Newer Design Guide Available

Cisco Smart Business Architecture has become part of the Cisco Validated Designs program.

For up-to-date guidance on the designs described in this guide, see http://cvddocs.com/fw/Aug13-134

For information about the Cisco Validated Design program, go to http://www.cisco.com/go/cvd

BYOD — Advanced Guest Wireless Access Deployment Guide

SMART BUSINESS ARCHITECTURE

February 2013 Series

Preface

Who Should Read This Guide

This Cisco® Smart Business Architecture (SBA) guide is for people who fill a variety of roles:

- Systems engineers who need standard procedures for implementing solutions
- Project managers who create statements of work for Cisco SBA implementations
- Sales partners who sell new technology or who create implementation documentation
- Trainers who need material for classroom instruction or on-the-job training

In general, you can also use Cisco SBA guides to improve consistency among engineers and deployments, as well as to improve scoping and costing of deployment jobs.

Release Series

Cisco strives to update and enhance SBA guides on a regular basis. As we develop a series of SBA guides, we test them together, as a complete system. To ensure the mutual compatibility of designs in Cisco SBA guides, you should use guides that belong to the same series.

The Release Notes for a series provides a summary of additions and changes made in the series.

All Cisco SBA guides include the series name on the cover and at the bottom left of each page. We name the series for the month and year that we release them, as follows:

month year Series

For example, the series of guides that we released in February 2013 is the "February Series".

You can find the most recent series of SBA guides at the following sites:

Customer access: http://www.cisco.com/go/sba

Partner access: http://www.cisco.com/go/sbachannel

How to Read Commands

Many Cisco SBA guides provide specific details about how to configure Cisco network devices that run Cisco IOS, Cisco NX-OS, or other operating systems that you configure at a command-line interface (CLI). This section describes the conventions used to specify commands that you must enter.

Commands to enter at a CLI appear as follows:

```
configure terminal
```

Commands that specify a value for a variable appear as follows:

```
ntp server 10.10.48.17
```

Commands with variables that you must define appear as follows:

```
class-map [highest class name]
```

Commands shown in an interactive example, such as a script or when the command prompt is included, appear as follows:

```
Router# enable
```

Long commands that line wrap are underlined. Enter them as one command:

```
wrr-queue random-detect max-threshold 1 100 100 100 100 100
100 100 100
```

Noteworthy parts of system output or device configuration files appear highlighted, as follows:

```
interface Vlan64
  ip address 10.5.204.5 255.255.255.0
```

Comments and Questions

If you would like to comment on a guide or ask questions, please use the SBA feedback form.

If you would like to be notified when new comments are posted, an RSS feed is available from the SBA customer and partner pages.

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What's In This SBA Guide

Cisco SBA Solutions

Cisco SBA helps you design and quickly deploy a full-service business network. A Cisco SBA deployment is prescriptive, out-of-the-box, scalable, and flexible.

Cisco SBA incorporates LAN, WAN, wireless, security, data center, application optimization, and unified communication technologies—tested together as a complete system. This component-level approach simplifies system integration of multiple technologies, allowing you to select solutions that solve your organization's problems—without worrying about the technical complexity.

Cisco SBA Solutions are designs for specific problems found within the most common technology trends. Often, Cisco SBA addresses more than one use case per solution because customers adopt new trends differently and deploy new technology based upon their needs.

Route to Success

To ensure your success when implementing the designs in this guide, you should first read any guides that this guide depends upon—shown to the left of this guide on the route below. As you read this guide, specific prerequisites are cited where they are applicable.

About This Guide

This *deployment guide* contains one or more deployment chapters, which each include the following sections:

- **Business Overview**—Describes the business use case for the design. Business decision makers may find this section especially useful.
- **Technology Overview**—Describes the technical design for the business use case, including an introduction to the Cisco products that make up the design. Technical decision makers can use this section to understand how the design works.
- **Deployment Details**—Provides step-by-step instructions for deploying and configuring the design. Systems engineers can use this section to get the design up and running quickly and reliably.

You can find the most recent series of Cisco SBA guides at the following sites:

Customer access: http://www.cisco.com/go/sba

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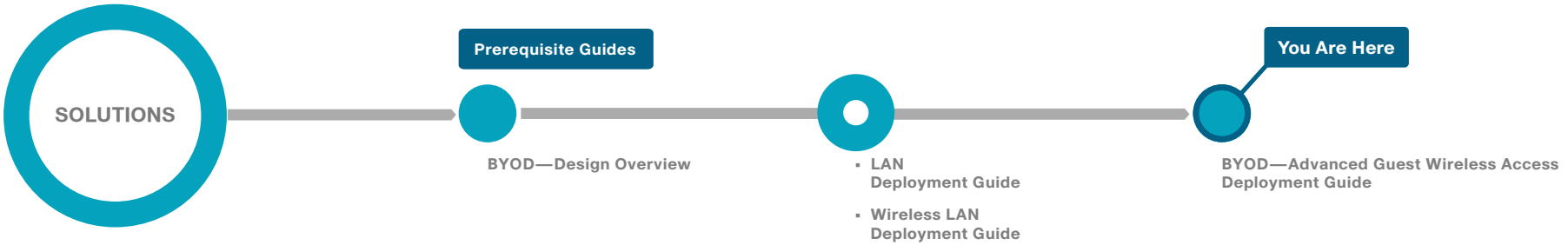


Introduction

Note

This guide is based on the Cisco SBA—Borderless Networks Advanced Guest Wireless Deployment Guide. The goal of this guide is to show you how a BYOD business problem can be solved by using Cisco Smart Business Architecture. Cisco has previously developed solutions to solve issues that are similar to the various BYOD business problems. Cisco SBA uses Cisco Identity Services Engine to solve the BYOD problem of providing guest wireless access.

There is a trend in the marketplace today that is often referred to as Bring Your Own Device (BYOD). BYOD is a spectrum of business problems that can be solved in various ways. These range from accessing guest wireless networks to providing device authentication and identification. The goal is to provide a common work environment, regardless of the type of device being used. This could be accomplished by providing a virtualized desktop or by allowing users to self-register devices for use on the network.

Organizations are experiencing an unprecedented transformation in the network landscape. In the past, IT typically provided network resources only to corporate-managed PCs, such as laptops and desktops. Today, employees are requiring access from both corporate managed and unmanaged devices, including mobile devices like smart phones and tablets. This rapid proliferation of mobile devices capable of supporting applications drastically increases workforce mobility and productivity, but it also presents an enormous challenge to IT organizations seeking to enforce security policies across a growing population of devices, operating systems, and connectivity profiles.

The distinction between a work device and a personal device has evolved. This evolution of mobile device usage and the introduction of mobile devices into the workplace has caused a paradigm shift in how IT views what qualifies as a network "end point device" and also what it means to "be at work."

An organization needs to know not only who is accessing their wired and wireless networks, but also when the networks are accessed and from where. In addition, with the wide adoption of nontraditional devices, such as smart phones and tablets, and people bringing their own devices to access the network, organizations need to know how many of these devices are connecting. With this information, the organization can create policy to prevent connection by nontraditional devices, limit connection to approved devices, or make access to network resources easier for these non-traditional devices. This presents a challenge for IT organizations that seek to provide end-users with a consistent network access experience and the freedom to use any device, while still enforcing stringent security policies to protect corporate intellectual property. Further complicating the situation is delivering both consistent access and enforcing proper security policy based on the specific user-access scenario (wired, wireless, guest, local, branch, and remote users).

To balance the productivity gains versus the security risks, IT needs to implement a solution that allows for seamless on-boarding of users and devices, simplicity of on-going operations, and the ability to extend end-user applications to any user or any device at any time.

Other Cisco SBA Solutions guides addressing BYOD business problems include:

- *BYOD—Design Overview*
- *BYOD—Internal Corporate Access Deployment Guide*
- *BYOD—Identity and Authentication Deployment Guide*
- *BYOD—Remote Mobile Access Deployment Guide*
- *BYOD—Virtual Desktop Access Deployment Guide*

Business Overview

Organizations' facilities are frequently called upon to host a wide range of guest users including customers, partners, and vendors. Many of these users want network connectivity while they are onsite in order to gain access to authorized organizational resources, as well as VPN connectivity to their employer's network and the Internet, so they can be as productive as possible. However, by offering guests the same level of network access that the organization's users have, the organization is exposed to a significant risk.

Relying on a set group of internal users, such as receptionists and IT helpdesk staff, to create the guest accounts may not be as flexible as an organization requires. The group might not be available 24-hours per day to create accounts, or the turnaround time for creation of the accounts might be significant. The turnaround times tend to be most significant when the resources that create the accounts have a cost associated with them. For example, a helpdesk representative might spend time creating guest accounts only after all higher priority issues have been resolved.

After a guest account has been created, you typically need to tell the guest the account details, the access instructions, and the acceptable-use policy. Dealing with this information when the guest arrives can take a lot of time. Additionally, a guest account often needs to change after it has been created. For example, you may want to extend the time on the guest account so you don't need to create a new one for the guest when it expires, or you may want to resend the account details to a guest if the information has been lost or forgotten.

Technical Overview

Cisco Identity Services Engine (ISE) is an identity and access-control policy platform that enables organizations to enforce compliance, enhance infrastructure security, and streamline their service operations. With the included sponsor portal, you can quickly open a web connection to the server running Cisco ISE, authenticate with a Microsoft Active Directory username and password, and create a guest account. The entire process is quick, easy, and involves no additional staff or costs.

Cisco ISE is deployed by organizations in their networks to manage all the different aspects of identity, including guest access. Cisco ISE includes a complete provisioning and reporting system that provides temporary network access for guests, visitors, contractors, consultants, and customers. Integrating Cisco ISE into the guest wireless network is accomplished by using ISE as the RADIUS server for authentication and accounting. Cisco ISE works alongside the Cisco wireless LAN controller (WLC), which provides the enforcement point for guest access and serves as a proxy for guest web authentication requests to the ISE server.

If the sponsor has a visitor coming for a meeting the following day, he can create a guest account and automatically send an email or Short Message Service (SMS) text message with account details to the visitor the night before. If the guest arrives early, she can get connected while waiting for the meeting.

When guest accounts are created, they are stored within the built-in database of the Cisco ISE server. When a guest user connects to the wireless guest network by using the guest Secure Set Identifier (SSID), their traffic is tunneled from the WLC that controls the AP they are using to the guest WLC in the demilitarized zone (DMZ) of the Internet edge component. The guest WLC then uses a web authorization redirect to point the guest user to the Cisco ISE guest login page. The guest WLC uses the credentials supplied to Cisco ISE by the guest user, and then uses those credentials in a RADIUS request to the Cisco ISE server to retrieve other information, like connection time. Cisco ISE verifies the supplied credentials against its own internal database, where guest information is stored.

The Cisco ISE server provisions the guest account for the amount of time that is specified when the account is created. Upon expiry of the account, Cisco ISE sends a RADIUS message that notifies the WLC of the amount of valid time that remains on the account before the WLC must remove the user.

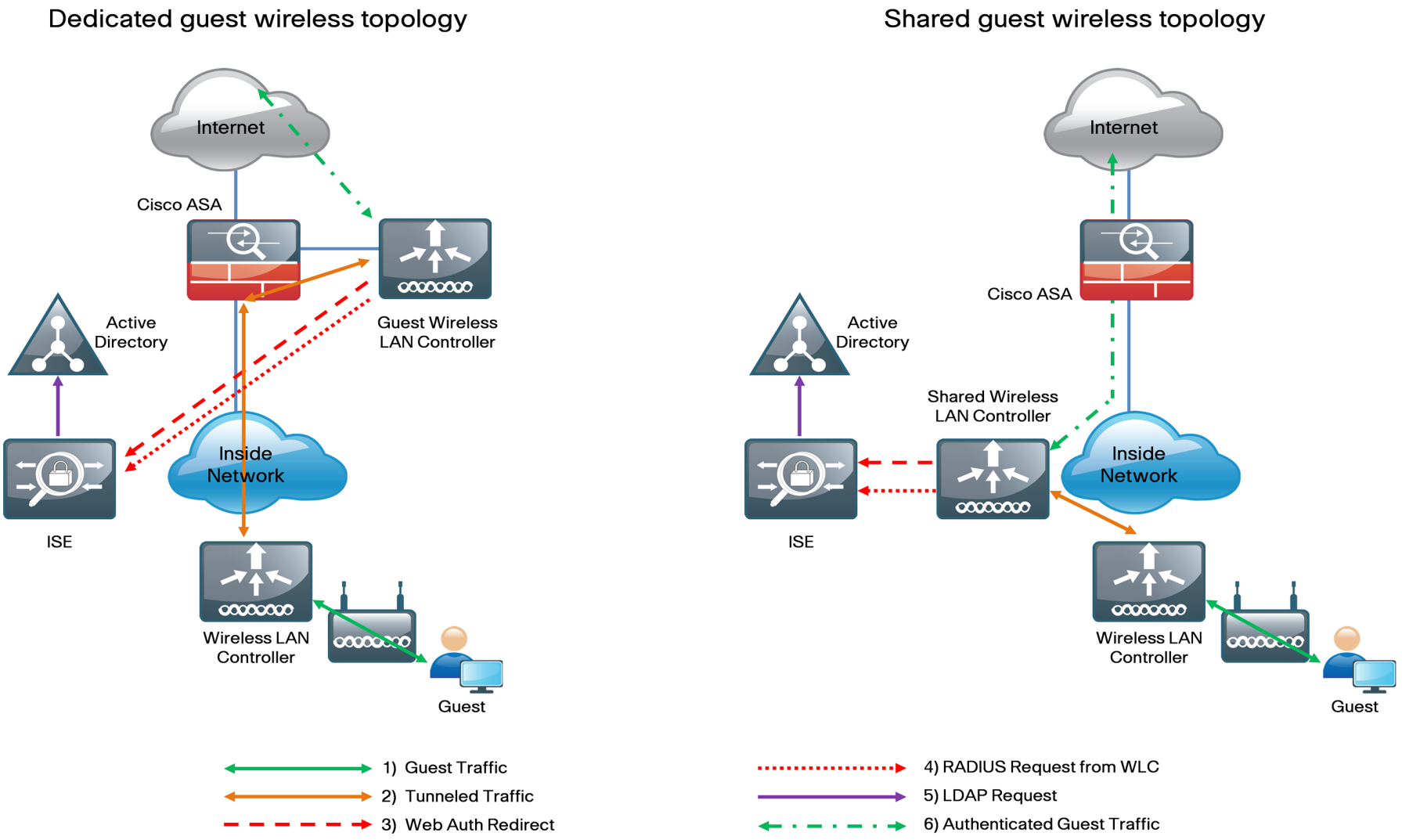
Risk is minimized because the guest account gives access only to the Internet, not the internal network. Sponsors can also suspend a guest account. Normally this feature is used in the event of malicious use of the account, but the organization could have a policy that requires suspension of the guest account as soon as the visitor leaves.

Because reporting is an important aspect of any guest access system, the whole process is recorded for audit purposes. If your organization gets a phone call from the security team at another company, and they explain that they were attacked at a specific time and date by an IP address that belongs to your organization's guest wireless deployment, you can use Cisco ISE to get a full audit trail of who had that IP address, when they logged in and out, and who created the account.

There are two deployment models used for guest wireless access, as illustrated in Figure 1:

- Dedicated guest model, in which the guest WLC resides in the DMZ and handles only guest users.
- Shared guest model, in which the WLC supports both internal staff and guests, and resides in the internal network.

Figure 1 - Guest wireless topologies



Deployment Details

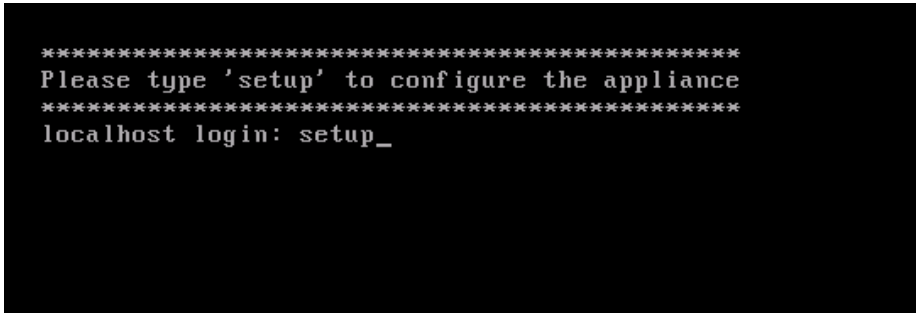
Process

Deploying Cisco ISE

1. Perform initial setup of Cisco ISE
2. Install the Cisco ISE license
3. Configure network devices in Cisco ISE
4. Configure Cisco ISE to use Active Directory

Procedure 1 Perform initial setup of Cisco ISE

Step 1: Boot Cisco ISE, and then, at the initial prompt, enter **setup**. The installation begins.



Step 2: Enter the host name, IP address, subnet mask, and default router of Cisco ISE.

```
Enter hostname[]: ise-1
Enter IP address[]: 10.4.48.41
Enter IP default netmask[]: 255.255.255.0
Enter IP default gateway[]: 10.4.48.1
```

Step 3: Enter Domain Name System (DNS) information.

```
Enter default DNS domain[]: cisco.local
Enter primary nameserver[]: 10.4.48.10
Add/Edit another nameserver? Y/N : N
```

Step 4: Configure the time.

```
Enter NTP server[time.nist.gov]: ntp.cisco.local
Add another NTP server? U/N [N]: N
Enter system timezone[UTC]: PST8PDT
```

Reader Tip

For time zone abbreviations, see the *Cisco Identity Services Engine CLI Reference Guide, Release 1.1*, here:

http://www.cisco.com/en/US/docs/security/ise/1.1/cli_ref_guide/ise_cli_app_a.html#wp1571855

Step 5: Configure an administrator account.

You must configure an administrator account in order to access the CLI console. This account is not the same as the one used to access the GUI.

```
Enter username[admin]: admin
Enter password: [password]
Enter password again: [password]
```

Cisco ISE completes the installation and reboots. This process takes several minutes.

Step 6: During the provisioning of the internal database, when you are asked, enter a new database administrator password and a new database user password. Enter a password greater than 11 characters for the database administrator password. (Example: C1sco123C1sco123)

Tech Tip

Do not press Control-C during the installation, or it will end the installation.

```
Do not use 'Ctrl-C' from this point on...
Virtual machine detected, configuring VMware tools...
Installing applications...
Installing ise ...
Executed with privileges of root
The mode has been set to licensed.

Application bundle (ise) installed successfully

 === Initial Setup for Application: ise ===

Welcome to the ISE initial setup.  The purpose of this setup is to
provision the internal ISE database.  This setup requires you create
a database administrator password and also create a database user password.
```

The Cisco ISE virtual appliance is now installed.

Procedure 2 Install the Cisco ISE license

Cisco ISE comes with a 90-day demo license for both the Base and Advanced packages. To go beyond 90 days, you need to obtain a license from Cisco.

Step 1: In your browser, enter http://ise-1.cisco.local. The Cisco ISE GUI opens.

Step 2: On the menu bar, mouse over **Administration**, and then, in the System section, choose **Licensing**.

Notice that you see only one node here because the secondary node does not require licensing.

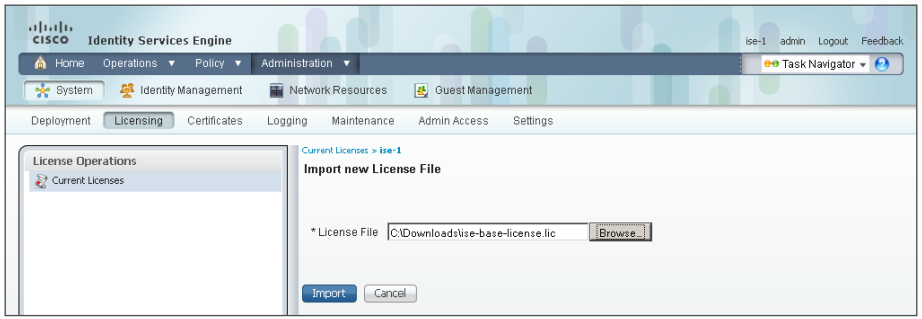
Step 3: Click the name of the Cisco ISE server. This allows you to edit the license details.

Step 4: Under Licensed Services, click **Add Service**.

Tech Tip

When installing a Base license and an Advanced license, you must install the Base license first.

Step 5: Locate your license file by clicking **Browse**, and then click **Import**.



Step 6: If you have multiple licenses to install, repeat the process for each.

Procedure 3 Configure network devices in Cisco ISE

Configure Cisco ISE to accept authentication requests from network devices. RADIUS requires a shared secret key to enable encrypted communications. Each network device that uses Cisco ISE for authentication needs to have this key.

Step 1: On the menu bar, mouse over **Administration**, and then, in the Network Resources section, choose **Network Devices**.

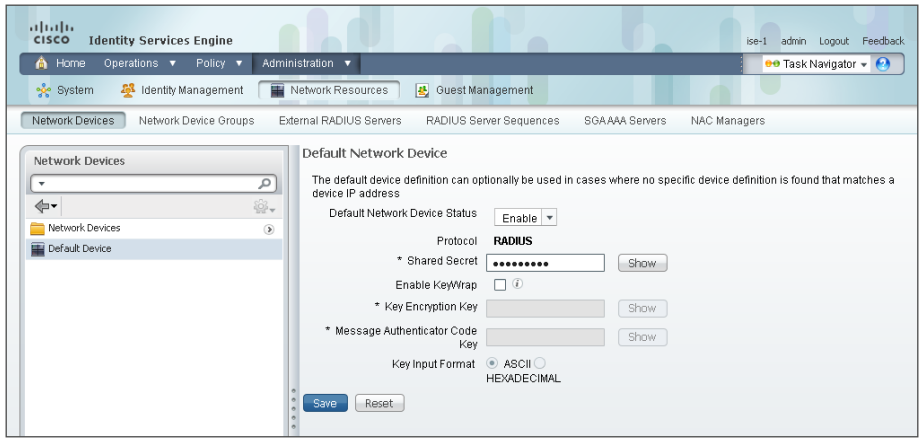
Step 2: In the left pane, click **Default Device**.

Tech Tip

Each network device can be configured individually, or devices can be grouped by location, by device type, or by using IP address ranges. The other option is to use the default device to configure the parameters for devices that aren't specifically configured. All of Cisco's network devices have to use the same key, so for simplicity, this example uses the default device.

Step 3: In the **Default Network Device Status** list, choose **Enable**.

Step 4: In the **Shared Secret** box, enter the RADIUS shared secret, and then click **Save**. (Example: SecretKey)



Procedure 4 Configure ISE to use Active Directory

Cisco ISE uses the existing Active Directory (AD) server as an external authentication server. First, you must configure the external authentication server.

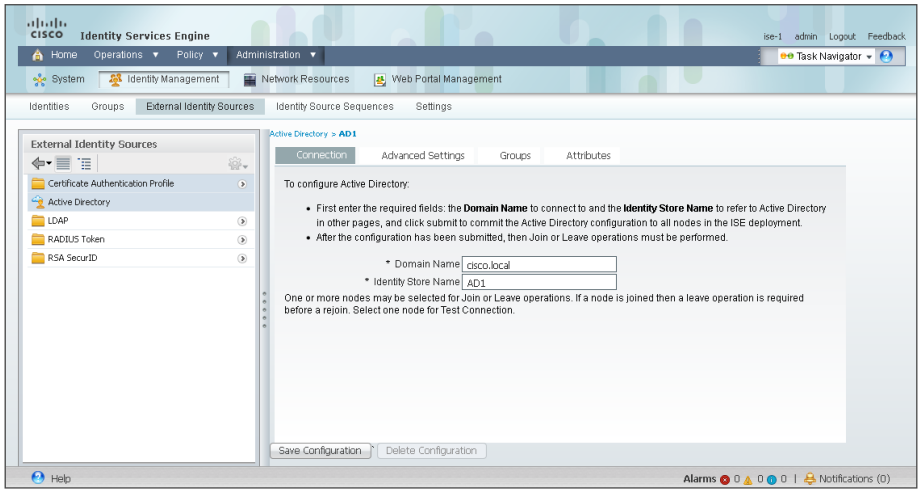
Step 1: On the menu bar, mouse over **Administration**, and then, in the Identity Management section, choose **External Identity Sources**.

Step 2: In the left panel, click **Active Directory**.

Step 3: On the Connection tab, configure the connection to the AD server by entering the AD domain (example: cisco.local), the name of the server (example: AD1), and then click **Save Configuration**.

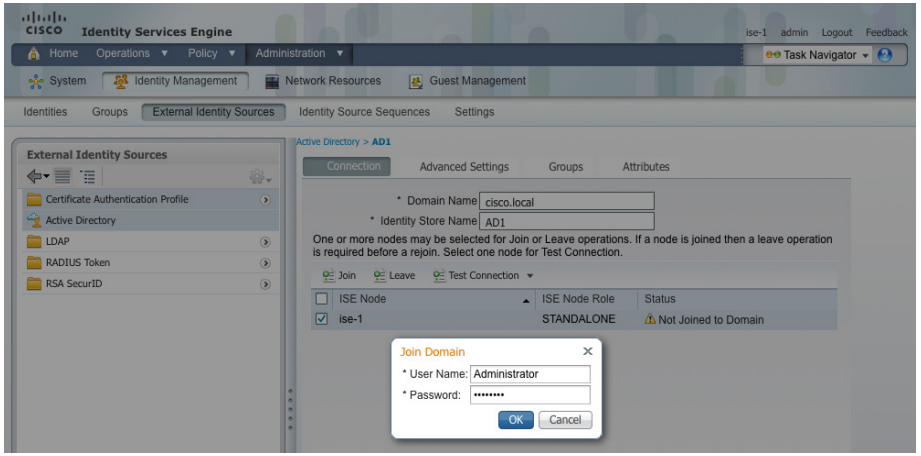
Step 4: Verify these settings by selecting the node, clicking **Test Connection**, and then choosing **Basic Test**.

Step 5: Enter the credentials for a domain user, and then click **OK**.



Step 6: Select the node, and then click **Join**.

Step 7: Enter the credentials for a domain administrator account. Cisco ISE is now joined to the AD domain.

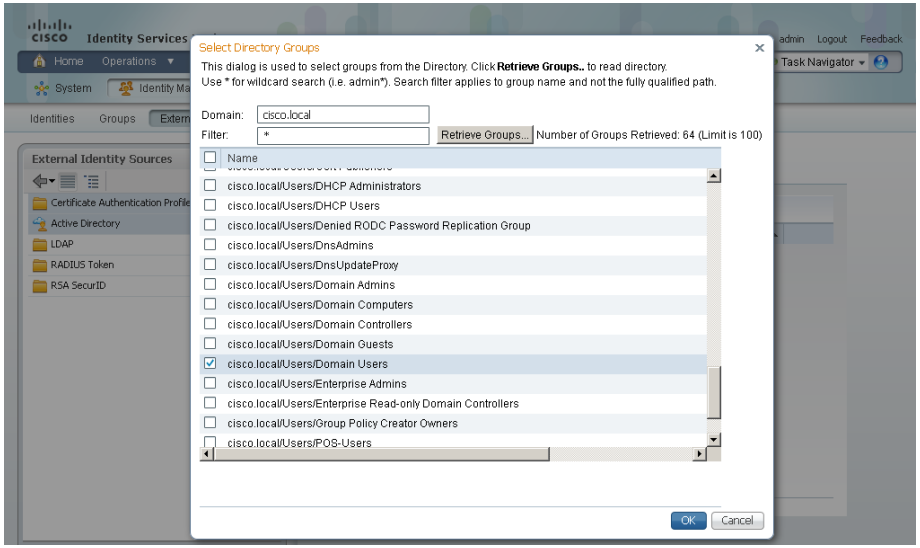


Next, select the groups from AD that Cisco ISE uses for authentication.

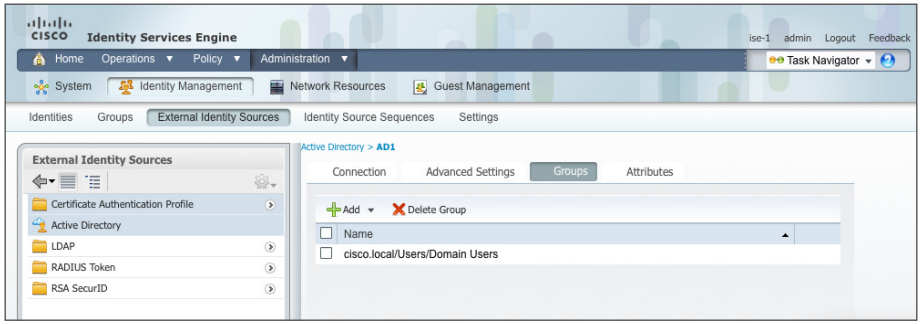
Step 8: Click the **Groups** tab, click **Add**, and then click **Select Groups from Directory**.

Step 9: Search for the groups you wish to add. The domain field is already filled in. The default filter is a wildcard to list all groups. You can click **Retrieve Groups** if you want to get a list of all groups in your domain.

Step 10: Select the groups you want to use for authentication, and then click **OK**. For example, if you want to select all users in the domain, select the group <domain>/Users/Domain Users.



Step 11: Click **OK** and then click **Save Configuration**.



Process

Configuring Cisco ISE Sponsor Portal Services

1. Configure sponsor settings
2. Configure guest settings

A sponsor portal provides a web-based interface to privileged users, or sponsors, within an organization that allows you to create guest accounts. This process covers the steps required to customize the sponsor portal and to configure general sponsor settings, which govern how sponsors access customized web portals for the creation and management of guest accounts.

Setting up the portal is a two-part task. First you need to configure sponsor settings, or specify who can create guest accounts, and then you need to configure guest settings.

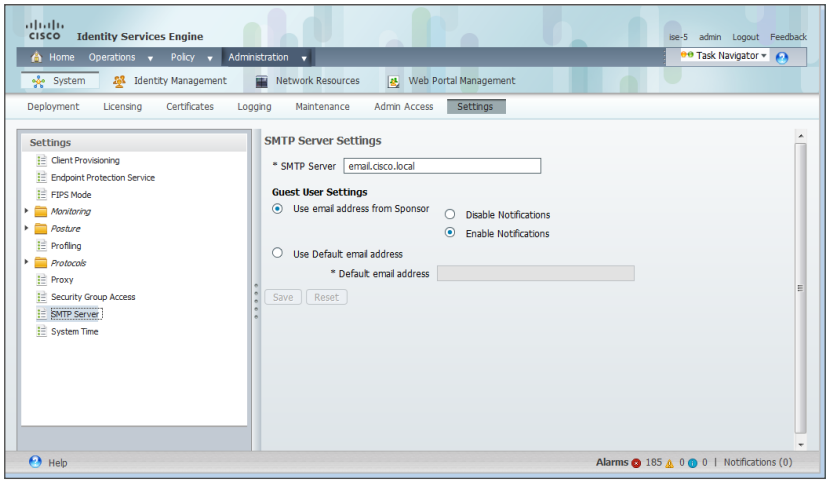
Procedure 1 Configure sponsor settings

A sponsor group defines which privileges are available to the sponsor after the sponsor has been authenticated. These privileges determine the menu options that are available, the guest accounts that can be managed, and the network access privileges that can be granted to a guest through role assignment and time restrictions. Organizations should set up sponsor groups according to their own policy. The privileges that are assignable are:

- **SponsorAllAccounts**—The sponsor in this group can manage all guest accounts.
- **SponsorGroups**—The sponsor in this group can manage all guest accounts created by sponsors in the same sponsor group only.
- **SponsorGroupOwnAccounts**—The sponsor in this group can manage only guest accounts that the sponsor created.

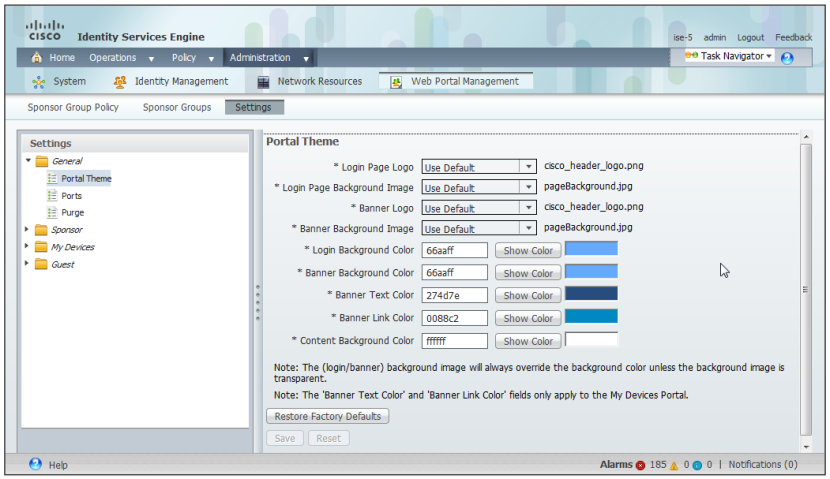
For this deployment, new groups are not required because the SponsorAllAccounts default group is sufficient, but the following steps detail how to build a new group in order to show the different settings available when setting up groups.

Step 1: In the Cisco ISE admin management web interface, navigate to **Administration > System > Settings > SMTP Server**, and then enter the location of the SMTP server that should be used to send guest wireless account notifications after creation. Emails can be sourced from either the sponsor's email address or from a global address. After entering the SMTP server information, click **Save**.



Step 2: Navigate to **Administration > Web Portal Management > Settings**, double-click **General**, and then, in the list, choose **Portal Theme**.

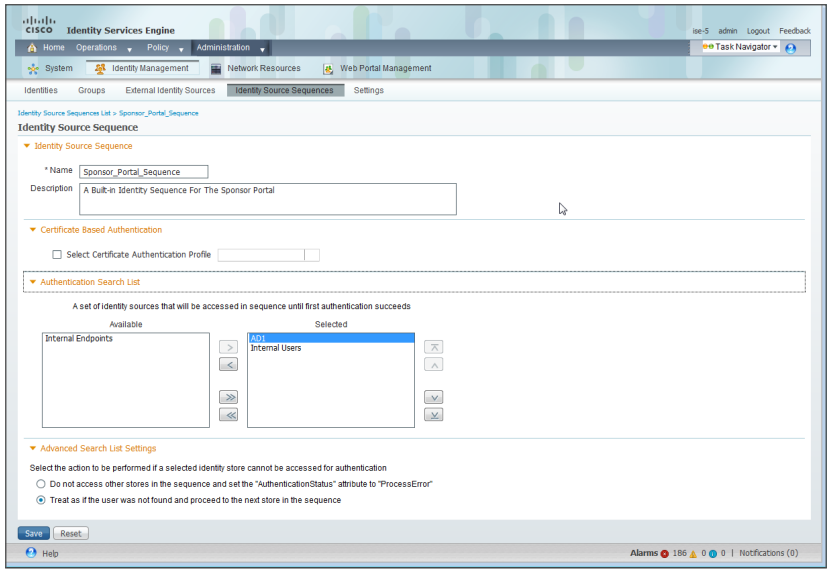
This page defines the sponsor portal layout and is where you configure customizations for the portal page.



Step 3: Navigate to **Administration > Identity Management > Identity Source Sequences**, and then click **Sponsor_Portal_Sequences**.

Step 4: In the **Available** list, choose the AD identity store, **AD1**, and then move it to the top of the **Selected** list.

This forces Sponsor authentication to use the AD database first and the Internal Users database second.

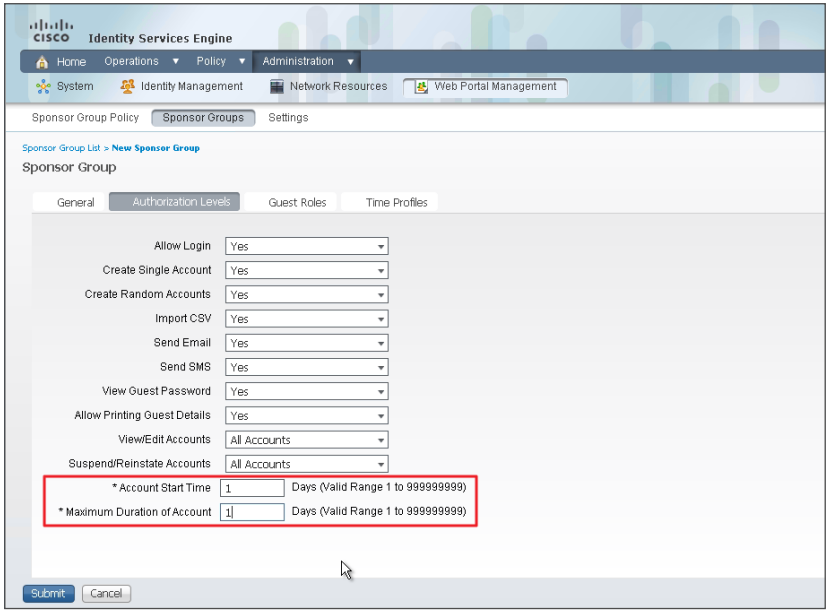


Step 5: Click **Save**.

Step 6: Navigate to **Administration > Web Portal Management > Sponsor Groups, and then click Add.**

Step 7: Give the new group a name (example: OrganizationSponsorAllGroup).

Step 8: On the **Authorization Levels** tab, set Account Start Time to **1 Day**, and then set Maximum Duration of Account to **1 Day**.



Step 9: In the **Guest Roles** section, select **SponsorAllAccount**.

Step 10: On the **Time Profiles** tab, choose **DefaultFirstLogin**.

Step 11: Click **Submit.**

Next, you configure policies that define the sponsor group that is assigned to a sponsor, based on login credentials and other conditions.

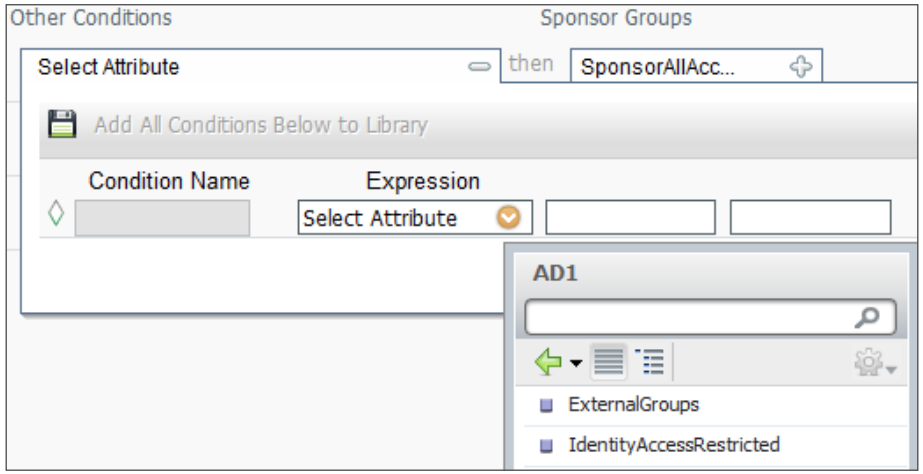
Step 12: Navigate to **Administration > Web Portal Management > Sponsor Group Policy**.

Step 13: Next to Manage All Accounts, next to Identity Groups, click the **+** symbol, and then choose **Any.**

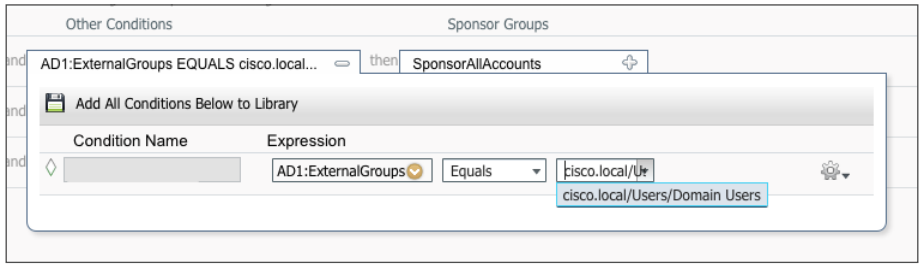
Step 14: Next to Other Conditions, click the **+** symbol, and then select **Create New Condition**.

Step 15: Under **Expression**, next to Select Attribute, click the arrow. The menu opens.

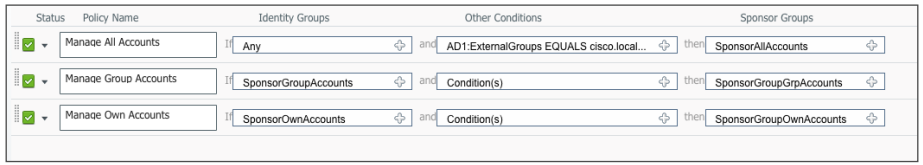
Step 16: Next to AD1, click the **>** symbol, and then choose **ExternalGroups**.



Step 17: In first drop-down list, choose **Equals**, and then, in the second drop-down list, choose the AD group **yourdomain.local/Domain Users** which was added earlier in Step 8 of Procedure 4.



Step 18: In the **Sponsor Groups** list, ensure the default, **SponsorAllAccounts**, is selected, and then click **Save**.



Procedure 2 Configure guest settings

In order to perform web-based authentication, guest users need a portal that allows the user to enter their login credentials, and also provides optional services, like password changes, device registration, or self-service account creation.

Step 1: Navigate to **Administration > Web Portal Management > Settings**, and then, in the Settings section, expand **Guest**.

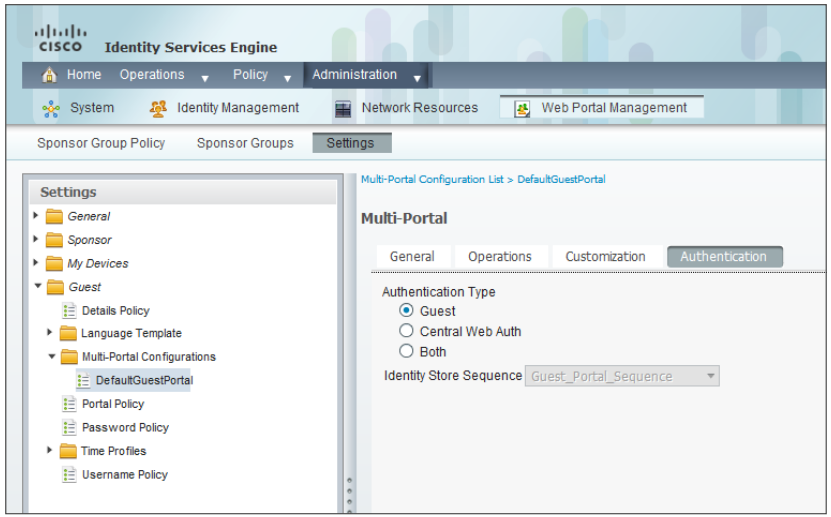
Tech Tip

The Details Policy option allows you to configure required guest account information. This can be changed from the default to fit a required security policy, as needed.

Step 2: On the left-hand panel, select **Multi-Portal Configurations**, and then click **DefaultGuestPortal**.

Step 3: On the **Authentication** tab, in the **Authentication Type** list, choose **Guest**. The Guest setting uses only the internal guest user database, which stores sponsor-created guest accounts.

Step 4: Click **Save.**



Specific security policies may also require changing password or username policy. You can do this by using the appropriate selections in this panel.

Process

Integrating the Cisco Wireless LAN Controller and Cisco ISE

1. Configure a firewall policy
2. Configure the wireless LAN controller

Procedure 1 Configure a firewall policy

If there is a firewall between the guest WLC and the Cisco ISE server, you need to allow UDP/1812 and UDP/1813.

Step 1: Connect to the Internet edge firewall by using Cisco ASDM.

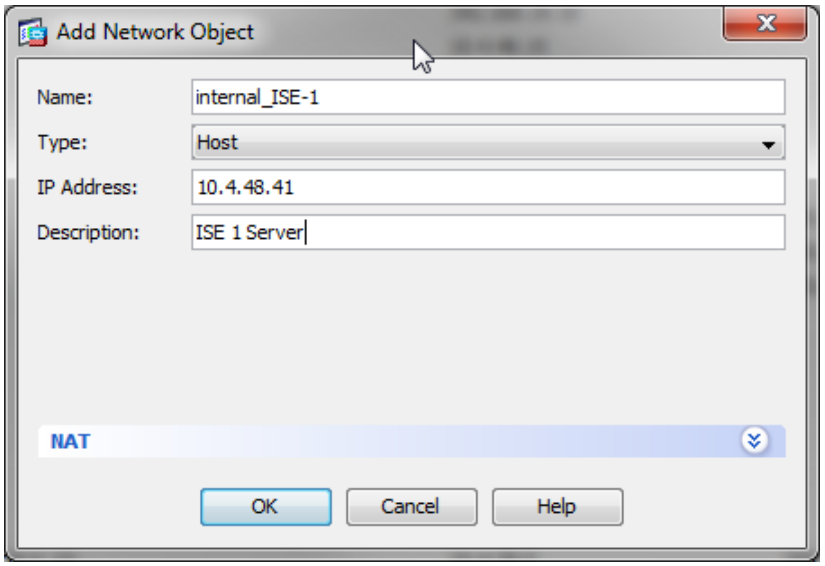
Step 2: Navigate to **Configuration** > **Firewall** > **Objects** > **"Network Objects/Groups"**.

Step 3: Click **Add**, and then click **Network Object**.

Step 4: In the **Name** box, enter the object name of the Cisco ISE server (example: internal_ISE-1).

Step 5: In the **Type** list, choose **Host**.

Step 6: In the **IP Address** box, enter the IP address of the Cisco ISE server (example: 10.4.48.41).



Step 7: Click **OK,** and then click **Apply**.

Step 8: Navigate to **Configuration** > **Firewall** > **Access Rules**.

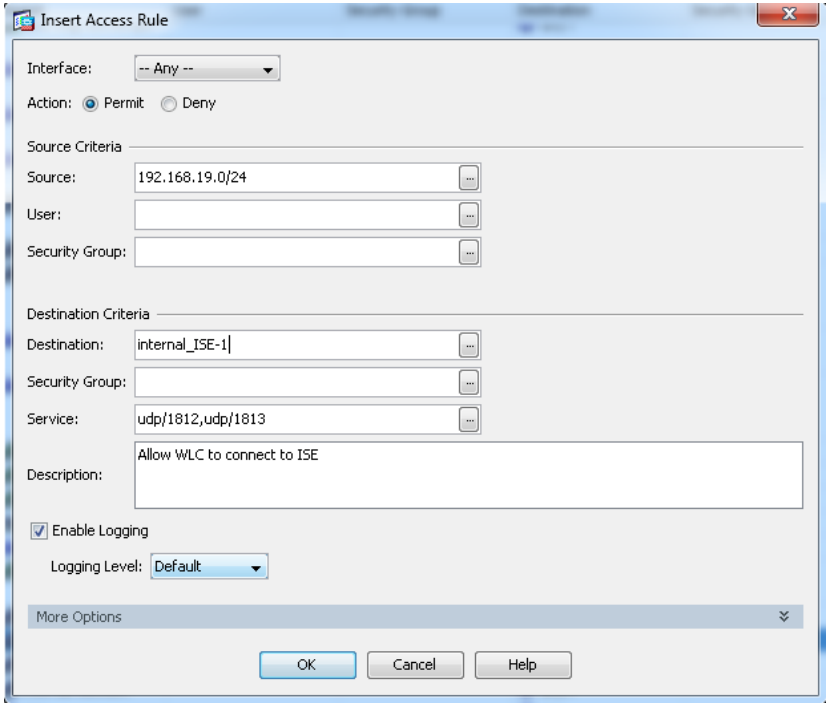
If you are using the shared deployment model, in which the WLC resides on the internal network, skip to Step 12. If you are using the dedicated deployment model, in which the WLC resides on the DMZ, continue to the next step.

Step 9: Click the rule that denies DMZ-network access to the internal networks.

Step 10: Click **Add**, and then click **Insert**. A new access rule is inserted before the deny rule that was selected.

Step 11: Enter the following access rule details, and then click **OK**.

- Source—192.168.19.0/24. This is the IP address for the guest Cisco Wireless LAN Controller management network.
- Destination—internal_ISE-1. This is the object name of the Cisco ISE server.
- Service—udp/1812, udp/1813



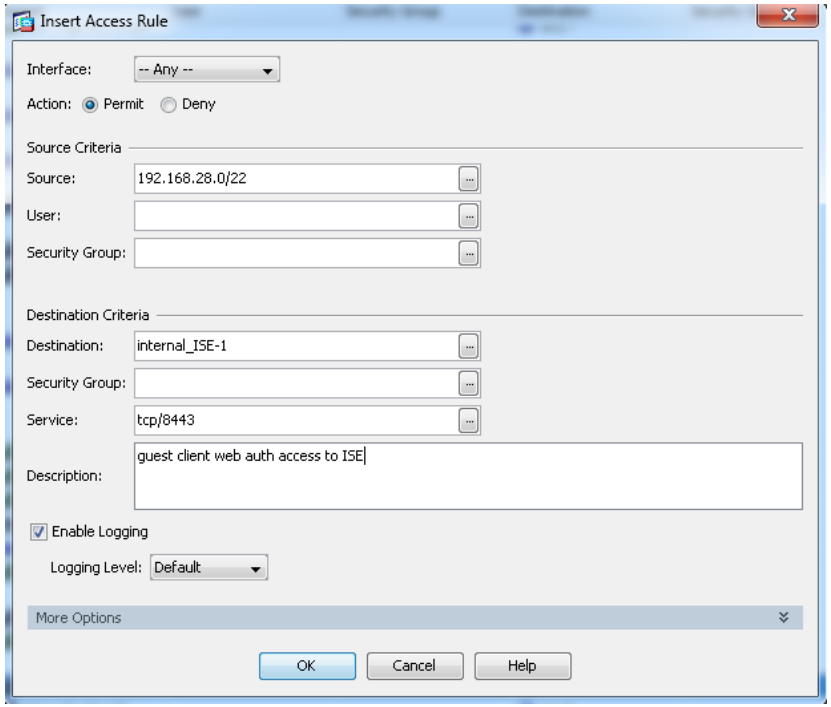
Guest client IP addresses need access through the firewall to the Cisco ISE server for web authentication attempts.

Step 12: Click the rule that denies DMZ-guest-network access to the DMZ-networks and the internal-network.

Step 13: Click **Add**, and then click **Insert**. A new access rule is inserted before the deny rule that is currently selected.

Step 14: Enter the following access rule details:

- Source—192.168.28.0/22. This is the network IP address for the DMZ guest network.
- Destination—internal_ISE-1
- Service—tcp/8443



Step 15: Click **OK**, click **Apply**, and then click **Save**.

Procedure 2 Configure the wireless LAN controller

Step 1: In your browser, enter the address of the guest anchor WLC management interface (example: https://guest-wlc), and then log in.

Step 2: Navigate to **Security** > **AAA** > **RADIUS** > **Authentication**. From here, you can add the Cisco ISE server as an authentication server in the WLC.

Step 3: If you are using the dedicated WLC model, ensure that the RADIUS servers that are already configured on this WLC are either disabled or removed; this ensures that Cisco ISE is used for guest user authentication. If you are using the shared model, there could possibly be other defined AAA servers.

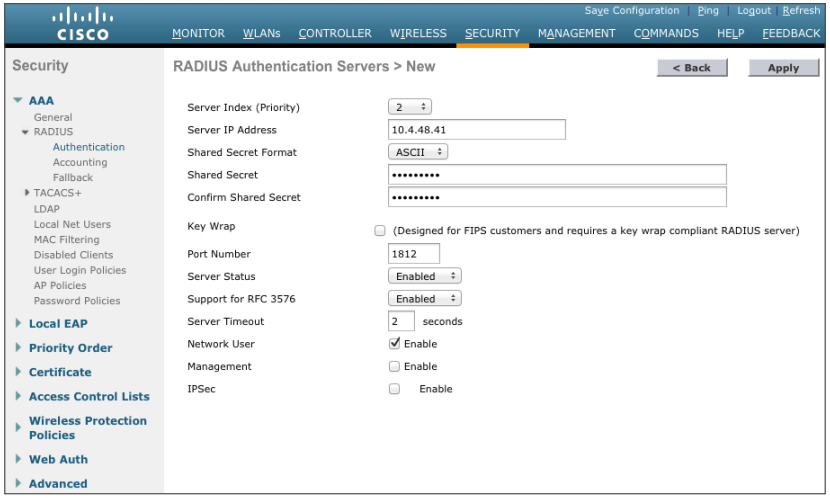
Step 4: Click **New**.

Step 5: Enter 10.4.48.41. This is the IP Address for the server running Cisco ISE.

Step 6: In the **Shared Secret** box, enter a shared secret (Example: SecretKey).

Step 7: In the **Confirm Shared Secret** box, re-enter the shared secret. (Example: SecretKey)

Step 8: Next to Management, clear the **Enable** check box, and then click **Apply**.



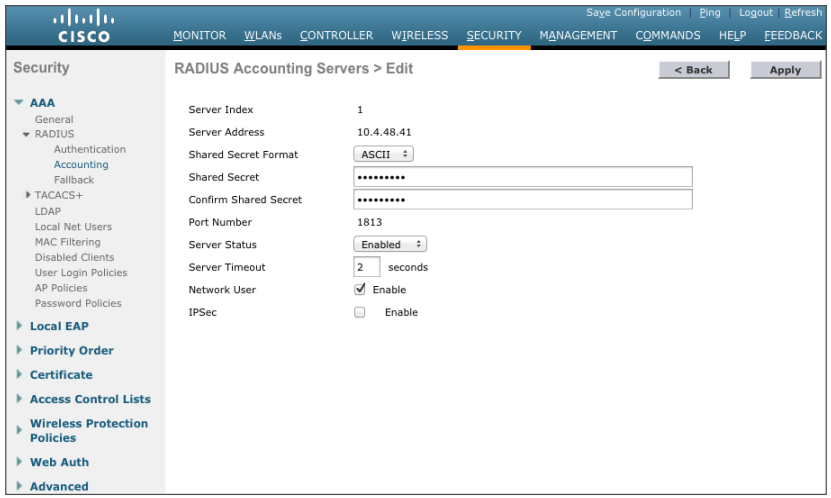
Step 9: Navigate to **Security > AAA > RADIUS > Accounting**. From here, you can add the guest server as an accounting server in the WLC.

Step 10: Click **New**.

Step 11: In the **Server Address** box, enter 10.4.48.41. This is the IP address of the Cisco ISE server.

Step 12: In the **Shared Secret** box, enter a shared secret. (Example: SecretKey)

Step 13: In the **Confirm Shared Secret** box, re-enter the shared secret.

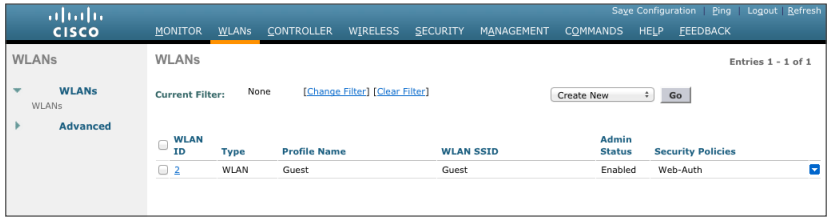


Step 14: Click **Apply**.

Step 15: On the menu bar, click **WLANs**.

Step 16: In order to modify the Web Authentication Type later in the procedure, you must disable the WLANs using Web-Auth as an authentication method.

Step 17: Next to Guest, select the check box.

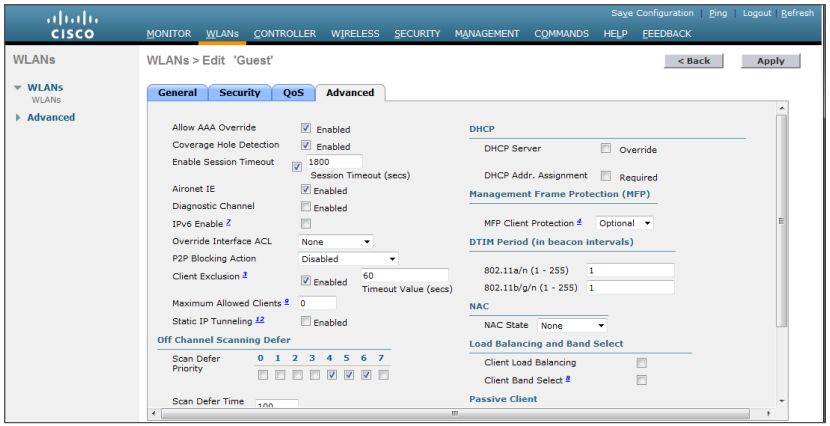


Step 18: Click the arrow next to Create New, in the list, choose **Disable Selected**, and then click **Go**.

Step 19: Click **OK**. This confirms that you want to disable the selected WLANs.

Step 20: Click the WLAN ID for the WLAN that you want to edit (example: 2).

Step 21: On the Advanced tab, next to Allow AAA Override, select **Enabled**. This allows the per-client session timeout to be set from the Cisco ISE server.



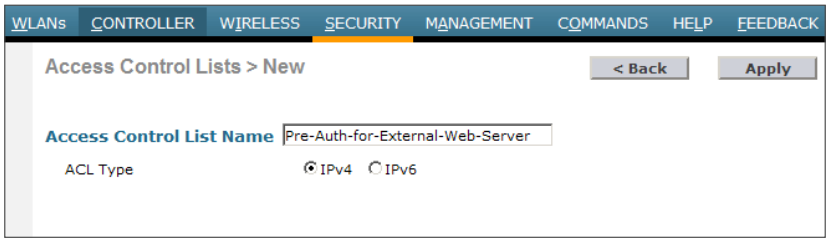
Step 22: Click **Apply.**

In order for the guest to have access to resources that they need before they authenticate, a pre-authentication ACL needs to be created that allows the guest access to DNS services and the Cisco ISE server.

Step 23: Navigate to **Security > Access Control Lists > Access Control Lists**.

Step 24: Click **New**. This allows you to create a new access control list.

Step 25: In the **Access Control List Name** box, enter a name for the ACL, and then click **Apply**.

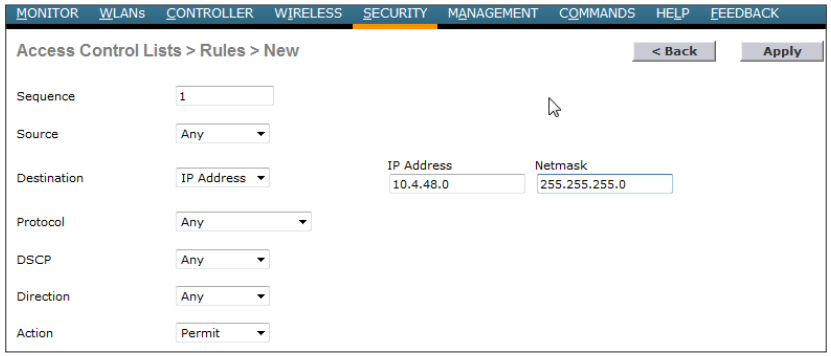


Step 26: Click the name of the ACL.

Step 27: Click **Add New Rule**

Step 28: Enter the following information, and then click **Apply**. This defines an ACL that allows access to the management network. In this example, access is allowed to the 10.4.48.0 network, and access to specific resources is controlled on the Cisco ASA itself. This reduces the locations in which changes need to be made as the network evolves.

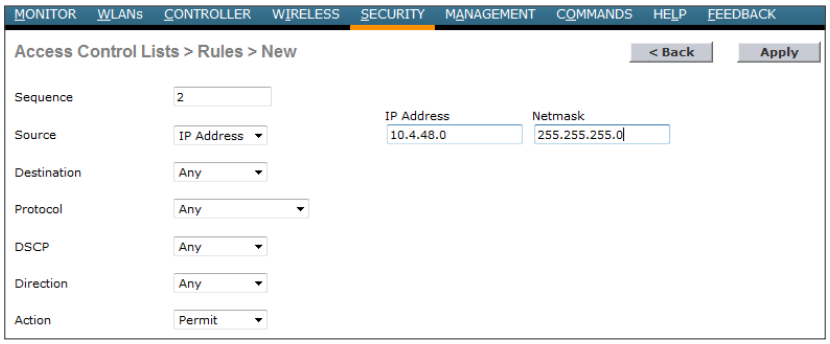
- Sequence—**1**
- Destination—**IP Address**
- IP Address—**10.4.48.0**
- Netmask—**255.255.255.0**
- Action—**Permit**



Step 29: Click **Add New Rule**.

Step 30: Enter the following information, and then click **Apply**. This defines another ACL entry in order to allow the return traffic from the 10.4.48.0 network to the guest clients.

- Sequence—**2**
- Source—**IP Address**
- IP Address—**10.4.48.0**
- Netmask—**255.255.255.0**
- Action—**Permit**

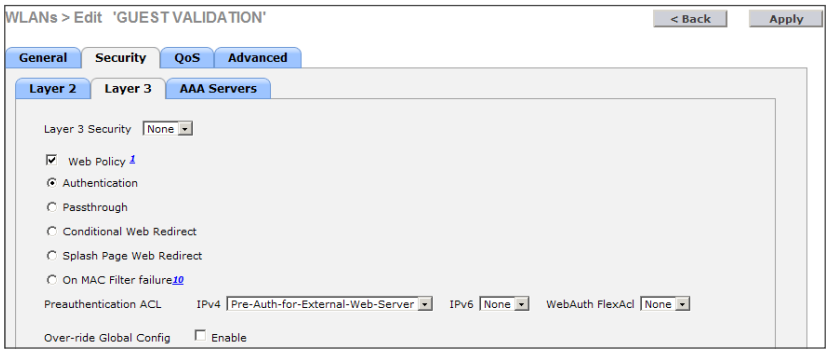


Step 31: Navigate to **WLANs**.

Step 32: Click the WLAN ID for the specific guest WLAN. This allows you to edit the WLAN.

Step 33: Click **Security**, and then click **Layer 3**.

Step 34: On the Layer 3 tab, make sure **Web Policy** is selected, and then in the **IPv4** list, choose the ACL that was created in Step 23, and then click **Apply**.



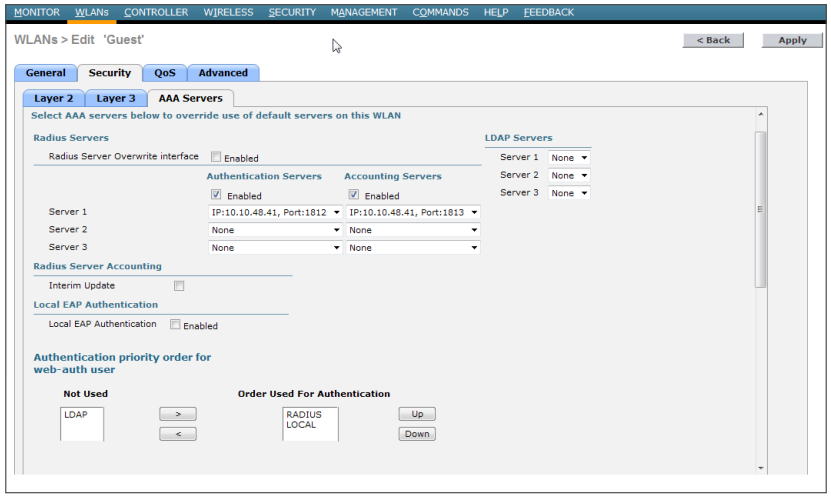
If you are using a shared deployment model, in which the WLC lives inside the firewall on the internal network and handles both guest users and internal users, continue to the next steps. If you are using a dedicated deployment model, in which the WLC resides on the DMZ and handles guest traffic only, skip to Step 36.

For this deployment, Cisco ISE is used only for guest traffic and not for the internal users. To support that, you need to set up the guest WLAN to use the Cisco ISE server for authentication.

Step 35: Navigate to **Security > AAA Servers**.

Step 36: Next to Server 1, in the **Authentication Servers** and **Accounting Servers** lists, choose the Cisco ISE server, 10.4.48.41.

Step 37: Under Authentication priority order for web auth user, in the **Order Used for Authentication** list, move **RADIUS** to the first position in the list, followed by **LOCAL**, and then ensure that **LDAP** is removed and then click **Apply**.



When a guest wants to log in to the wireless network, they are presented with a web-based login screen that authenticates them against the credentials stored on the Cisco ISE server's internal database. To do this, any web session the guest begins must be redirected to the Cisco ISE server's web authentication URL to allow credential input. When the guest user enters their credentials, the WLC intercepts the credentials and the results, and uses them in a separate RADIUS request to Cisco ISE to retrieve the other options, such as time, that are specific to this guest account.

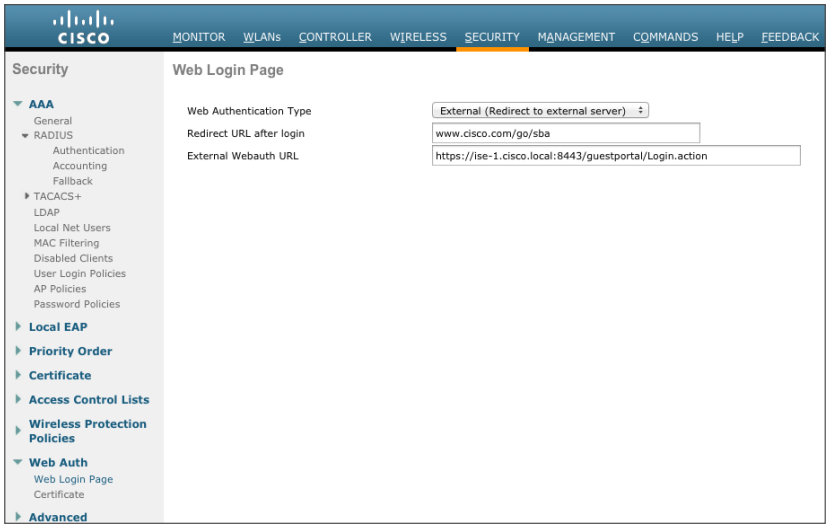
Step 38: Navigate to **Security > Web Auth > Web Login Page.**

Step 39: In the **Web Authentication Type** list, choose **External (Redirect to external server).**

Step 40: If desired, in the **Redirect URL after login** field, enter a URL for the webpage that the user will be redirect to after they login (Example www.cisco.com/go/sba)

Step 41: In the **External Webauth URL** box, enter **https://ise-1.cisco.local:8443/guestportal/Login.action**. This is the location of the Cisco ISE server's guest portal login page.

Step 42: Click **Apply**, and then click **OK**. This confirms that the pre-authentication ACL has been configured.



Step 43: On the menu bar, navigate to **WLANs**.

Step 44: Select the check box for the Guest WLAN ID you want to edit (example: 2).

Step 45: Next to Create New, click the arrow, and then choose **Enable Selected**.

Step 46: Click **Go**, and then click **OK**.

Because of a change made in iOS device behavior (Apple iPhone, iPad, and iMac), you need to execute a command on the CLI of the WLC to allow those devices to be guests on the wireless network.

Step 47: Using SSH, navigate to the IP address of the WLC, and then log in with an administrator account.

Step 48: Enter the following command. This turns on captive bypass.

```
(Cisco Controller) >config network web-auth captive-bypass
enable
```

Step 49: In the WLC GUI, on the right-hand side of the page, click **Save Configuration**.

Step 50: On the menu bar, navigate to **Commands**, and then click **Reboot**. The WLC reboots.

Step 51: If using a Cisco 2500 series WLC, repeat Procedure 2 for the resilient 2500 series WLC. This is necessary as the 2500 WLC does not support AP-SSO and the two controllers must be individually configured.

Process

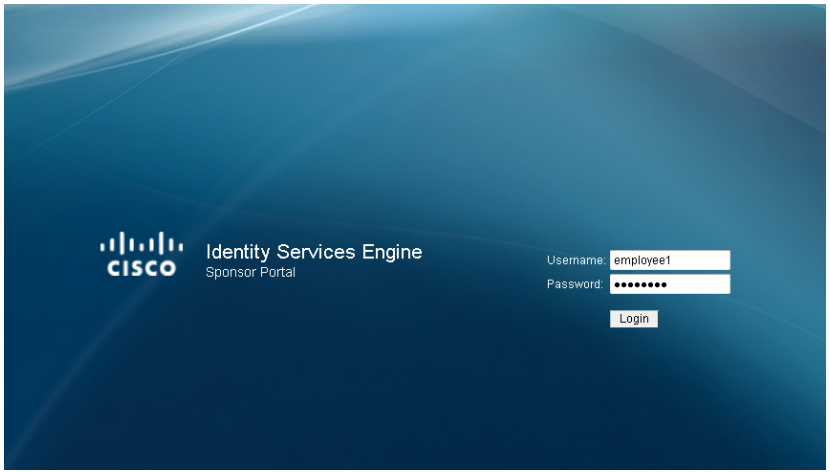
Creating and Using Guest Accounts

1. Use the Sponsor Portal
2. Use guest accounts

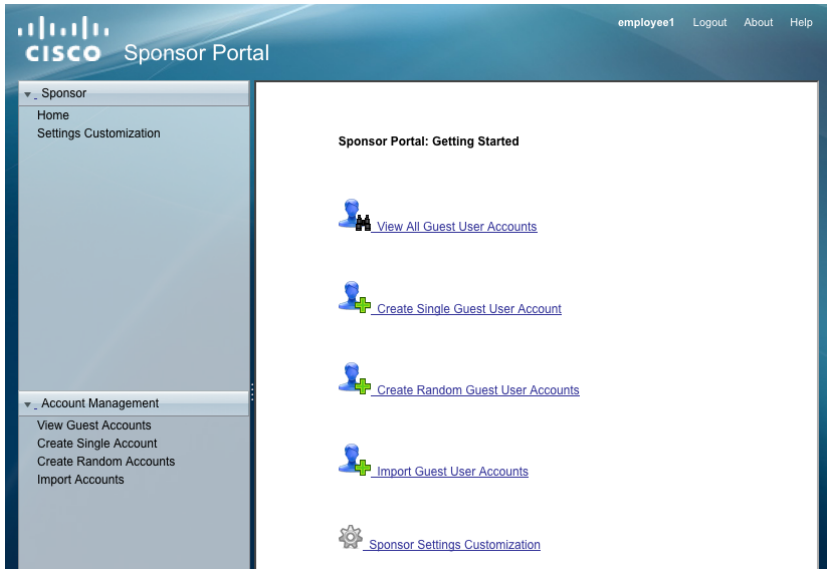
Procedure 1 Use the Sponsor Portal

To create the guest account, the authorized guest-user-account sponsor performs the following steps.

Step 1: In your browser, enter https://ise-1.cisco.local:8443/sponsorportal, and then log in to the Cisco ISE Sponsor Portal.

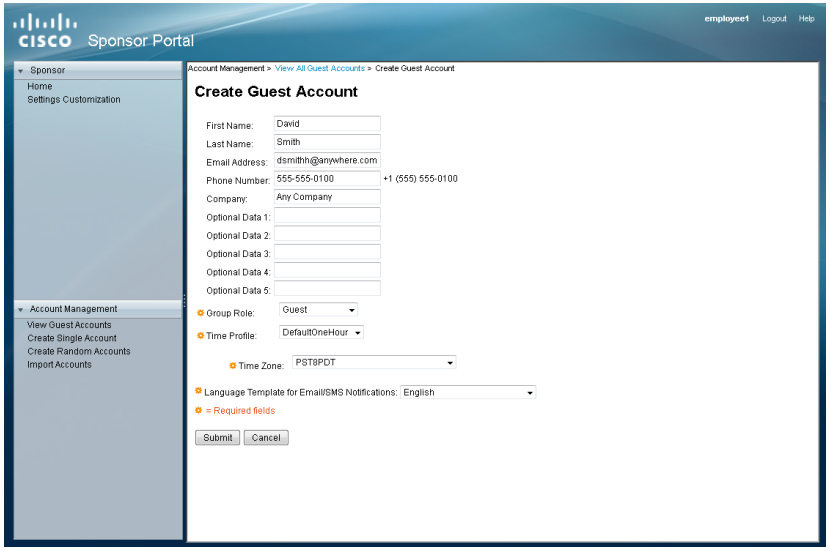


Step 2: Click **Create Single Guest User Account**.

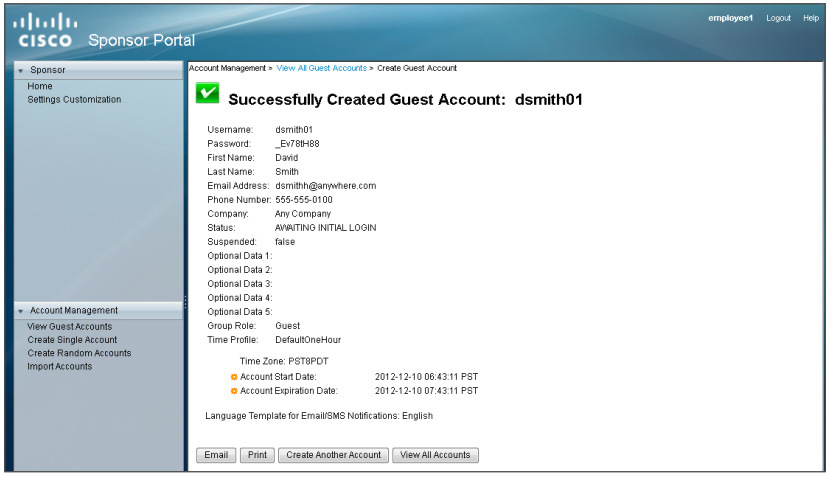


Step 3: Enter the information for the guest account as required by corporate policy (and the settings implemented in the "Configure Sponsor Portal" procedure in the "Configuring Cisco ISE Sponsor Portal Services" process). After you enter the required Guest User account info, click **Submit.**

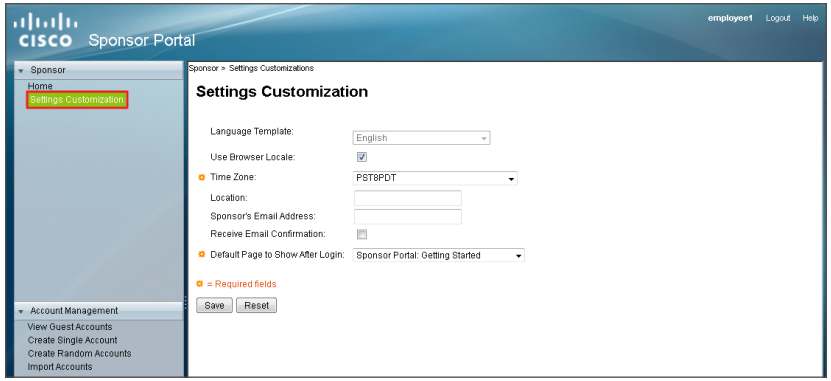
Step 4: In this particular example, first and last name, email address, and company were entered by the sponsor.



Step 5: If the account was successfully created, Cisco ISE displays the guest account and credentials. For testing purposes, write down the user-name that was automatically created (Example: dsmith01/_Ev78tH88)



Step 6: If you want to customize sponsor account options, such as language and email notification, click **Settings Customization**.

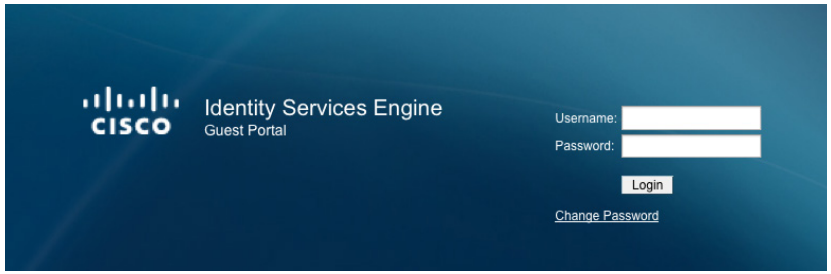


Procedure 2 Use guest accounts

For guests to be authenticated, they need to connect to the guest SSID and get an IP address in the 192.168.28.0/22 range.

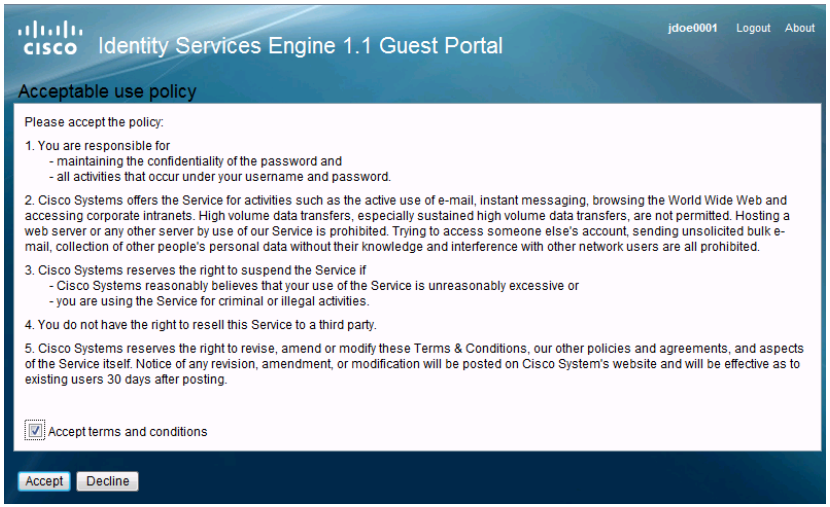
Step 1: From a wireless device, connect to the wireless guest network created. (Example: Guest)

Step 2: In the browser on the wireless device, browse to a known website (Example: http://www.cisco.com). The wireless guest machines browser is first redirected to the Cisco ISE Guest Portal, where the guest account credentials can be entered.



Step 3: Enter guest credentials. The Acceptable Use Policy opens.

Step 4: Select **Accept terms and conditions,** and then click **Accept**.



The credentials have been successfully authenticated by Cisco ISE and the guest now has access as determined by the security policy implemented on the firewall.

Tech Tip

When using Internet Explorer, ensure that you have administrative authority to accept and install the digital certificate presented by the WLC using its configured virtual IP address of 192.0.2.1. By right clicking on the Internet Explorer ICON and selecting Run as Administrator you will be permitted to install the WLC certificate in the trusted root certificate store. Failure to do so will result in error 501 invalid certificate error messages. To avoid the use of certificates all together, issue the following command on the console port of each of the anchor WLC in the DMZ:

```
config network web-auth secureweb disable
```

Appendix A: Product List

Wireless LAN

Functional Area	Product Description	Part Numbers	Software
Cisco ISE Server	Cisco Identity Services Engine Virtual Appliance	ISE-VM-K9=	1.1.2.145
	Cisco ISE Wireless 5-year License for 500 Endpoints	LS-ISE-AD5Y-W-500=	
	Cisco ISE Wireless 5-year License for 250 Endpoints	LS-ISE-AD5Y-W-250=	
	Cisco ISE Wireless 5-year License for 100 Endpoints	LS-ISE-AD5Y-W-100=	

Wireless LAN Controllers

Functional Area	Product Description	Part Numbers	Software
Remote Site Controller	Cisco 7500 Series Wireless Controller for up to 6000 Cisco access points	AIR-CT7510-6K-K9	7.4.100.0
	Cisco 7500 Series Wireless Controller for up to 3000 Cisco access points	AIR-CT7510-3K-K9	
	Cisco 7500 Series Wireless Controller for up to 2000 Cisco access points	AIR-CT7510-2K-K9	
	Cisco Flex 7500 Series Wireless Controller for up to 1000 access points	AIR-CT7510-1K-K9	
	Cisco 7500 Series Wireless Controller for up to 500 Cisco access points	AIR-CT7510-500-K9	
	Cisco 7500 Series Wireless Controller for up to 300 Cisco access points	AIR-CT7510-300-K9	
	Cisco 7500 Series High Availability Wireless Controller	AIR-CT7510-HA-K9	
	Cisco Virtual Wireless Controller for up to 5 Cisco access points	L-AIR-CTVM-5-K9	
	Cisco Virutal Wireless Controller 25 Access Point Adder License	L-LIC-CTVM-25A	
	Cisco Virtual Wireless Controller 5 Access Point Adder License	L-LIC-CTVM-5A	
	Cisco Virtual Wireless Controller 1 Access Point Adder License	L-LIC-CTVM-1A	

Functional Area	Product Description	Part Numbers	Software
On Site, Remote Site, or Guest Controller	Cisco 5500 Series Wireless Controller for up to 500 Cisco access points	AIR-CT5508-500-K9	7.4.100.0
	Cisco 5500 Series Wireless Controller for up to 250 Cisco access points	AIR-CT5508-250-K9	
	Cisco 5500 Series Wireless Controller for up to 100 Cisco access points	AIR-CT5508-100-K9	
	Cisco 5500 Series Wireless Controller for up to 50 Cisco access points	AIR-CT5508-50-K9	
	Cisco 5500 Series Wireless Controller for up to 25 Cisco access points	AIR-CT5508-25-K9	
	Cisco 5500 Series Wireless Controller for up to 12 Cisco access points	AIR-CT5508-12-K9	
	Cisco 5500 Series Wireless Controller for High Availability	AIR-CT5508-HA-K9	
On Site Controller, Guest Controller	Cisco 2500 Series Wireless Controller for up to 50 Cisco access points	AIR-CT2504-50-K9	7.4.100.0
	Cisco 2500 Series Wireless Controller for up to 25 Cisco access points	AIR-CT2504-25-K9	
	Cisco 2500 Series Wireless Controller for up to 15 Cisco access points	AIR-CT2504-15-K9	
	Cisco 2500 Series Wireless Controller for up to 5 Cisco access points	AIR-CT2504-5-K9	

Internet Edge

Functional Area	Product Description	Part Numbers	Software
Firewall	Cisco ASA 5545-X IPS Edition - security appliance	ASA5545-IPS-K9	ASA 9.0(1) IPS 7.1(6)E4
	Cisco ASA 5525-X IPS Edition - security appliance	ASA5525-IPS-K9	
	Cisco ASA 5515-X IPS Edition - security appliance	ASA5515-IPS-K9	
	Cisco ASA 5512-X IPS Edition - security appliance	ASA5512-IPS-K9	
	Cisco ASA5512-X Security Plus license	ASA5512-SEC-PL	
	Firewall Management	ASDM	7.0(2)

Internet Edge LAN

Functional Area	Product Description	Part Numbers	Software
DMZ Switch	Cisco Catalyst 3750-X Series Stackable 24 Ethernet 10/100/1000 ports	WS-C3750X-24T-S	15.0(2)SE IP Base license

Appendix B: Changes

This appendix summarizes the changes to this guide since the previous Cisco SBA series.

- We upgraded Cisco ISE software to version 1.1.2
- We added Guest Anchor support for the 2500 Series Wireless LAN Controller

Notes

Feedback

Please use the feedback form to send comments and suggestions about this guide.

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