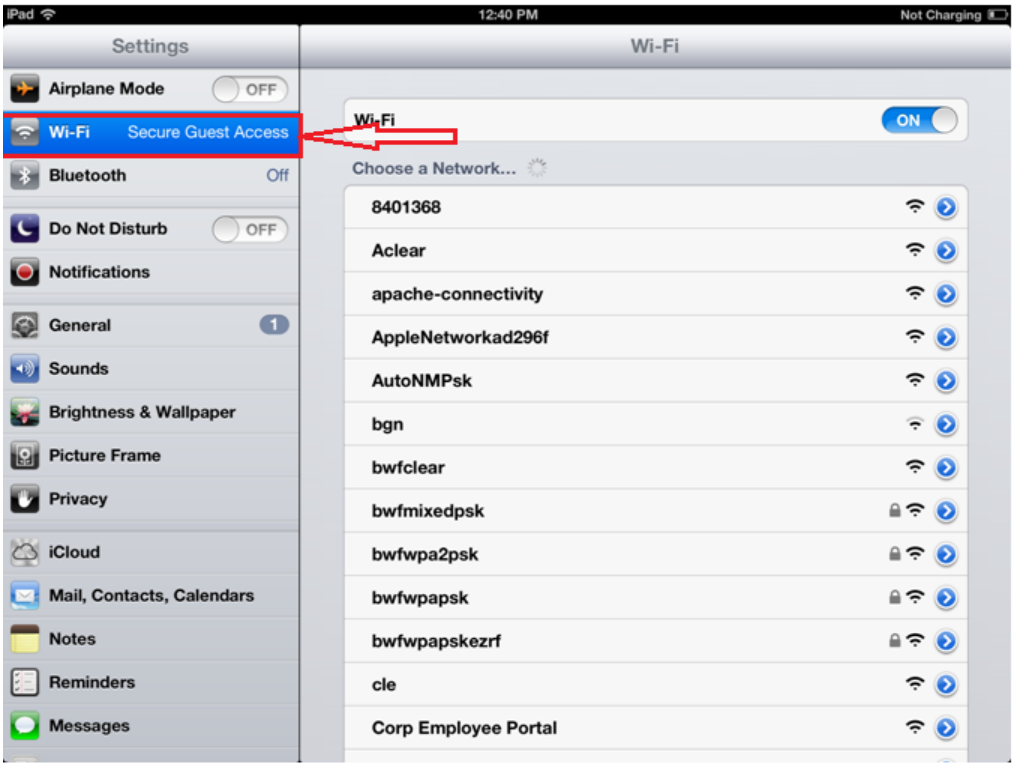


Figure 51: Automatically Connect to Secure Guest Network

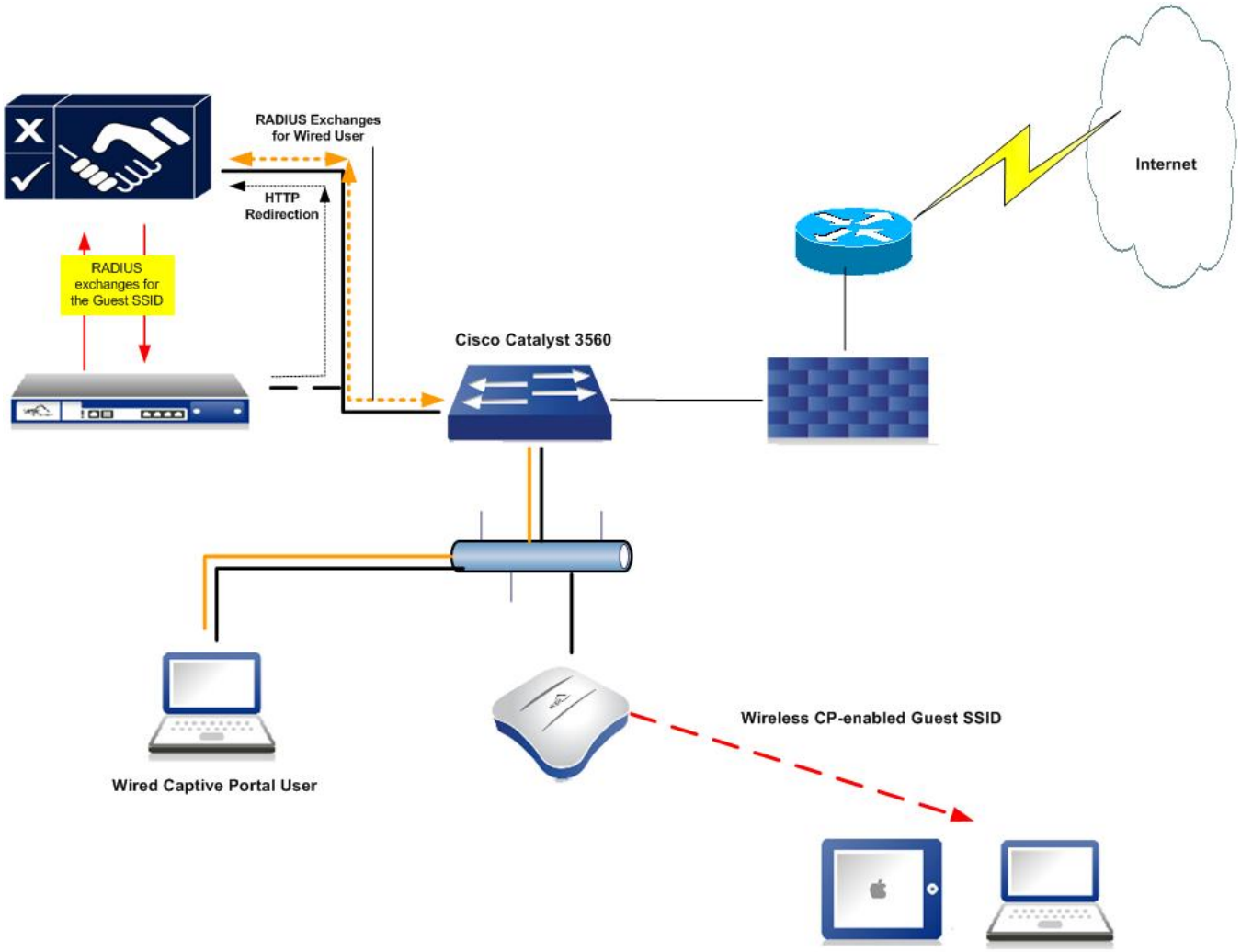


Use Case 3: Configuring Captive Portal for Wired Clients

You can configure wired switches to use a captive portal and Identity Manager to provide the same look and feel for wired and wireless guest users. In this use case, a Cisco Catalyst 3560 switch is used to enable Web authentication, with Identity Manager handling only the RADIUS authentication. If you are using a different network device, the configuration steps can vary; see the documentation for your device for vendor-specific configuration information.

Figure 52 shows the network diagram for Use Case 3.

Figure 52: Use Case 3 Network Diagram



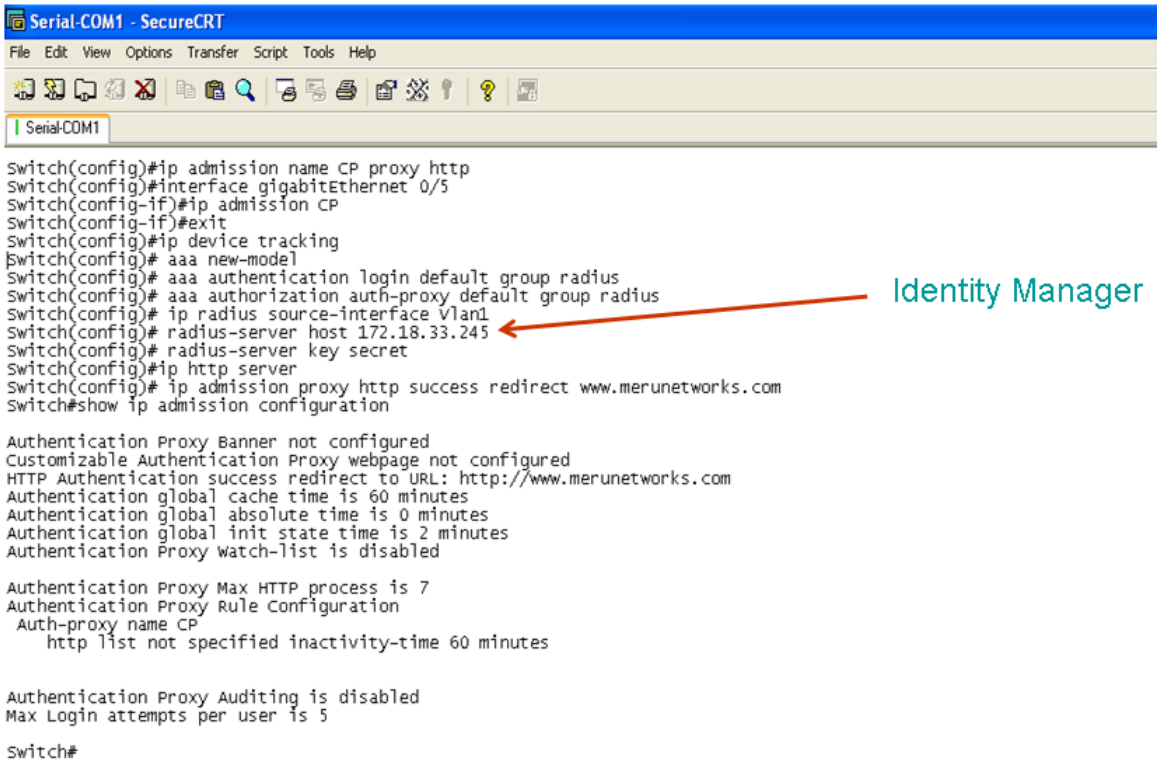
You perform the following tasks to configure Captive Portal for wired clients:

- Configuring the Switch
- Configuring Identity Manager
- Creating a Custom Captive Portal for Web Authentication

Configuring the Switch

Figure 53 shows the configuration for the switch. Note that Identity Manager, whose IP address is 172.18.33.245, is identified as a RADIUS server in the configuration.

Figure 53: Switch Configuration



Configuring Identity Manager

You need to configure Identity Manager to recognize the switch as a RADIUS client. The switch has an IP address of 172.18.33.248.

When configuring a RADIUS client in Identity Manager:

- Specify the type of RADIUS client as **Cisco Switch**, as shown in Figure 54.
- As shown in Figure 55, add the following AV pair value: `cisco-AVPair "priv-lvl=15"`. Adding this value specifies that the highest privilege level on the router is used so that you can permit all user traffic for the port after successful user authentication.
- Add the following AV pair value: `cisco-AVPair " auth-proxy:proxyacl#1=permit ip any any"`. Adding this value allows all user traffic after successful user authentication.

Figure 54: RADIUS Client Tab

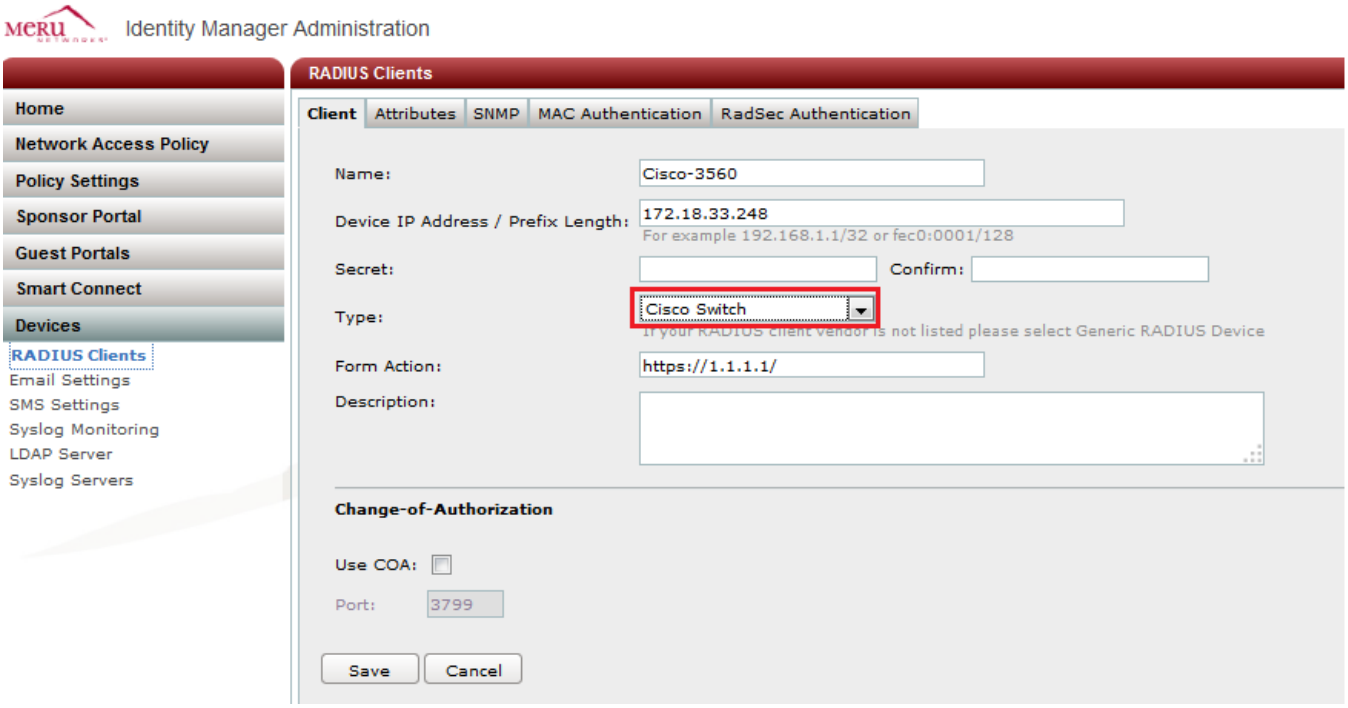
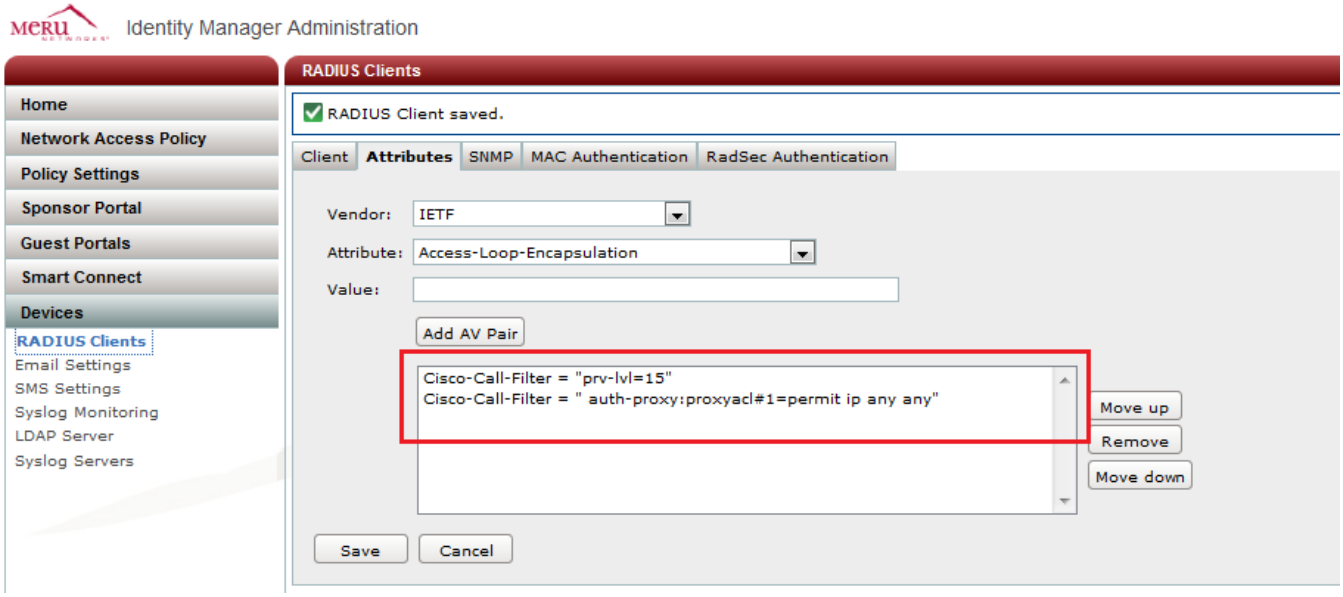


Figure 55: RADIUS Client Attributes Tab



You can now connect a wired station to the interface for which Captive Portal is enabled, and the user is redirected to the default Captive Portal splash page for the switch. Figure 56 shows an example of the switch's default Captive Portal page and successful authentication window. To create a custom Captive Portal, see Creating a Custom Captive Portal for Web Authentication

Figure 56: Example of Switch Default Captive Portal Page and Successful Authentication Window

Creating a Custom Captive Portal for Web Authentication

To create a custom Captive Portal for Web authentication, you perform the following tasks:

- Defining Custom Captive Portal Pages
- Previewing the Wired Guest Portal Configured in Identity Manager
- Configuring the Switch to Permit Traffic to Identity Manager
- Copying the Custom Captive Portal Pages to the Switch
- Registering Custom Captive Portal Pages
- Verifying Authentication Using the Captive Portal Pages

Defining Custom Captive Portal Pages

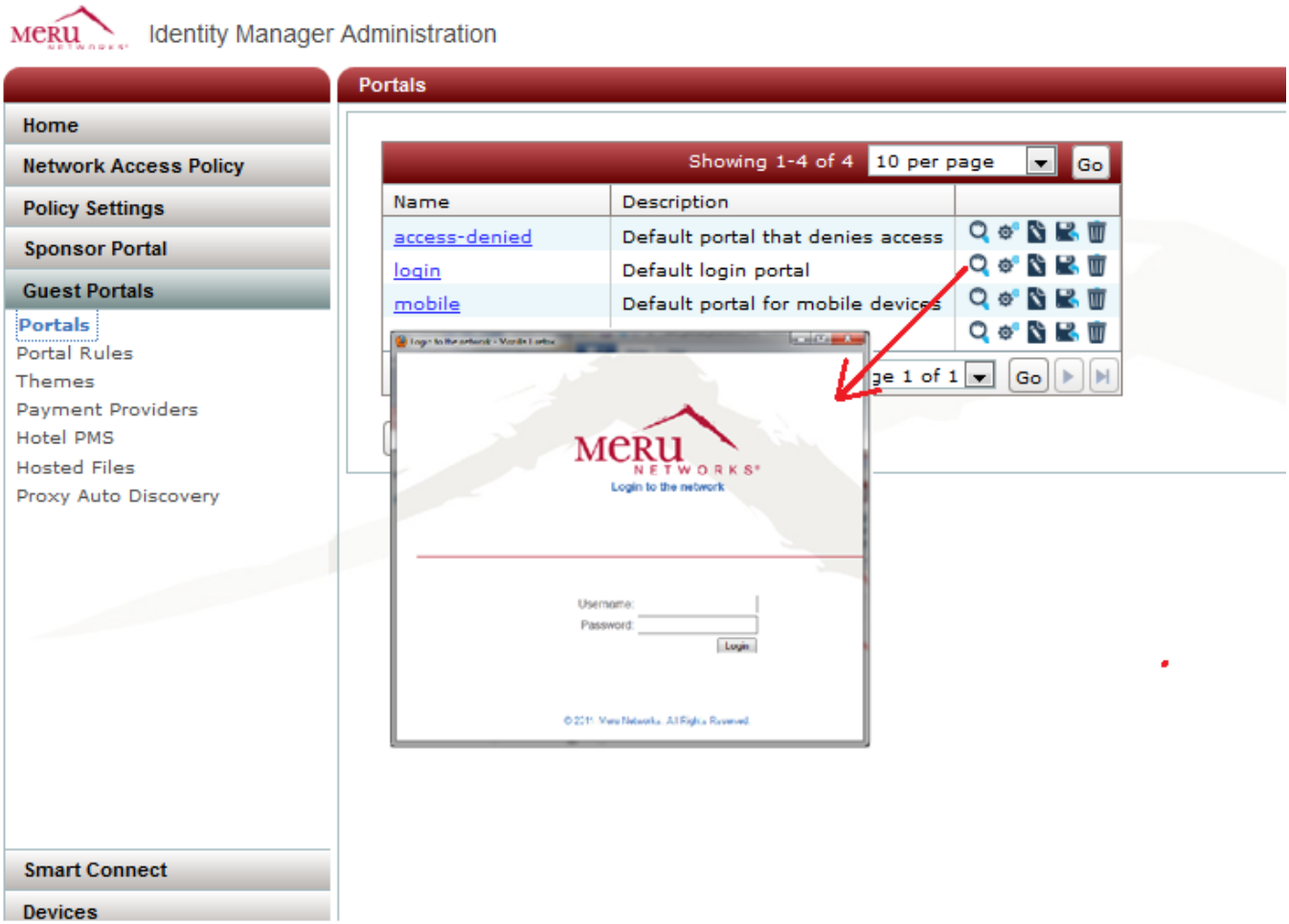
If you do not want to use the switch's default Captive Portal pages that are provided, you can transfer Identity Manager guest portal pages to use for the Captive Portal. In this use case, a set of default Identity Manager portal pages is used. You can customize guest portal pages using Identity Manager. For more information, see the *Meru Identity Manager User Guide*.

Previewing the Wired Guest Portal Configured in Identity Manager

To preview the wired guest portal:

1. In the Identity Manager Administration Interface, select **Guest Portals > Portals**.
2. Click the Preview icon of the wired guest portal, as shown in Figure 57.

Figure 57: Preview Wired Guest Portal



Configuring the Switch to Permit Traffic to Identity Manager

You need to configure an access list on the switch to permit traffic to Identity Manager. The following configuration configures access list rules to allow incoming TCP traffic to ports 80, 8080, 443, and 8443 of Identity Manager.

```
Switch(config-ext-nacl)#10 permit tcp any host 172.18.33.245 eq www
Switch(config-ext-nacl)#20 permit tcp any host 172.18.33.245 eq 8080
Switch(config-ext-nacl)#30 permit tcp any host 172.18.33.245 eq 443
Switch(config-ext-nacl)#40 permit tcp any host 172.18.33.245 eq 8443
```

Copying the Custom Captive Portal Pages to the Switch

Next, you copy the custom Captive Portal pages to the switch. Four custom pages (success.html, failed.html, expired.html, and login.html) located on Identity Manager (172.18.33.245) are extracted and copied to the portalpages directory on the flash drive of the switch (173.18.33.248).

```
Switch#archive tar /xtract http://admin:admin@172.18.33.245/switch/tme-
idm/172.18.33.248/  flash:/portalpages
Loading http://***********@172.18.33.245/switch/tme-idm/172.18.33.248/
extracting success.html (572 bytes)!
extracting failed.html (291 bytes)!
extracting expired.html (291 bytes)!
extracting login.html (1116 bytes)!!!!
Switch#
```

Registering Custom Captive Portal Pages

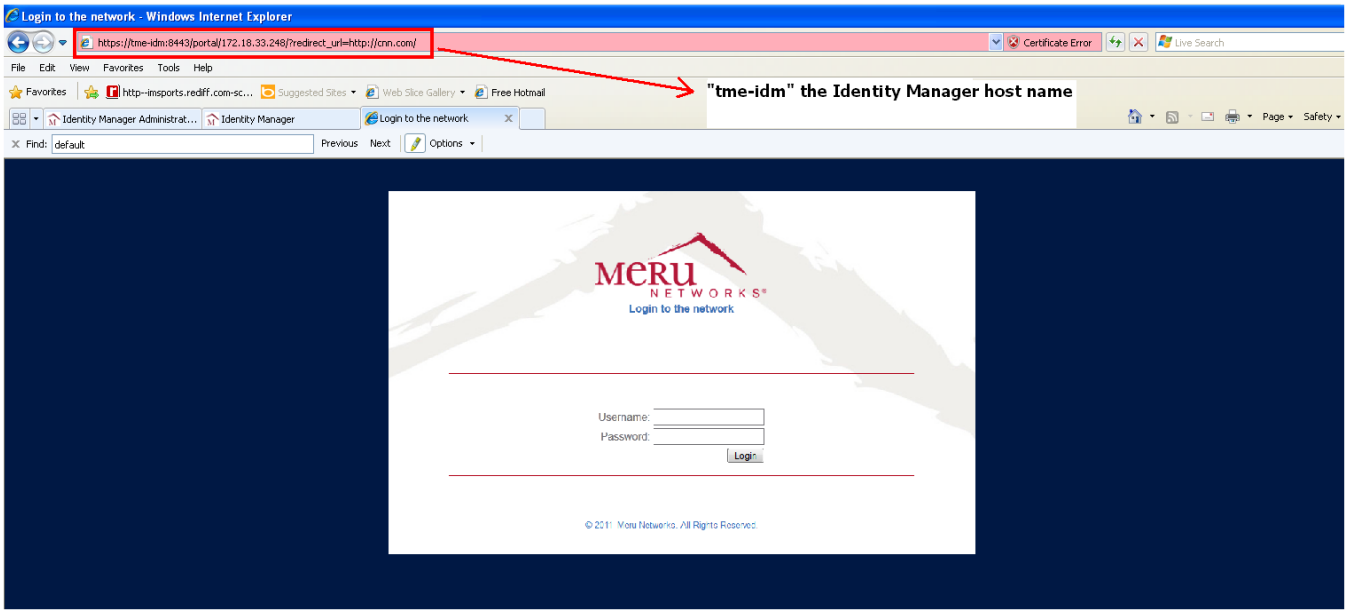
After copying the Captive Portal pages, you need to register them on the switch:

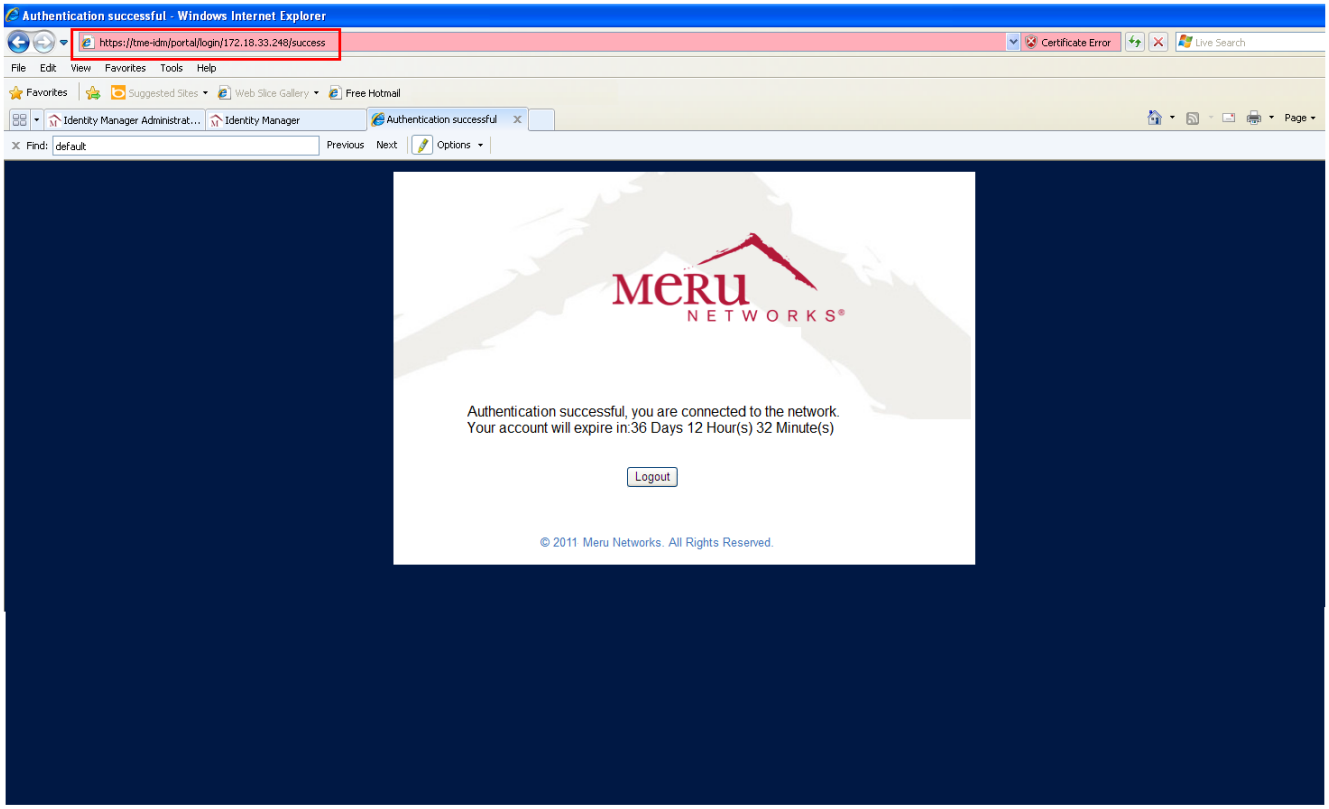
```
Switch(config)#ip admission proxy http login page file
flash:/portalpages/login.html
Switch(config)#ip admission proxy http success page file
flash:/portalpages/success.html
Switch(config)#ip admission proxy http fail page file
flash:/portalpages/failed.html
Switch(config)#ip admission proxy http login expired page file
lash:/portalpages/expired.html
Switch#show ip admission configuration

Authentication Proxy Banner not configured
Authentication Proxy webpage
        Login page              : flash:/portalpages/login.html
        Success page            : flash:/portalpages/success.html
        Fail page               : flash:/portalpages/failed.html
        Login Expire page       : flash:/portalpages/expired.html
HTTP Authentication success redirect to URL: http://www.merunetworks.com
Authentication global cache time is 60 minutes
Authentication global absolute time is 0 minutes
Authentication global init state time is 2 minutes
Authentication Proxy Watch-list is disabled

Authentication Proxy Max HTTP process is 7
Authentication Proxy Rule Configuration
 Auth-proxy name CP
    http list not specified inactivity-time 60 minutes

Authentication Proxy Auditing is disabled
Max Login attempts per user is 5
```

Verifying Authentication Using the Captive Portal Pages

After configuring the switch, verify the configuration by connecting a system with a wired connection to the interface on which Captive Portal is enabled. Provide user credentials to test the authentication process. (See Figure 58.)

Figure 58: Verifying Authentication





Use Case 4: Configuring Role-Based Access Control for Personal and Corporate Devices

Using Identity Manager Version, you can configure role-based access control for corporate and personal devices. For example, you can restrict access to your network for personal devices but allow corporate devices to access some or the entire network.

To configure role-based access control for personal and corporate devices, perform the following tasks:

- Perform controller configuration tasks. See Controller Configuration Tasks.
- Create authorization profiles for personal and corporate devices. See Creating Authorization Profiles.
- Create authorization policies for personal and corporate devices. See Creating Authorization Policies.
- Create device accounts for personal and corporate devices. See Creating Device Accounts.

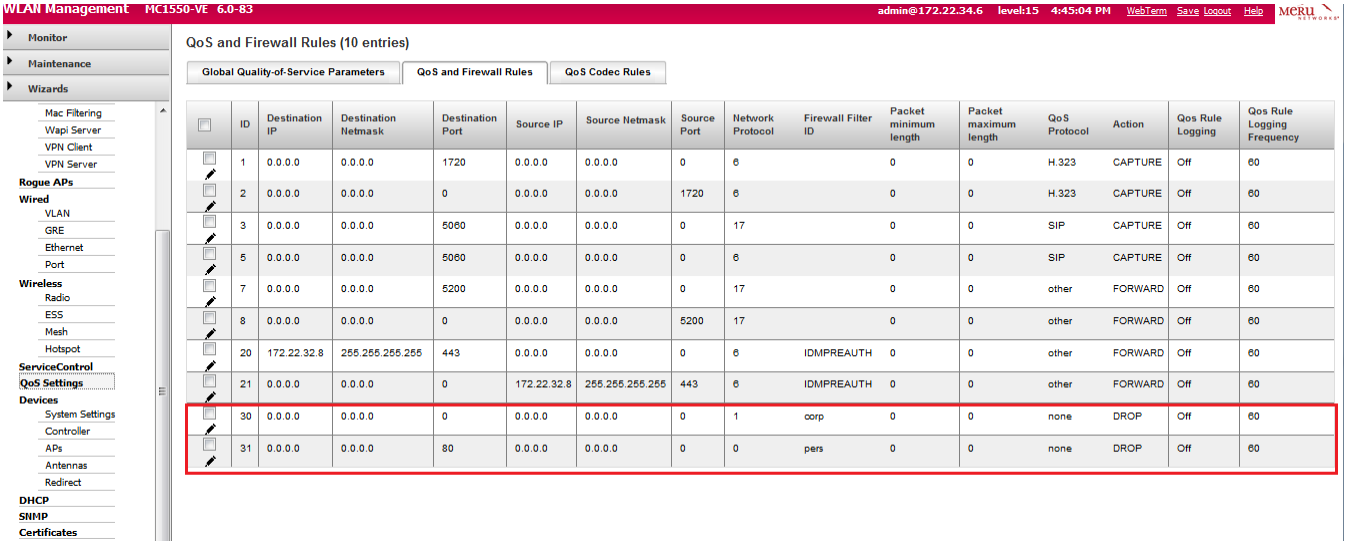
Controller Configuration Tasks

- Creating QoS and Firewall Rules
- Creating a Security Profile

Creating QoS and Firewall Rules

Using Identity Manager, you create authorization profiles with filter ID strings for personal and corporate devices. The Filter-Id strings you use in authorization profiles must match the controller's firewall filter ID values in its QoS configuration, as shown in Figure 59. You can also create firewall policies for bandwidth throttling for users.

Figure 59: QoS and Firewall Rules Page

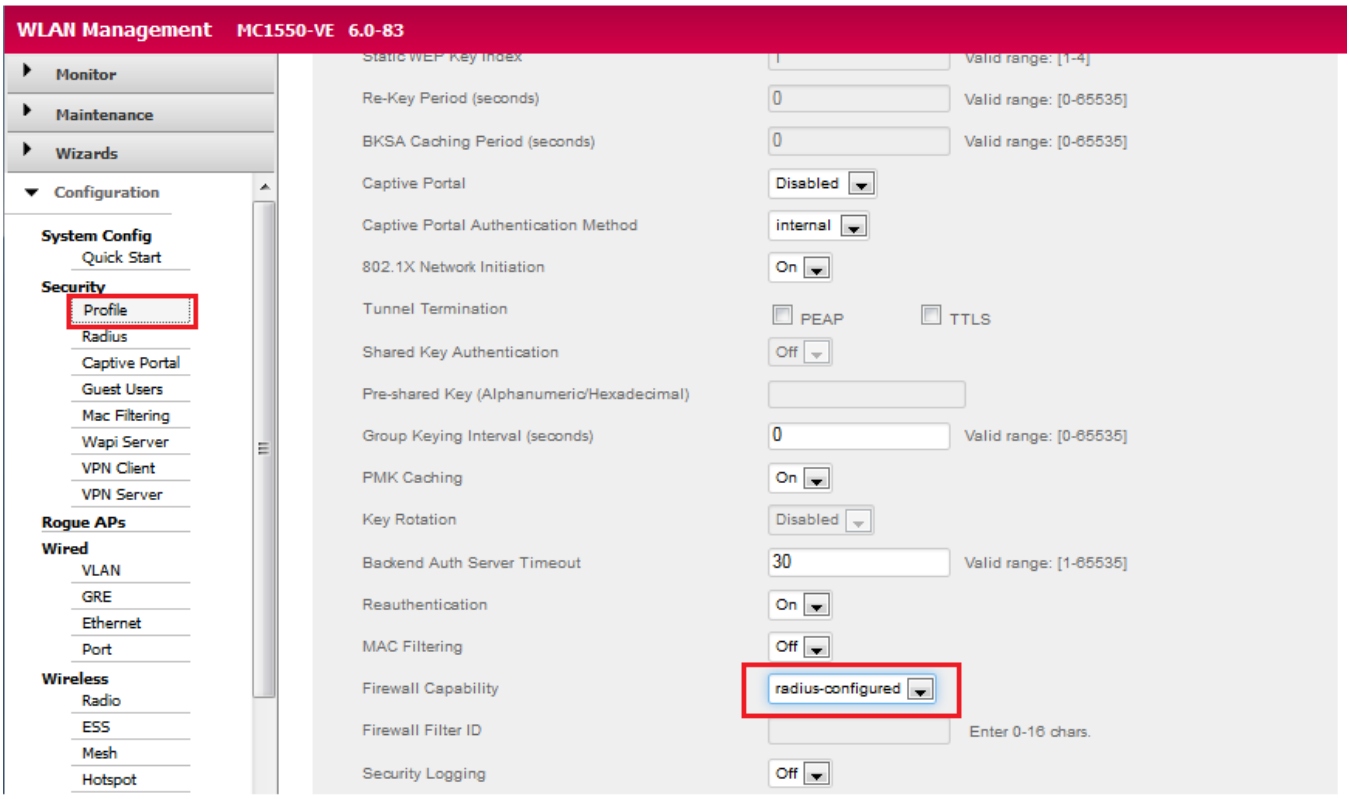


ID	Destination IP	Destination Netmask	Destination Port	Source IP	Source Netmask	Source Port	Network Protocol	Firewall Filter ID	Packet minimum length	Packet maximum length	QoS Protocol	Action	Qos Rule Logging	Qos Rule Logging Frequency
1	0.0.0.0	0.0.0.0	1720	0.0.0.0	0.0.0.0	0	6		0	0	H.323	CAPTURE	Off	60
2	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	1720	6		0	0	H.323	CAPTURE	Off	60
3	0.0.0.0	0.0.0.0	5060	0.0.0.0	0.0.0.0	0	17		0	0	SIP	CAPTURE	Off	60
5	0.0.0.0	0.0.0.0	5060	0.0.0.0	0.0.0.0	0	6		0	0	SIP	CAPTURE	Off	60
7	0.0.0.0	0.0.0.0	5200	0.0.0.0	0.0.0.0	0	17		0	0	other	FORWARD	Off	60
8	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	5200	17		0	0	other	FORWARD	Off	60
20	172.22.32.8	255.255.255.255	443	0.0.0.0	0.0.0.0	0	6	IDMPREAUTH	0	0	other	FORWARD	Off	60
21	0.0.0.0	0.0.0.0	0	172.22.32.8	255.255.255.255	443	6	IDMPREAUTH	0	0	other	FORWARD	Off	60
30	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	0	1	corp	0	0	none	DROP	Off	60
31	0.0.0.0	0.0.0.0	80	0.0.0.0	0.0.0.0	0	0	pers	0	0	none	DROP	Off	60

Creating a Security Profile

You need to create a security profile that dynamically assigns filter IDs using RADIUS, as shown in Figure 60.

Figure 60: Security Profile Page



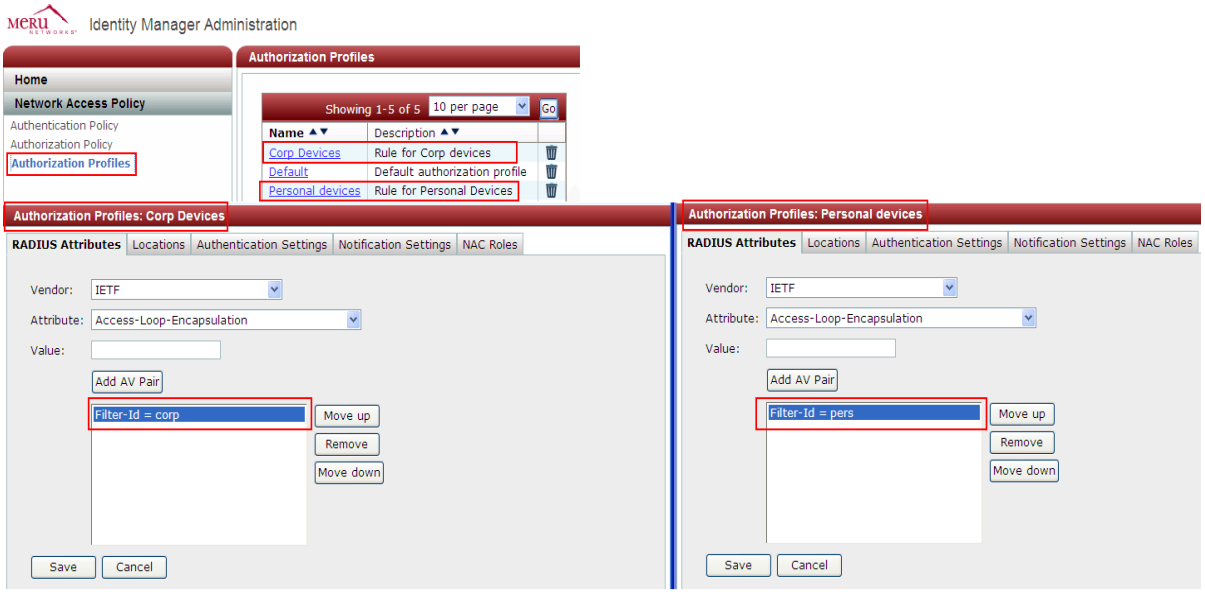
Creating Authorization Profiles

For this use case, you need to create authorization profiles for personal devices and corporate devices: “Corp Devices” for corporate devices and “Personal devices” for personal devices.

When creating each authorization profile:

- Specify the RADIUS attribute as Filter-Id.
- Specify the value of the RADIUS attribute as **corp** for corporate devices and **pers** for personal devices.
- Make sure that the RADIUS attribute values are specified in QoS and firewall rules on the controller, as shown in Figure 59.

Figure 61: Creating Authorization Profiles



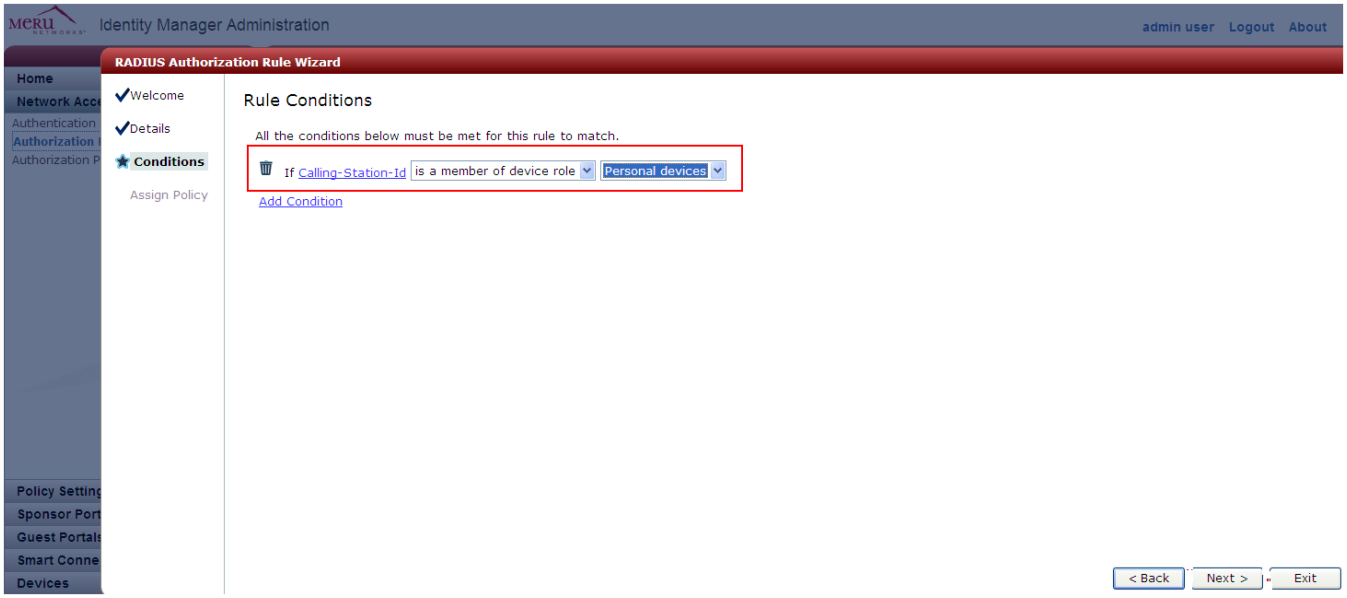
Creating Authorization Policies

For this use case, you need to create authorization policies for personal devices and corporate devices: “Personal” for personal devices and “Corporate” for corporate devices.

Before creating the authorization policies, make sure that the mode for assigning authorization profiles to user is set to Advanced.

When creating the “Personal” policy, on the Rule Conditions page, set RADIUS as the attribute type. Also, as shown in Figure 62, specify the rule conditions for the authorization policy as **is a member of device role** and **Personal devices**. On the Policy page, specify the profile to assign to users to **Personal devices**.

Figure 62: Rule Conditions Page



Creating Device Accounts

Now you need to create device accounts for the corporate and personal devices. Make sure that you have the MAC addresses of the devices when creating device accounts.

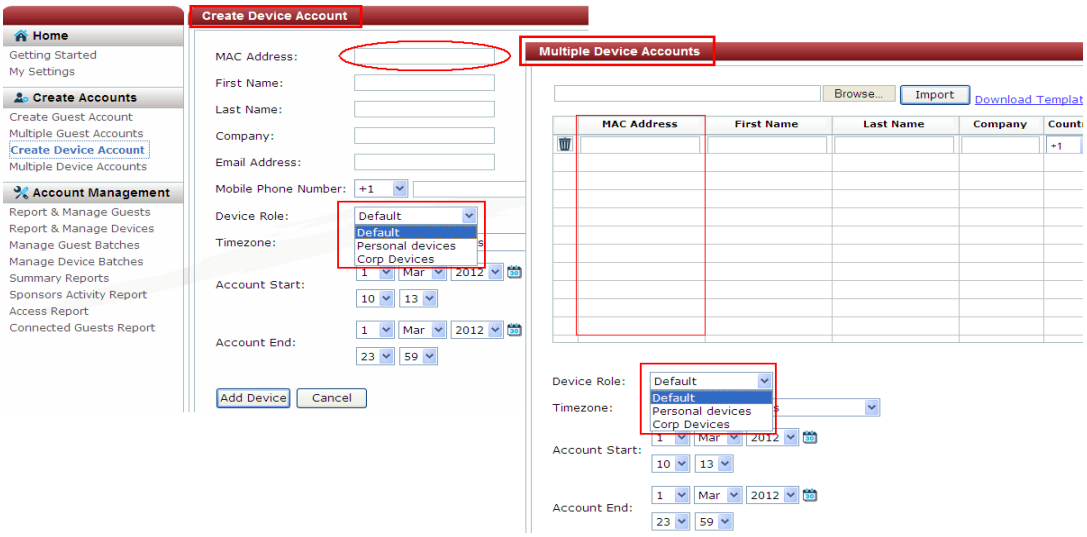
Note

You need only maintain a list of MAC addresses of the corporate-owned devices and can create rules for the personal devices to make them part of a "personal" role with access restrictions.

To create a device account:

1. Log in to Identity Manager using a sponsor account.
2. Create a device accounts one at a time, or create multiple device accounts all at once, as shown in Figure 63.
3. Make sure to select Corp Devices from the Device Role list.

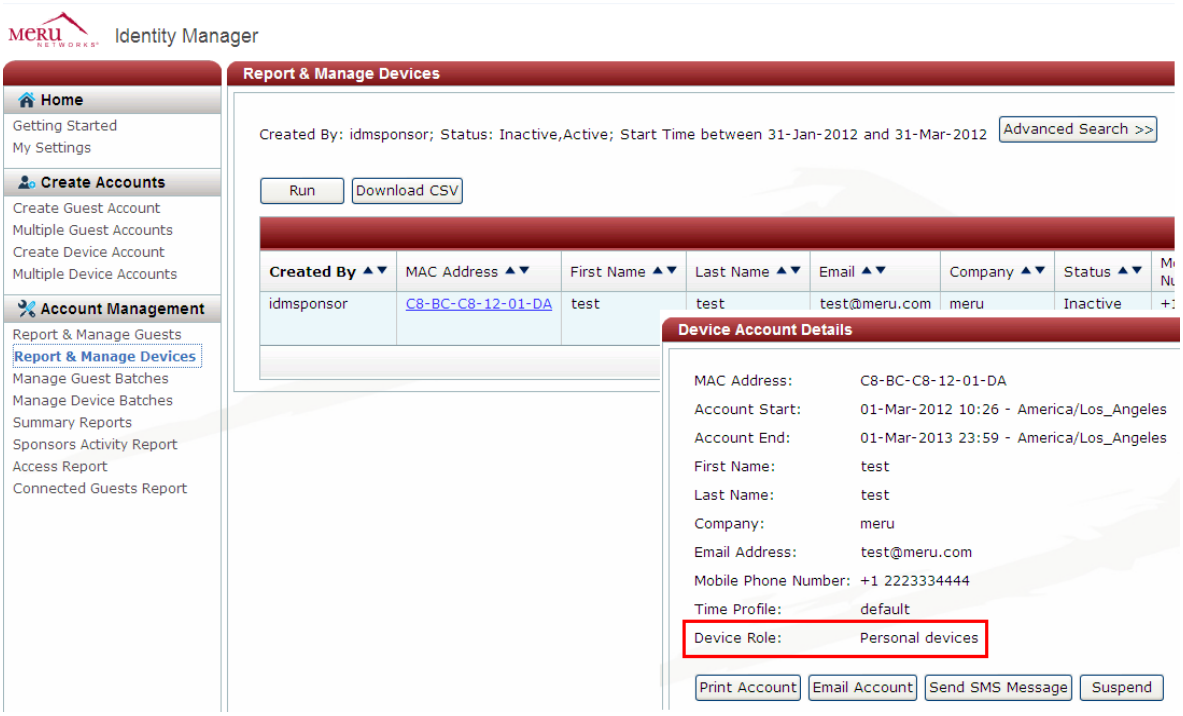
Figure 63: Creating Device Accounts



If you need to change the Device Role value for a device account, suspend the account and create a new device account with the new Device Role value. You can also suspend device accounts if they are no longer necessary.

To review device accounts, select **Account Management > Report & Manage Devices**. To see device account details, click the MAC address link for the device. (See Figure 64.)

Figure 64: Reviewing Device Accounts



Use the personal device to connect to your network, and verify the firewall restriction on user traffic defined by the rule in the QoS policy that you created for personal devices. For personal devices, HTTP traffic is denied, and for corporate devices, ICMP traffic is denied.

Use Case 5: Providing Guest Access Paid Subscription Systems for Wi-Fi Hotspots

Many public Wi-Fi hotspots in hotels, airports, casinos, and holiday resorts provide for guest on-boarding, such as provisioning self-service guest portals, PMS billing (hotels), and so on. A guest access system can also include paid subscriptions; usually, the sign-up process involves providing credit card information online to gain Internet access.

This use case shows how you can configure a Meru controller and Identity Manager so that users can self-register using a guest portal and choose access plans with different speeds. Allowing users to self-register and choose access plans allows for better subscription management. For example, the ability to provide different classes of service in the business lounge of an airport enhances the individual Wi-Fi experience while still using the same Wi-Fi infrastructure.

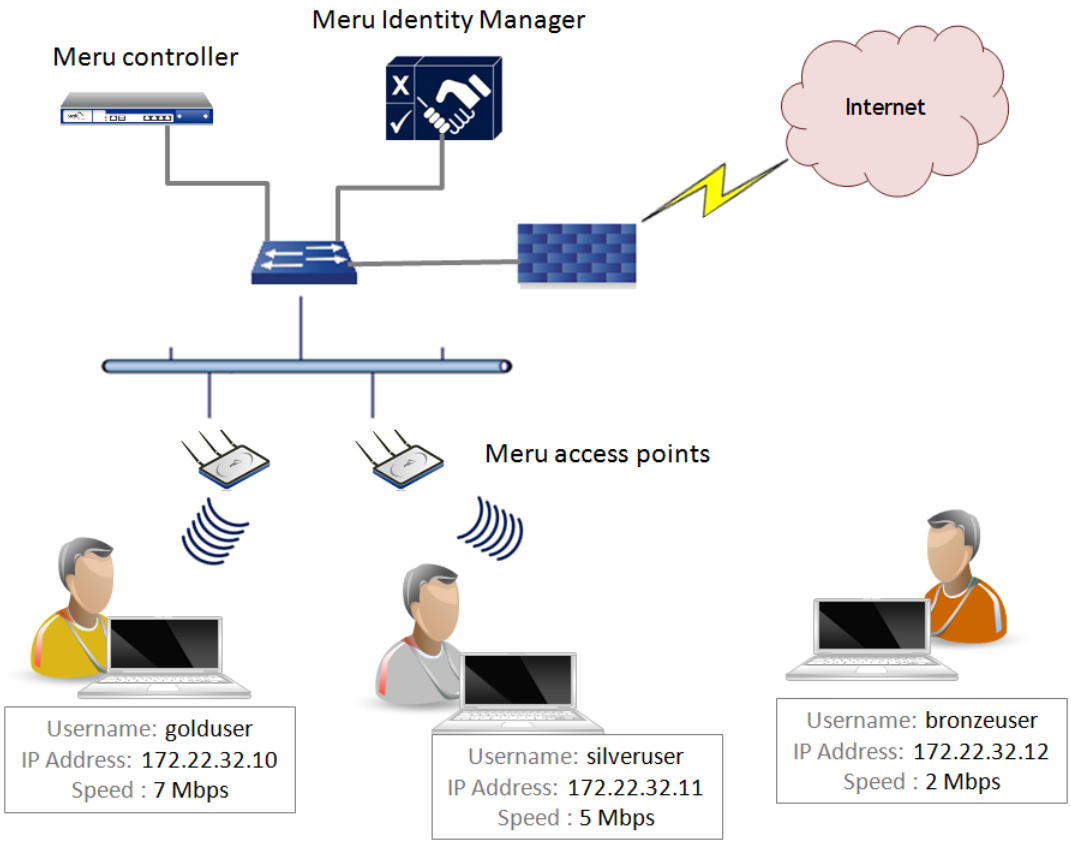
Guest Access Paid Subscription System Deployment

In this deployment, after connecting to the Meru guest portal, users have the option to purchase one of the following access plans:

- Gold plan, which provides network access at a speed of 7 Mbps for $15 (United States dollars) per hour
- Silver plan, which provides network access at a speed of 5 Mbps for $10 per hour
- Bronze plan, which provides network access at a speed of 2 Mbps for $5 for per hour

Figure 65 shows a network diagram of the deployment described in this document.

Figure 65: Network Infrastructure



Configuring the Meru Controller and Identity Manager

To deploy a guest access paid subscription system, you must perform configuration tasks on the Meru controller before configuring Identity Manager.

Controller Configuration Tasks

The following is a high-level list of configuration tasks that you must perform with System Director. For more information, see the *Meru Identity Manager User Guide* and the *Meru System Director Configuration Guide*.

- Create a RADIUS profile that references Identity Manager.
- Map the RADIUS profile to the Captive Portal configuration page.
- Create a security profile with WebAuth enabled, firewall capability defined as RADIUS-configured, and a pass-through Filter-Id specified for Identity Manager access.
- Configure an ESS profile, and map it to the security profile. (See Figure 66.)
- Create two QoS rules for the controller to permit pre-authentication traffic to and from Identity Manager. For configuration information, see the *Meru Identity Manager User Guide*.

- Create a QoS rule for each access plan (total of three) to match any source and destination subnet with Filter-IDs. (See Figure 67 and Figure 68.)
- Make sure that QoS rules for rate limiting have the following configured:
  - Firewall Filter-ID with Match and Flow class enabled.
  - Token Bucket rate.
  - Action option value is set to Forward.
  - Flow Class is enabled for the source (any source). You must enable Flow Class to allow clients to be rate limited individually.
- Change the Captive Portal mode.
- Verify that the QoS rules work correctly.
- Verify authentication for Captive Portal.

Figure 66: Set Up an ESS Profile Mapped to the Security Profile

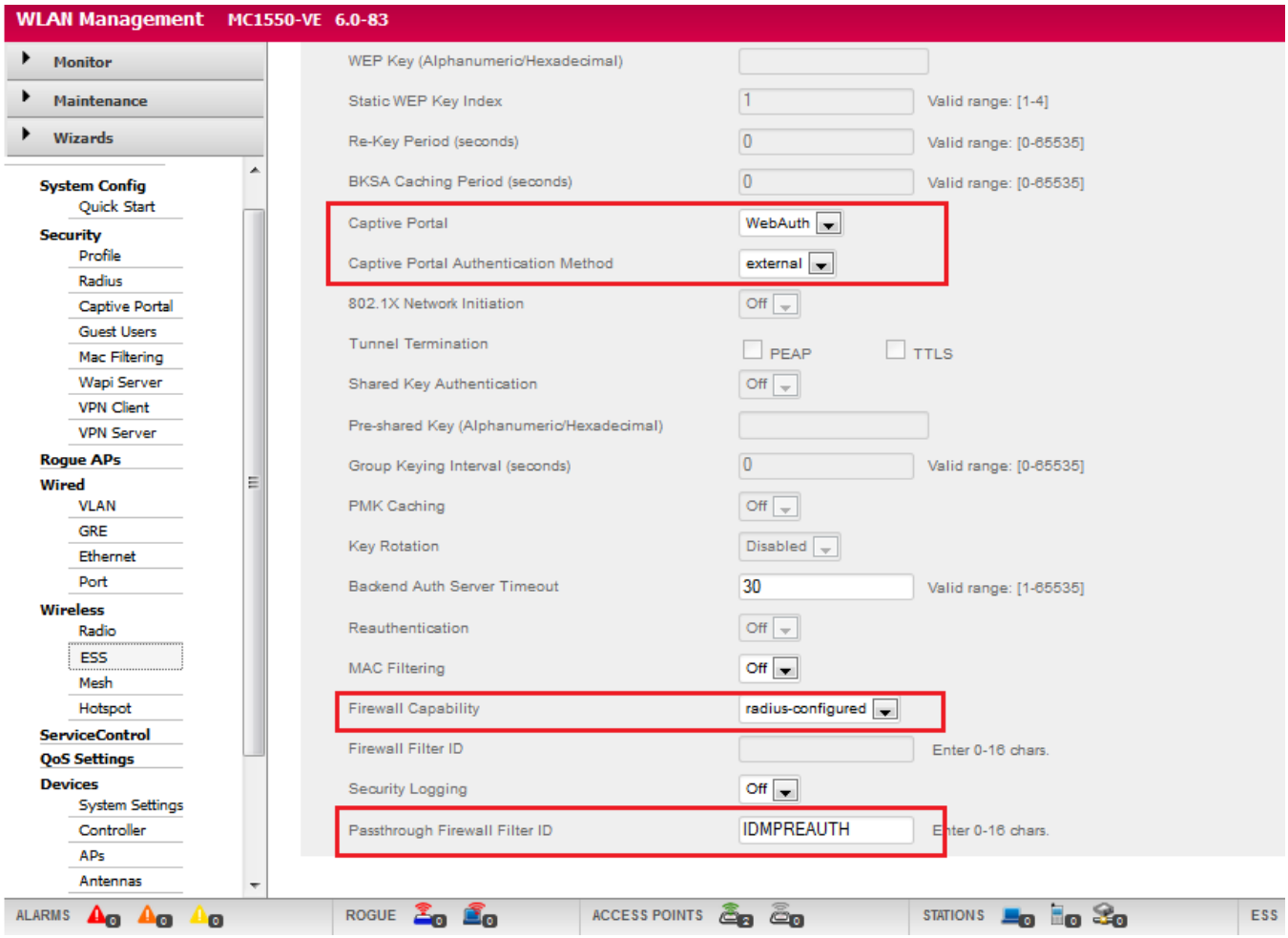


Figure 67: Configuring QoS Rules

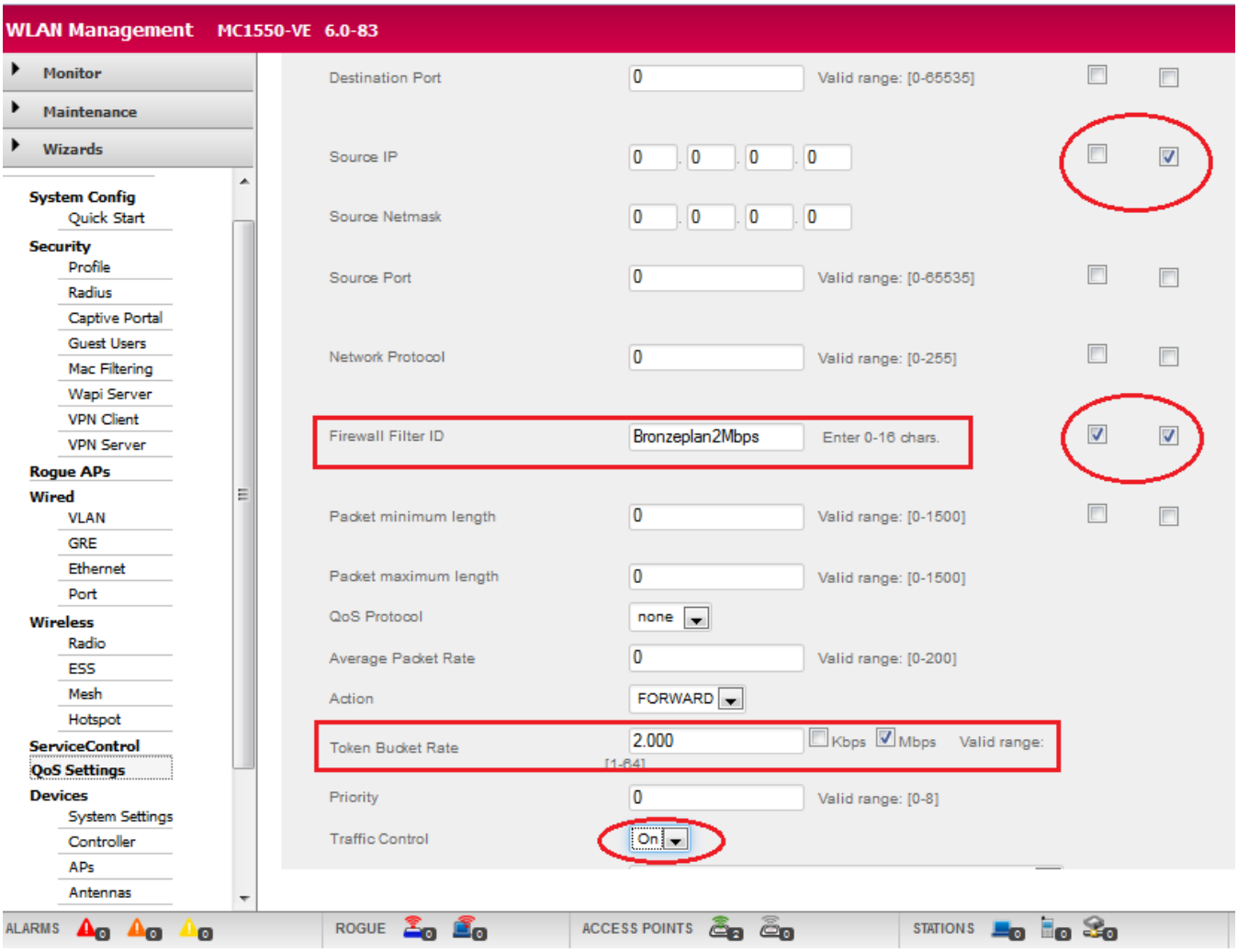
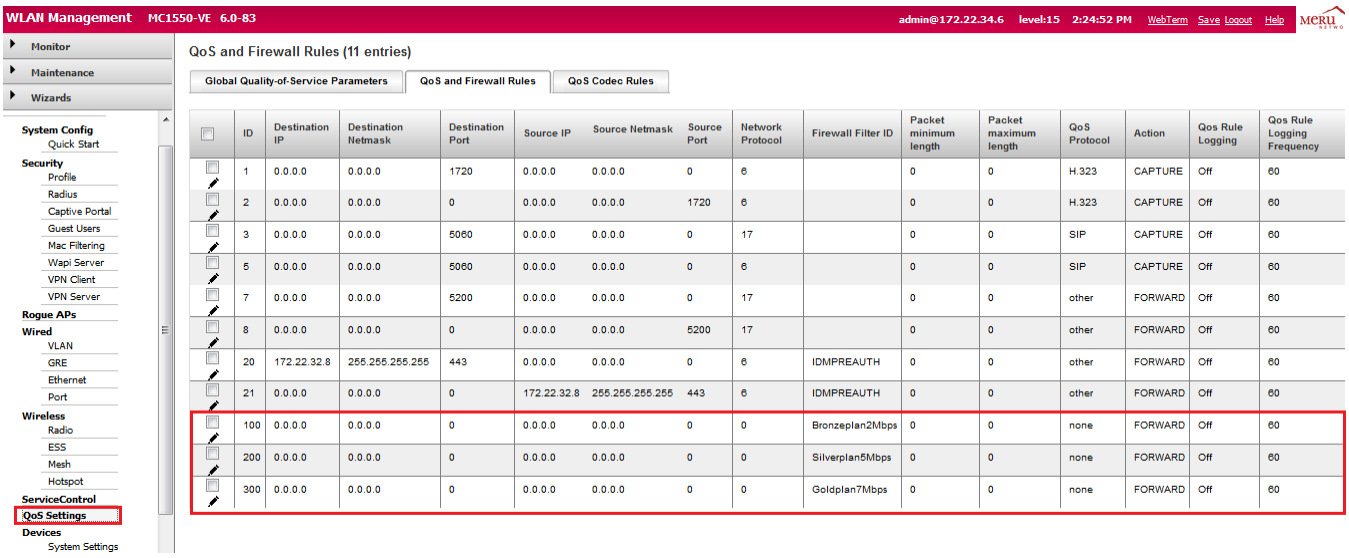


Figure 68: QoS Rules Specifying Different Token Bucket Rates



ID	Destination IP	Destination Netmask	Destination Port	Source IP	Source Netmask	Source Port	Network Protocol	Firewall Filter ID	Packet minimum length	Packet maximum length	QoS Protocol	Action	Qos Rule Logging	Qos Rule Logging Frequency
1	0.0.0.0	0.0.0.0	1720	0.0.0.0	0.0.0.0	0	6		0	0	H.323	CAPTURE	Off	60
2	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	1720	6		0	0	H.323	CAPTURE	Off	60
3	0.0.0.0	0.0.0.0	5060	0.0.0.0	0.0.0.0	0	17		0	0	SIP	CAPTURE	Off	60
5	0.0.0.0	0.0.0.0	5060	0.0.0.0	0.0.0.0	0	6		0	0	SIP	CAPTURE	Off	60
7	0.0.0.0	0.0.0.0	5200	0.0.0.0	0.0.0.0	0	17		0	0	other	FORWARD	Off	60
8	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	5200	17		0	0	other	FORWARD	Off	60
20	172.22.32.8	255.255.255.255	443	0.0.0.0	0.0.0.0	0	6	IDMPREAUTH	0	0	other	FORWARD	Off	60
21	0.0.0.0	0.0.0.0	0	172.22.32.8	255.255.255.255	443	6	IDMPREAUTH	0	0	other	FORWARD	Off	60
100	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	0	0	Bronzeplan2Mbps	0	0	none	FORWARD	Off	60
200	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	0	0	Silverplan5Mbps	0	0	none	FORWARD	Off	60
300	0.0.0.0	0.0.0.0	0	0.0.0.0	0.0.0.0	0	0	Goldplan7Mbps	0	0	none	FORWARD	Off	60

Identity Manager Configuration Tasks

After configuring the controller as described in Controller Configuration Tasks, you must add the controller as a RADIUS client in Identity Manager. (Also make sure to specify that the guest portal pages you configure in Identity Manager are automatically transferred to the controller.) For more information, see the Identity Manager Deployment Guide.

The following topics describe the additional configuration tasks that you need to perform in Identity Manager:

- Creating Authorization Profiles
- Adding Payment Provider Accounts
- Creating a Portal for Login and Credit Card Billing
- Previewing the Portal

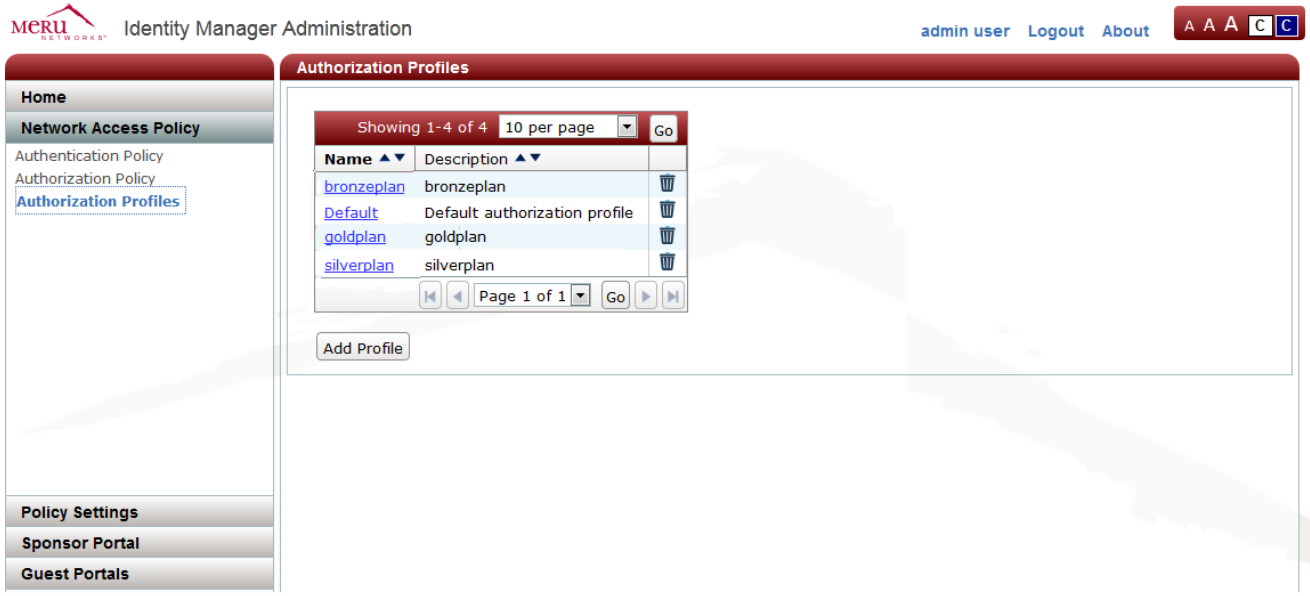
Creating Authorization Profiles

You use authorization profiles to define network access for users. For the network scenario in Figure 65, three authorization profiles must be created:

- bronzeplan: Access plan of 2 Mbps
- goldplan: Access plan of 5 Mbps
- silverplan: Access plan of 7 Mbps

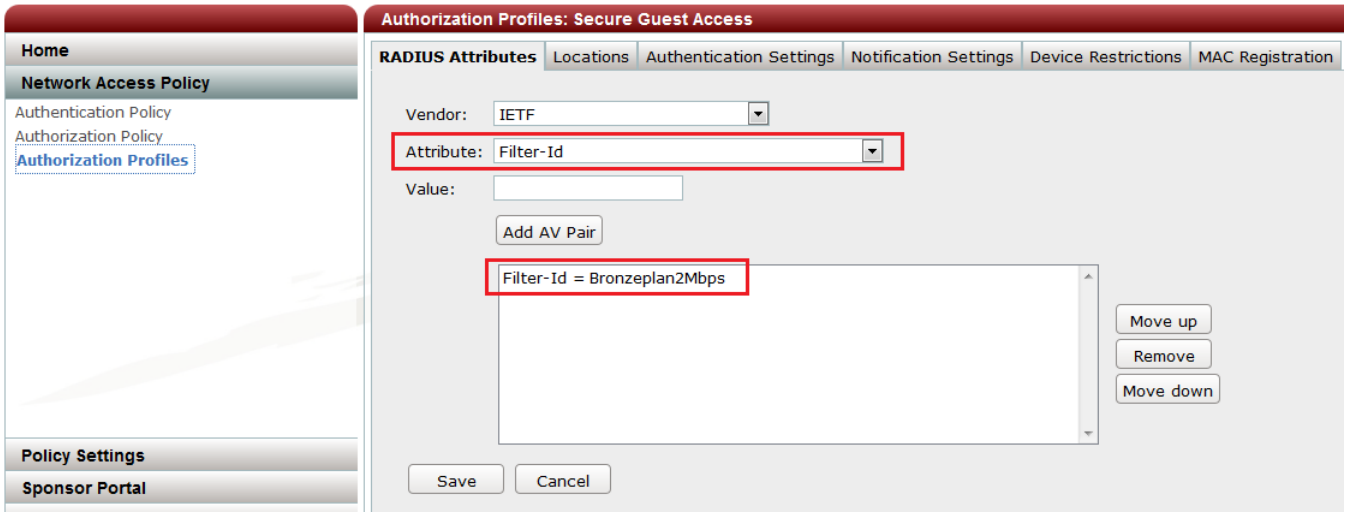
The authorization profile is added to the list of authorization profiles on the Authorization Profiles main page, as shown in Figure 69.

Figure 69: Authorization Profiles Main Page



After an authorization profile has been added, edit the profile so that you specify the Filter-Id values that you previously configured with System Director as RADIUS attributes for the authorization profile. For example, the Filter-Id value for the bronzeplan profile is "Bronzeplan2Mbps," as shown in Figure 70.

Figure 70: Configuring Filter-Id as a RADIUS Attribute for Authorization Profile



Adding Payment Provider Accounts

After creating authorization profiles, as described in Creating Authorization Profiles, you need to add a payment provider.

The account created in this example is only for illustrative purposes. When adding a payment provider, use the appropriate information for your payment provider account. (See Figure 71.)

To test the connection to the payment provider, click **Test Connection**. A test transaction is sent, and a message appears with the results of the test.

The payment provider is added, as shown in Figure 72.

Figure 71: Configuring Payment Gateways

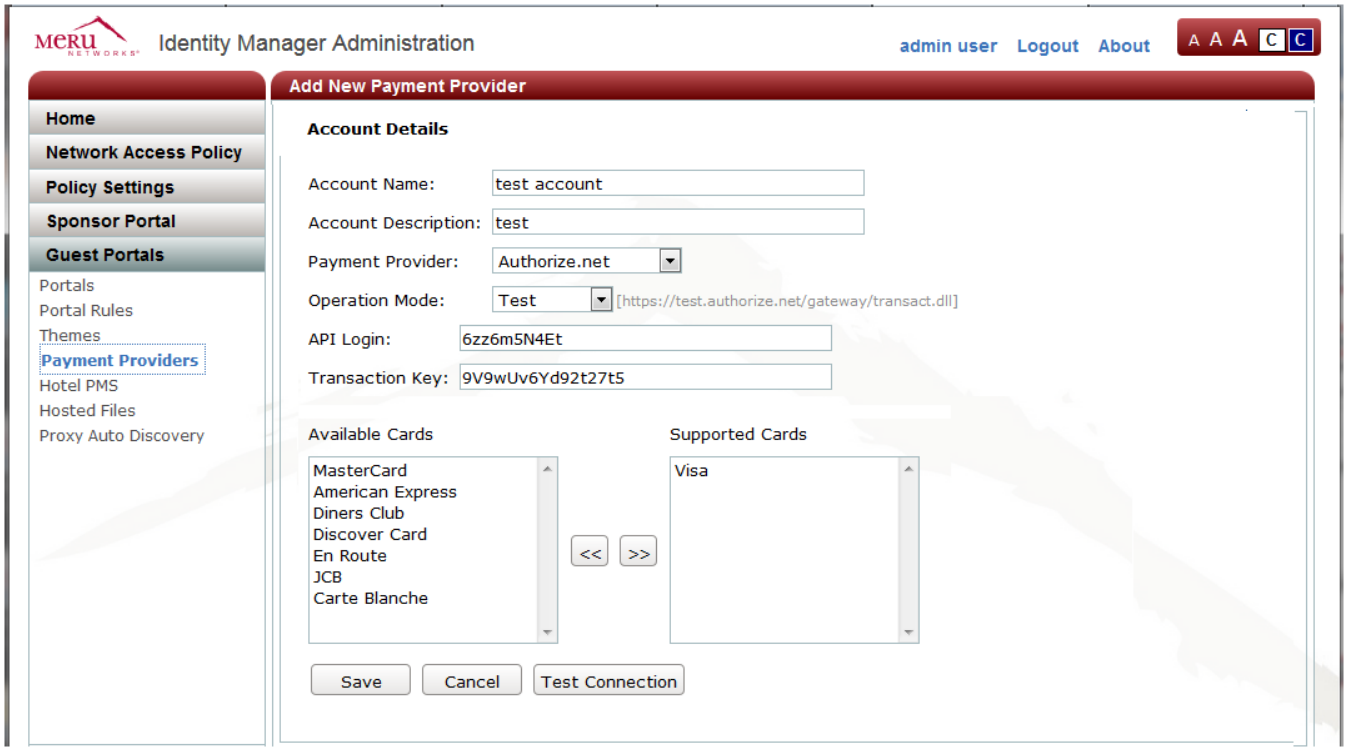
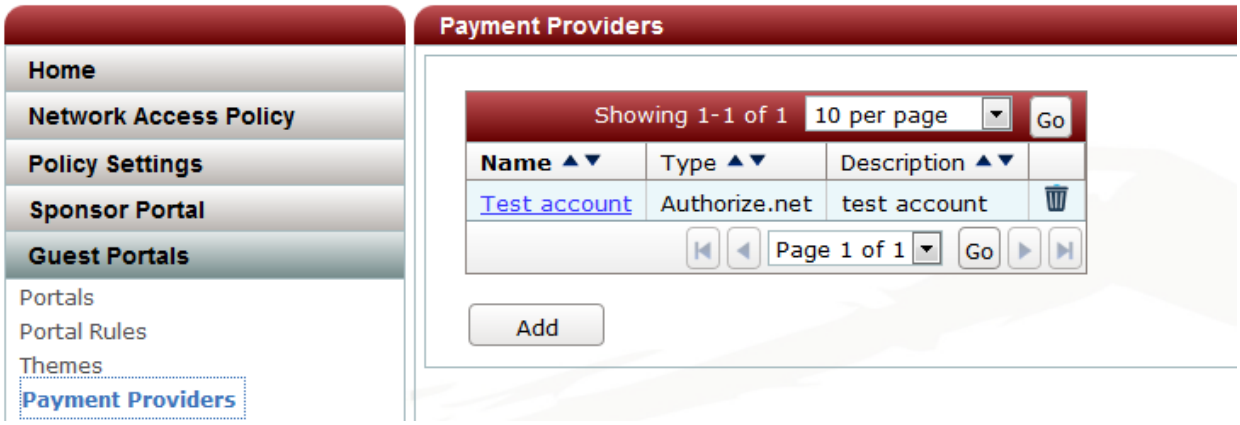


Figure 72: Payment Provider List



Creating a Portal for Login and Credit Card Billing

When creating a portal, Identity Manager provides many options for customization in the wizard. This document describes only the configuration for the wizard pages required to deploy the guest access paid subscription system, as shown in Figure 65. Depending on your organization's requirements, modify other wizard pages as appropriate.

Creating a portal for the guest access paid subscription system consists of the following tasks:

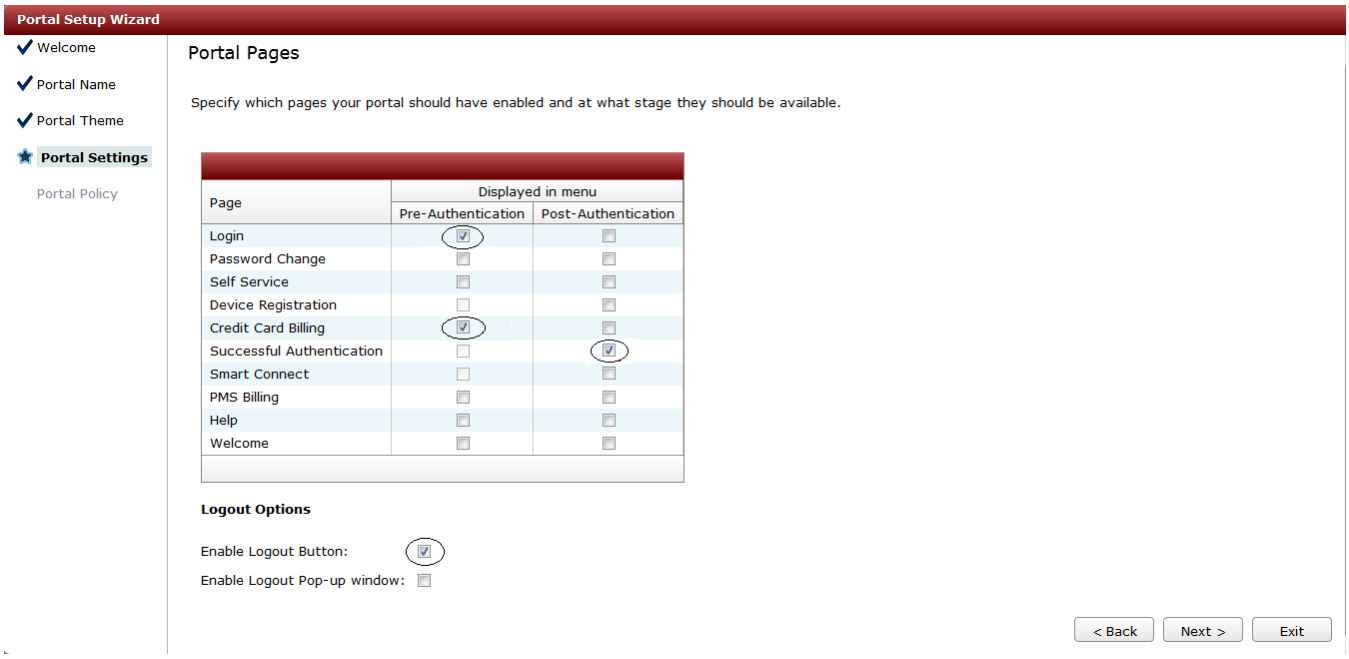
- Enabling Display of Pre-Authentication and Post-Authentication Pages
- Configuring Guest Account Options
- Mapping the Payment Provider to the Portal
- Configuring Access Plans for Credit Card Billing
- Configuring Guest User and Password Policies

You must create a portal that users access to purchase an access plan and log in to for Internet access.

Enabling Display of Pre-Authentication and Post-Authentication Pages

In this use case, the display of pre-authentication and post-authentication pages is enabled. On the Portal Pages page, select the Pre-Authentication check box for Login and Credit Card Billing, and Post-Authentication check box for Successful Authentication, as shown in Figure 73. Also select the **Enable Logout Button** check box.

Figure 73: Portal Pages Page

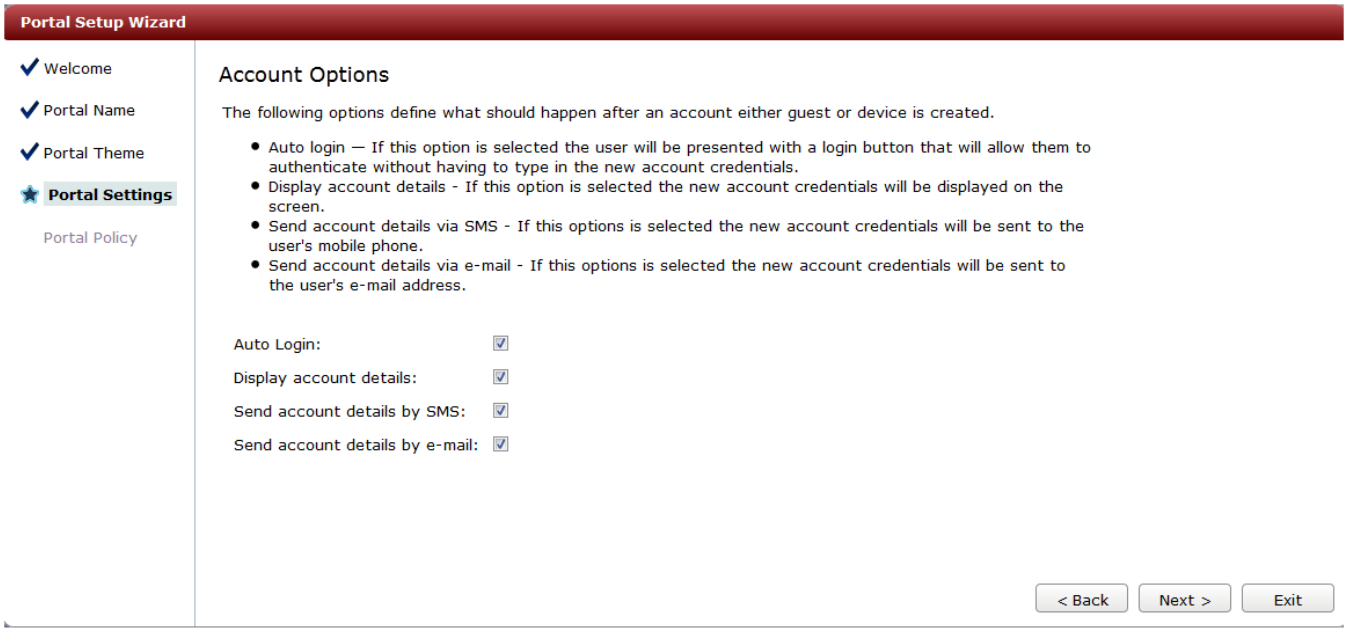


Configuring Guest Account Options

To configure guest account options, make sure that the check boxes are selected for the following, as shown in Figure 74:

- Auto Login
- Display account details
- Send account details by SMS
- Send account details by e-mail

Figure 74: Account Options Page



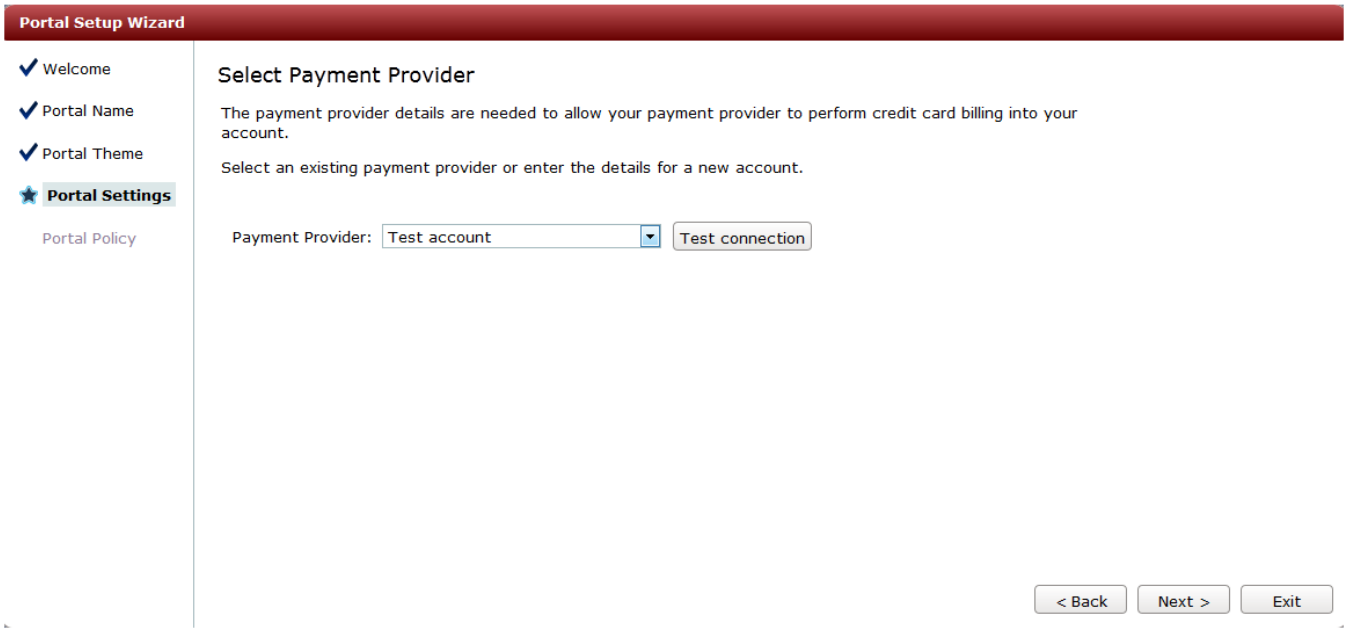
Mapping the Payment Provider to the Portal

To map the payment provider, which you added in Adding Payment Provider Accounts, to the portal:

On the Select Payment Provider page, as shown in Figure 75, select your payment provider. In this example, select **Test account**.

To test the connectivity to the payment provider, click **Test connection**.

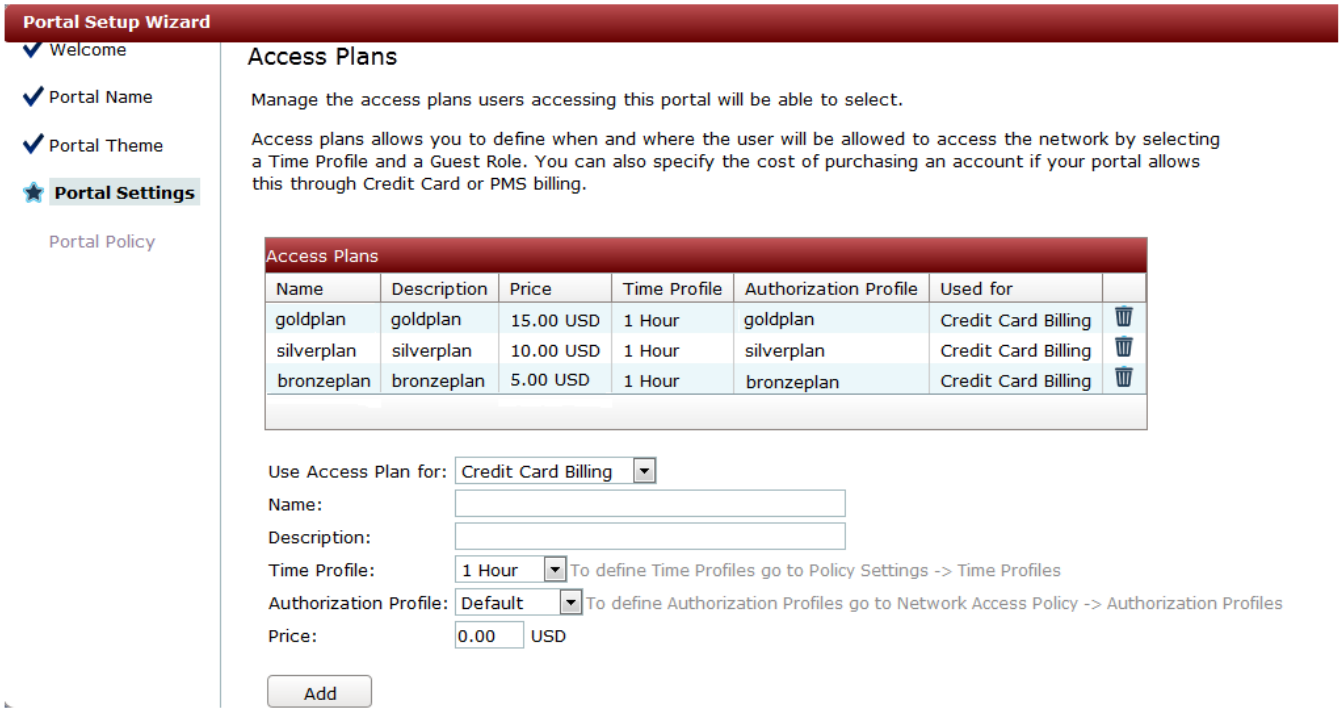
Figure 75: Select Payment Provider Page



Configuring Access Plans for Credit Card Billing

In Identity Manager, you need to create an access plan for each level of service (goldplan, silverplan, and bronzeplan). Figure 76 shows the Access Plans page after the access plans have been created.

Figure 76: Access Plans Page



Configuring Guest User and Password Policies

You need to define the guest username and password policies for the portal, as shown in the Guest Username Policy page, as shown in Figure 77, and the Guest Password Policy page, as shown in Figure 78.

Figure 77: Guest Username Policy Page

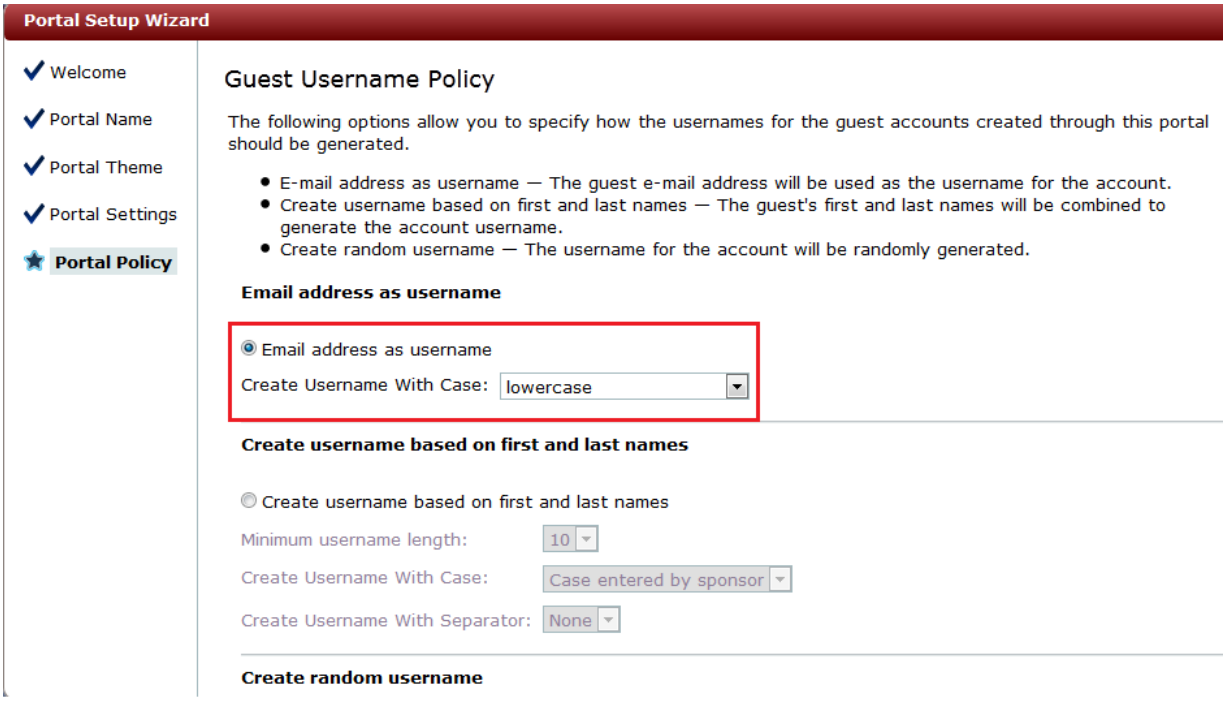
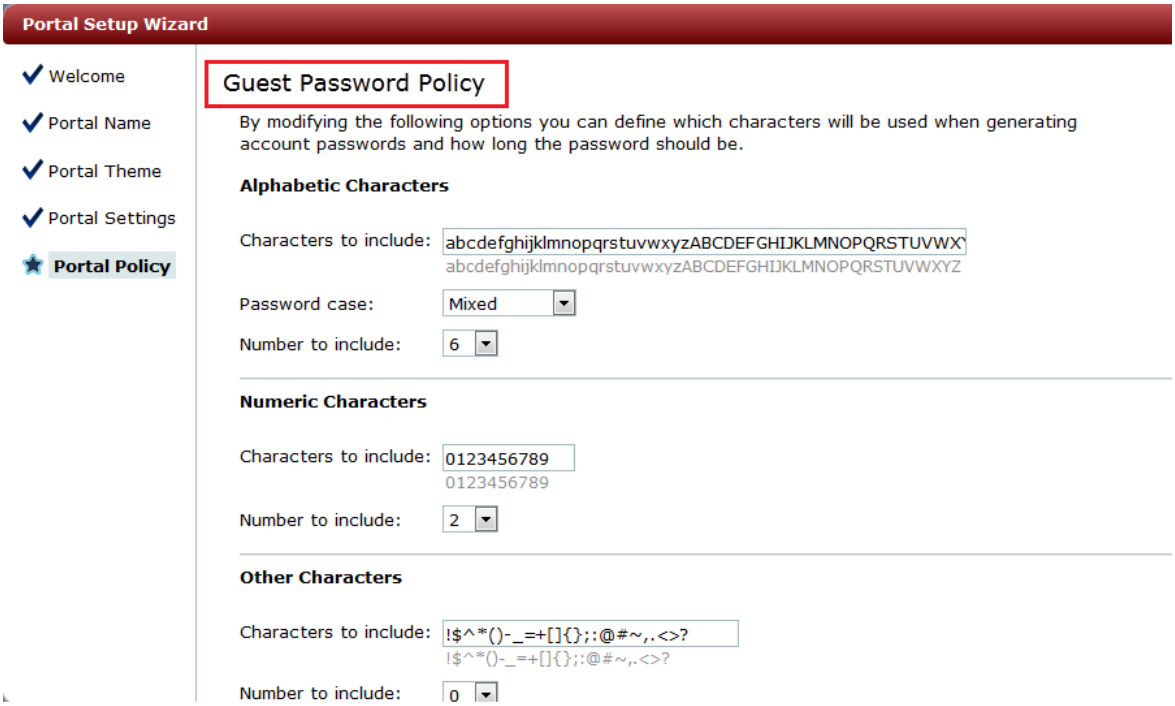


Figure 78: Guest Password Policy Page



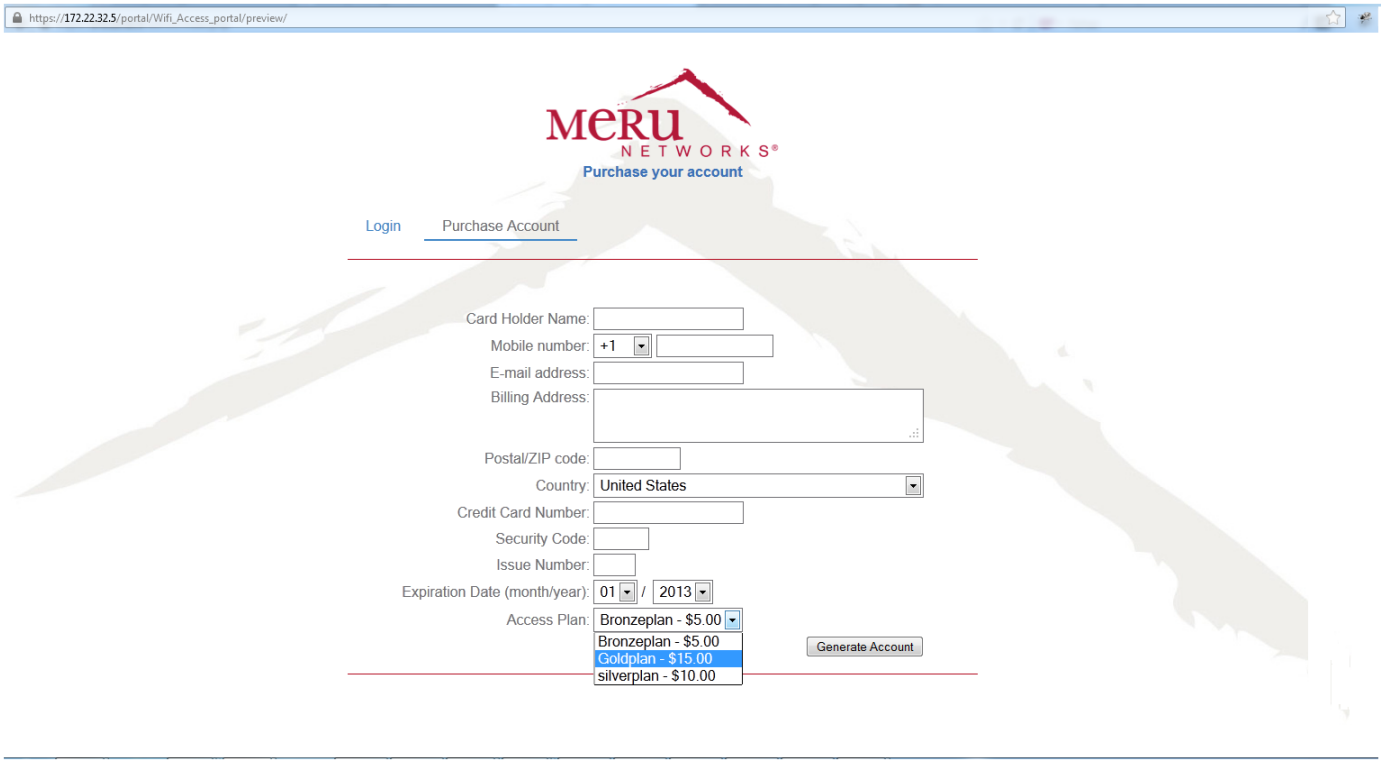
Previewing the Portal

After creating a portal, you can use the portal preview feature to verify that the portal works properly:

1. In the Identity Manager Administration interface, select **Guest Portals > Portals**.
2. Click the Portal Preview icon ( ) for the portal.

   Figure 79 shows an example of a portal.

Figure 79: Previewing Portal Content



Guest Portal Pages

Figure 80 shows the page that users see when accessing the guest portal.

Figure 80: Guest Login Page

Users who want to purchase an access plan can click Purchase Account. Figure 81 shows the purchase page. After providing user and credit card information, the user clicks Generate Account to purchase the plan and receive guest account credentials to log in to the portal and access the Internet.

Figure 82 shows an example of the page with account credentials that the user gets after the guest account is generated. Figure 83 shows a successful authentication page a user sees after successfully logging in.

Figure 81: Self-Registering and Purchasing an Access Plan

Figure 82: Guest User Generated by the System

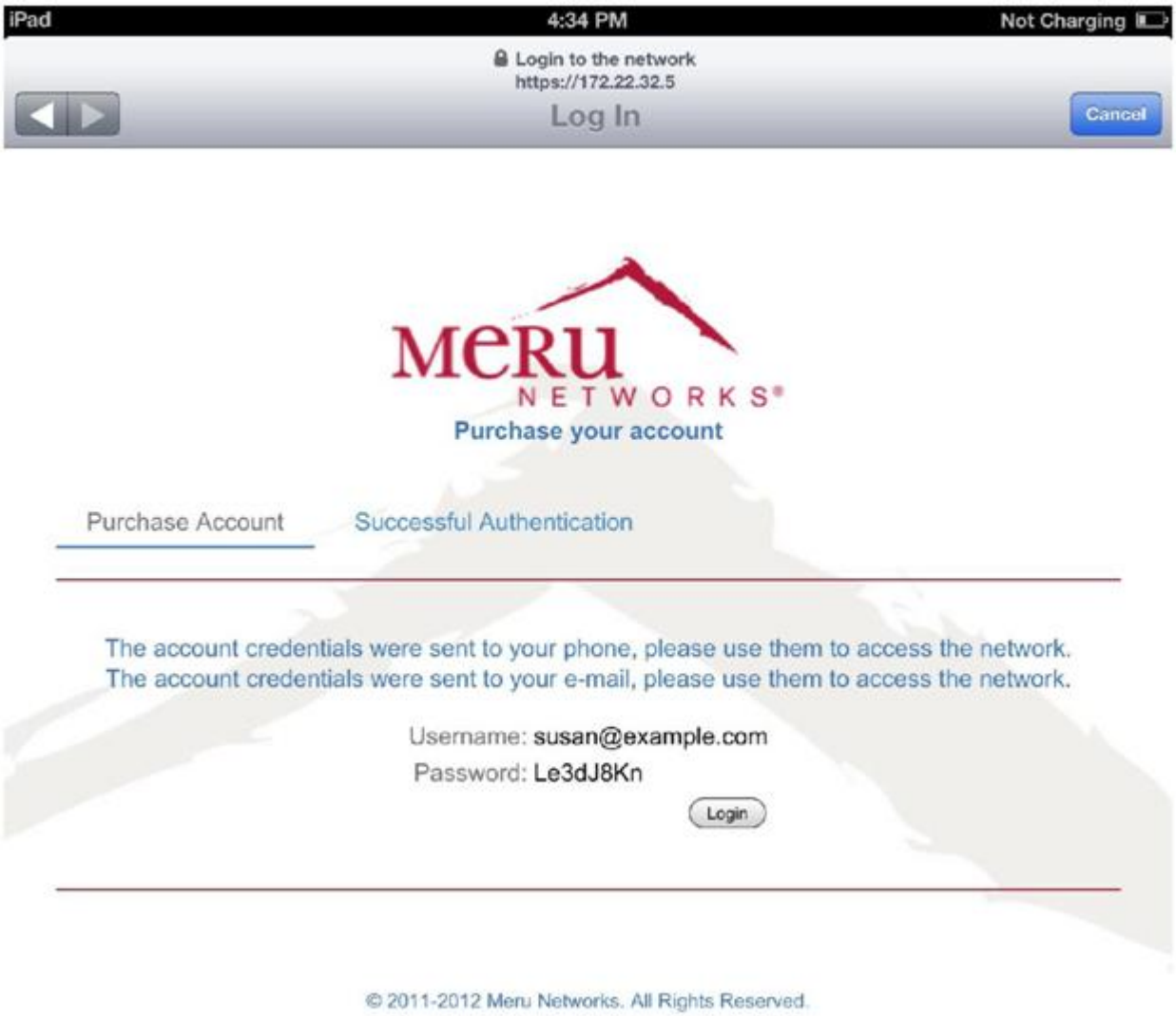
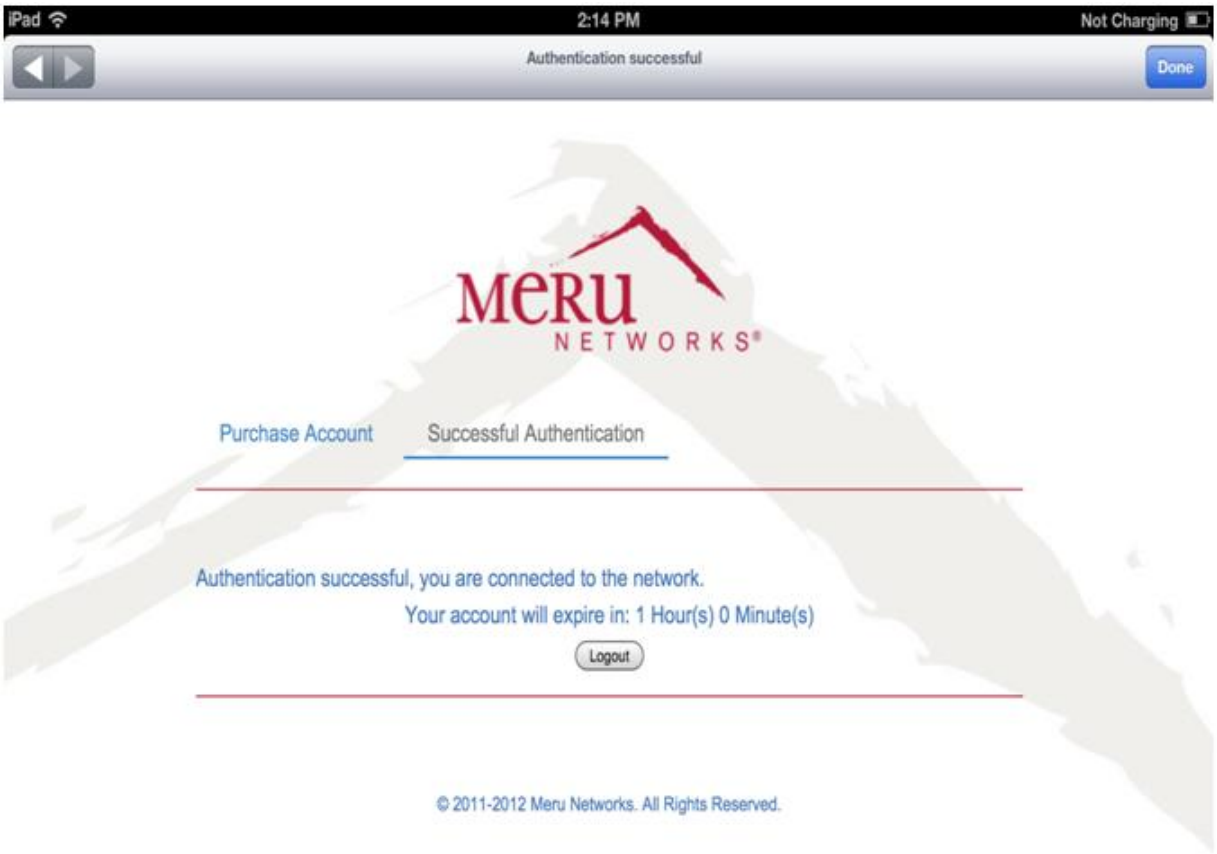


Figure 83: Successful User Authentication

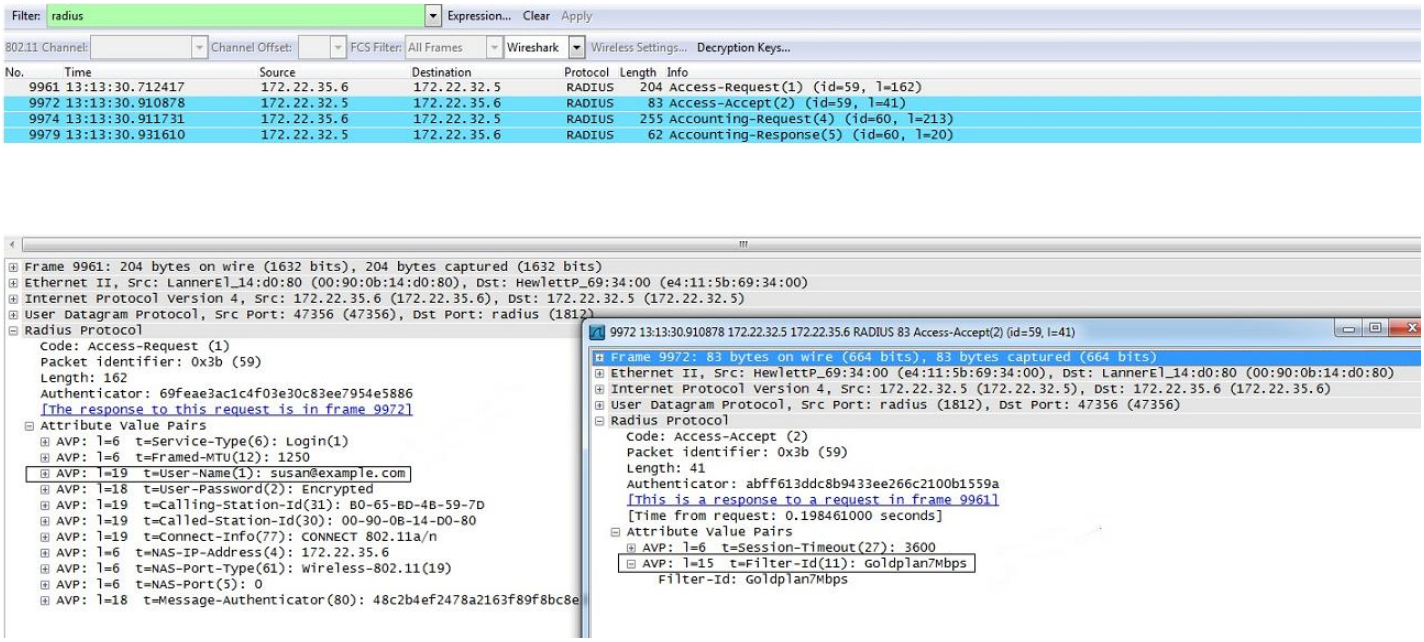


Verifying Connectivity

To test that the configuration is working correctly:

- Run a packet-capture on the controller or Identity Manager and filter the packets for the RADIUS protocol. Make sure the correct Filter-ID is returned for "Access-accept," as configured for the access plans. Figure 84 shows an example of packet-capture results.
- Run throughput tests using common tools, FTP file transfer, or a speed test to the Internet and verify that client traffic is rate limited, as defined by your configuration.

Figure 84: Verifying Connectivity Using Packet Capture



Use Case 6: Basic Customization of a Guest Portal Using Default Tools

In this use case, you create a basic portal using the default Meru Networks (white) theme. You upload a custom logo and a custom background to Identity Manager to customize the portal. You also configure the portal with only login and logout features enabled.

Figure 85 shows the default login page for the Meru Networks (white) theme. Figure 86 shows the login page after customization.

Figure 85: Default Login Page

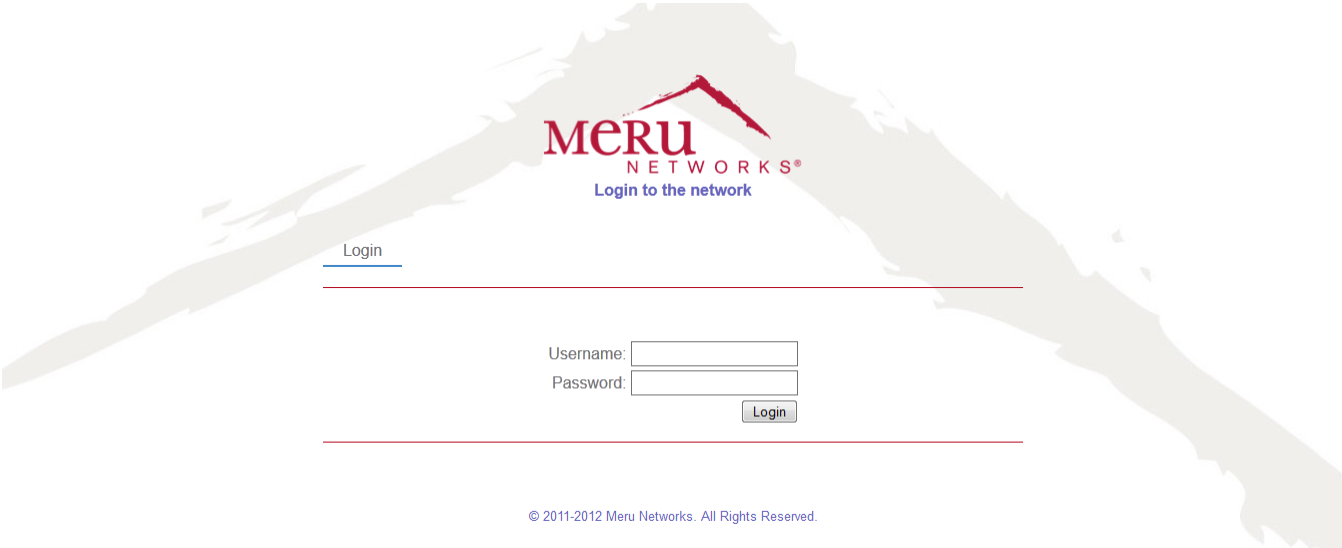
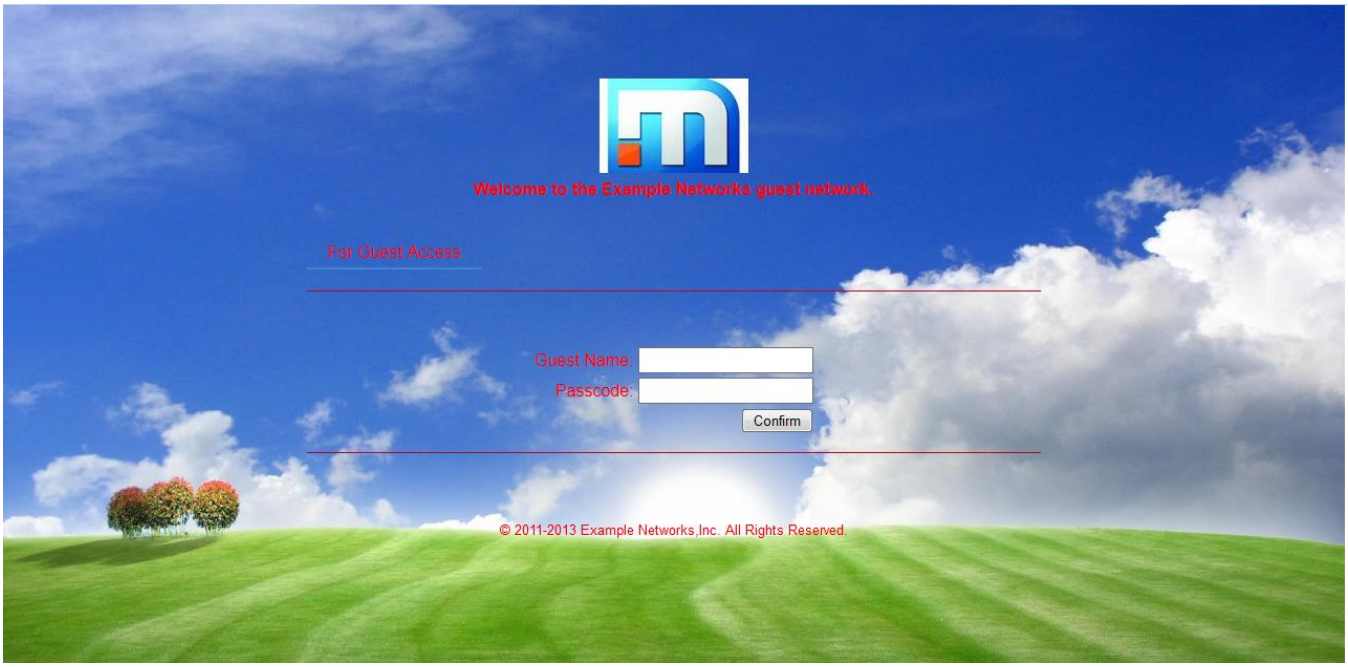


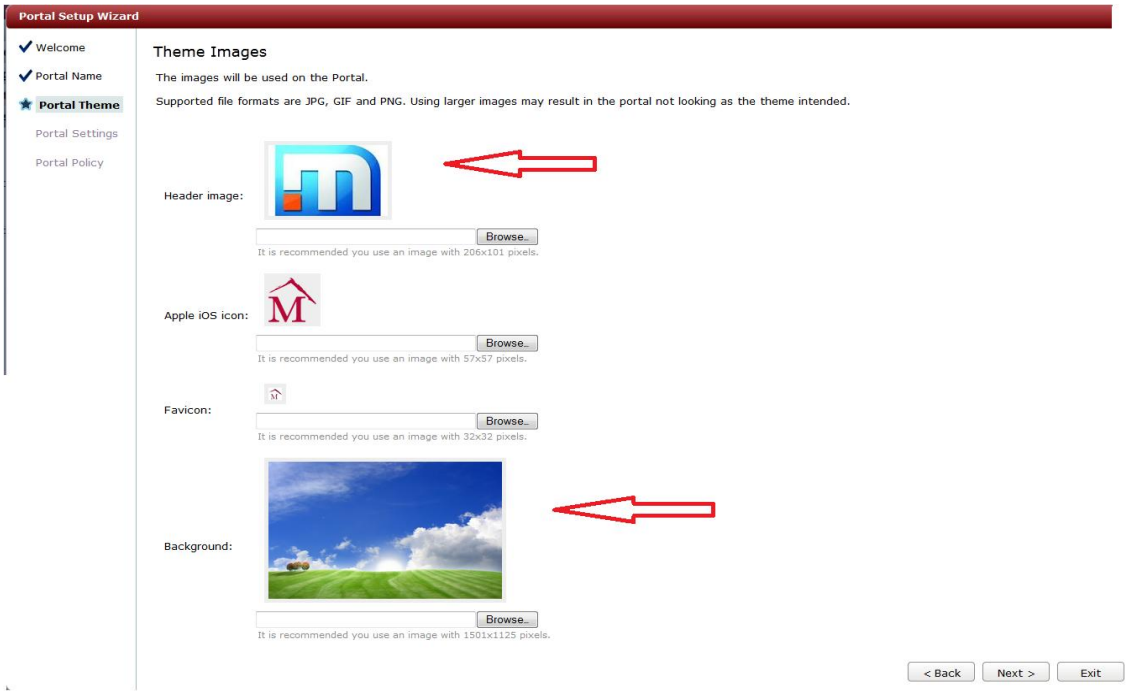
Figure 86: Customized Login Page



Create a customized portal:

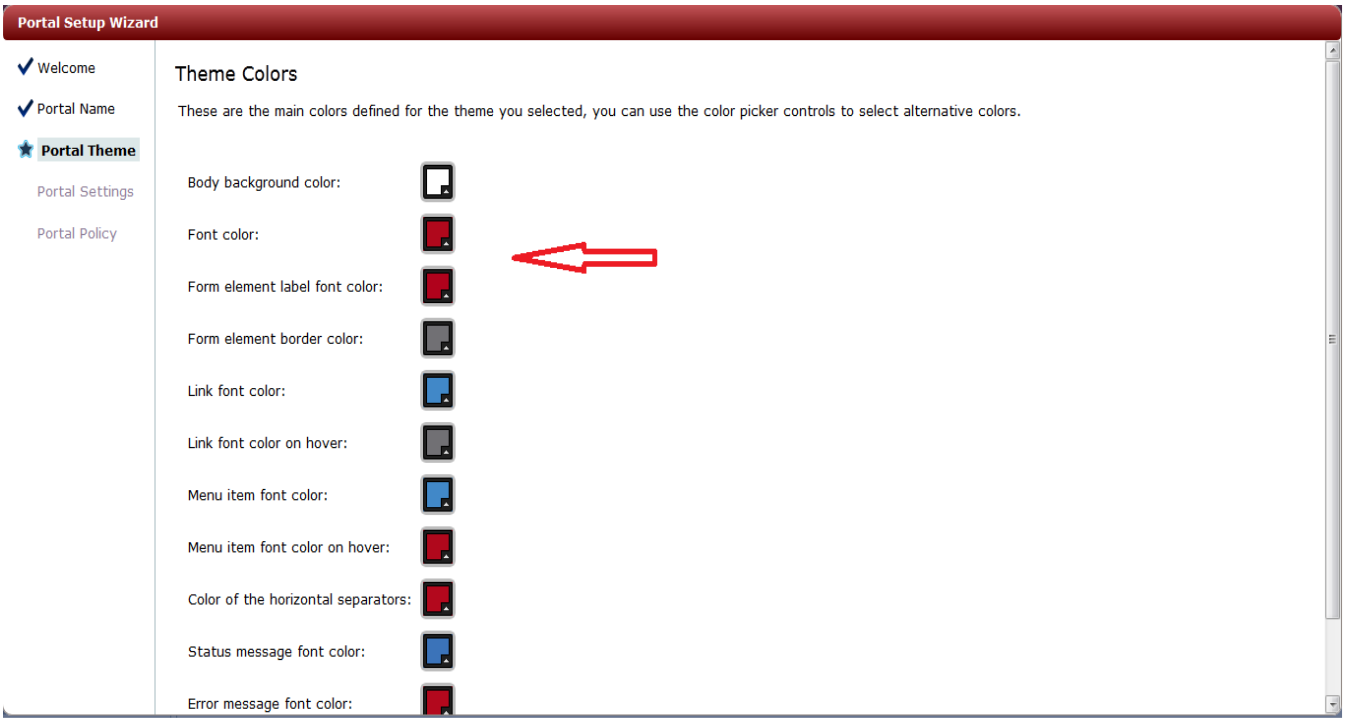
1. On the Theme Images page, specify the logo and background for the portal by uploading the new logo and background images for the portal theme, as shown in Figure 87.

Figure 87: Theme Images Page



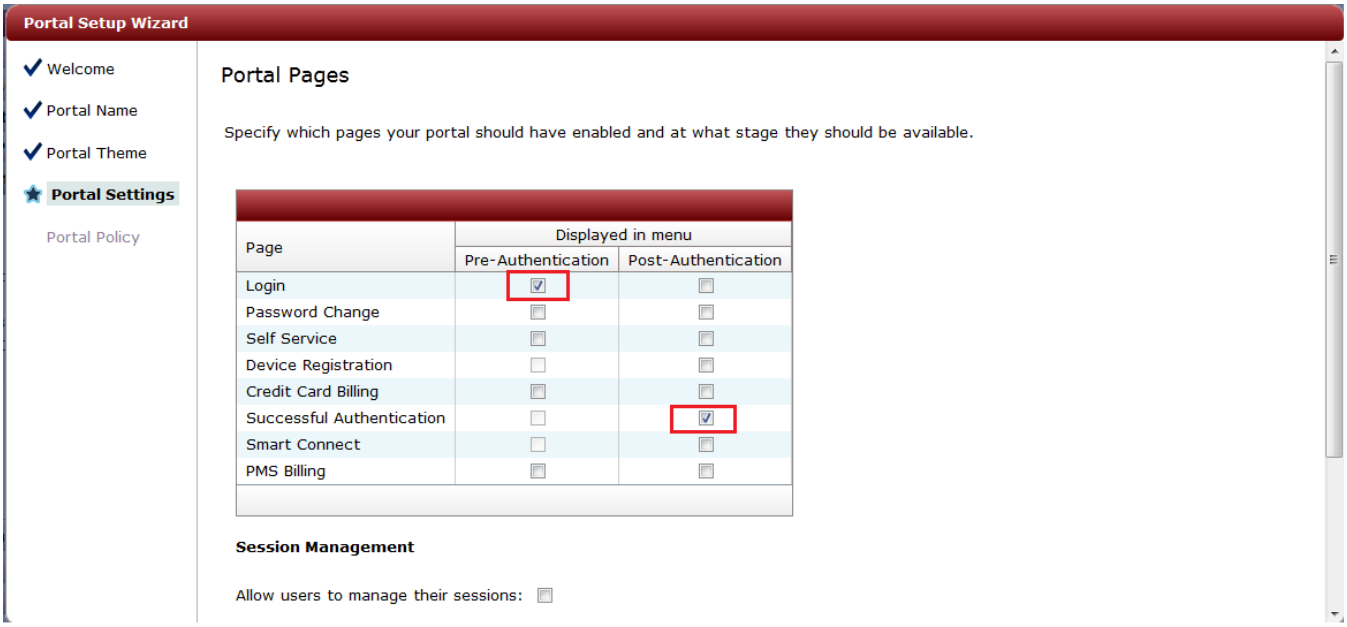
2. On the Theme Colors page, change the font colors to match the newly uploaded background image, as shown in Figure 88.

Figure 88: Theme Colors Page



3. On the Portal Pages page, enable the following changes, as shown in Figure 89:
   - Select the **Login** check box in the Pre-Authentication Column.
   - Select the **Successful Authentication** check box in the Post-Authentication column.
   - Make sure that the Session Management and Logout Options check boxes are clear.

Figure 89: Portal Pages Page

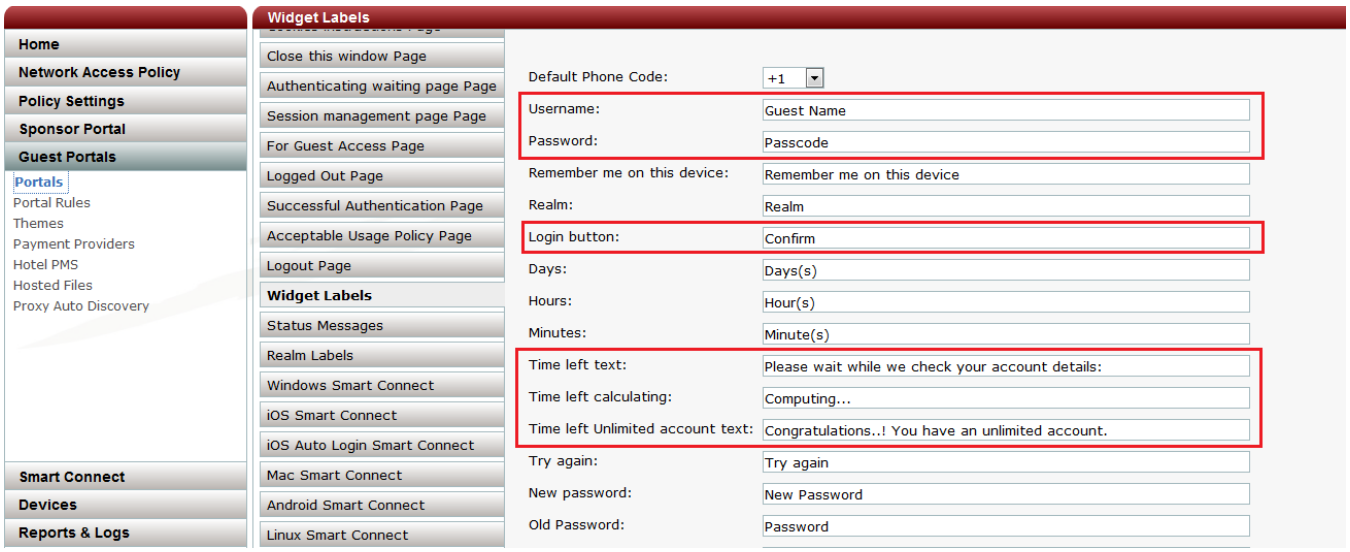


4. Complete the wizard pages to save the portal.
5. Edit the portal settings, and make the following changes on the Login Page, as shown in Figure 90.
   - Page label: For Guest Access
   - Footer: © 2011-2013 Example Networks Inc. All Rights Reserved.
   - Header: Welcome Example Networks guest network

Figure 90: Changing the Login Page

6. Make the following changes to the widget labels, as shown in Figure 91.
   - Login: Guest Name
   - Password: Passcode
   - Time left text: Please wait while we check your account details:
   - Time left calculating: Computing...
   - Time left unlimited account text: Congratulations..! You have an unlimited account.

Figure 91: Widget Labels Page



7. Save the changes for the portal.

Figure 86 shows the customized login page. Figure 92 shows the customized initial successful authentication page, with the modified text that appears while the system checks the guest user account information. Figure 93 shows the customized authentication success page.

Figure 92: Customized Initial Successful Authentication Page

Figure 93: Successful Authentication Page After Customization

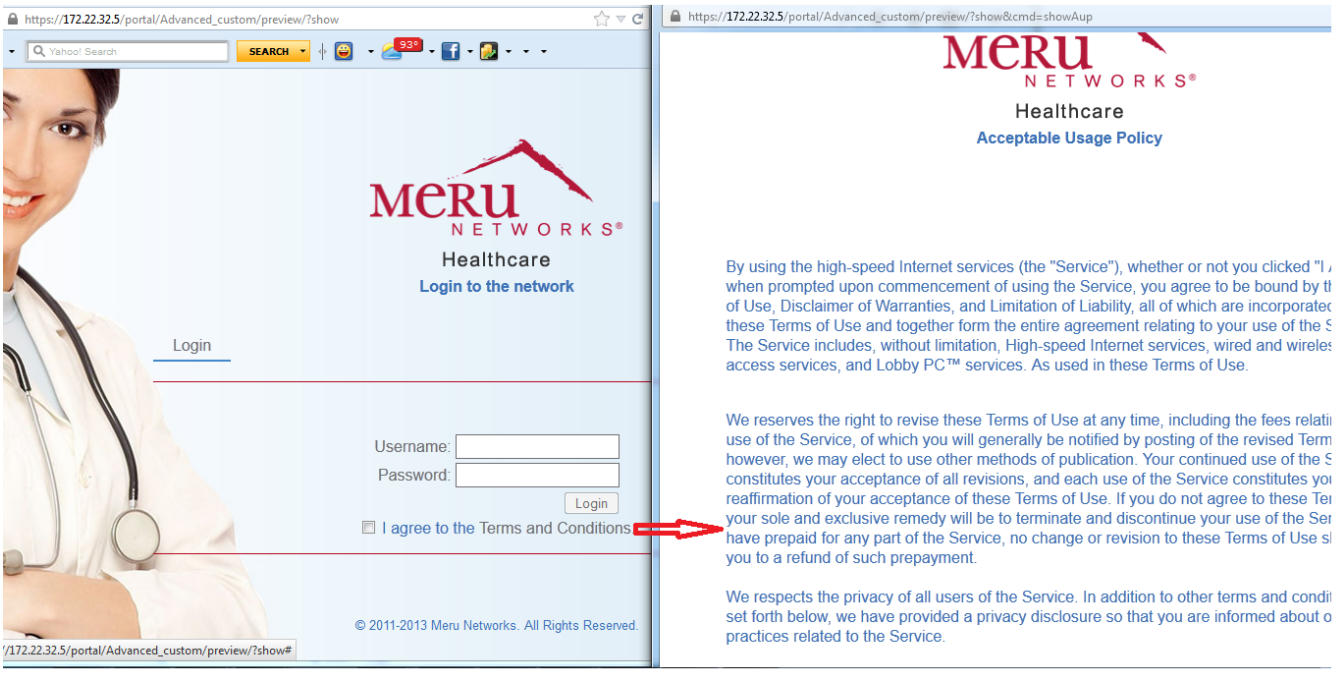
Use Case 7: Advanced Customization of Guest Portals by Importing a New Theme

You can completely change the look and layout of portal pages by importing custom HTML files that contain images and scripts. Depending on the complexity of pages, you need to be experienced in HTML coding, CSS, and JavaScript. This use case illustrates how you can use your images and JavaScript to customize the look of a portal.

In this use case, you create a customized portal that consists of the following elements, as shown in Figure 94:

- New logo.
- New background image.
- Addition of "I agree to the Terms and Conditions" link and check box on login page.
- Enabling of login button only after user clicks “I agree to the Terms and Conditions” check box.
- Clicking the "Terms and Conditions" link opens a new window that provides the usage policy.

Figure 94: Customized Portal



In this use case, you create a portal named Advanced_custom that initially uses the default Meru_Networks (white) theme with only login and logout features enabled.

To customize the portal design, you edit the following theme files:

- theme.xml
- aup.html

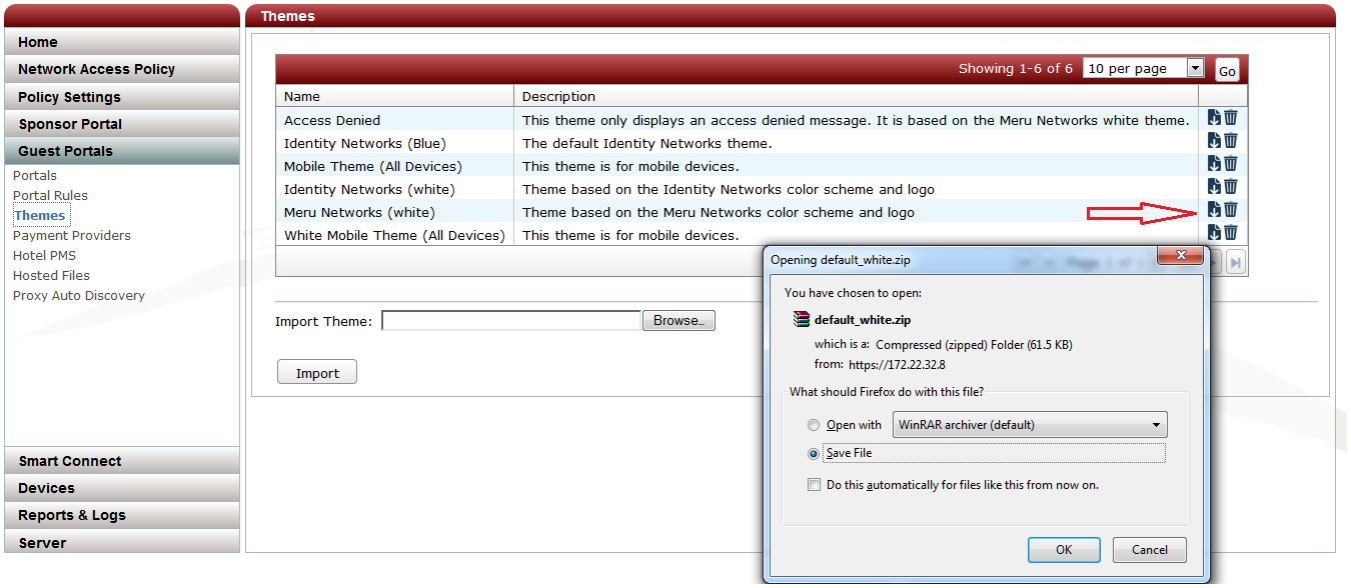
You also need to provide new logo and background images, as shown in Figure 95. You then create a new zip file with the modified theme files, which you upload to Identity Manager. After uploading, you can select the new theme for the portal customization.

Figure 95: New Logo and Background

Customizing the Portal Theme

To customize the portal theme:

1. Download the default theme named “Meru Networks (white)” and save it to a local folder.



2. Extract the contents of the zip file.

3. Edit the theme.xml file to make the following changes:

   - Replace the <name> value of `meru_white` with `meru_healthcare`.
   - Replace the <publicName> value of `Meru Networks (white)` with `meru_healthcare(white)`.

```
<hotspotTheme>
    <name>meru_healthcare</name>
    <publicName>meru_healthcare(white)</publicName>
    <description>Theme based on the Meru Networks color scheme and
logo</description>
```

   These changes rename the theme, which you will see after you upload the theme to Identity Manager.

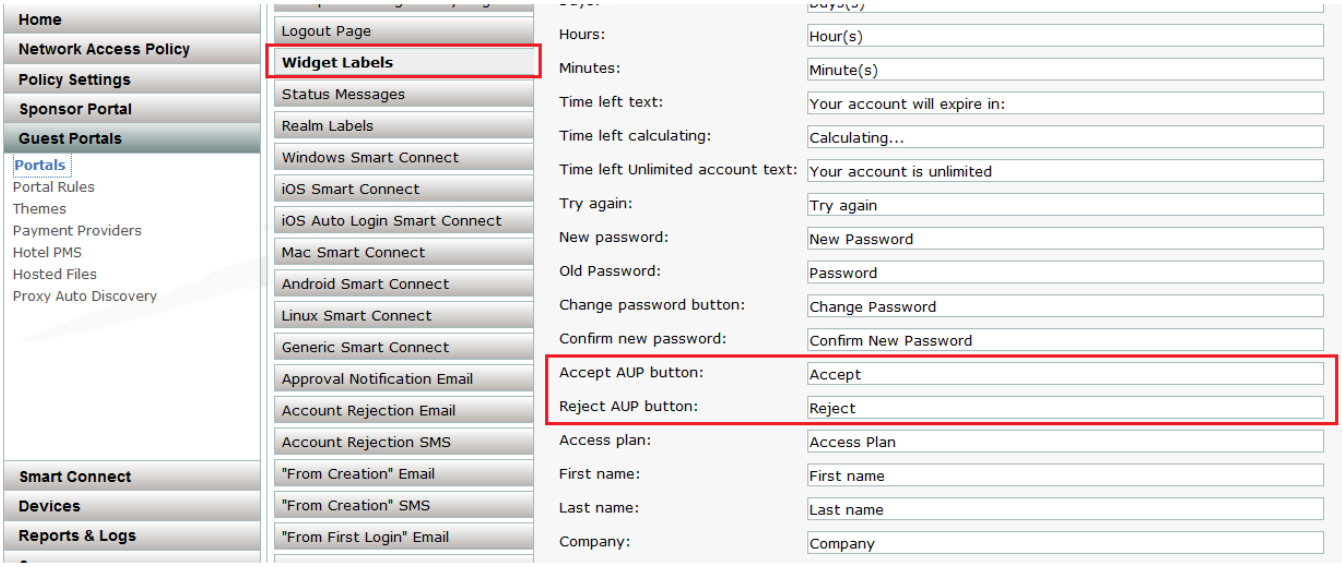
4. Copy the new logo and background files to the images directory.

5. Edit the aup.html, which contains the acceptance usage policy (in the html directory), by adding the following code to the end of the file:

```
<script type="text/javascript">
     window.onload = function() {
           document.body.style.backgroundImage = "none";
     }
</script>

<script>
$(".widgetContainer").hide();
</script>
```

   Editing the AUP page as previously described creates a blank background and also hides the widget labels for accepting or rejecting the terms and conditions. Figure 97 shows the new AUP page.

Figure 97: New AUP Page



6. In the login.html file, find the following lines (labeled “a” and “b” in this document but not in the file itself):

```
a. <div id="feedback">
        <div class="feedbackContent">%FEEDBACK_AREA%</div>
    </div>
b. <div id="main">
        <div class="mainContent">%MAIN%</div>
        <div class="widgetContainer">%LOGIN_WIDGET%</div>
```

Add the following JavaScript code between lines "a" and "b":

```
<script language="javascript">
window.onload = function() {
     document.getElementById("form").cmd_doLogin.disabled  = true;

     if(!document.forms['form'].chkboc_tnc.checked){
     document.getElementById("form").cmd_doLogin.disabled  = true;
     }
}
function btn_display(){
     if(!document.forms['form'].chkboc_tnc.checked){
     document.getElementById("form").cmd_doLogin.disabled  = true;
     }
     else
     document.getElementById("form").cmd_doLogin.disabled  = false;
}
$(document).ready(function(){
$("#testAup").click(function (event){
    var pathArray = window.location.pathname.split( '/' );
    var newURL = window.location.protocol + "//" + window.location.host + "/"
+ pathArray[1] + "/" + pathArray[2] + "/" + pathArray[3] +
"/?show&cmd=showAup";
    var w = window.open(newURL,
                              "AUP",

"menubar=no,location=no,status=no,scrollbars=yes,resizable=yes,height=650px,w
idth=900px");
    w.focus();
    event.preventDefault();

});
});
</script>
```

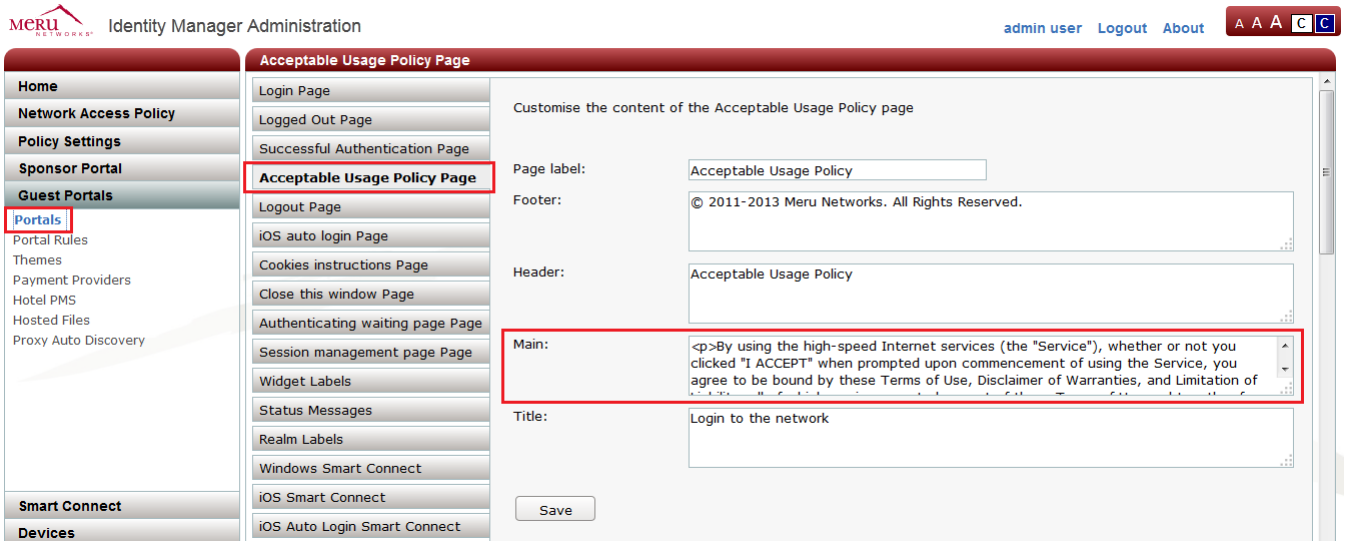
Add the following code after line "b":

```
<div class="frm_blk tnc"><input name="" id="chkboc_tnc" type="checkbox"
value="" onclick="btn_display()"  /> I agree to the
<a id="testAup" href="#">Terms and Conditions</a>.
<a href="#tclink" onclick="submitForm('showAup'); return false;"
accesskey="0" title="Terms and Conditions" pagetype="aup" command="showAup"
style="display:none">Terms and Conditions</a>
</div>
```

The previous script specifies that the login button remains disabled unless the check box for the "I agree to the Terms and Conditions" link is enabled. The script also calls the function to open the "acceptance usage policy" in a new window (AUP) by clicking the Term and Conditions.

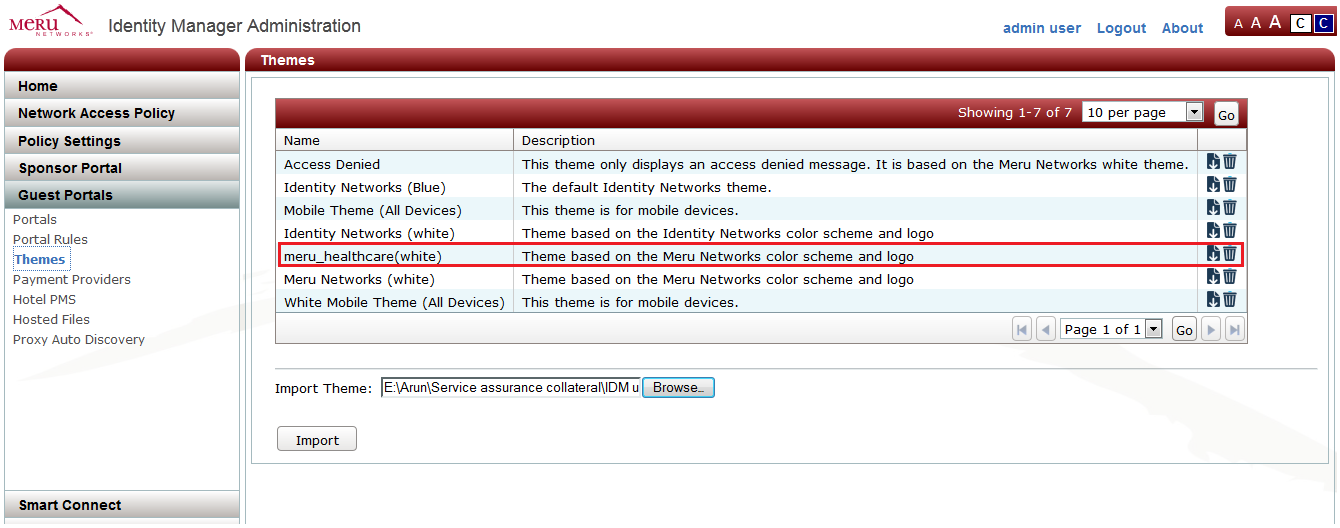
7. Save the login.html file.

8. Edit the Advanced_custom portal settings, and add contents to the Main section on the Acceptable Usage Policy page. The content added is dependent on the requirements of your organization or the service provider who hosts the guest network.



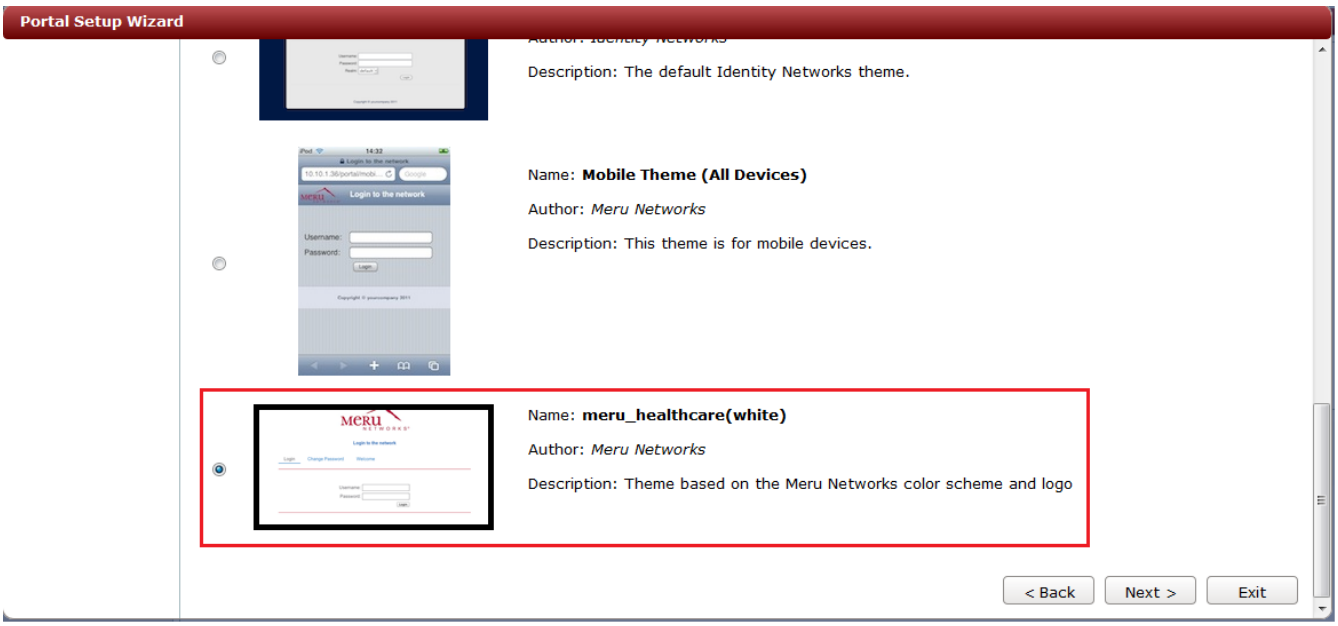
9. Create a new zip file containing the files, and upload the zip file to Identity Manager. In this example, the file is changed to meru_healthcare.zip, as shown in Figure 98.

Figure 98: New Theme Uploaded to Identity Manager



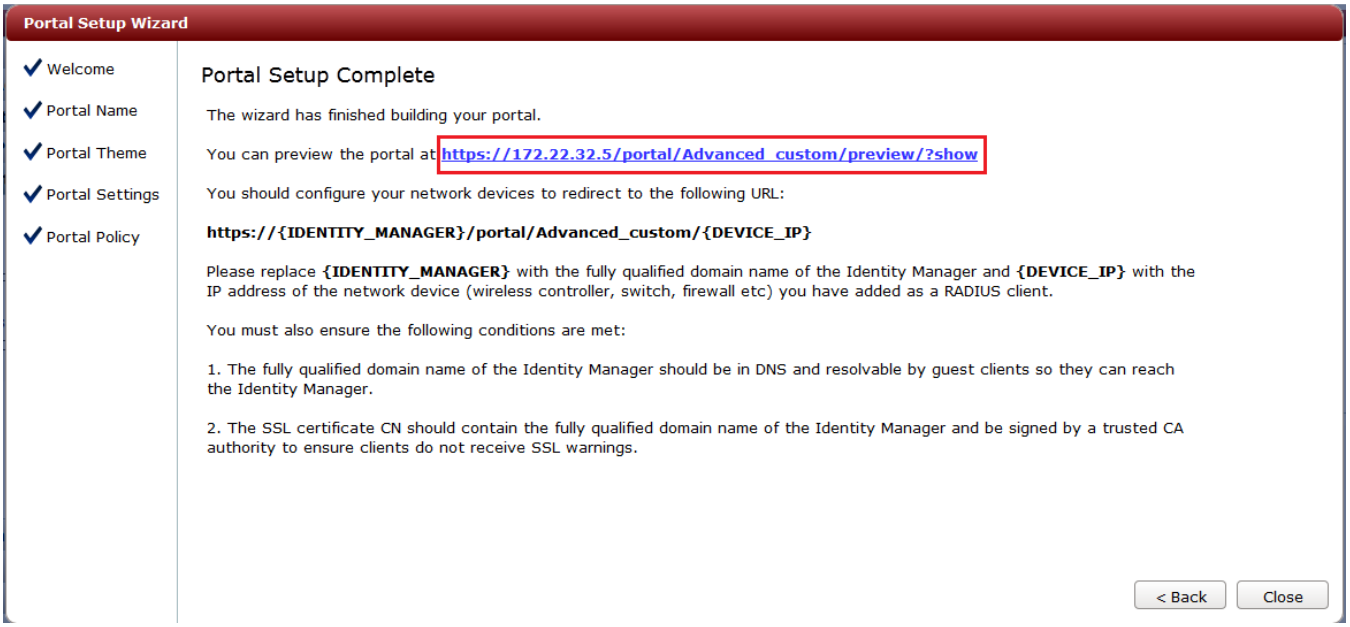
10. Edit the Advanced_custom portal, and select the newly uploaded theme, as shown in Figure 99.

Figure 99: Selecting New Portal Theme



11. Before closing the wizard, preview the portal to make sure everything works correctly, as shown in Figure 100.

Figure 100: Portal Setup Complete Page



Where to Find More Information

Refer to the following documents for additional information:

- *Meru Identity Manager User Guide*
- *Meru System Director Configuration Guide* (On the Software Downloads & Documentation page, click the link for the release of System Director that you are using.)

Meru Networks | Copyright © 2013 Meru Networks, Inc. All rights reserved worldwide. Meru Networks is a registered trademark of Meru Networks, Inc. All other trademarks, trade names, or service marks mentioned in this document are the property of their respective owners.