

# PIX/ASA 8.0: Use LDAP Authentication to Assign a Group Policy at Login

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**Introduction**

**Prerequisites**

**Background Information**

**Configure the ASA**

ASDM

Command Line Interface

**Configure the Active Directory or Other LDAP Server**

**Verify**

Login

Debug the LDAP Transaction

**Troubleshoot**

Attribute Names and Values are Case-Sensitive

**NetPro Discussion Forums – Featured Conversations**

**Related Information**

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## Introduction

Frequently, administrators want to provide VPN users with different access permissions or WebVPN content. On the ASA this is regularly achieved through the assignment of different group policies to different users. When Lightweight Directory Access Protocol (LDAP) authentication is in use, this can be achieved automatically with an LDAP attribute map.

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 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.

**Note:** This document describes how to assign different policies to different users and still allow VPN access for all users. Refer to ASA/PIX: Mapping VPN Clients to VPN Group Policies Through LDAP Configuration Example for an example of LDAP attribute mapping that denies access to some users.

## Prerequisites

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.

## 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 Attribute 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 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.

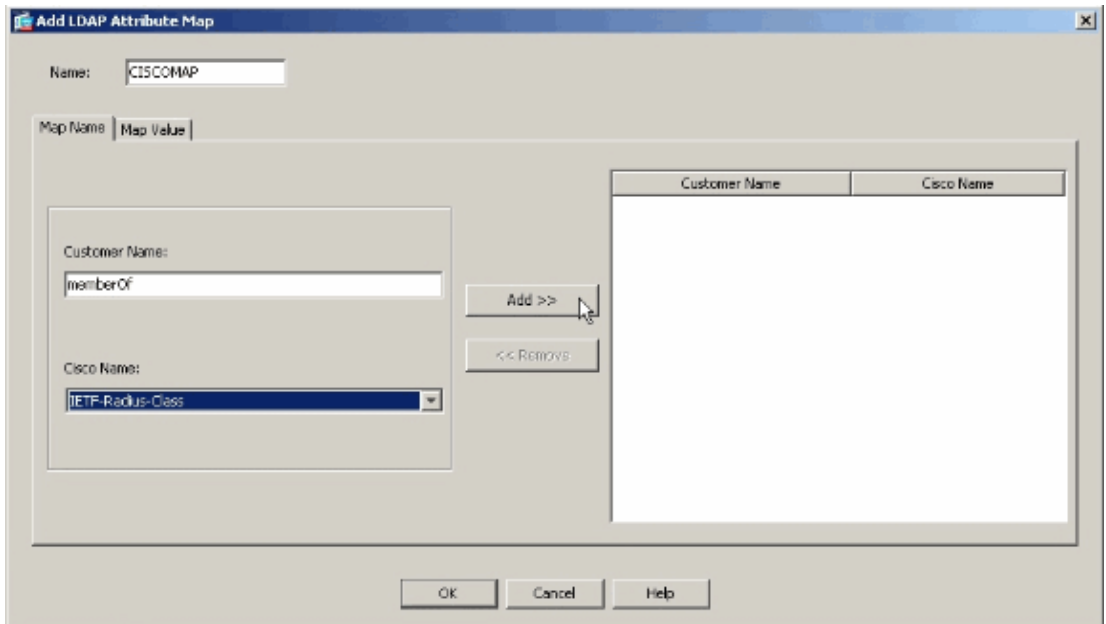
### ASDM

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.

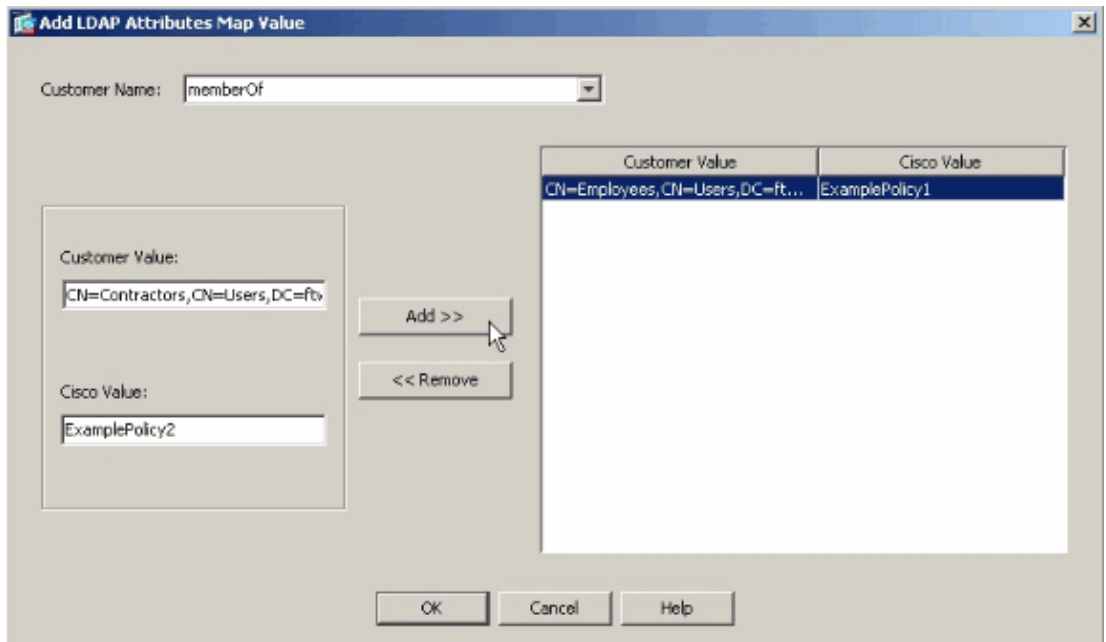
**Note:** If you do not know the exact attribute names or spellings that are provided by the LDAP server, it can be helpful to examine the debugs before you create the map. See the Verify section for more information on how to identify LDAP attributes with debugs.



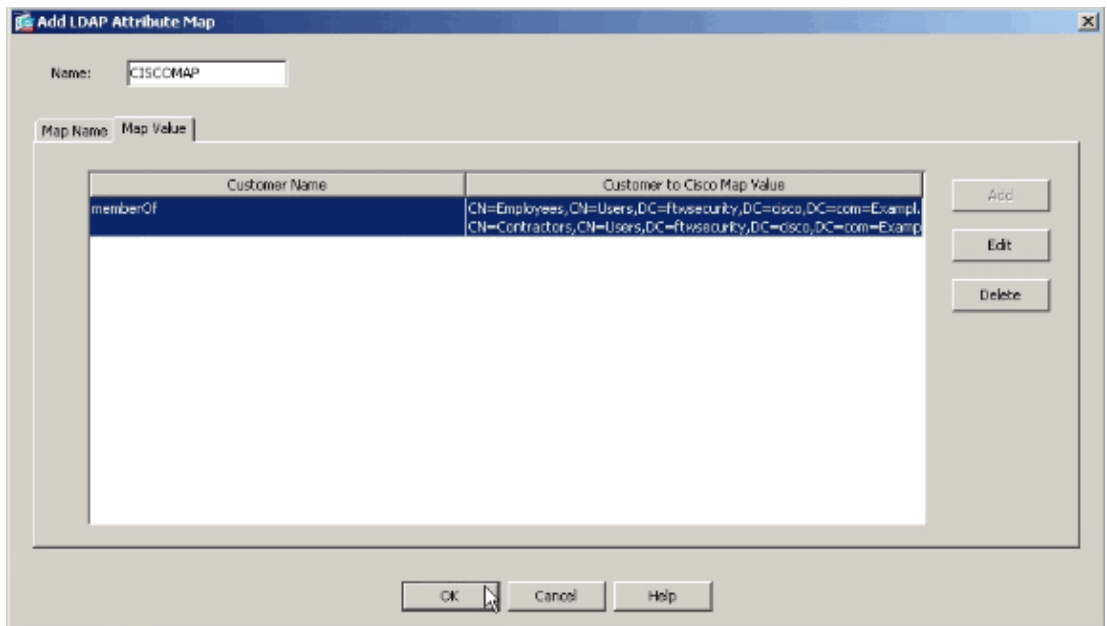
5. After you add the attribute mapping, click the **Map Value** tab, and click **Add** in order to create a value mapping. Add as many value mappings as required, and click **OK** when finished.

- ◆ **Customer Value** the attribute value from the LDAP server
- ◆ **Cisco Value** the name of the group policy on the ASA

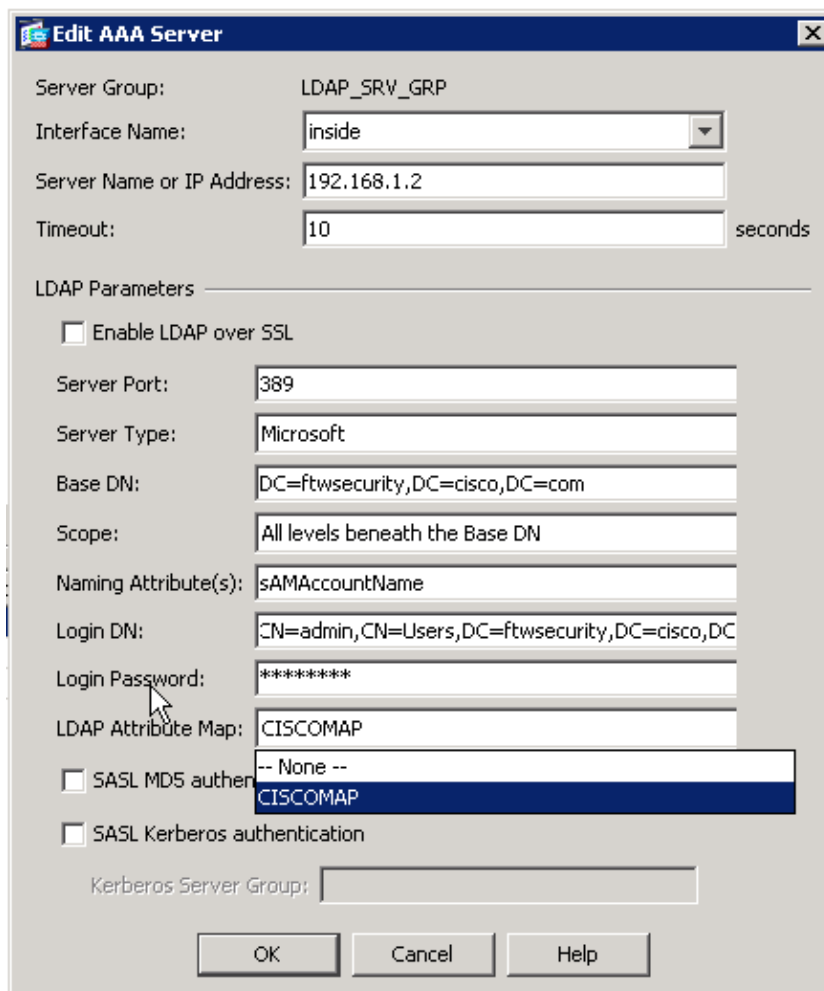
In this example, the **CN=Employees,CN=Users,DC=ftwsecurity,DC=cisco,DC=com** memberOf value is mapped to **ExamplePolicy1** and the **CN=Contractors,CN=Users,DC=ftwsecurity,DC=cisco,DC=com** memberOf value is mapped to **ExamplePolicy2**.



### Complete LDAP Attribute Map



6. Once you create the map, it must be assigned to the AAA server that is configured for LDAP authentication. Choose **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.



## Command Line Interface

Complete these steps in the command line interface (CLI) in order to configure the LDAP map on the ASA.

```
ciscoasa#configure terminal
```

```
!--- Create the LDAP Attribute Map.
```

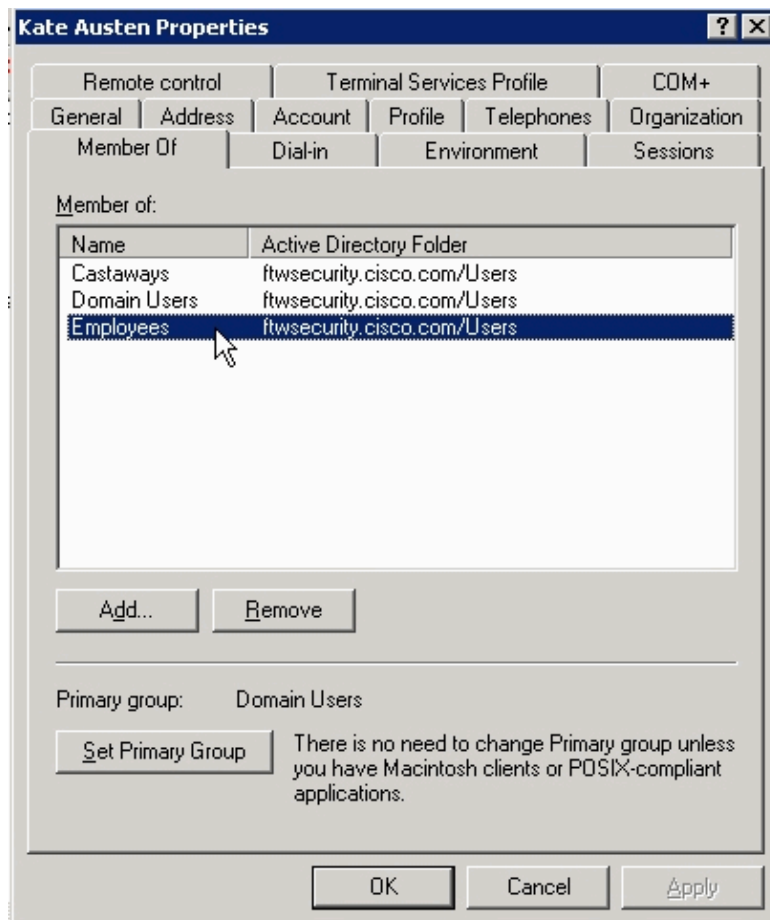
```
ciscoasa(config)#ldap attribute-map CISCOMAP
ciscoasa(config-ldap-attribute-map)#map-name memberOf IETF-Radius-Class
ciscoasa(config-ldap-attribute-map)#map-value memberOf CN=Employees,CN=Users,
    DC=ftwsecurity,DC=cisco,DC=com ExamplePolicy1
ciscoasa(config-ldap-attribute-map)#map-value memberOf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

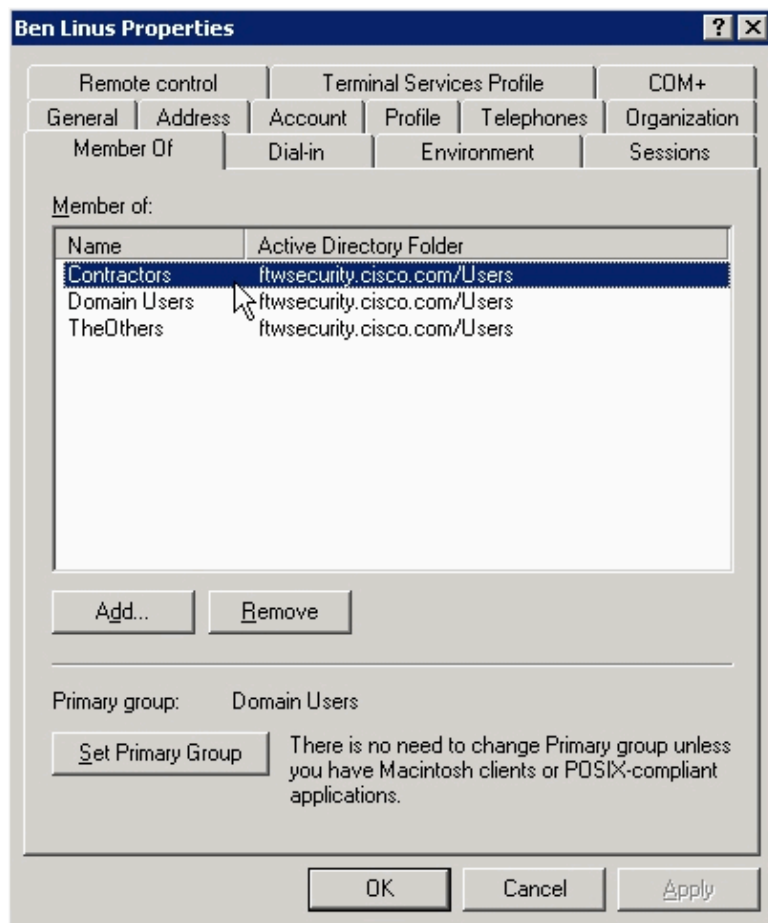
```
ciscoasa(config)#aaa-server LDAP_SRV_GRP (inside) host 192.168.1.2
ciscoasa(config-aaa-server-host)#ldap-attribute-map CISCOMAP
```

## Configure 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 Austin is a member of the Employees group in AD:



Ben Linus is a member of the Contractors group:

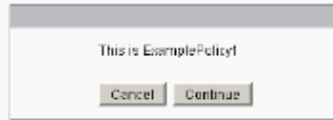


## Verify

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,  
**[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

## 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.

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