Contents

Introduction

This document describes how to use Lightweight Directory Access Protocol (LDAP) authentication in order to assign a group policy at login.

In order to use LDAP to assign a group policy to a user, you need to configure a map that maps an LDAP attribute, such as the Active Directory (AD) attribute **memberOf**, to the **IETF-Radius-Class** attribute that is understood by the ASA. Once the attribute mapping is established, you must map the attribute value configured on the LDAP server to the name of a group policy on the ASA.

> **Note**: The **memberOf** attribute corresponds to the group that the user is a a part of in the Active Directory. It is possible for a user to be a member of more than one group in the Active Directory. This causes multiple **memberOf** attributes to be sent by the server, but the ASA can only match one attribute to one group policy.

Prerequisites

Requirements

This document requires that a working LDAP authentication setup is already configured on the ASA. Refer to Configure LDAP Authentication for WebVPN Users in order to learn how to set up a basic LDAP authentication configuration on the ASA.

Components Used

The information in this document is based on the PIX/ASA 8.0.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Background Information

In this example, the AD/LDAP attribute **memberOf** is mapped to the ASA attribute **CVPN3000-Radius-IETF-Class**. The class attribute is used in order to assign group policies on the ASA. This is the general process that the ASA completes when it authenticates users with LDAP:

1. The user initiates a connection to the ASA.
2. The ASA is configured to authenticate that user with the Microsoft AD/LDAP server.
3. The ASA binds to the LDAP server with the credentials configured on the ASA (admin in this case), and looks up the provided username.
4. If the username is found, the ASA attempts to bind to the LDAP server with the credentials that the user provides at login.
5. If the second bind is successful, the ASA processes the users attributes, which includes **memberOf**.
6. The **memberOf** attribute is mapped to **CVPN3000-Radius-IETF-Class** by the configured LDAP Attibute map.The value that indicates membership in the **Employees** group is mapped to **ExamplePolicy1**.The value that indicates membership in the **Contractors** group is mapped to **ExamplePolicy2**.
7. The newly assigned **CVPN3000-Radius-IETF-Class** attribute is examined and a group policy determination is made.The ExamplePolicy1 value causes the ExamplePolicy1 group policy to be assigned to the user.The ExamplePolicy2 value causes the ExamplePolicy2 group policy to be assigned to the user.

Configure

Configure the ASA

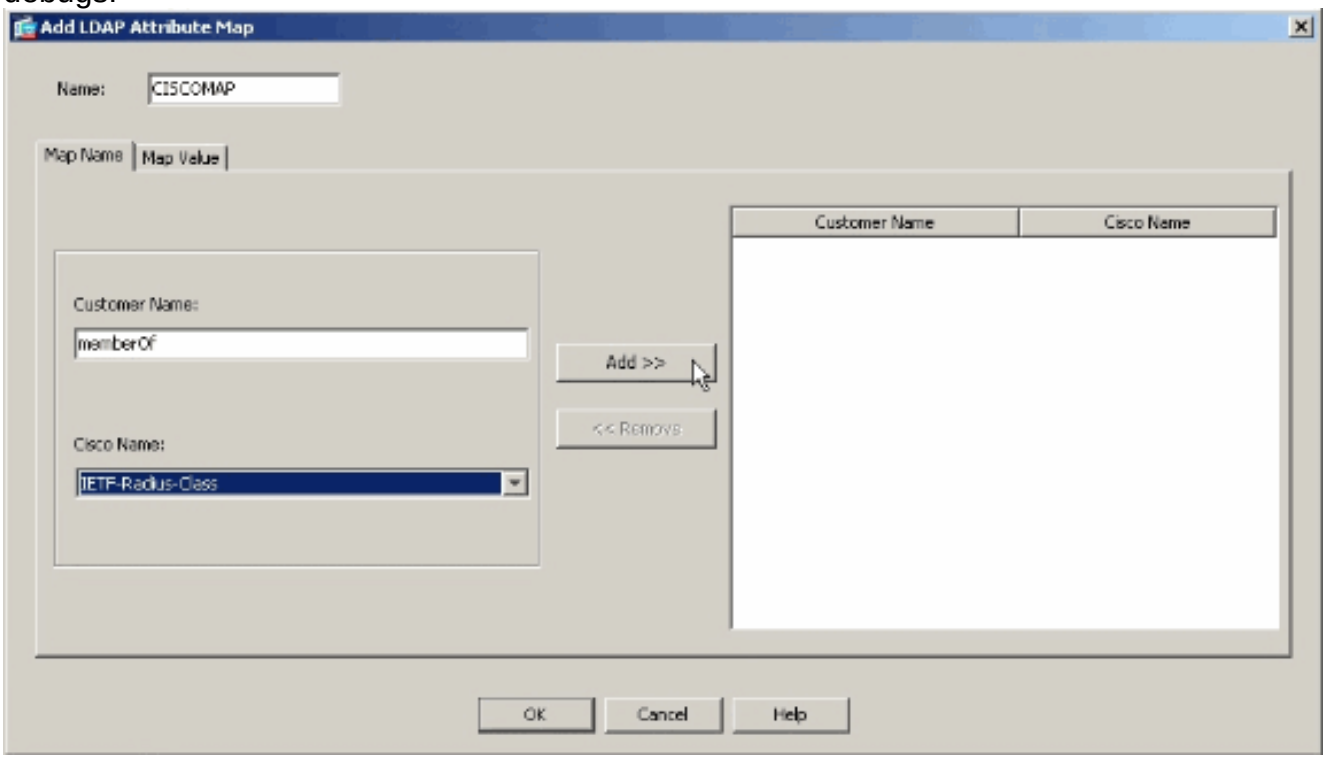
In this section, you are presented with the information to configure the ASA to assign a group policy to users based on their LDAP attributes.

ASDM

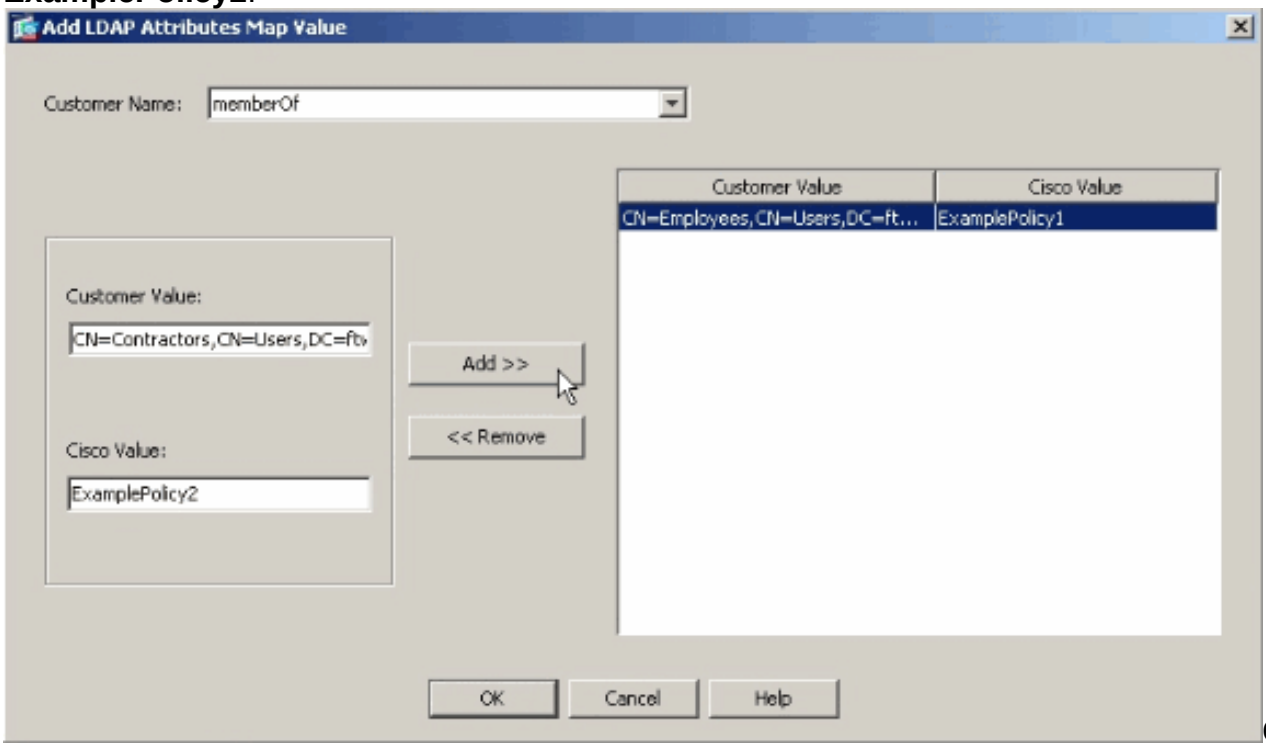
Complete these steps in the Adaptive Security Device Manager (ASDM) in order to configure the LDAP map on the ASA.

1. Navigate to **Configuration > Remote Access VPN > AAA Setup > LDAP Attribute Map**.
2. Click **Add**.
3. Name the map.
4. Create a mapping between an LDAP attribute and the **IETF-Radius-Class** attribute on the ASA. In this example, the **Customer Name** is the **memberOf** attribute in Active Directory. It is mapped to the **Cisco Name** of **IETF-Radius-Class**. Click **Add**.**Note**: Attribute names and

values are case sensitive.**Note**: If you do not know the exact attribute names or spellings that are provided by the LDAP server, it can be helpful to examine the debugs before you create the map. See the Verify section for more information on how to identify LDAP attributes with debugs.



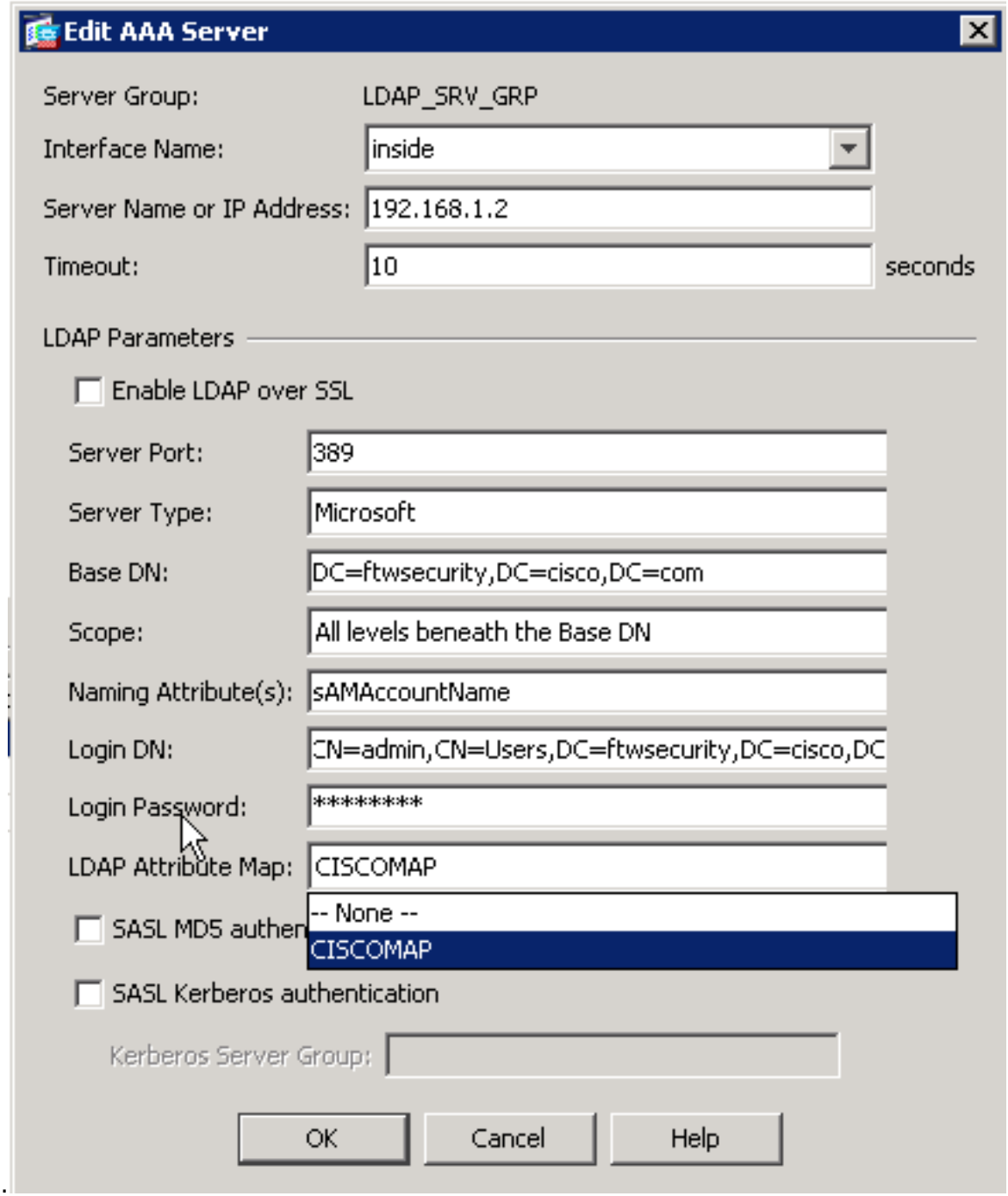
5. After you add the attribute mapping, click the **Map Value** tab, and click **Add** in order to create a value mapping. Add as many value mappings as required, and click **OK** when finished.**Customer Value -** the attribute value from the LDAP server**Cisco Value -** the name of the group policy on the ASAIn this example, the **CN=Employees,CN=Users,DC=ftwsecurity,DC=cisco,DC=com** memberOf value is mapped to **ExamplePolicy1** and the **CN=Contractors,CN=Users,DC=ftwsecurity,DC=cisco,DC=com** memberOf value is mapped to **ExamplePolicy2**.



Co

mplete LDAP Attribute Map

6. Once you create the map, it must be assigned to the Authentication, Authorization, and Accounting (**AAA Server Groups** from the left pane.
7. Select your AAA server that is configured for LDAP, and click **Edit**.
8. At the bottom of the window that appears, locate the **LDAP Attribute Map** drop-down list. Choose the list that you just created. Click **OK** when finished.



CLI

Complete these steps in the CLI in order to configure the LDAP map on the ASA.

```
ciscoasa#configure terminal

!--- Create the LDAP Attribute Map. ciscoasa(config)#ldap attribute-map CISCOMAP
ciscoasa(config-ldap-attribute-map)#map-name memberOf IETF-Radius-Class ciscoasa(config-ldap-
attribute-map)#map-value memberOf CN=Employees,CN=Users, DC=ftwsecurity,DC=cisco,DC=com
ExamplePolicy1 ciscoasa(config-ldap-attribute-map)#map-value memberOf CN=Contractors,CN=Users,
```

```
DC=ftwsecurity,DC=cisco,DC=com ExamplePolicy2 ciscoasa(config-ldap-attribute-map)#exit !---
Assign the map to the LDAP AAA server. ciscoasa(config)#aaa-server LDAP_SRV_GRP (inside) host
192.168.1.2 ciscoasa(config-aaa-server-host)#ldap-attribute-map CISCOMAP
```

Configure a NOACCESS group-policy

You can create a NOACCESS group-policy in order to deny the VPN connection when the user is not part of any of the LDAP groups. This configuration snippet is shown for your reference:

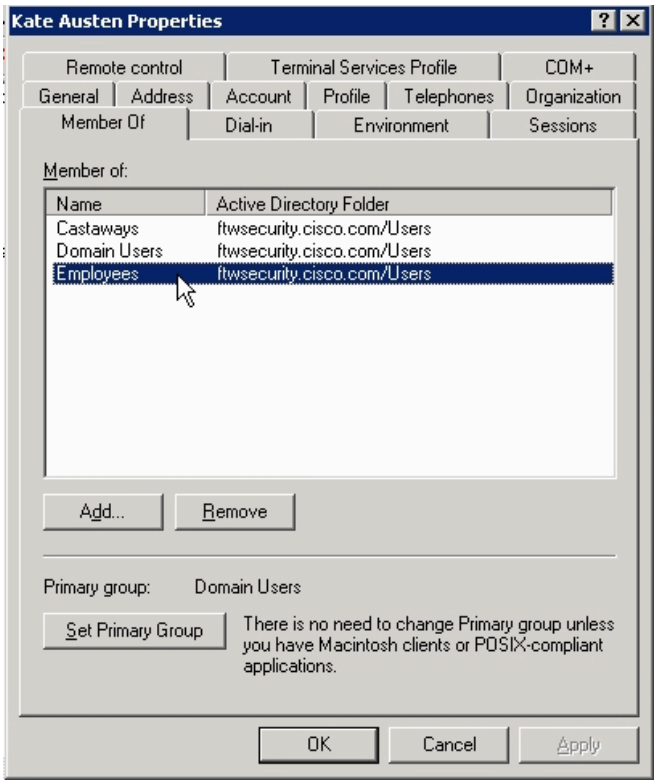
```
ciscoasa#configure terminal

!--- Create the LDAP Attribute Map. ciscoasa(config)#ldap attribute-map CISCOMAP
ciscoasa(config-ldap-attribute-map)#map-name memberOf IETF-Radius-Class ciscoasa(config-ldap-
attribute-map)#map-value memberOf CN=Employees,CN=Users, DC=ftwsecurity,DC=cisco,DC=com
ExamplePolicy1 ciscoasa(config-ldap-attribute-map)#map-value memberOf CN=Contractors,CN=Users,
DC=ftwsecurity,DC=cisco,DC=com ExamplePolicy2 ciscoasa(config-ldap-attribute-map)#exit !---
Assign the map to the LDAP AAA server. ciscoasa(config)#aaa-server LDAP_SRV_GRP (inside) host
192.168.1.2 ciscoasa(config-aaa-server-host)#ldap-attribute-map CISCOMAP
```

You need to apply this group policy as a default group policy to the tunnel-group. So that users who get a mapping from the LDAP attribute map, for example those who belong to a desired LDAP group, are able to get their desired group policies and users who do not get any mapping, for example those who do not belong to any of the desired LDAP groups, are able to get NOACCESS group-policy from the tunnel-group, which blocks the access for them.

> **Note**: Refer to ASA/PIX: Mapping VPN Clients to VPN Group Policies Through LDAP Configuration Example for more information on how to create different LDAP attribute mappings that denies access to some users.

Configure the Active Directory or Other LDAP Server

The only configuration required on the Active Directory or other LDAP server relates to the attributes of the user. In this example, the user Kate Austen is a member of the Employees group in AD:



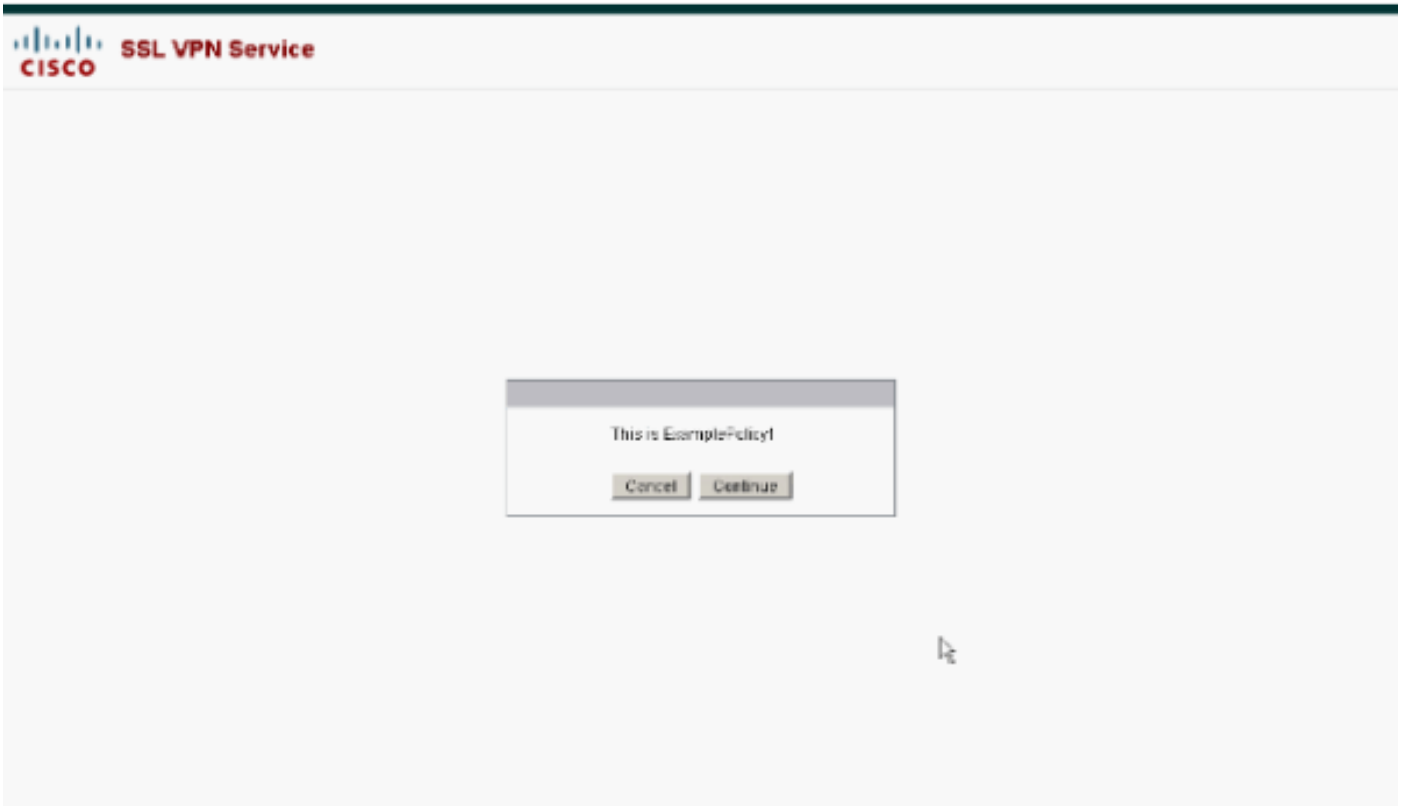
Ben Linus is a member of the Contractors group:

Verify

Use this section in order to verify your configuration.

Login

In order to verify the success of your configuration, log in as a user who is supposed to have a group policy assigned with the LDAP attribute map. In this example, a banner is configured for each group policy. The screenshot shows that the user **kate** logs in successfully and has **ExamplePolicy1** applied, because she is a member of the Employees group.



Debug the LDAP Transaction

In order to verify that the LDAP mapping occurs, or to get more information on what attributes the LDAP server sends, issue the **debug ldap 255** command at the ASA command line, and then attempt authentication.

In this debug, the user **kate** is assigned the group policy **ExamplePolicy1** because she is a member of the **Employees** group. This debug also shows that **kate** is a member of the **Castaways** group, but that attribute is not mapped, so it is ignored.

```
ciscoasa#debug ldap 255
debug ldap  enabled at level 255
ciscoasa#
[105] Session Start
[105] New request Session, context 0xd5481808, reqType = 1
[105] Fiber started
```

```
[105] Creating LDAP context with uri=ldap://192.168.1.2:389
[105] Connect to LDAP server: ldap://192.168.1.2:389, status = Successful
[105] defaultNamingContext: value = DC=ftwsecurity,DC=cisco,DC=com
[105] supportedLDAPVersion: value = 3
[105] supportedLDAPVersion: value = 2
[105] supportedSASLMechanisms: value = GSSAPI
[105] supportedSASLMechanisms: value = GSS-SPNEGO
[105] supportedSASLMechanisms: value = EXTERNAL
[105] supportedSASLMechanisms: value = DIGEST-MD5
[105] Binding as administrator
[105] Performing Simple authentication for admin to 192.168.1.2
[105] LDAP Search:
        Base DN = [dc=ftwsecurity, dc=cisco, dc=com]
        Filter  = [sAMAccountName=kate]
        Scope   = [SUBTREE]
[105] User DN = [CN=Kate Austen,CN=Users,DC=ftwsecurity,DC=cisco,DC=com]
[105] Talking to Active Directory server 192.168.1.2
[105] Reading password policy for kate, dn:CN=Kate Austen,CN=Users,
   DC=ftwsecurity,DC=cisco,DC=com
[105] Read bad password count 0
[105] Binding as user
[105] Performing Simple authentication for kate to 192.168.1.2
[105] Checking password policy for user kate
[105] Binding as administrator
[105] Performing Simple authentication for admin to 192.168.1.2
[105] Authentication successful for kate to 192.168.1.2
[105] Retrieving user attributes from server 192.168.1.2
[105] Retrieved Attributes:
[105]   objectClass: value = top
[105]   objectClass: value = person
[105]   objectClass: value = organizationalPerson
[105]   objectClass: value = user
[105]   cn: value = Kate Austen
[105]   sn: value = Austen
[105]   givenName: value = Kate
[105]   distinguishedName: value = CN=Kate Austen,CN=Users,DC=ftwsecurity,
   DC=cisco,DC=com
[105]   instanceType: value = 4
[105]   whenCreated: value = 20070815155224.0Z
[105]   whenChanged: value = 20070815195813.0Z
[105]   displayName: value = Kate Austen
[105]   uSNCreated: value = 16430
[105]   memberOf: value = CN=Castaways,CN=Users,DC=ftwsecurity,DC=cisco,DC=com
[105]           mapped to IETF-Radius-Class: value = CN=Castaways,CN=Users,
   DC=ftwsecurity,DC=cisco,DC=com
[105]   memberOf: value = CN=Employees,CN=Users,DC=ftwsecurity,DC=cisco,DC=com
[105]           mapped to IETF-Radius-Class: value = ExamplePolicy1
[105]   uSNChanged: value = 20500
[105]   name: value = Kate Austen
[105]   objectGUID: value = ..z...yC.q0.....
[105]   userAccountControl: value = 66048
[105]   badPwdCount: value = 0
[105]   codePage: value = 0
[105]   countryCode: value = 0
[105]   badPasswordTime: value = 128316837694687500
[105]   lastLogoff: value = 0
[105]   lastLogon: value = 128316837785000000
[105]   pwdLastSet: value = 128316667442656250
[105]   primaryGroupID: value = 513
[105]   objectSid: value = ............Q..p..*.p?E.Z...
[105]   accountExpires: value = 9223372036854775807
[105]   logonCount: value = 0
[105]   sAMAccountName: value = kate
[105]   sAMAccountType: value = 805306368
```

```
[105]   userPrincipalName: value = kate@ftwsecurity.cisco.com
[105]   objectCategory: value = CN=Person,CN=Schema,CN=Configuration,
   DC=ftwsecurity,DC=cisco,DC=com
[105]   dSCorePropagationData: value = 20070815195237.0Z
[105]   dSCorePropagationData: value = 20070815195237.0Z
[105]   dSCorePropagationData: value = 20070815195237.0Z
[105]   dSCorePropagationData: value = 16010108151056.0Z
[105] Fiber exit Tx=685 bytes Rx=2690 bytes, status=1
[105] Session End
```

In this debug, the user **ben** is assigned the **ExamplePolicy2** group policy because he is a member of the **Contractors** group. This debug also shows that **ben** is member of the **TheOthers** group, but that attribute is not mapped, so it is ignored.

```
ciscoasa#debug ldap 255
debug ldap  enabled at level 255
ciscoasa#
[106] Session Start
[106] New request Session, context 0xd5481808, reqType = 1
[106] Fiber started
[106] Creating LDAP context with uri=ldap://192.168.1.2:389
[106] Connect to LDAP server: ldap://192.168.1.2:389, status = Successful
[106] defaultNamingContext: value = DC=ftwsecurity,DC=cisco,DC=com
[106] supportedLDAPVersion: value = 3
[106] supportedLDAPVersion: value = 2
[106] supportedSASLMechanisms: value = GSSAPI
[106] supportedSASLMechanisms: value = GSS-SPNEGO
[106] supportedSASLMechanisms: value = EXTERNAL
[106] supportedSASLMechanisms: value = DIGEST-MD5
[106] Binding as administrator
[106] Performing Simple authentication for admin to 192.168.1.2
[106] LDAP Search:
        Base DN = [dc=ftwsecurity, dc=cisco, dc=com]
        Filter  = [sAMAccountName=ben]
        Scope   = [SUBTREE]
[106] User DN = [CN=Ben Linus,CN=Users,DC=ftwsecurity,DC=cisco,DC=com]
[106] Talking to Active Directory server 192.168.1.2
[106] Reading password policy for ben, dn:CN=Ben Linus,CN=Users,DC=ftwsecurity,
   DC=cisco,DC=com
[106] Read bad password count 0
[106] Binding as user
[106] Performing Simple authentication for ben to 192.168.1.2
[106] Checking password policy for user ben
[106] Binding as administrator
[106] Performing Simple authentication for admin to 192.168.1.2
[106] Authentication successful for ben to 192.168.1.2
[106] Retrieving user attributes from server 192.168.1.2
[106] Retrieved Attributes:
[106]   objectClass: value = top
[106]   objectClass: value = person
[106]   objectClass: value = organizationalPerson
[106]   objectClass: value = user
[106]   cn: value = Ben Linus
[106]   sn: value = Linus
[106]   givenName: value = Ben
[106]   distinguishedName: value = CN=Ben Linus,CN=Users,DC=ftwsecurity,
   DC=cisco,DC=com
[106]   instanceType: value = 4
[106]   whenCreated: value = 20070815160840.0Z
[106]   whenChanged: value = 20070815195243.0Z
[106]   displayName: value = Ben Linus
[106]   uSNCreated: value = 16463
[106]   memberOf: value = CN=TheOthers,CN=Users,DC=ftwsecurity,DC=cisco,DC=com
[106]           mapped to IETF-Radius-Class: value = CN=TheOthers,CN=Users,
```

```
DC=ftwsecurity,DC=cisco,DC=com [106]  memberOf: value =
CN=Contractors,CN=Users,DC=ftwsecurity,DC=cisco,DC=com
[106]          mapped to IETF-Radius-Class: value = ExamplePolicy2
[106]   uSNChanged: value = 20499
[106]   name: value = Ben Linus
[106]   objectGUID: value = ..j...5@.z.|...n
[106]   userAccountControl: value = 66048
[106]   badPwdCount: value = 0
[106]   codePage: value = 0
[106]   countryCode: value = 0
[106]   badPasswordTime: value = 0
[106]   lastLogoff: value = 0
[106]   lastLogon: value = 0
[106]   pwdLastSet: value = 128316677201718750
[106]   primaryGroupID: value = 513
[106]   objectSid: value = ............Q..p..*.p?E.^...
[106]   accountExpires: value = 9223372036854775807
[106]   logonCount: value = 0
[106]   sAMAccountName: value = ben
[106]   sAMAccountType: value = 805306368
[106]   userPrincipalName: value = ben@ftwsecurity.cisco.com
[106]   objectCategory: value = CN=Person,CN=Schema,CN=Configuration,
   DC=ftwsecurity,DC=cisco,DC=com
[106]   dSCorePropagationData: value = 20070815195243.0Z
[106]   dSCorePropagationData: value = 20070815195243.0Z
[106]   dSCorePropagationData: value = 20070815195243.0Z
[106]   dSCorePropagationData: value = 16010108151056.0Z
[106] Fiber exit Tx=680 bytes Rx=2642 bytes, status=1
[106] Session End
```

Troubleshoot

Use this section in order to troubleshoot your configuration.

Attribute Names and Values are Case-Sensitive

Attribute names and values are case-sensitive. If your mapping does not occur properly, be certain that you use the correct spelling and capitalization in your LDAP attribute map for ***both*** the Cisco and LDAP attribute names and values.

ASA is Not Able to Authenticate Users from the LDAP Server

The ASA is not able to authenticate users from the LDAP server. Here are the debugs:

```
ldap 255 output:[1555805] Session Start[1555805] New request Session, context 0xcd66c028,
reqType = 1[1555805] Fiber started[1555805] Creating LDAP context with
uri=ldaps://172.30.74.70:636[1555805] Connect to LDAP server: ldaps://172.30.74.70:636, status =
Successful[1555805] supportedLDAPVersion: value = 3[1555805] supportedLDAPVersion: value =
2[1555805] Binding as administrator[1555805] Performing Simple authentication for sysservices to
172.30.74.70[1555805] Simple authentication for sysservices returned code (49) Invalid
credentials[1555805] Failed to bind as administrator returned code (-1) Can't contact LDAP
server[1555805] Fiber exit Tx=222 bytes Rx=605 bytes, status=-2[1555805] Session End
```

As for the debugs, either the LDAP Login DN format is incorrect or the password is incorrect so verify both in order to resolve the issue.