CHAPTER 15

Using Trusted ID Authorization with SESM

Cisco Prime Access Registrar (Cisco Prime AR) can be used in a Service Selection Gateway (SSG) - Cisco Subscriber Edge Services Manager (SESM) deployment to enable the Trusted Identity (Trusted ID) Authorization feature. This chapter describes how to use Cisco Prime AR with SESM, and how to configure Cisco Prime AR to use the Trusted ID feature.

The Trusted ID feature provides transparent login capabilities for users based on a trusted ID instead of the user's name, enabling end users of an SSG to maintain an always-on connection without the need to authenticate on each connect. Using SSG's Transparent Auto-Login (TAL) feature, a TAL access-request packet contains a Trusted ID, such as a MAC address, that identifies the user without the user's real username and password.The *SESM Profile Management Guide* provides detailed information about Trusted ID authorization in SESM.

If Cisco Prime AR knows the user associated with the Trusted ID, Cisco Prime AR uses the Trusted ID to authenticate and authorize the user. If the authentication and authorization succeeds, Cisco Prime AR returns the user's username in the Access-Accept so the SSG can include the user's identity in subsequent Accounting-Requests.

If Cisco Prime AR does not know the user associated with the Trusted ID, Cisco Prime AR returns an Access-Reject. The Access-Reject causes the SSG to redirect the user to a SESM web portal login page. When the user explicitly authenticates, Cisco Prime AR captures the Trusted ID and maps it to a user association so subsequent attempts to authenticate with the Trusted ID succeed.

This chapter contains the following sections:

- Trusted ID Operational Overview
- Software Requirements
- Configuring Cisco Prime Access Registrar for Trusted Identity with SESM
- Configuration Imported by TrustedIdInstall Program
- Configuring EAP-MD5 Authentication

Trusted ID Operational Overview

This section describes the following operations of the Trusted ID Authentication feature:

- Configuration Overview
- Request Processing
- Session Cache Life Cycle
- Configuration Restrictions

Configuration Overview

The Trusted ID features require two objects in Cisco Prime AR, a UserService, a SessionManager, and a ResourceManager. The UserService references another service called to perform the authentication and authorization (AA). The SessionManager references a SessionManager that contains a reference to a session-cache Resource Manager. These objects are imported into the Cisco Prime AR server configuration when you run the **TrustedIdInstall.bin** program. Configuration Imported by TrustedIdInstall Program, page 15-14 lists the configuration imported into the Cisco Prime AR server by the **TrustedIdInstall.bin** program.

The Resource Manager is configured with the QueryKey property set to a RADIUS attribute that contains the Trusted ID such as the Calling-Station ID. The Query Key should be set to an attribute present in all appropriate AA requests that uniquely identifies the user such as Calling-Station ID. The Query Key can be set to only one RADIUS attribute.

The Resource Manager is also configured to cache the attributes required to identify the user, username, and the user's credentials, password or CHAP-Password and CHAP-Challenge. The attributes User-Name, User-Password, NAS-Identifier, NAS-Port, or NAS-Port-Type are not appropriate choices for Query Key because they do not uniquely identify users.

The RollingEncryptionKeyChangePeriod specifies the length of time a given EncryptionKey will be used before a new one is created. When the session-cache ResourceManager caches User-Password attributes, Cisco Prime AR encrypts the User-Password so it is not stored in memory or persisted on disk in clear text. Cisco Prime AR uses up to 255 encryption keys, using a new one after each RollingEncryptionKeyChangePeriod expires. If RollingEncryptionKeyChangePeriod is set to *2 days*, Cisco Prime AR will create and begin using a new EncryptionKey every two days. The oldest key will be retired, and Cisco Prime AR will re-encrypt any User-Passwords that used the old key with the new key. This way, if the RollingEncryptionKeyChangePeriod is set to *1 day*, no key will be older than 255 days.

The encryption keys are indirectly connected to Trusted ID. Since User-Passwords might be stored for a long time in memory and on disk, Cisco Prime AR uses the RollingEncryptionKey to encrypt the User-Passwords. The RollingEncryptionKey makes it more difficult for someone to crack or decode the User-Passwords because the key used changes frequently. If someone were to break one key, that would only give them the ability to decrypt those User-Passwords that had been encrypted with that key. All others, including those yet to be encrypted after the key change period expires would not be vulnerable.

Request Processing

When the Trusted ID service processes Access-Requests, it queries the session-cache Resource Manager for a cache entry associated with the Trusted ID. If found, the Resource Manager returns the cached attributes. The Trusted ID service replaces the request's existing attributes with the cached attributes.

After the Resource Manager is queried (and the request's existing attributes are replaced with the cached attributes if the cache entry exists), the Trusted ID's UserService authenticates and authorizes the request. The UserService is always called whether the cache entry exists or not. The only attributes cached in the Resource Manager are the ones listed in AttributesToBeCached. The user profile is usually not cached and is retrieved each time by the UserService.

Whether the request succeeds or not, the request is passed on to the service referenced by the UserService property. When that service completes authentication and authorization, control returns to the Trusted ID service. The session-cache might be updated if AA is successful.

Session Cache Life Cycle

Session cache management comprises adding and deleting Trusted ID to user mapping to and from the cache and is initiated from the Trusted ID service. The mapping is one-to-one mapping. For each Trusted ID, there can be only one cache entry, and conversely for each cache entry, there can be only one Trusted ID.

If a user is not presently in the session cache (the query failed), the AA done by the UserService succeeded and the internal attribute (Implicit-Auth-Enabled) was returned with a value of *true*, Cisco Prime AR adds the user to the cache. Since the AA succeeded, Cisco Prime AR assumes this is an explicit authentication by the user and the attributes required by the session-cache are present in the Access-Request.

If the user is already in the session cache (the query succeeded) and the AA done by the UserService failed, the internal attributes Implicit-Auth-Enabled was not returned, or was returned with a value other than true, Cisco Prime AR removes the user from the session cache.

If the user has enabled implicit authentication (and if that results in Implicit-Auth-Enabled being returned as *true*), after the first Explicit Auth (from the login page), the user will be in the cache and will always be implicitly authenticated and authorized. In this case, you can get them out of the cache three ways:

- Have the user disable implicit authentication, then reconnect
- Have the system administrator release the session using **aregcmd** commands
- Use the SessionTimeout property in the Session Manager

If the user's account becomes orphaned (the user no longer exists), the cache entry will persist until it is removed using **aregcmd**.

If you have disabled implicit authentication, you are forced to authenticate each time and the cache is not updated. If you subsequently enable implicit authentication, you must explicitly authenticate one more time to create the user's cache entry. After creating the user's cache entry, they will not need to explicitly authenticate again (with this instance of Cisco Prime AR) as long as implicit authentication is enabled.

Configuration Restrictions

The Session Manager referenced by the TrustedID Service should not be used for general session management. The Trusted ID Session Manager should be a separate Session Manager used only for the Trusted ID session cache. The data in the session-cache must persist longer than the length of the session. If the Trusted ID Session Manager was used for general session management, the cache would be updated for the general session, overwriting the cache entry for the special session created for the Trusted ID service. When the general session ended it would delete that data and subsequent queries for implicit authentication would fail.

Software Requirements

The Trusted ID feature requires the following software to be installed:

- Cisco Subscriber Edge Services Manager (SESM) 3.3(1)
- Cisco Subscriber Policy Engine (SPE) 2.1.12
- Cisco Prime AR

In addition to the software listed above, you must run the **TrustedIdInstall.bin** standalone, Java application that runs on the Solaris platform. **TrustedIdInstall.rpm** is an equivalent Java application that runs on the Linux platform.

Note The disk space required to run the **TrustedIdInstall** program is about 1.3 MB.

The **TrustedIdInstall** program verifies the software prerequisites, installs the required jar files, and extends the configuration for Cisco Prime AR. The **TrustedIdInstall** program is only available on Cisco.com under the Cisco Prime AR download area at the following URL:

http://www.cisco.com/cgi-bin/tablebuild.pl/access-registrar-encrypted

This section contains the following topics:

- Installing Cisco Prime Access Registrar
- Running the TrustedIdInstall Program

Installing Cisco Prime Access Registrar

See the *Cisco Prime Access Registrar Installation and Configuration Guide, 6.0.* for detailed information about how to install Cisco Prime AR software.

Note You must specify a Java Runtime Environment (JRE) when you install Cisco Prime AR software.

Running the TrustedIdInstall Program

Cisco provides a Java-based program called **TrustedIdInstall** that installs required jar files, the configuration for Subscriber Policy Engine (SPE), and Cisco Prime AR. The **TrustedIdInstall** program can be run as an InstallShield wizard using the graphical user interface (GUI) or from the command line.

Note Before running the TrustedIDInstall program, ensure that the SPE 2.1.12 software has been installed with SESM 3.3(1) (in SPE mode).

Using the TrustedIdInstall.bin GUI

You must run the **TrustedIdInstall** program on the workstation where Cisco Prime AR is installed with a Java Runtime Environment (JRE) up to and including 1.4.2 in the path.

Installing the TrustedIdInstall

To install TrustedIdInstall:

Step 1 Log in as a user with root privileges.

Step 2 Enter the following from the Cisco Prime AR server's command line:

TrustedIdInstall.bin (for the Solaris platform) or

TrustedIdInstall.rpm (for the Linux platform)

The following message appears after you enter the command line above:

```
# TrustedIdInstall.bin
InstallShield Wizard

Initializing InstallShield Wizard...

Searching for Java(tm) Virtual Machine...
.............running under 1.2
```

Figure 15-1 shows the welcome window of the Trusted ID Azn AR SESM Integration 1.0 Installer.

Figure 15-1 Trusted ID Azn AR SESM Integration 1.0 Installer Welcome

Step 3 Click **Next** to continue.

The **InstallIdInstall.bin** wizard displays the Prerequisites window.

Step 4 Check to ensure that Cisco SESM 3.3(1) is installed and available on the network, then click **Next**.

The **InstallIdInstall.bin** wizard checks for Cisco Prime AR 5.1 software. You will need the SESM 3.3(1) configuration parameters later in this procedure.

Step 5 Select the vendor name of the LDAP data store you are using for SPE, then click **Next**.

The **InstallIdInstall.bin** wizard displays the Password Encryption Panel. This panel prompts you for a master password (entered twice to ensure accuracy) and a Password Encryption Algorithm which can be None, SHA, or SHA-1.

Note If you plan to use EAP-MD5 authentication, choose **None**. See Configuring EAP-MD5 Authentication, page 15-15 for information about configuring EAP-MD5 authentication.

Step 6 Enter the password in field provided, and select the password encryption type, then click **Next**.

Step 7 If in **Step 5** you selected iPlanet as the Data Store Type, continue with **Step 8**. If you chose any other Data Store Type, proceed to **Step 9**.

The iPlanet Data Store Type requires that you set the value for the naming variable in **ACNSchema.xml** and **DESSSchema.xml**, either for Uid or Cn as shown in Figure 15-2. You can set the naming variable to either Uid or Cn.

Figure 15-2 Selecting iPlanet Naming Variable

Step 8 Select either **Uid** or **Cn** as the inetOrgPerson naming variable, then click **Next**.

The **InstallIdInstall.bin** wizard displays the Service Type Selection panel.

Step 9 Accept the default Trusted ID Service Enable True or click to select False, then click **Next**.

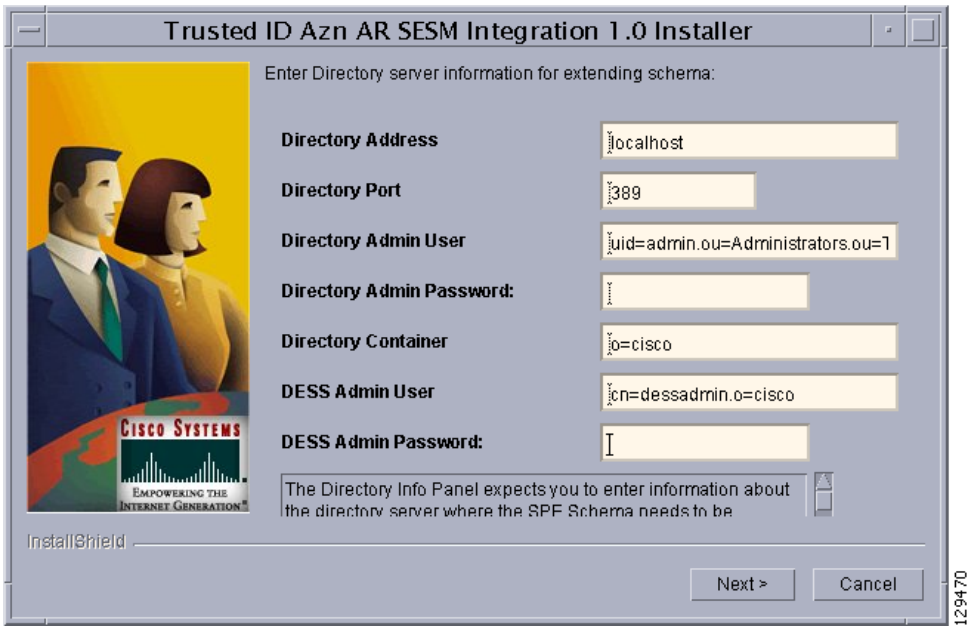
The TrustedIdInstall program displays a panel that indicates the following:

- Location where the Trusted ID Authorization SESM Integration files will be stored (/cisco-ar)
- Features to be stored (Admin Tool)
- Amount of space required (about 1.3 MB)

The **InstallIdInstall.bin** wizard displays the Directory Information panel, requesting information about the directory server required to extend the schema.

Step 10 Provide the requested Directory Server information as shown in Figure 15-3.

Figure 15-3 Directory Server Information



Contact the directory administrator if you are unsure about the information required.

a. Enter a **Directory Address**.

   The Directory Address field requires the directory server IP address or DNS hostname.

b. Enter a **Directory Port** number.

   Provide the TCP/IP port on which your directory server listens. (This is usually port 389.)

c. Enter a **Directory Admin User**.

   Provide the User ID of the directory server administrator with permissions to extend the schema in the form:

   `cn=admin`

d. Enter a **Directory Admin Password**.

   Provide the password for the directory administrator user.

e. Enter a **Directory Container**.

   Provide the container in which the default RBAC objects should be created in the form:

   `ou=sesm,o=cisco`

f. Enter a **DESS Admin User**.

   Provide the User ID of the DESS administrator in the form:

   `uid=admin,ou=sesm,o=cisco`

g. Enter a **DESS Admin Password**.

   Provide the password for the DESS administrator.

Step 11 Click **Next** to continue.

The **InstallIdInstall.bin** wizard begins the installation and displays a progress bar. When the installation completes, the wizard displays any warnings or errors it might have detected. Both boxes being empty indications a successful install.

Step 12 Click **Next** to continue.

A final window indicates a successful installation of the Trusted ID Authorization AR SESM Integration software.

Step 13 Click **Finish**.

Using the TrustedIdInstall Command Line

You can run the **TrustedIdInstall** program using the command line option on a workstation where Cisco Prime AR is installed with a JRE up to and including 1.4.2 in the path. The command line interface requires the same information as the GUI method.

Note You must be a root user to run the **TrustedIdInstall** program

Installing the TrustedIdInstall using Command Line

To install TrustedIdInstall using command lin:

Step 1 To run the **TrustedIdInstall** program using the command line interface, enter the following from the Cisco Prime AR server's command line:

TrustedIdInstall.bin -console (for the Solaris platform)

TrustedIdInstall.rpm -console (for the Linux platform)

```
InstallShield Wizard

Initializing InstallShield Wizard...

Searching for Java (tm) Virtual Machine...
.............
-------------------------------------------------------------------------------

Welcome to the InstallShield Wizard for Trusted ID Azn AR SESM Integration.
The InstallShield Wizard will install Trusted ID Azn AR SESM Integration
 on your computer.
To continue, choose Next.
Trusted ID Azn AR SESM Integration1.0
Cisco Systems, Inc.
http://www.cisco.com

   Press 1 for Next panel, 3 to Cancel or 4 to Redisplay [1] 1
```

The line above provides a way for you to enter your selection. You can press **Enter** to go to the next panel. Enter 3 to cancel the installation, or enter 4 to redisplay the current panel.

Step 2 Press **Enter** to go to the next panel.

```
-------------------------------------------------------------------------------

Please read the information below.

Cisco Systems
 Prerequisites
Please ensure that minimally the following products are installed.
1 Check to ensure that Cisco SESM 3.3(1) is installed and available on the
```

```
network
2 Checking for Cisco Prime AR 6.0 or later
 Please ensure the configuration parameter supplied during SESM installation
is used in this integration.

   Press 1 for Next panel, 2 for Previous panel, 3 to Cancel or 4 to
   Redisplay [1] 1
```

This panel lists prerequisites required for successful installation. Before continuing to the next panel, ensure that SESM 3.3(1) is installed and available or the network. The program checks for Cisco Prime AR 3.5.3 (or later).

Step 3 After insuring that SESM 3.3(1) is installed and available on the network, press **Enter**.

```
[X]  1   -  Novell Directory Server
 [ ]      -  iPlanet
 [ ]      -  Data Communications Directory
 [ ]      -  IBM Directory Server
 [ ]      -  Active Directory Server
 [ ]      -  Open LDAP

   Choose the Vendor for Directory ,Select 0 to exit [0]

   Press 1 for Next panel, 2 for Previous panel, 3 to Cancel or 4 to
   Redisplay [1]
```

This panel requests the data store type selection and indicates the Novell Directory Server is the default selection.

Step 4 Press **Enter** to select the Novell Directory Server.

You can press **2** to select iPlanet, **3** to select Data Communications Directory, **4** to select IBM Directory Server, **5** to select Active Directory Server, or **6** to select Open LDAP.

```
--------------------------------------------------------------------------------

Enter the master password for SPE

   Master Password []
```

This panel requests a master password for SPE.

Step 5 Enter a password to be used as the master password for SPE and press **Enter**.

You are asked to re-enter the master password. The following panel requests an encryption algorithm and generates a secret key using the master password and selected algorithm.

```
[X]  1   -  NONE
 [ ]      -  SHA
 [ ]      -  SSHA

   Choose the installation type for SPE ,Select 0 to exit [0]

   Press 1 for Next panel, 2 for Previous panel, 3 to Cancel or 4 to
   Redisplay [1] 1
```

This panel indicates the default installation type as None. Enter “2” and press **Enter** to select SHA, or enter “3” and press **Enter** to select SSHA.

Note If you plan to use EAP-MD5 authentication, choose **None**. See Configuring EAP-MD5 Authentication, page 15-15 for information about configuring EAP-MD5 authentication.

Step 6 If in **Step 4** you selected iPlanet as the Data Store Type, continue with **Step 7**. If you chose any other Data Store Type, proceed to **Step 8**.

```
--------------------------------------------------------------------------------

 [X]  1   -  Uid
 [ ]      -  Cn
--------------------------------------------------------------------------------
```

The iPlanet Data Store Type requires that you set the value for the naming variable in **ACNSchema.xml** and **DESSSchema.xml**, either for Uid or Cn as shown above.

Step 7 Press **Enter** to use the naming variable to Uid, or press **2** to select Cn.

```
Service Type Selection panel

Trusted ID Service Enable
 [X]  1  -  True
 [ ]  2  -  False

   To select a choice enter its number, or 0 when you are finished [0]:

   Press 1 for Next panel, 2 for Previous panel, 3 to Cancel or 4 to
   Redisplay [1] 1
```

The Service Type Selection panel asks if you want to enable the Trusted ID service. Enter 2 to choose to not enable the Trusted ID service.

Step 8 Press **Enter** to enable the Trusted ID service.

```
Trusted ID Azn AR SESM Integration will be installed in the following
location:
/cisco-ar
with the following features:
Admin tool
for a total size:
 1.3 MB

   Press 1 for Next panel, 2 for Previous panel, 3 to Cancel or 4 to
   Redisplay [1] 1
```

This panel indicates the location where the TrustedIdInstall program will write data and the amount of storage required.

Step 9 Press **Enter** to begin writing data.

```
--------------------------------------------------------------------------------

Enter the IP Address (or) hostname of the system where the directory server is
running.
Please contact your directory administrator if you are not sure about this
information.

   Please enter the host address  [localhost]:
```

Step 10 Press **Enter** to use the current system as the directory server, or enter another directory server name or IP address.

```
Enter the TCP/IP Port on which your directory server listens. Usually, the
port is 389.
Please contact your directory administrator if you are not sure about this
information.

   Please enter the Port number  [389]:
```

Step 11 Press **Enter** to use the default port, 389, or enter a different port number.

Note Contact your directory server administrator if you are not sure about which port to use or other information required in the following steps.

```
Enter the User Id of the directory server with permissions to extend schema.
Please contact your directory administrator if you are not sure about this
information.

   Please enter directory user
   [uid=admin,ou=Administrators,ou=TopologyManagement,o=NetscapeRoot]:
```

Step 12 Enter the User ID of the directory server administrator with the necessary permissions to extend the schema.

```
Enter the password for the above user.
Please contact your directory administrator if you are not sure about this
information.

   Please enter the password  []: cisco
```

Step 13 Enter the password for the user provided in the previous step.

```
Enter the container in which the default RBAC objects should be created.
Please contact your directory administrator if you are not sure about this
information.

   Please enter the container  [o=cisco]:
```

Step 14 Press **Enter** to use the default container, or enter a different container and press **Enter**.

```
Enter the User Id of the DESS user.

   Please enter Dess user  [cn=dessadmin,o=cisco]:
```

Step 15 Press **Enter** to use the default DESS user, or enter a different user ID and press **Enter**.

```
Enter the password of the DESS user.
Please contact your directory administrator if you are not sure about this
information.

   Please enter the Dess user password  []: cisco
```

Step 16 Enter the DESS user password, then press **Enter**.

```
Press 1 for Next panel, 3 to Cancel or 4 to Redisplay [1] 1
```

At this point, the software installation is ready to begin.

Step 17 Press **Enter** to begin the software installation and extend the schema.

As the installation proceeds, status messages will be displayed.

When the installation completes successfully, the following message displays:

```
Trusted ID Azn AR SESM Integration 1.0 installation completed

The InstallShield Wizard has successfully installed Trusted ID Azn AR SESM
Integration. Choose Finish to exit the wizard.

   Press 3 to Finish or 4 to Redisplay [3] 3
```

Step 18 Press **Enter** to end the program.

Configuring Cisco Prime Access Registrar for Trusted Identity with SESM

Use the command line interface **aregcmd** to configure Cisco Prime AR to use Trusted ID authorization in SSG-SESM deployments.

This section contains the following topics:

- Configuring the RADIUS Ports
- Configuring NAS Clients
- Configuring AAA and SPE Services

Configuring the RADIUS Ports

By default, Cisco Prime AR listens on ports 1645 and 1646 for any type of RADIUS request. It might be necessary to change the port assignments in the case of a resource collision. For example, if the RADIUS Directory Enabled Service Selection (DESS) Proxy (RDP) component of SPE is using ports 1645 and 1646, a port assignment change would be required.

The following command sequence causes Cisco Prime AR to listen on the explicitly defined ports, 1812 and 1813, for all types of RADIUS requests.

cd /Radius/Advanced/Ports

add 1812 ""radius

```
Added 1812
```

add 1813 ""radius

```
Added 1813
```

After changing the port assignments, Cisco Prime AR no longer listens on the default ports. It might be necessary to add ports 1645 and 1646 if you are also using Cisco Prime AR for other AAA functionality.

Note By default, Cisco Prime AR listens on ports 1645 and 1646 on Solaris platforms and on ports 1812 and 1813 for the Linux platform.

Configuring NAS Clients

Change directory to **/Radius/Clients**, then add and configure the NAS clients required by SESM deployments:

cd /Radius/Clients

add SESM1 "" 10.3.3.2 cisco

```
Added SESM1
```

add SESM2 "" 10.3.3.101 cisco

```
Added SESM2
```

add SESM3 "" 10.3.3.102 cisco

```
Added SESM3
```

Configuring AAA and SPE Services

To configure AAA and SPE services:

Step 1 Change directory to **/Radius/Services**, then add and configure an accounting service.

cd /Radius/Services

add SESMaccounting "" file

```
Added SESMaccounting
```

Step 2 Change directory to **/Radius**, then configure a DefaultAccountingService.

cd /Radius

set DefaultAccountingService SESMaccounting

```
Set DefaultAccountingService SESMaccounting
```

Configuration Imported by TrustedIdInstall Program

The following is a listing of the configuration imported into the Cisco Prime AR server when you run the TrustedIdInstall program:

- /Radius
- /radius/services/spe
- /radius/services/trusted-id
- /Radius/SessionManagers/session-cache/
- /radius/ResourceManagers/session-cache
- /radius/advanced/
- /Radius/Scripts/ChangeServiceType

/Radius

```
DefaultAuthenticationService trusted-id
DefaultAuthorizationService trusted-id
```

/radius/services/spe

```
type java
ClassName com.cisco.cns.security.arspe.SPEExtension
```

/radius/services/trusted-id

```
type trusted-id
UserService spe
SessionManager session-cache
```

/Radius/SessionManagers/session-cache/

```
AllowAccountingStartToCreateSession FALSE
ResourceManagers/1 session-cache
```

/radius/ResourceManagers/session-cache

```
type session-cache
OverwriteAttributes TRUE
PendingRemovalDelay 10
QueryKey Calling-Station-ID
AttributesToBeCached/1 User-Name
AttributesToBeCached/2 User-Password
AttributesToBeCached/3 Calling-Station-ID
```

/radius/advanced/

```
ClasspathForJavaExtensions /cisco-ar/conf
```

/Radius/Scripts/ChangeServiceType

```
Language TCL
Filename ChangeServiceType.tcl
EntryPoint ChangeServiceType
IncomingScript ChangeServiceType
```

Configuring EAP-MD5 Authentication

EAP-MD5 authentication is an optional authentication configuration. The following configuration changes are required to support EAP-MD5 authentication:

- Creating the CheckEap.tcl Script
- Adding the CheckEap.tcl Script
- Using the CheckEap.tcl Script
- Adding the EAP-MD5 Authentication Service
- Adding an LDAP Remote Server
- Adding an LDAP Service
- Saving the Configuration and Reloading the Server
- Cisco SSG VSAs in Cisco Prime Access Registrar Dictionary

Note If you configure Cisco Prime AR to use EAP-MD5 authentication with the Trusted ID feature, you will not be able to use the Transparent Auto Login feature.

Creating the CheckEap.tcl Script

The **CheckEap.tcl** script must be created and stored in the file called **/cisco-ar/scripts/radius/tcl/CheckEap.tcl**. Use a text editor and copy the following lines into the **CheckEap.tcl** file:

```
proc CheckEap { request response environment } {
    if { [ $request containsKey EAP-Message ] } {
        $environ put Authentication-Service "EAP-MD5"
        $environ put Authorization-Service "spe"
    }
}
```

Adding the CheckEap.tcl Script

To add the CheckEap.tcl script:

Step 1 Start **aregcmd**, then change directory to **/Radius/Scripts** and add the CheckEap script.

cd /Radius/Scripts

add EapCheck

Step 2 Change directory to **EapCheck**.

cd EapCheck

```
[ //localhost/Radius/Scripts/EapCheck ]
        Name = EapCheck
        Description =
        Language =
```

Step 3 Set the Language property to TCL.

set Language TCL

```
Set Language TCL
```

Step 4 Set the filename property to CheckEap.tcl.

set Filename CheckEap.tcl

```
Set Filename CheckEap.tcl
```

Step 5 Set the EntryPoint property to CheckEap.

set EntryPoint CheckEap

```
Set EntryPoint CheckEap
```

Note The following sections also require you to use **aregcmd**, the command line interface.

Using the CheckEap.tcl Script

This section describes how to configure Cisco Prime AR to use the CheckEap script by setting the **/Radius/IncomingScript** property to CheckEap.

cd /Radius

set IncomingScript EapCheck

Adding the EAP-MD5 Authentication Service

To add and configure the EAP-MD5 service:

Step 1 Change directory to **/Radius/Services** and add an EAP-MD5 service.

cd /Radius/Services

add EAP-MD5

Step 2 Change directory to the EAP-MD5 service and set the Type and UserService properties as shown below:

cd EAP-MD5

Step 3 Change directory to the EAP-MD5 service.

cd EAP-MD5

Step 4 Set the service Type property to eap-md5 and the UserService property to LDAP.

set Type eap-md5

set UserService LDAP

The following example shows the configuration of the EAP-MD5 service:

```
[ //localhost/Radius/Services/EAP-MD5 ]
    Name = EAP-MD5
    Description =
    Type = eap-md5
    IncomingScript~ =
    OutgoingScript~ =
    AuthenticationTimeout = 120
    UserService = LDAP
```

Adding an LDAP Remote Server

Cisco Prime AR adds a new type of service and remote server called ldap-accounting that enables inserting accounting records into LDAP. You can write accounting records into LDAP by referring this service in /Radius/DefaultAccountingService or in the Accounting-Service environment variable.

Adding and Configuring an LDAP Remote Server

To add and configure an LDAP remote server:

Step 1 Change directory to **/Radius/RemoteServers** and add a RemoteServer object.

cd /Radius/RemoteServers

add LDAP

Step 2 Change directory to the LDAP RemoteServer.

cd LDAP

```
[ //localhost/Radius/RemoteServers/LDAP ]
    Name = LDAP
    Description =
    Protocol =
```

Step 3 Set the RemoteServer protocol property to ldap.

set Protocol ldap

The following example shows the default configuration of an LDAP remote server:

```
[ //localhost/Radius/RemoteServers/LDAP ]
    Name = LDAP
    Description =
    Protocol = ldap
    Port = 389
    ReactivateTimerInterval = 300000
    Timeout = 15
    HostName =
    BindName =
    BindPassword =
    UseSSL = FALSE
    SearchPath~ =
    Filter~ = (uid=%s)
    UserPasswordAttribute = userpassword
    LimitOutstandingRequests = FALSE
    MaxOutstandingRequests = 0
    MaxReferrals = 0
    ReferralAttribute =
    ReferralFilter =
    PasswordEncryptionStyle = Dynamic
    EscapeSpecialCharInUserName = FALSE
    DNSLookupAndLDAPRebindInterval =
    LDAPToRadiusMappings/
    LDAPToEnvironmentMappings/
    LDAPToCheckItemMappings/
```

Step 4 Set the HostName property to the SPE/DESS directory IP address or hostname.

Step 5 Set the BindName property to the SPE/DESS administrator name.

Step 6 Set the BindPassword property to the SPE/DESS administrator password.

Step 7 Set the SearchPath property to the SPE/DESS directory container.

Step 8 Set the UserPasswordAttribute property type to clearpassword.

Adding an LDAP Service

You must configure a service of type ldap-accounting under /Radius/Services using the ldap accounting feature.

Adding and Configuring an LDAP Service

To add and configure an LDAP service:

Step 1 Change directory to **/Radius/Service** and add LDAP.

cd /Radius/Service

add LDAP

Step 2 Change directory to LDAP and set the type property to ldap.

cd LDAP

set Type ldap

The following shows the default configuration for an LDAP service:

```
[ //localhost/Radius/Services/LDAP ]
    Name = LDAP
    Description =
    Type = ldap
    IncomingScript~ =
    OutgoingScript~ =
    OutagePolicy~ = RejectAll
    OutageScript~ =
    MultipleServersPolicy = Failover
    RemoteServers/
```

Step 3 Change directory to RemoteServers and associate the LDAP RemoteServer with the LDAP service.

cd RemoteServers

set 1 LDAP

Saving the Configuration and Reloading the Server

Use the **save** command to save the configuration, then **reload** the Cisco Prime AR server.

save

```
Validating //localhost...
Saving //localhost...
```

reload

```
Reloading Server 'Radius'...
Server 'Radius' is Running, its health is 10 out of 10
```

Cisco SSG VSAs in Cisco Prime Access Registrar Dictionary

The following vendor-specific attributes (VSAs) are defined by default in the attribute dictionary after installing Cisco Prime AR software:

- Cisco-AVPair
- Cisco-SSG-Account-Info
- Cisco-SSG-Service-Info
- Cisco-SSG-Command-Code
- Cisco-SSG-Control-Info