

Developing with uConnect

What is uConnect?

Microsoft Active Directory (Directory Services)

Microsoft Exchange (email and smtp routing)

Domain Name System (DNS)

Used to authorize and authenticate users and computers

Utilizes Lightweight Directory Access Protocol (LDAP)

AD Forest Configuration

Parent domain: ad3.ucdavis.edu

Child domains:

ou.ad3.ucdavis.edu

ex.ad3.ucdavis.edu

Trust with Microsoft Office365

AD Servers

AD Directory Services servers are called domain controllers (dc)

Each uConnect domain has domain controllers

Most uConnect DCs also function as Global Catalog servers

Global Catalog server stores its own full, writable domain replica (all objects and all attributes) plus a partial, read-only replica of every other domain in the forest.

AD Object Types

Organization Unit (OU)

Group

Computer

User

Contact

AD Search Components

AD Server

Search Base

Scope

Filter

Attributes

Search Base

The location in AD from which the LDAP search begins

Distinguished Name format

Examples:

OU=ucdUsers,DC=ad3,DC=ucdavis,DC=edu

OU=COE,OU=Departments,DC=ou,DC=ad3,DC=ucdavis,DC=edu

DC=ad3,DC=ucdavis,DC=edu

DC=ou,DC=ad3,DC=ucdavis,DC=edu

Important uConnect OUs

Campus members accounts are in AD3

OU=ucdUsers,DC=ad3,DC=ucdavis,DC=edu

PPS Department Groups

OU=ucdDepts,DC=ad3,DC=ucdavis,DC=edu

Departments

OU=COE,OU=Departments,DC=ou,DC=ad3,DC=ucdavis,DC=edu

Search Scope

Sets how deep to search within the search base

Base: search of the base object only

One Level: search of the immediately subordinate objects to the base. Does not include the base object

Subtree: search of the base object and the entire subtree

Search Filter

Selects which AD object(s) to return

Examples:

```
(&(objectClass=user)(sAMAccountName=dbunn))
```

```
(&(objectclass=computer)(!(name=coe-w10)(sAMAccountName=coe-w10$)))
```

```
(&(objectClass=group)(mail=* ))
```

```
(&(objectClass=group)(whenChanged>=20161011083000.0Z))
```

```
(&(objectclass=group)(!(groupType=8)(groupType=-2147483640))(extensionAttribute3=UCDBoxSync))
```

Search Attributes

The desired AD object properties to view

Pulling all attributes make large searches slower

Vary depending upon AD object type

Special handling is required for groups with over 1,500 members

Names in camel case

userPrincipalName, distinguishedName, proxyAddresses, displayName

Searching for Unique Objects

cn values unique only at the OU level

objectSid and sAMAccount values are only unique at the domain level

distinguishedName values are unique across AD forest but easily changed by
moving AD object

objectGuid and userPrincipalName unique across the AD forest

objectGuid never changes and stored in little endian format

Pulling AD Group by objectGuid via C# .NET

```
using System.Web;
using System.DirectoryServices;

namespace DBConsoleTestCode
{
    class Program
    {
        static void Main(string[] args)
        {
            //Var for Group's LDAP Path Based Upon AD objectGUID
            string grpLDAPPath = "LDAP://ad3.ucdavis.edu/<GUID=407f5264-9564-485f-8c83-7214afed1099>";

            //Pull Directory Entry of AD Group
            DirectoryEntry deADGroup = new DirectoryEntry(grpLDAPPath);

            Console.WriteLine(deADGroup.Properties["cn"][0].ToString());

            Console.WriteLine(" ");
            Console.WriteLine("-----End of Program-----");
            Console.ReadLine();
        }
    }
}
```

Active Directory Users and Computers

File Action View Help



Active Directory Users and Computers [OUDC2C.ou.ad3.ucdavis.edu]

- ▶ Saved Queries
- ▶ ou.ad3.ucdavis.edu
 - ▶ Builtin
 - ▶ Computers
 - ▶ DC Member Servers
 - ▶ DCPreStage
 - ▶ DEPARTMENTS
 - ▶ ADCE
 - ▶ AE
 - ▶ ANES
 - ▶ ANR
 - ▶ ARE
 - ▶ ARM
 - ▶ AVHR
 - ▶ BFTV
 - ▶ BME
 - ▶ BML
 - ▶ CAES
 - ▶ CAHFS
 - ▶ CBS
 - ▶ CBST
 - ▶ CCM
 - ▶ CL
 - ▶ CloudRbacGroups
 - ▶ CLTC
 - ▶ CM
 - ▶ CNPRC
 - ▶ CNS
 - ▶ COE
 - ▶ COE-OU-AHMCT
 - ▶ COE-OU-BAE
 - ▶ COE-OU-BME
 - ▶ COE-OU-CEE
 - ▶ COE-OU-CGM
 - ▶ COE-OU-CHMS

Name	Type
COE-GS-Group-Policy-Creators	Security Group - Global
COE-OU-AHMCT	Organizational Unit
COE-OU-BAE	Organizational Unit
COE-OU-BME	Organizational Unit
COE-OU-CEE	Organizational Unit
COE-OU-CGM	Organizational Unit
COE-OU-CHMS	Organizational Unit
COE-OU-CS	Organizational Unit
COE-OU-CWS	Organizational Unit
COE-OU-DAS	Organizational Unit
COE-OU-DBDev	Organizational Unit
COE-OU-ECE	Organizational Unit
COE-OU-EDO	Organizational Unit
COE-OU-IT	Organizational Unit
COE-OU-ITS	Organizational Unit
COE-OU-MAE	Organizational Unit
COE-OU-SITS	Organizational Unit
coe-uac	Computer
COE-US-Admins	Security Group - Universal
COE-US-Exchange-View-Only	Security Group - Universal
COE-US-MsgAdmins	Security Group - Universal

File Action View Help



- ▶ CNS
- ▶ COE
 - ▶ COE-OU-AHMCT
 - ▶ COE-OU-BAE
 - ▶ COE-OU-BME
 - ▶ COE-OU-CEE
 - ▶ COE-OU-CGM
 - ▶ COE-OU-CHMS
 - ▶ COE-OU-CS
 - ▶ COE-OU-CWS
 - ▶ COE-OU-DAS
 - ▶ COE-OU-DBDev
 - ▶ COE-OU-DBDev-Computers
 - ▶ COE-OU-DBDev-Groups
 - ▶ COE-OU-DBDev-MoreGroups
 - ▶ COE-OU-DBDev-Servers
 - ▶ COE-OU-DBDev-ServiceAccounts
 - ▶ COE-OU-DBDev-Workstations
 - ▶ COE-OU-DBDev-Demo
 - ▶ COE-OU-ECE
 - ▶ COE-OU-EDO
 - ▶ COE-OU-IT
 - ▶ COE-OU-ITS
 - ▶ COE-OU-MAE
 - ▶ COE-OU-SITS
- ▶ CrashPlan
- ▶ CRUS
- ▶ Department Administrators OU
- ▶ DeptBackups
- ▶ DEV
- ▶ ENT
- ▶ ER
- ▶ ESP

Name	Type
COE-DBUNN-W12D	Computer
COE-DBUNN-WN10	Computer

COE-DBUNN-W12D Properties

Location	Managed By	Object	Security	Dial-in	Attribute Editor
General	Operating System	Member Of	Delegation	Password Replication	



COE-DBUNN-W12D

Computer name (pre-Windows 2000): DNS name: DC Type: Site: Description:

OK

Cancel


Apply

Help

COE-AD-Dev-Users Properties



Object	Security	Attribute Editor	
General	Members	Member Of	Managed By

 COE-AD-Dev-Users

Group name (pre-Windows 2000):

Description:

E-mail:

Group scope

Domain local

Global

Universal

Group type

Security

Distribution

Notes:

OK

Cancel

Apply

Help

COE-AD-Dev-Users Properties



General

Members

Member Of

Managed By

Object

Security

Attribute Editor

Attributes:

Attribute	Value
cn	COE-AD-Dev-Users
description	Test Group for COE AD Development
extensionAttribute14	;OU\coe\
extensionAttribute2	COESync
groupType	0x80000008 = (UNIVERSAL_GROUP SECUR
member	CN=postit,OU=ucdUsers,DC=ad3,DC=ucdavis,[
objectCategory	CN=Group,CN=Schema,CN=Configuration,DC=a
objectClass	top; group
sAMAccountName	COE-AD-Dev-Users
sAMAccountType	268435456 = (GROUP_OBJECT)



Edit

Filter

OK

Cancel

Apply

Help

COE-AD-Dev-Users Properties



General	Members	Member Of	Managed By
Object	Security	Attribute Editor	

Group or user names:

- COE-IT-SCCMReports (COE-IT-SCCMReports@ou.ad3.ucdavis...)
- COE Neelix (coe-neelix@ou.ad3.ucdavis.edu)**
- MSOL_AD_Sync_RichCoexistence (AD3\MSOL_AD_Sync_Ric...)
- Organization Management (AD3\Organization Management)
- Delegated Setup (AD3\Delegated Setup)
- Exchange Windows Permissions (AD3\Exchange Windows Per...)

Add... Remove

Permissions for COE Neelix

	Allow	Deny	
Full control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	^
Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>	≡
Write	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Create all child objects	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Delete all child objects	<input checked="" type="checkbox"/>	<input type="checkbox"/>	v

For special permissions or advanced settings, click Advanced.

Advanced

OK

Cancel

Apply

Help

COE-US-DBDev-Testing1 Properties



General

Members

Member Of

Managed By

Object

Security

Attribute Editor

Attributes:

Attribute	Value
cn	COE-US-DBDev-Testing1
description	DB Test Group
extensionAttribute14	.DU\coe\
extensionAttribute2	COEADGM
extensionAttribute3	UCDBoxSync
groupType	0x80000008 = (UNIVERSAL_GROUP SECU

String Attribute Editor



Attribute: extensionAttribute2

Value:

COEADGM

Clear

OK

Cancel

Edit

Filter

OK

Cancel

Apply

Help

COE-AD-Dev-Users Properties

Object	Security	Attribute Editor
General	Members	Member Of
	Managed By	

Members:

Name	Active Directory Domain Services Folder
COE-US-DBD...	ou.ad3.ucdavis.edu/DEPARTMENTS/COE/CO...
dbunn	ad3.ucdavis.edu/ucdUsers
drbunn	ad3.ucdavis.edu/ucdStudents

Add... Remove

OK Cancel Apply Help

al DB Test Group
al Test Group for Testir
al Testing for Dean

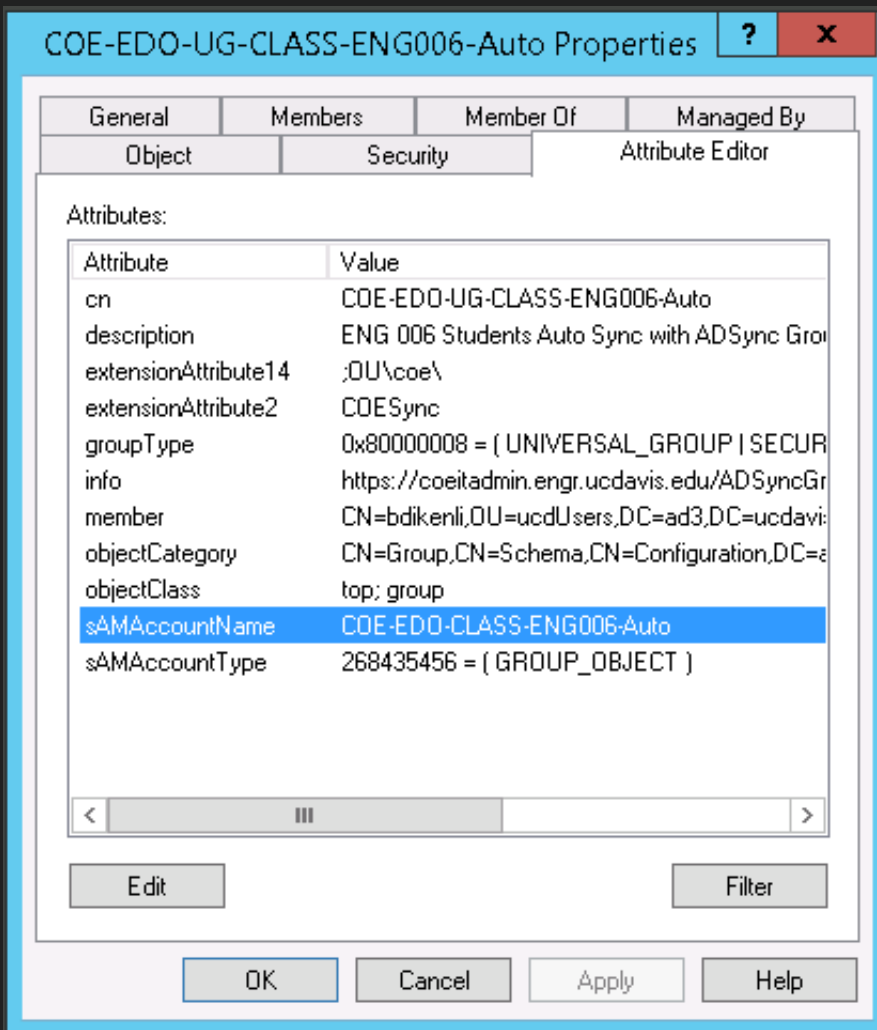
Select Users, Contacts, Computers, Service Accounts, or Groups

Select this object type:

From this location:

Enter the object names to select (examples):

Please
remember
a group's
“cn” can lie



Group Membership Changes

When modifying a group, use a domain controller in the same domain

Pull the distinguishedName of the user to be added or removed

When syncing with Campus data sources make sure nested groups and OU
domain accounts are not removed

Code Demo