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IBM SECURITY IDENTITY GOVERNANCE AND INTELLIGENCE

**Advanced Scenario Labs (Lab10)
for the MasterSkills University 2018**

5.2.x

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Document Purpose

This document provides the instructions for running the labs for the advanced scenarios for the 2018 MasterSkills University – IGI Track.

For any comments/corrections, please contact David Edwards (davidedw@au1.ibm.com).

Document Conventions

The following conventions are used in this document:

- A step to be performed by the student.
- A note, some special information or warning.

A piece of code

Normal paragraph font is used for general information. **Bold** is used to highlight something in an instruction, like a command or menu selection.

The term “IGI” is used to refer to IBM Security Identity Governance and Intelligence.

Document Control

Release Date	Version	Authors	Comments
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1 Introduction to the Lab

This document is a lab guide for some advanced labs developed for the 2018 Master Skills University – IGI Track.

There are three labs covered in this guide:

- 1) An end to end AD integration with reconciliation and provisioning, comprising:
 - a) AD adapter integration and reconciliation
 - b) AD provisioning and attribute policy enforcement
- 2) A user department move drives user access re-certification

The labs are based on the IGI Virtual Machine (VM) that contains IGI, the Brokerage layer, the IGI database and the Brokerage LDAP.

Where detailed steps are shown for the labs, the steps to be performed are shown by the square () beside them.

2 Lab Pre-Requisites

This section defines the lab pre-requisites.

2.1 Expected Knowledge

This lab assumes the following knowledge has been acquired before attempting the labs:

- Familiarity with IGI, the data objects and concepts, processes and activities, the Admin Console and the Service Center
- These labs require knowledge of, and experience with, advanced configuration in IGI including Java rules. The detailed instruction steps will guide you through configuration of these but knowledge of these would be helpful

This knowledge can be gained via the introductory (Foundation or Basic) training of IGI.

2.2 Standard Lab Setup

This lab uses the standard IGI training lab. Setup for this lab is described in the document ***Lab00 - IGI Lab Environment Setup Guide***.

These documents describe the standard training environment used for the IGI labs and the steps to prepare for this lab.

The AD lab requires the Windows server. This is provided as standard with the Skytap templates and SCS-Portal profiles but must be downloaded for the locally run VMs.

2.3 Additional Lab Setup

This lab uses a different Windows AD system to other IGI labs. It is using a Windows Server 2016 machine running Active Directory and little else. It has an IP of 192.168.42.69 and two administrative accounts: Administrator and NetworkAdmin (both with password of "Passw0rd"). If running this server locally, you just need to unpack and start the VM. If running on Skytap or SCS-Portal, it is included in the template-instance.

No further lab setup is required.

3 Lab 1 – AD Integration with Reconciliation and Provisioning

This lab is built around the requirement for managing accounts and access on Active Directory. It will involve configuration and use of:

- The AD Adapter and the Enterprise Connector module (including reconciliation schedules)
- Account configuration including attribute mapping and enforcement
- Access requests and provisioning

Note that this lab is independent of the other lab. They can be run in any order. This lab needs the Windows Server image as well as the IGI VA and Data Server.

3.1 Overview of Scenario

This scenario is summarized in the following table. This is just for your information.

Summary	Configuring AD account attributes linked to person attributes, changing the target attributes then running a recon and forcing a policy enforcement to correct the account attributes (including a rule to drive a trivial person change to trigger the attribute defaults). Configuring an AD adapter with the Enterprise Connectors module and adding some attribute mapping rules.
Requirement statement	<i>Our main source of concern around identity management is our Active Directory environment.</i> <i>We need to be able to centrally manage accounts in AD based on users and their roles. This includes provisioning accounts for new users and reconciling accounts to ensure they are within policy.</i> <i>Many AD account attributes are linked to attributes on the person in HR. If one of the AD admins changes a value in AD, we need to be able to re-apply the correct (person) attribute value.</i> <i>There are also some complex AD attributes that we need to define with some logic on provisioning.</i>
Demonstration requirements	Must be able to demonstrate: <ul style="list-style-type: none"> • User create generates AD account with the correct attribute values • Reconcile of account with changed attributes will re-apply the correct person attributes to the AD account
Implementation notes	This will require configuration of the following: <ol style="list-style-type: none"> 1. Target configuration - a new AD target defined in the Enterprise Connectors module 2. Account configuration - including attribute management 3. Rules - a User (Account) Modify rule to trigger re-eval of the person-account attribute defaults 4. Entitlements - default basic AD entitlements associated with specific OUs Assume: User mods done in Admin Console, account mods done in AD, admin roles are there (user manager etc.)
Skills required	Students should have a good grasp of the following: <ol style="list-style-type: none"> 1. Target Configuration (Product documentation and AD Adapter Guide) 2. Account attribute configuration (B340 trg module) 3. Rules (Rules Guide and D2** trg modules) 4. Entitlement Management (B320 trg module)

3.2 Lab1 – Part A – Detailed Lab Instructions

The following instructions will walk you through the lab setup and execution. This is the first part of Lab1 and will focus on AD adapter setup and running a reconciliation. The second part of the lab, Part B, will look at provisioning and recon with attribute enforcement.

3.2.1 Summary of Lab Flow and Configuration

This lab is focused on the identity management of Active Directory accounts with IGI. It involves setting up the AD adapter (and initial reconciliation), then configuring for and executing two use cases; provisioning with account creation and reconciliation with policy enforcement.

The overall flow for this lab would be:

1. Setup
 - a. Check account adoption rules
 - b. Create the AD adapter in the Enterprise Connectors module
 - c. Check the account configuration for the new AD and setup the account attributes
2. Recon
 - a. Setup and run a reconciliation on the new AD
 - b. Check the loaded data (accounts and groups)
 - c. Check for automatic adoption
3. Provision (*in Lab 1 – Part B*)
 - a. Publish a permission as a default permission and check accounts and access are provisioned
 - b. Check and run the access request (select a user that doesn't already have an AD account)
 - c. Review the provisioning flow
4. Recon with Attribute Enforcement (*in Lab 1 – Part B*)
 - a. Setup a User (Account) Modify rule to trigger a re-evaluation of user-account attribute mapping
 - b. Change an account on AD and rerun the recon
 - c. Check that the custom rule has run and that the target changes have been overwritten

Some demonstration is performed as you walk through the first two steps. Later, in Lab1 – Part B, we configure the components for the third and fourth steps, then run the two use cases.

The areas of configuration that we will explore in this lab are:

- Rules for account adoption
- AD Adapter, Enterprise Connector and EC Reconciliation Schedule

The following sections provide a detailed walk through of the steps to configure and demonstrate the use cases.

3.2.2 Checking Account Adoption Rules

Prior to installing the adapter and running the initial reconciliation, we need to check the rules around account adoption. These are the rules that will try to adopt accounts from a recon to existing users in IGI.

The training system comes with a set of ootb account adoption rules, that will attempt to match (adopt) a new incoming account from a recon with an existing user. These rules run, in sequence, when a new account is returned to IGI from a recon. They will attempt to find a matching user and connect this account to that user.

To check the rules:

- Log into the Admin Console (admin/admin)
- Go to **Access Governance Core > Configure > Rules**

Identity Governance and Intelligence Access Governance Core Ideas / admin Help Logout IBM

Manage Configure Monitor Tools Settings

Certification Campaigns Certification Datasets Admin Roles Rules Notifications Rights Lookup Hierarchy

Rules Rules Sequence

Rule Class: Rule Flow:

[Hide Filter](#) [Actions](#)

Rule Concept

Authorization Digest

- Triggered by: User authorization changes
- Processing: Real Time
- Purpose: Validations enforcement

Live events

- Triggered by: Event Queues (In, Out, Target)
- Processing: Real time
- Purpose: I/O data flow control

Advanced

- Triggered by: Not triggered
- Processing: On Demand / Scheduled
- Purpose: Any sort of processing

Deferred events

- Triggered by: Event Queues (In)
- Processing: Scheduled
- Purpose: Event Aggregations

[Rules Package](#) [Package Imports](#)

The rules are associated with the Target queue, ACCOUNT_CREATE event.

- On the rules page select **Live Events**, Queue = **Target**, Flow = **ACCOUNT_CREATE**.
- In the bottom left section, expand the ACCOUNT_CREATE flow to see the rule sequence
- In the right pane, sales the (+) beside Rules Package to see the available rules for this flow.

Certification Campaigns Certification Datasets Admin Roles Rules Notifications Rights Lookup Hierarchy

Rules Rules Sequence

Rule Class: Live Events Queue: TARGET Rule Flow: ACCOUNT_CREATE

[Hide Filter](#) [Actions](#)

Before Run After

▼ ACCOUNT_CREATE

- >Create Account Target Default Group
 - Check level
 - Create Account [UserId Matching]
 - Create Account [Email Matching]
 - Create Account [Name-Surname Matching]
 - Create Account [Post Matching]

Rule Concept

Name	Description
Check level	[V1.0 - 2014-05-26]
Create Account [Email Matching-]	[V1.0 - 2015-06-25] - email = event.getEmail() -Valid for connector
Create Account [Email Matching]	[V1.5 - 2014-05-26] - email = event.getAttr3()
Create Account [Name-Surname Matching-]	[V1.0 - 2015-06-25] - name = event.getName() surname = event.get
Create Account [Name-Surname Matching]	[V1.5 - 2014-05-26] - name = event.getAttr1() surname = event.get
Create Account [Post Matching]	[V1.5 - 2014-05-26]
Create Account [UserId Matching]	[V1.5 - 2014-05-26]
Find account attributes	[V1.0 - 2016-09-30]
[EXAMPLE] Create Account - custom match...	[V1.1 - 2014-05-26] - Match the user using the description from the

You can see, based on the rule name, that there is a sequence of rules that will try to match the new account with an existing person by 1) UserId, 2) Email, and then 3) Name-Surname.

Given that the account data in the training system was built from the IGI user data, you can assume that 99% of AD accounts will match by userid. If you want to check the rule code, you select the rule in the right pane and then click Actions > Modify. We are not focusing on rules in this lab, so you don't need to do that.

Now that we know the rules are setup for matching we can configure the adapter and run the initial reconciliation.

3.2.3 Install and Configure the Adapter

The Windows Active Directory adapter (AD adapter) is one of the older ADK-based adapters from the IBM Security Identity Manager heritage. It does not use Tivoli Directory Integrator – it has an installable agent that is deployed to the AD domain controller (not recommended) or onto another server in the same Windows domain.

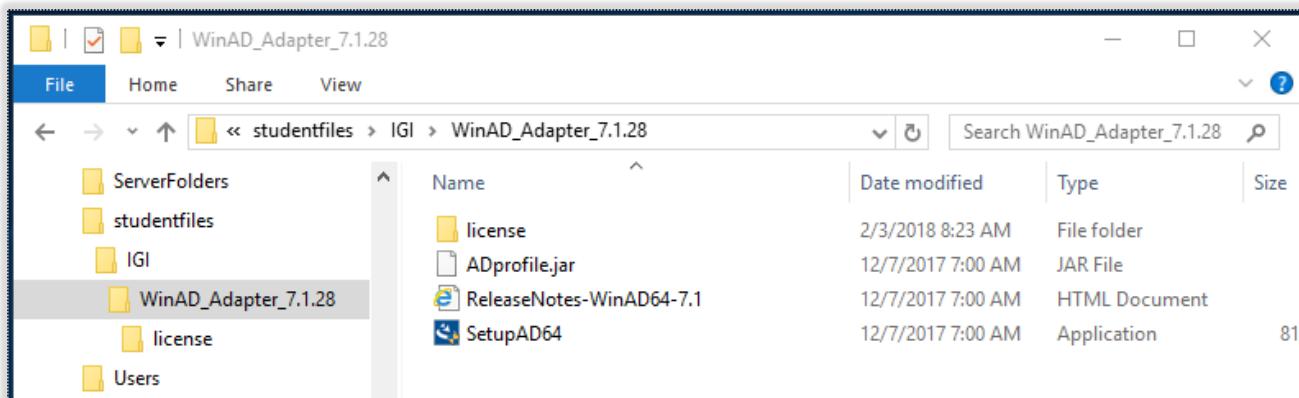
Thus, the installation and configuration of the adapter involves:

1. Installing the adapter agent onto the Windows system
2. Installing the adapter profile into the Enterprise Connectors module
3. Creating a new connector for the adapter
4. Configuring and running an initial reconciliation

We will walk through these steps in the next sections.

3.2.3.1 Installing the AD Adapter Agent

The adapter download includes three files, the agent installer (SetupAD64.exe), the release notes and the profile install (ADprofile.jar).



You would normally download the adapter package, extract the SetupAD64.exe, run it on the Windows server and follow the install prompts. This is very straightforward. This has already been done on the training Windows Server 2016 image.

To check that the adapter is installed and running, perform the following steps (you would normally do this post-install anyway):

- Start **Services** and look for the **ISIM Active Directory Adapter**. It should be there and running.

Name	Description	Status	Startup Type	Log On As
Interactive Services Detection	Enables user notification of us...	Manual	Local Syste...	
Internet Connection Sharing (ICS)	Provides network address trans...	Manual (Trig...	Local Syste...	
Intersite Messaging	Enables messages to be excha...	Running	Automatic	Local Syste...
IP Helper	Provides tunnel connectivity u...	Running	Automatic	Local Syste...
IPsec Policy Agent	Internet Protocol security (IPs...	Running	Manual (Trig...	Network S...
ISIM Active Directory Adapter	ISIM Active Directory Adapter	Running	Automatic	Local Syste...
KDC Proxy Server service (KPS)	KDC Proxy Server service runs ...	Manual	Network S...	
Kerberos Key Distribution Center	This service, running on doma...	Running	Automatic	Local Syste...
KtmRm for Distributed Transaction Coordinator	Coordinates transactions betw...	Manual (Trig...	Network S...	
Link-Layer Topology Discovery Mapper	Creates a Network Map, consi...	Manual	Local Service	

- Next, start a **Cmd** window, cd to c:\Program Files\IBM\ISIM\Agents\ADAgent". There should be files and folders there.

```
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\NetworkAdmin>cd "c:\Program Files\IBM\ISIM\Agents\ADAgent"

c:\Program Files\IBM\ISIM\Agents\ADAgent>dir
Volume in drive C has no label.
Volume Serial Number is BEAA-E066

Directory of c:\Program Files\IBM\ISIM\Agents\ADAgent

02/03/2018  08:24 AM    <DIR>        .
02/03/2018  08:24 AM    <DIR>        ..
02/03/2018  08:24 AM    <DIR>        bin
02/03/2018  08:24 AM    <DIR>        data
02/03/2018  08:24 AM    <DIR>        jre
02/03/2018  08:35 AM    <DIR>        log
02/03/2018  08:29 AM    <DIR>        Uninstall_Windows Active Directory Adapter (64 Bit)
          0 File(s)      0 bytes
          7 Dir(s)   26,418,683,904 bytes free
```

The bin (binary) directory is where the agent executables and tools are stored. The data directory is not used with the IGI functions of the agent. The jre folder contains a local java runtime environment (also not used). The log folder contains all of the agent logs which is very useful for problem diagnostics. There is also an uninstaller folder to remove the agent.

- Change directory to bin
 Run agentcfg -ag ADAgent (password (configuration key) when prompted is "Passw0rd")

```
c:\Program Files\IBM\ISIM\Agents\ADAgent>cd bin

c:\Program Files\IBM\ISIM\Agents\ADAgent\bin>agentcfg -ag ADAgent

Looking for agent 'ADAgent' on node '127.0.0.1'..

Enter configuration key for Agent 'ADAgent':
```

- Select **option A** to see the current agent settings

```

Configuration Settings
-----
Name : ADAGENT
Version : 7.1.28 64bit
ADK Version : 7.0.3 x64
ERM Version : 7.0.3 x64
Adapter Events : TRUE
License : NONE
Asynchronous ADD Requests : TRUE (Max.Threads:3)
Asynchronous MOD Requests : TRUE (Max.Threads:3)
Asynchronous DEL Requests : TRUE (Max.Threads:3)
Asynchronous SEA Requests : TRUE (Max.Threads:3)
Available Protocols : DAML
Configured Protocols : DAML
Logging Enabled : TRUE
Logging Directory : C:\Program Files\IBM\ISIM\Agents\ADAgent\log
Log File Name : WinADAgent.log
Max. log files : 10
Max.log file size (Mbytes) : 100
Debug Logging Enabled : TRUE
Detail Logging Enabled : TRUE
Thread Logging Enabled : FALSE

```

This shows the agent version (7.1.28 is the latest at time of writing – Feb 2018). Now we need to check the listening port.

- Select any key to go back to the main menu ("ADAGENT 7.1.28 64bit Agent Main Configuration Menu")
- Select B. Protocol Configuration, then C. Configure Protocol, then A. DAML

```

DAML Protocol Properties
-----
A. USERNAME ***** ;Authorized user name.
B. PASSWORD ***** ;Authorized user password.
C. MAX CONNECTIONS 100 ;Max Connections.
D. PORTNUMBER 45580 ;Protocol Server port number.
E. USE_SSL FALSE ;Use SSL secure connection
F. SRV_NODENAME ----- ;Event Notif. Server name.
G. SRV_PORTNUMBER 9443 ;Event Notif. Server port number.
H. HOSTADDR ANY ;Listen on address ( or "ANY" )
I. VALIDATE_CLIENT_CE FALSE ;Require client certificate.
J. REQUIRE_CERT_REG FALSE ;Require registered certificate.
K. READ_TIMEOUT 0 ;Socket read timeout (seconds)
L. DISABLE_SSLV3 TRUE ;Disable SSLv3

X. Done

Select menu option:

```

The important thing here is the agent listening port, in this case 45580 (this is the default for an agent). We won't explore any of the other options here (see the Adapter Guide for details).

- To return, type X repeatedly until you return to the windows command prompt.
- Close the command window (we won't need it again)

We have confirmed the adapter agent is installed and working.

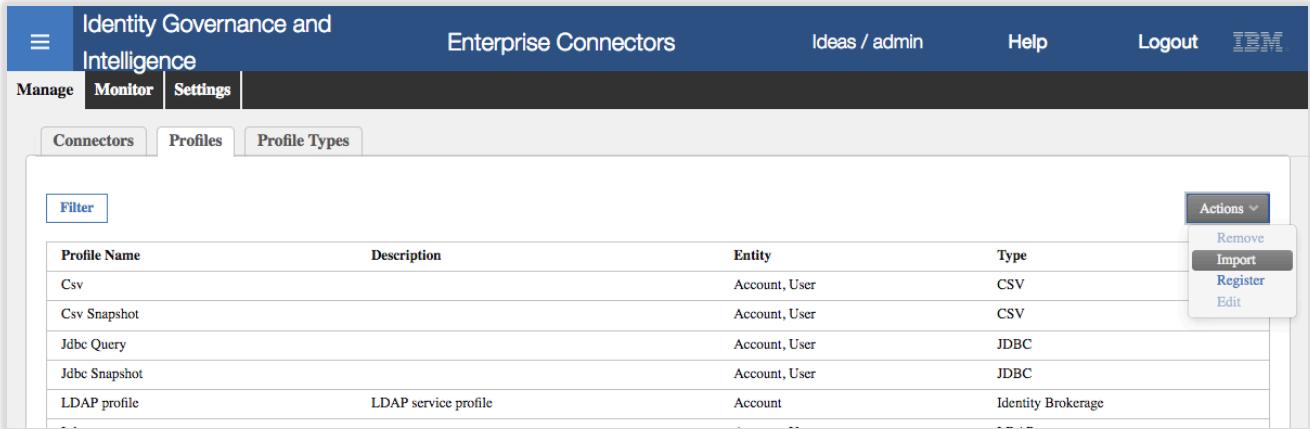
3.2.3.2 Installing the Adapter Profile into the Enterprise Connectors Module

Some legacy Enterprise Connectors and Identity Brokerage adapter profiles are pre-loaded into IGI.

The Windows AD adapter profile is not. It must be loaded before creating a connector for it.

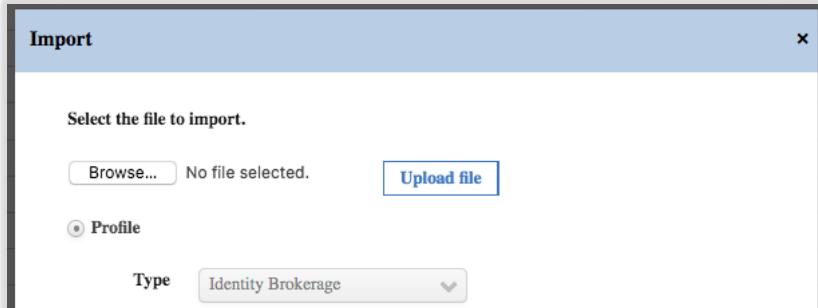
To do this:

- Log into the IGI Admin Console (admin/admin)
- Go to the **Enterprise Connectors** module
- In Enterprise Connectors go to **Manage > Profiles**

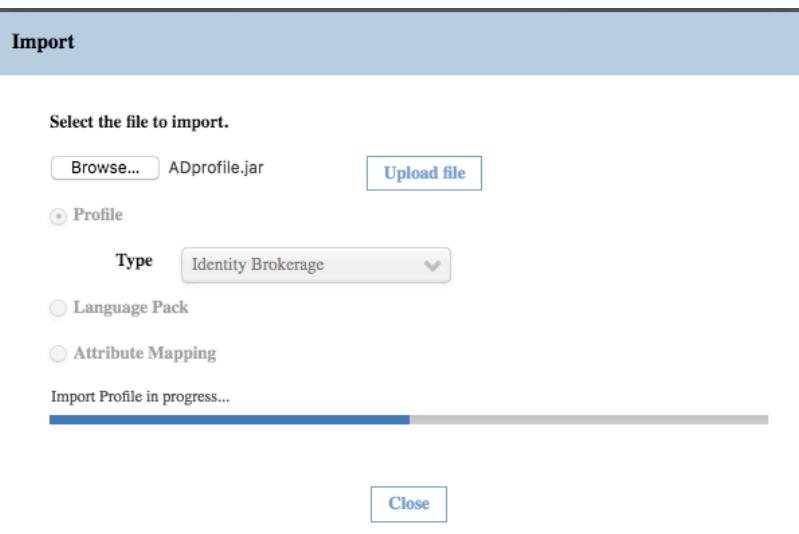


Profile Name	Description	Entity	Type
Csv		Account, User	CSV
Csv Snapshot		Account, User	CSV
Jdbc Query		Account, User	JDBC
Jdbc Snapshot		Account, User	JDBC
LDAP profile	LDAP service profile	Account	Identity Brokerage

- Select **Actions > Import**



- On the Import dialog, select **Browse..** (may be different label in other browsers) and find the **ADprofile.jar** for the AD adapter
- Click the **Upload file** button



- When the import completes, click the **Close** button

The profile should now show on the Manage > Profiles screen. You can now create a new connector.

3.2.3.3 Creating a New Connector for the Adapter

To create the connector:

- Within Enterprise Connectors go to **Manage > Connectors**
- In the left pane, select **Actions > Add**
- In the right pane enter the following values:

- Name – Training AD
- Description - <whatever>
- Profile Type – Identity Brokerage
- Profile – Active Directory Profile
- Entity – Account (this will be automatically selected once you select the profile and you can't change)
- Trace ON – Select
- Trace Level – Debug
- History ON - Select

The screenshot shows the 'Enterprise Connectors' section of the IBM Security interface. On the left, there's a list of existing connectors. On the right, a 'Connector Details' dialog is open with the following fields filled in:

Connector Details	
Name*	Training AD
Description	Training AD system
Profile Type*	Identity Brokerage
Profile*	Active Directory Profile
Entity*	Account
Trace Level	DEBUG
<input checked="" type="checkbox"/> Trace ON <input checked="" type="checkbox"/> History ON	

At the bottom right of the dialog are 'Save' and 'Cancel' buttons.

The tracing and history settings are up to you. Given this is the first time the profile and adapter are being used, it makes sense to turn on tracing and set it to DEBUG level. You would turn it down later.

- Click **Save**
- When the page refreshes, select both the **Enable write-to channel** and **Enable read-from channel** options (do not select Enabled yet)
- Click **Save** (this will turn on two more tabs – Channel-Write To and Channel-Read From)

The screenshot shows the 'Connector Details' dialog after saving the connector. The 'Enabled' checkbox is unchecked. Under 'Channel Mode', the 'Enable write-to channel' and 'Enable read-from channel' checkboxes are checked. The 'Name*' field is still 'Training AD' and the 'Description' field is 'Training AD system'. At the bottom right are 'Save' and 'Cancel' buttons.

Next, we need to configure the connection parameters, called the Driver Configuration:

- Click the **Driver Configuration** tab
- Make sure the **Training AD** connector is still selected in the left pane
- In the right pane, you need to specify the following parameters in the Active Directory Service section:

- URL – <http://192.168.42.69:45580> (this is the IP of the AD server and listening port for the agent)
- User ID – agent
- Password – agent

The screenshot shows the 'Connectors' section of the IBM Security interface. On the left, there's a list of connectors including 'APP - CSV - Recon - Simple Permissions', 'APP - JDBC - Recon - Permissions with multiple rights', 'CSV - HR Feed OUs (Delta)', 'CSV - HR Feed OUs (Full)', 'CSV - HR Feed Users (Delta)', 'CSV - HR Feed Users (Full)', 'CSV - Target System assignments sync (Full)', and 'GenSys LDAP'. On the right, the 'Driver Configuration' tab is selected under 'Connector Details'. It shows a table for 'Active Directory Service*' with columns for 'Mandatory' (marked with a green dot), 'Name', 'Value', and 'Description'. The entries are: URL (http://192.168.42.69:45580), User ID (agent), and Password (*****). Below the table are buttons for 'Reset', 'Test Connection', 'Query', 'Dump', 'Save', and 'Cancel'. An 'Events Marker' dropdown is also present.

- To test the parameters, click the **Test Connection** button

You should see an Information dialog with “The connection is successful”. If you see an error, check your parameters, that the AD server is running and contactable and check that the agent is running. There are commands in the Virtual Appliance command line interface to ping an IP and connect to an IP:port.

- Close the **Information** dialog
- Save** the Driver Configuration

The Driver Attributes List is provided with the adapter profile. For this lab you don't need to change anything.

- Go to the **Channel-Write To** tab
- Select the mapping icon to see the mapping list
- You need to check/set mapping between AD account attributes and IGI generic account attributes. This involves finding the attribute in the list and clicking the Map button to select the mapped attribute. The attributes to be mapped are as follows:

Target Account Attribute	Mapped (IGI) Attribute	Comments
erADD displayName	DISPLAY_NAME	Default mapping
erADD distinguishedName	DN	Default mapping
erAD expirationDate	EXPIRE	Default mapping
erp password	PASSWORD	Default mapping
eruid	CODE	Default mapping
mail	EMAIL	Default mapping
sn	SURNAME	Default mapping
givenName	NAME	First name

The list of attributes available for mapping at the account level is very limited due to the IGI account model. All extended attributes are stored in the Broker LDAP (or in a separate table in the IGI DB for legacy connectors) and there is no account-account mapping. We will look at the person-account mapping in the next section.

There is no Save function for this – if you've updated the mapping list, it is automatically saved.

ADAccount

[Filter](#)[Actions ▾](#)

Key	Attribute		Mapped Class	Mapped Attribute
	eraccountstatus	Map		
	erpassword	Unmap	ACCOUNT	PASSWORD
	eruid*	Unmap	ACCOUNT	CODE
	givenName	Unmap	ACCOUNT	NAME
	homePhone	Map		
1		Map		
	mail	Unmap	ACCOUNT	EMAIL
		...		

- Go to the **Channel-Read From** tab
- Select the mapping icon to see the mapping list
- You need to check/set mapping between IGI generic account and AD Account attributes. This involves finding the attribute in the list and clicking the Map button to select the mapped attribute. The attributes to be mapped are as follows:

IGI Account Attribute	Mapped (Target) Attribute	Comments
CODE*	eruid	Default mapping
DISPLAY_NAME	erADDisplayName	Default mapping
DN	erADDistinguishedName	Default mapping
EMAIL	mail	Default mapping
EXPIRE	erADExpirationDate	Default mapping
LAST_ACCESS_DATE	erADLastLogin	Default mapping
LAST_PWD_CHANGE	erADPasswordLastChange	Default mapping
LAST_WRONG_LOGIN	erADLastFailedLogin	Default mapping
NAME	givenName	First name
PASSWORD	erpassword	Default mapping
SURNAME	sn	Default mapping

As above, there is a limited set to map and most of them are mapped out-of-the-box.

Key	Attribute		Mapped Class	Mapped Attribute
	DN	Unmap	ADAccount	erADDistinguishedName
	EMAIL	Unmap	ADAccount	mail
	EXPIRE	Unmap	ADAccount	erADExpirationDate
	LAST_ACCESS_DATE	Unmap	ADAccount	erADLastLogon
	LAST_PWD_CHANGE	Unmap	ADAccount	erADPasswordLastChange
	LAST_WRONG_LOGIN	Unmap	ADAccount	erADLastFailedLogin
	NAME	Unmap	ADAccount	givenName

- Go back to the **Connector Details** tab and select the Enabled checkbox.
- Click **Save**

The screenshot shows the IBM Security Enterprise Connectors interface. On the left, there's a navigation bar with 'Manage', 'Monitor' (selected), and 'Settings'. Below it, a sub-navigation bar has 'Connectors' (selected), 'Profiles', and 'Profile Types'. The main area is divided into two panes. The left pane displays a table of connectors with columns: Enabled, Name, Write To, Read From, and Reconciliation. A single row is shown for 'Training AD', which is enabled. The right pane shows the 'Connector Details' tab, which includes fields for Name (Training AD), Description (Training AD system), Profile Type (Identity Brokerage), Profile (Active Directory Profile), Entity (Account), and Trace Level (DEBUG). There are also checkboxes for 'Enabled', 'Enable write-to channel', 'Enable read-from channel', 'Trace ON', and 'History ON'. Buttons for 'Save' and 'Cancel' are at the bottom right of the details pane.

It shows as enabled (blue icon to the left of the connector name, and it is using both Write To and Read From channels).

We are now ready to configure the adapter for operation and run a recon.

3.2.3.4 Configuring and Running an Initial Recon

Reconciliation for Identity Brokerage adapters is a two-step process;

1. The IB will tell the adapter/agent to run a recon, it will run the recon, compare the results with what's in the IB cache (LDAP) and write the changes into a delta table. This is called the "Change Log Sync".
2. The connector will periodically scan the delta table and process any entries there.

In the Enterprise Connectors module, you need to configure two schedules; the one for the change log sync, and the one for the connector Read From processing.

To configure the Change Log Sync schedule

- Still in the Enterprise Connectors module, go to **Monitor > Change Log Sync Status**
- Select the **Training AD** connector (note that it is in a Stopped Status)
- Set the **Schedule Frequency** (in Schedule Details in the right pane) to 5 Minutes (or similar)
- Select the **Effective Immediately** checkbox
- Click **Save**

- In the left pane select **Actions > Start** to start the sync (the status should change immediately to pending)

Identity Governance and Intelligence

Enterprise Connectors

Ideas / admin Help Logout IBM

Manage Monitor Settings

Connector Status Reconciliation Status Change Log Sync Status

Connectors

Name	Read From	Status
GenSys LDAP		Stopped
Training AD		Stopped

Actions ▾

- Sync Now
- Cancel
- Start**
- Stop

Status Details Sync History

Name: Training AD

Description: Training AD system

Message:

Last Run / Start

Last Run / Elapsed

Schedule

Frequency: 5 Minutes

Effective Immediately:

Effective Date: Feb 8, 2018, 02:17 AM

Save Cancel

We will come back and check on this in a minute.

To configure the adapter to run periodically:

- Go to **Connector Status** and select the **Training AD** connector (note that it is in a Stopped Status)
- Set the **Schedule Frequency** (in Schedule Details in the right pane) to 1 Minute (or similar)
- Click **Save**
- In the left pane select **Actions > Start** (the status should change immediately to pending)

, Read From: , Status: Error), 'Stopped' (Active, Identities, Write To: , Read From: , Status: Stopped), and 'Stopped' (Active, Training AD, Write To: , Read From: , Status: Stopped). A context menu for 'Actions' is open over the 'Training AD' row, with 'Start' highlighted. On the right, a detailed configuration dialog for 'Training AD' shows fields for 'Description' (Training AD system), a 'Message' box, and a 'Schedule Details' section with 'Local Scheduling' selected, frequency set to '1 Minute', and effective date set to Feb 8, 2018, 01:43 AM. Buttons for 'Save' and 'Cancel' are at the top right."/>

Connector Status

Active	Name	Write To	Read From	Status
Local Scheduling	GenSys LD...			Error
Stopped	Identities			Stopped
Stopped	Training AD			Stopped

Actions ▾

Connector Status Details Connector History

Description: Training AD system

Message:

Last Run / Start

Last Run / Elapsed

Schedule Details

Local Scheduling
 External Scheduling

Frequency: 1 Minute

Effective Immediately:

Effective Date: Feb 8, 2018, 01:43 AM

Save Cancel

- Go back to the **Change Log Sync Status** tab and select the **Training AD** connector

The Status Details view should show a recent execution.

Name	Read From	Status
GenSys LDAP	○●○	Stopped
Training AD	○●○	Pending

Details

Name: Training AD
Description: Training AD system
Message: Change Log Sync requested

Last Run / Start: Feb 8, 2018, 2:19:08 AM
Last Run / Elapsed: 00:01:25

- Click on the **Sync History** tab

You should see a recent successful execution (if it's showing that it's still running, just click the refresh button).

Status	Request ID	Started	Completed	Request Details
Success	7396625444	Feb 8, 2018, 2:19:08 AM	Feb 8, 2018, 2:20:33 AM	

This means the agent recon has been successfully run and processed by the identity brokerage module. We can now check to see if the connector has picked up the accounts and groups from the recon.

- Go to the **Connector Status** tab and select the **Training AD** connector

You should see details of the last execution.

Active	Name	Write To	Read From	Status
Local Scheduling	GenSys LDAP	○●○	○●○	Error
Stopped	Identities	○●○	○●○	Stopped
Local Scheduling	Training AD	○●○	○●○	Pending

Details

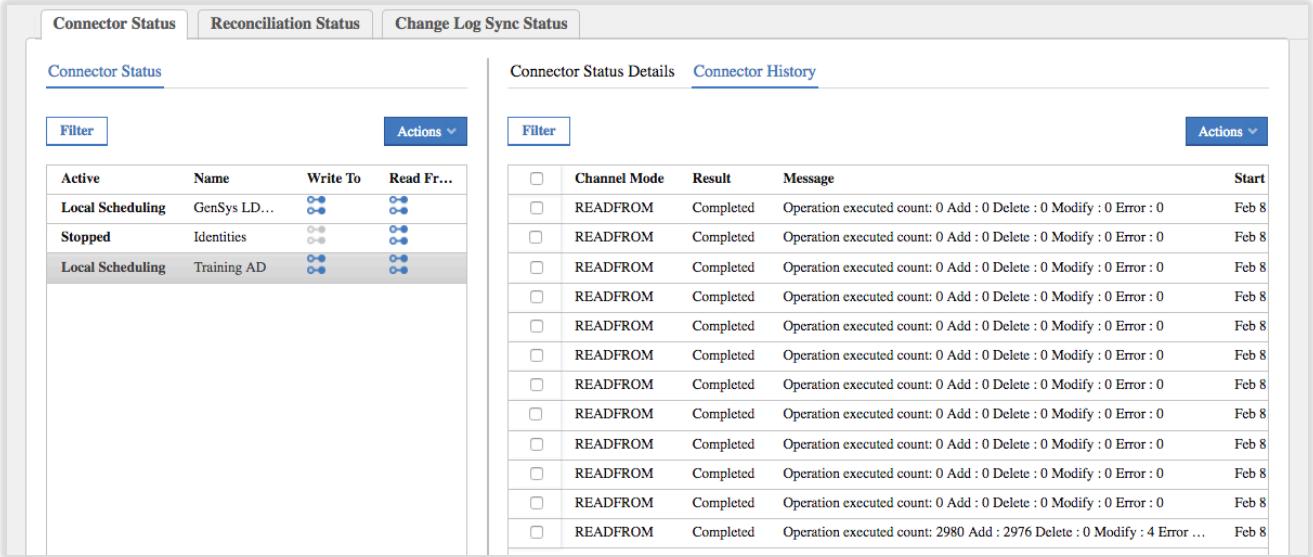
Name: Training AD
Description: Training AD system
Message: Channel-ReadFrom:
Operation executed count: 0
Add : 0
Delete : 0
Modify : 0
Error : 0

Last Run / Start: Feb 8, 2018, 2:24:07 AM
Last Run / Elapsed: 00:00:02

It may show information about the load of all accounts and groups from AD in the right pane. However if there have been multiple cycles of the connector, it may show as above.

- Go to the **Connector History** view

There should be an execution showing the load of all objects (2980 in total).



The screenshot shows two main panes. The left pane, titled 'Connector Status', contains a table with columns: Active, Name, Write To, and Read Fr... (with ellipsis). It lists three entries: 'Local Scheduling' (GenSys LD...) with status 'Active', 'Stopped' (Identities) with status 'Stopped', and 'Local Scheduling' (Training AD) with status 'Active'. The right pane, titled 'Connector Status Details', has a sub-section 'Connector History' which also lists the same three connector entries. Below these, a detailed log table shows 14 rows of 'READFROM' operations, each completed successfully with 0 errors. The log includes columns: Channel Mode, Result, Message, and Start Date (all dated Feb 8).

Active	Name	Write To	Read Fr...
Local Scheduling	GenSys LD...	○●	○●
Stopped	Identities	○●	○●
Local Scheduling	Training AD	○●	○●

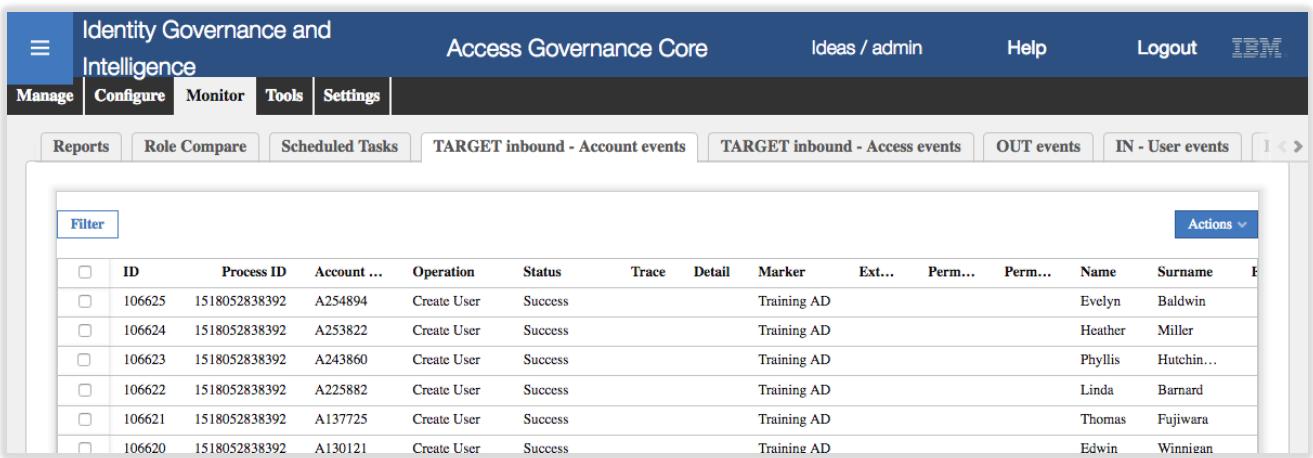
Channel Mode	Result	Message	Start
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 0 Add : 0 Delete : 0 Modify : 0 Error : 0	Feb 8
READFROM	Completed	Operation executed count: 2980 Add : 2976 Delete : 0 Modify : 4 Error ...	Feb 8

This shows that the connector has consumed all of the accounts and groups from AD.

As a final check we can look at the TARGET queue in Access Governance Core to see the result of this processing.

- Go to **Access Governance Core > Monitor > TARGET inbound – Account events**
- Click **Filter** and filter on Marker = "Training AD"

You should see a lot of entries (2916) consisting of Add Permission and Create User (create account) events. You may need to scroll or page to see the Create User events.



The screenshot shows the 'TARGET inbound - Account events' log. The top navigation bar includes 'Identity Governance and Intelligence', 'Access Governance Core', 'Ideas / admin', 'Help', 'Logout', and the IBM logo. The log table has columns: ID, Process ID, Account ..., Operation, Status, Trace, Detail, Marker, Ext..., Perm..., Perm..., Name, Surname, and E. It lists 10 entries, all successful 'Create User' operations for 'Training AD' marker, with names like Evelyn Baldwin, Heather Miller, Phyllis Hutchin..., Linda Barnard, Thomas Fujiwara, and Edwin Winnigan.

ID	Process ID	Account ...	Operation	Status	Trace	Detail	Marker	Ext...	Perm...	Perm...	Name	Surname	E
106625	1518052838392	A254894	Create User	Success			Training AD				Evelyn	Baldwin	
106624	1518052838392	A253822	Create User	Success			Training AD				Heather	Miller	
106623	1518052838392	A243860	Create User	Success			Training AD				Phyllis	Hutchin...	
106622	1518052838392	A225882	Create User	Success			Training AD				Linda	Barnard	
106621	1518052838392	A137725	Create User	Success			Training AD				Thomas	Fujiwara	
106620	1518052838392	A130121	Create User	Success			Training AD				Edwin	Winnigan	

- Check also the **TARGET inbound – Access events** to see the group processing
- If you see errors, you can select the failed event and click **Actions > Re-execute** (this normally works). If there are any JDBC/DBMS errors on the events, select the event and re-execute (**Actions > Re-execute**).

We have now setup the adapter and run the initial recon to get accounts and groups into IGI. This completes Lab1 – Part A.

3.3 Lab1 – Part B – Detailed Lab Instructions

The following instructions will walk you through the lab setup and execution. This is the second part of Lab1 and will look at provisioning and recon with attribute enforcement for the AD system.

3.3.1 Summary of Lab Flow and Configuration

This lab is focused on the identity management of Active Directory accounts with IGI. It involves setting up the AD adapter (and initial reconciliation), then configuring for and executing two use cases; provisioning with account creation and reconciliation with policy enforcement.

The overall flow for this lab would be:

1. *Setup (done in Lab 1 – Part A)*
 - a. *Check account adoption rules*
 - b. *Create the AD adapter in the Enterprise Connectors module*
 - c. *Check the account configuration for the new AD and setup the account attributes*
2. *Recon (done in Lab 1 – Part A)*
 - a. *Setup and run a reconciliation on the new AD*
 - b. *Check the loaded data (accounts and groups)*
 - c. *Check for automatic adoption*
3. *Provision*
 - a. *Publish a permission as a default permission and check accounts and access are provisioned*
 - b. *Check and run the access request (select a user that doesn't already have an AD account)*
 - c. *Review the provisioning flow*
4. *Recon with Attribute Enforcement*
 - a. *Setup a User (Account) Modify rule to trigger a re-evaluation of user-account attribute mapping*
 - b. *Change an account on AD and rerun the recon*
 - c. *Check that the custom rule has run and that the target changes have been overwritten*

In this section we configure the components for the third and fourth steps, then run the two use cases.

The areas of configuration that we will explore in this lab are:

- Account Configuration (with Account Attributes), entitlement management and Default access
- Access Request Management workflow
- User Modify workflow (for attribute enforcement)

The following sections provide a detailed walk through of the steps to configure and demonstrate the use cases.

3.3.2 Configuring the New AD Account (incl. Attribute Mapping)

Now that we have setup the adapter and loaded accounts and groups from AD, we can configure IGI to support the two remaining use cases; provisioning (with automatic account creation) and reconciliation (with attribute policy enforcement). This and the next few sections will run through these configuration activities.

3.3.2.1 Check AD Account Configuration

When we created the new connector in the Enterprise Connectors module, the process also defined both an application and account configuration to correspond to the connector. We will have a quick look at these.

Follow these steps:

- Login to the Admin Console (`admin/admin`) and go to **Access Governance Core**
- Go to **Manage > Applications** and find and select the Training AD application

It has been defined based on the new connector defined. Notice an events marker of Training AD

- Select the **Application Access** tab

Here you will see the AD groups loaded from the reconcile. There should be 64 groups.

The screenshot shows the IBM Security Identity Governance and Intelligence (IGI) interface. At the top, there's a navigation bar with tabs for 'Manage', 'Configure', 'Monitor', 'Tools', and 'Settings'. Below this is a secondary navigation bar with tabs for 'Users', 'Groups', 'Roles', 'Applications' (which is currently selected), 'Accounts', and 'Resources'. The main content area has a title 'Identity Governance and Intelligence' and a subtitle 'Access Governance Core'. On the left, under 'Applications', there's a table listing various systems like JohnsonControls, AD, Pivotal, SAP-FICO, SAP-Prod1, PadLock, zSecure RACF, GenSys, Workday, G53, SugarCRM, CVISION, and Training AD. The 'Training AD' row is highlighted with a grey background and has a checkmark in the 'R...' column. On the right, there's a detailed view of the 'Training AD' application. It shows a table of permissions with columns 'Name', 'Permission Type', and 'Application'. The 'Name' column lists items like 'Protected Users', 'WscAllowMediaAccess', 'WscAllowDashboardAccess', etc. The 'Permission Type' column shows 'ADGroupProfile' for most items. The 'Application' column shows 'Training A' for all items. Below this table is a 'Details' panel with fields for 'Name', 'Code', 'External Ref', 'Attribute Name', 'Description', 'Permission Type', 'Owner', 'Expiration', and 'Last Review Date'. Buttons for 'Save' and 'Cancel' are at the top of this panel. At the bottom of the detailed view, there's a footer with 'Items Per Page' set to 50, 'Results: 64', and navigation links.

Notice that the groups are permissions (not external roles – these groups did not have a hierarchy in AD) and are not published by default.

- Now go to the **Users** tab

There should be 1367 users listed. This means that of the accounts loaded from the reconcile, 1367 were able to be automatically matched to existing IGI users.

If you found 1362 users in the user list, there was a JDBC/DBMS error on processing some of the accounts or access. It won't really affect the flow of the lab, but you could re-execute those failing events.

Next, we will check the account configuration (account policy):

- Go to **AGC > Manage > Accounts**
- Find and select the **Training AD** account

The screenshot shows the IBM Security Access Governance Core interface. The top navigation bar includes 'Identity Governance and Intelligence', 'Access Governance Core', 'Ideas / admin', 'Help', 'Logout', and the 'IBM' logo. Below the navigation is a menu bar with 'Manage', 'Configure' (selected), 'Monitor', 'Tools', and 'Settings'. The main content area has tabs for 'Users', 'Groups', 'Roles', 'Applications', 'Accounts' (selected), and 'Resources'. On the left, there's a search/filter section and an 'Actions' dropdown. A table lists accounts with columns for 'Name' and 'Description', showing 'Training AD' as selected. On the right, the 'Details' tab is active, showing fields for 'Name' (Training AD), 'Description' (Training AD), 'Fulfillment' (Automatic), and a 'Linked Applications' section with a 'New' button.

The new account configuration is tied to the Training AD application (via the Training AD event marker). The Fulfillment is set to Automatic to any provisioning events sent to the OUT queue will get automatically processed by the adapter.

- Go to the **Creation Policy** tab

This is a standard configuration that we don't need to change. Note that the default UserID will be based on the Ideas account ID (which is the Master ID of the person).

- Have a look at the **Management** and **Password Creation** tabs

Again, the policy here is fairly standard, and we don't need to modify for this lab's use cases.

- Click on the **Users** tab

This lists all of the accounts (even though the tab is called "Users" they are actually accounts).

Notice that there are 1367 accounts, as we saw before.

- Select one of the accounts to see the account details (you may need to resize the different panes to see the account attributes)

The screenshot shows the IBM Security interface with the Accounts tab selected. The left pane lists accounts with checkboxes and a dropdown for items per page (50). The middle pane displays a detailed list of users with columns for First Name, Last Name, Master U..., Status, and Actions. The right pane shows application details for 'Training AD' with tabs for Application, Details, and a form for account ID, first name, last name, email, display name, account expiration date, last login, number of login errors, and last password change.

In this case you can see the Account ID, first and last names, email address, AD DN for the account, display name, account expiration date and some login information. We will enhance that list and default mapping in the next section.

3.3.2.2 Setup for Account Attribute Mapping

For account creation (and for policy enforcement in the next lab scenario) we need to setup the Target Attributes for this account type. To do this:

- Still in **AGC > Manage > Accounts**, go to the **Target Attributes** tab
- In the right pane select **Actions > Discover Account attributes from Target**

The screenshot shows the IBM Security interface with the Target Attributes tab selected. The left pane lists accounts with checkboxes and a dropdown for items per page (50). The right pane shows a table for discovering account attributes from the target with columns for Requi..., Visible, Editable, Position, Na..., Multiple values, Lookup, UI Ren, and Actions. A modal dialog is open titled 'Discover Account attributes from Target' with buttons for Add, Cancel, and Save.

- On the Discover Attributes from Target dialog, select the following attributes: cn, description, erADDisplayname, erADEmployeeID, erADFullName, erCompany, erDepartment, givenName, mail, postalCode, sn, street, telephoneNumber and title.
- Click **Import** when all selected.

The Target Attributes view no shows all of those AD attributes.

Users Groups Roles Applications Accounts Resources

Account Configuration

Filter Actions

<input checked="" type="checkbox"/>	Name	Description
<input checked="" type="checkbox"/>	Training AD	

Target Attributes

<input type="checkbox"/>	Requi...	Visible	Editable	Position	Name	Multiple values	Lookup	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="cn"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="description"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="erADDisplayName"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="erADEmployeeID"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="erADFullName"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="erCompany"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="erDepartment"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="givenName"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="mail"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="postalCode"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="street"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="sn"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="telephoneNumber"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="text" value="title"/>	<input type="checkbox"/>	<input type="button" value="..."/>	<input type="button" value="-"/>

Save Cancel Actions

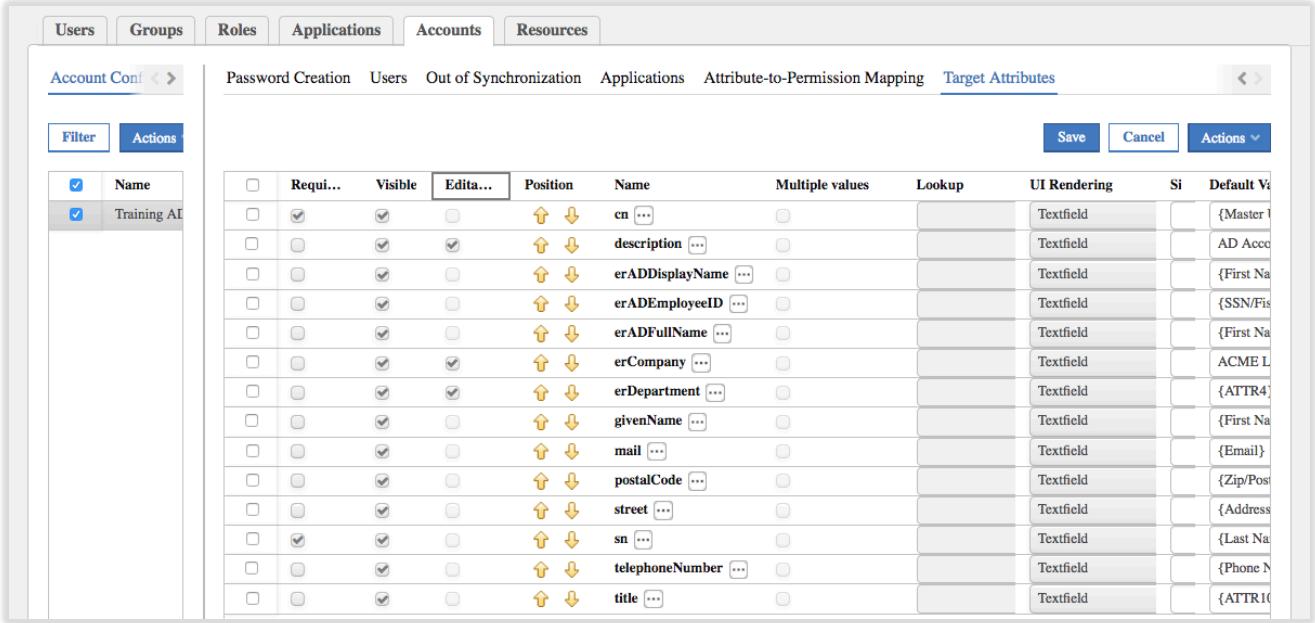
These are the attributes that will show in the Admin Console and Service Center and will also be used when IGI automatically creates accounts.

- For each attribute set the following:
- **Required** – leave blank for now (except cn and sn)
 - **Visible** – leave selected for now (you could have some attributes hidden)
 - **Editable** – leave selected for now (will change when we set enforcement)
 - **Position** – leave as the alphabetic order for now (you would probably re-arrange in a production deployment into logical groupings like name, address, business details etc.)
 - **Name** – for each attribute we want to set the label as per the table below. Click the ellipses button ([...]) beside the Name and set the English label. Note that the Labels do not change the Name displayed on this view.
 - **Multiple value** – leave unselected
 - **Lookup** – not set (we aren't setting any lookup values, but in a production deployment you may do so for fixed values, like titles)
 - **UI Rendering** – leave all as textfield
 - **Size** – leave as blank (you could change the textfield box length if you wanted)
 - **Default Value** – some of these will be based on strings, some on Person attribute values and some a mix. Enter the values as shown in the following table (can use the User.field button)
 - **Enforce User value** – as per the following table

Attribute	Label	Default Value (strings and/or User.field value)	Enforced (Y/N)
cn	Common Name	{Master UID}	Y
description	Description	AD Account provisioned from IGI for {First Name} {Last Name}	
erADDisplayName	Display Name	{First Name} {Last Name}	Y
erADEmployeeID	Employee ID	{SSN/Fiscal Code}	Y
erADFullName	Full Name	{First Name} {Last Name}	Y
erCompany	Company	ACME Ltd.	
erDepartment	Department	{ATTR4}	
givenName	First Name	{First Name}	Y
mail	Email Addr	{Email}	Y
postalCode	Zip/Postcode	{Zip/Postal Code}	Y
sn	Last Name	{Last Name}	Y
street	Street	{Address}	Y
telephoneNumber	Phone Number	{Phone Number}	Y
title	Title	{ATTR10}	Y

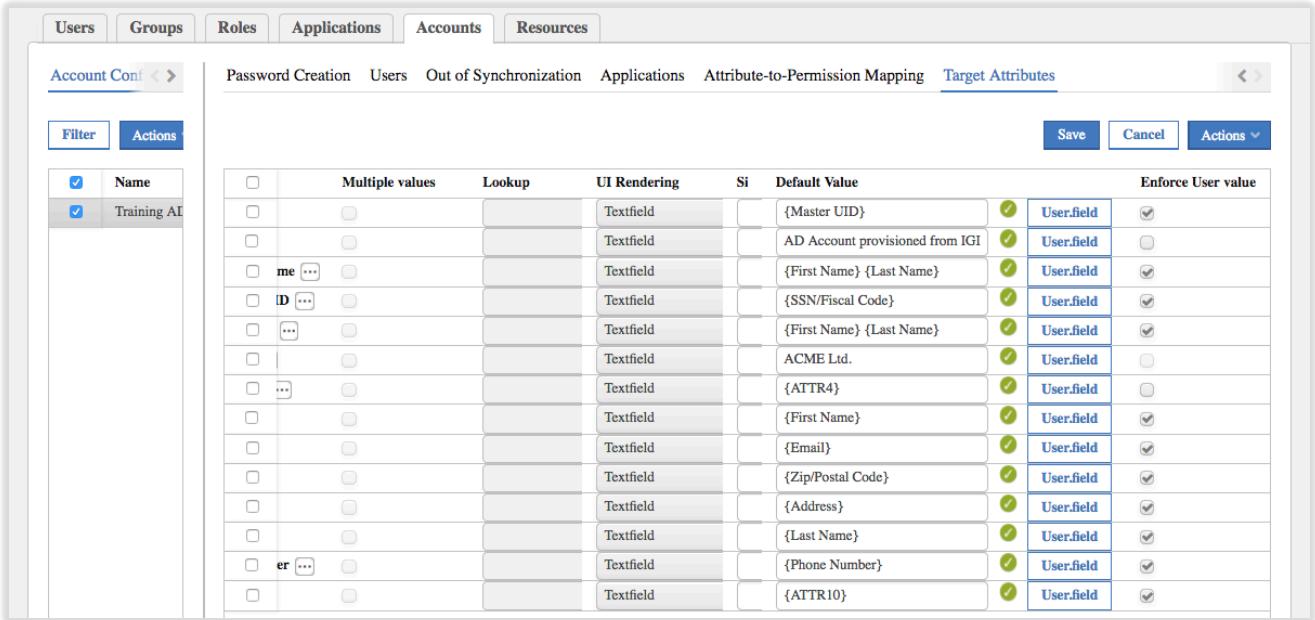
Save the changes

The result should look like this (with a bit of column resizing)



This screenshot shows the 'Target Attributes' configuration page. The left sidebar has 'Filter' and 'Actions' buttons. The main area lists attributes with columns for 'Requi...', 'Visible', 'Edita...', 'Position', 'Name', 'Multiple values', 'Lookup', 'UI Rendering', 'Si', and 'Default Value'. The 'Name' column contains attribute names like 'cn', 'description', 'erADDisplayName', etc. The 'UI Rendering' column shows 'Textfield' for most attributes. The 'Default Value' column includes placeholders like '{Master UID}' and '{First Name}'. Buttons for 'Save', 'Cancel', and 'Actions' are at the top right.

Scrolling to the right...



This screenshot shows the same 'Target Attributes' configuration page after scrolling to the right. It includes an additional column 'Enforce User value' with checkboxes. Most checkboxes are checked, indicating that the corresponding attribute values will be enforced. The rest of the table structure is identical to the first screenshot.

We have now set AD account attributes to be defined based on corresponding user account attribute values (or strings/combinations) and also set that most of them will be enforced in the right circumstances (more on this later).

FYI, there are many person attributes we can access to use in defining target attributes. The following table gives a list with examples (for our training system). ATTRnn may be different in other deployments. If you have extended the UserERC schema with your own attributes, you can access them as well. You could also use custom attributes and populate them in mapping rules in the connector (see the pre- and post-mapping rules in the different channel modes in the Enterprise Connector module).

User Attribute	Contains	Example
USER_TYPE	User type	Employee
OU	Department or Org Unit	Legal
PM_CODE	Master UID (Userid)	SChang
GIVEN_NAME	First Name	Shirley
SURNAME	Last Name	Chang
EMAIL	Email	Shirley.Chang@acme.com
PHONE_NUMBER	Phone Number	555 123456
GENDER	Sex	Female
BIRTHDAY	Date of Birth	11/01/1960
ADDRESS	Address (house, number, street)	1 High Street
CITY	City	Hightown
???	State (training data uses Nation for State)	PA
NATION	Country (training data uses Nation for State)	USA
ZIPCODE	Zip/Postal Code	12345
IDENTIFICATION_NUMBER	CODFISC (we will use for employee id)	AA12345
ATTR1	Userid of the manager	DFox
ATTR2	Are they flagged as a department manager	N
ATTR3	Highest education level	Upper Secondary
ATTR4	Department	ACME IT
ATTR7	Position	S
ATTR9	Changed	
ATTR10	Title	Solicitor

We are not using any Attribute Permissions in this lab. Next, we will setup some of the AD groups for access requests and default assignment.

3.3.3 Configure Entitlement Management and Default Entitlements

As we saw earlier, we have sixty-four (64) groups in IGI reconciled from the AD system. As noted earlier, they are all sitting there in an unpublished state, which means they are not visible from an access request perspective, nor will that be automatically assigned to any users. We want to fix this for some groups.

To see the group for the new AD system:

- In the Admin Console, go to **AGC > Manage > Roles**
- Filter to search for **Application = Training AD**

Name	Application	Description
Protected Users	Training AD	Members of this group are afforded additional protection against authentication security threats. See http://go.microsoft.com/fwlink/?LinkId=298939 for more information.
WseAllowMediaAccess	Training AD	Users with permissions to access media.
WseAllowDashboardAccess	Training AD	Users with permissions to access dashboard.

You should see the sixty-four groups shown. The names and descriptions have been pulled from AD.

We are going to work on six groups as shown in the following table. You may want to scroll through the list to find each or use the filter function. For each group in the following table:

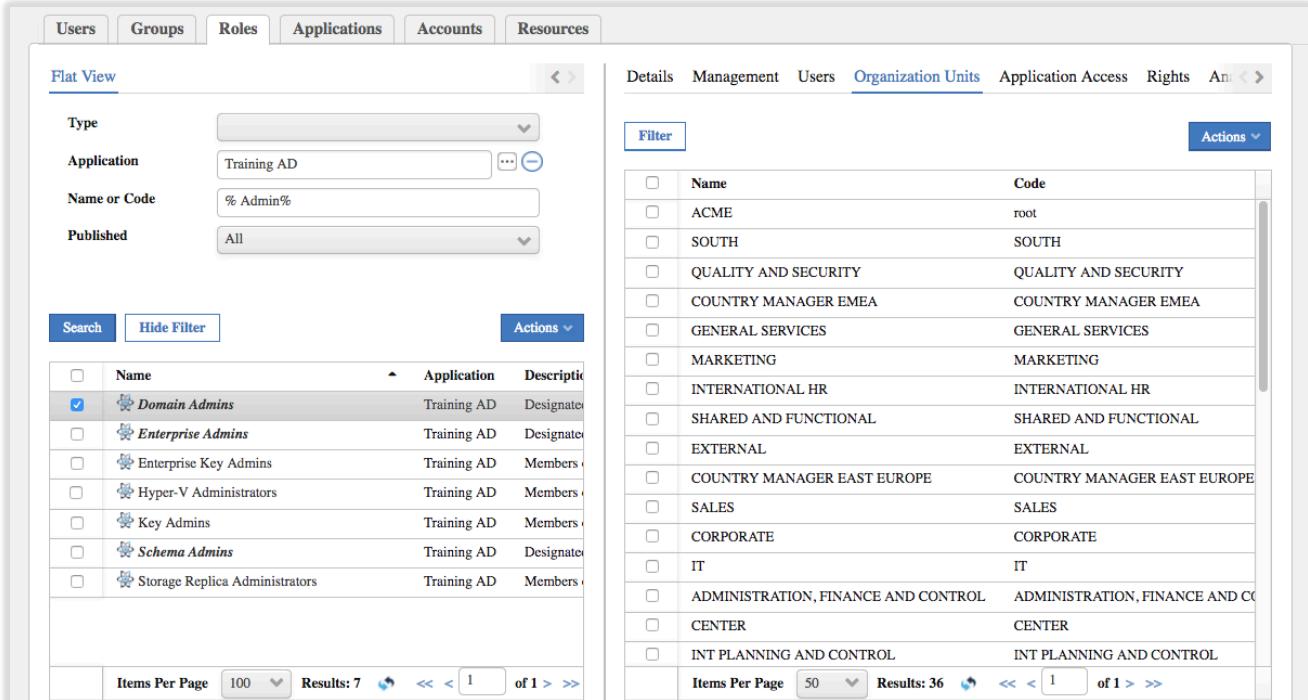
- Select the group in the left pane
- Select **Actions > Publish** and click **OK** on the information dialog (note that the group changes to bold+italic font)
- Go to the **Organization Units** tab in the right pane

If there was already an account-group mapping for this group, when you publish the group you will see that the organizational unit of the user is already defined in the Organization Units view. This will be the case for NorthRegion and SouthRegion. In this case you do not need to do the next steps.

- Use **Actions > Add** (in the right pane) and on the **Group Selection** dialog, select the org unit listed in the table below and click **OK**
- When the **Insert Group Entitlements** dialog appears, set the **Default**, **Visibility Violation**, **Enabled** and **Hierarchy** settings as per the table and click **OK**, then click **OK** on the Information dialog
- Repeat for all groups in the table.

Group	Org Unit	Default	VV	Enabled	Hier.
NorthRegion	NORTH (in PRODUCT DIVISION)	N	N	Y	Y
SouthRegion	SOUTH (in PRODUCT DIVISION)	N	N	Y	Y
Domain Admins	SYSTEMS ADMINISTRATION (in CORPORATE / IT)	<u>Y (& align)</u>	N	Y	Y
Domain Admins	ACME	N	Y	Y	Y
Enterprise Admins	ACME	N	Y	Y	Y
Schema Admins	ACME	N	Y	Y	Y

Note that we have two settings for the Domain Admins group. If a user is in the System Administration org unit they will automatically get added to the group (and will not be flagged with a visibility violation). All other users can request the access, but it will be flagged as a visibility violation.



The screenshot shows the IBM Security interface with the 'Groups' tab selected. On the left, a 'Flat View' search panel includes fields for Type (set to Application), Application (Training AD), Name or Code (% Admin%), and Published (All). Below this is a list of groups with checkboxes and icons. The 'Domain Admins' group is selected. On the right, the 'Organization Units' tab is active, showing a hierarchical tree of units. The root node is 'root'. Other visible nodes include 'SOUTH' under 'PRODUCT DIVISION', 'QUALITY AND SECURITY', 'COUNTRY MANAGER EMEA', 'GENERAL SERVICES', 'MARKETING', 'INTERNATIONAL HR', 'SHARED AND FUNCTIONAL', 'EXTERNAL', 'COUNTRY MANAGER EAST EUROPE', 'SALES', 'CORPORATE', 'IT', 'ADMINISTRATION, FINANCE AND CONTROL', 'CENTER', and 'INT PLANNING AND CONTROL'. At the bottom of both panels are pagination controls.

- Go to **AGC > Manage > Groups**
- Expand the **ORGANIZATIONAL_UNIT** view to find and select the **SYSTEMS ADMINISTRATION** org unit
- Go to the **Entitlements** tab and **Filter** on **Application** = Training AD

Hierarchy: ORGANIZATIONAL_UNIT

Actions: Actions ▾

Type: Training AD

Application: Training AD

Name or Code:

Enabled: Administrative

	VV	Default	Name	Application	Description
<input type="checkbox"/>	!		Schema Admins	Training AD	Designated administrators of the schema
<input type="checkbox"/>	!		Enterprise Admins	Training AD	Designated administrators of the enterprise
<input type="checkbox"/>	✓		Domain Admins	Training AD	Designated administrators of the domain
<input type="checkbox"/>			AllEmployees	Training AD	

This shows there are four AD groups visible to users in the Systems Administration org unit, and the Domain Admin group is set to default.

- Go to the **Users** tab to see the users in Systems Administration

Hierarchy: ORGANIZATIONAL_UNIT

Actions: Actions ▾

First Name: Margie

Last Name: Chandler

Master U...: A251333

Group Name: SYSTEMS ADMINISTRATION

Group Code: SYSTEMS ADMINISTRATOR

First Name: Marissa

Last Name: Leist

Master U...: A231873

Group Name: SYSTEMS ADMINISTRATION

Group Code: SYSTEMS ADMINISTRATOR

- Now go to **AGC > Manage > Users** and find Margie Chandler
- Confirm that she does now have the AD Domain Administrators group

Assigned

View: Search

Actions: Actions ▾

	VV	Name	Application	Group Name	Group Code
<input type="checkbox"/>		Employee	SYSTEMS ADMINISTRATOR	SYSTEMS ADMINISTRATOR	SYSTEMS AD
<input type="checkbox"/>		Domain Admins	Training AD	SYSTEMS ADMINISTRATOR	SYSTEMS AD
<input type="checkbox"/>		AllEmployees	Training AD	SYSTEMS ADMINISTRATOR	SYSTEMS AD

Setting the Domain Administrator group to Default with "Yes, and align users" meant that IGI added that group to any user already in the Systems Administration org unit. This triggered events to the OUT queue to be processed by the adapter.

To check this:

- Go to AGC > Monitor > OUT events

ID	Account ID	Master U...	Operation	Status	ERC Sta...	Tr...	Detail	Marker	Application	Operation Code	ATT
73877	A231873	A231873	Add Permission	Success	Success		Training AD	Training ...	I		Dom
73876	A251333	A251333	Add Permission	Success	Success		Training AD	Training ...	I		Dom
73875	AY58582	AY58582	Add Permission	Success	Ignored		Training AD	Training	MR_TARGET_108784 null		Nor

There should be two “Add Permission” events for out two users (Margie A251333, and Marissa A231873).

If the events are sitting in an Unprocessed state for some time, you may need to check for the time drift problem (see the Lab Setup Guide). Often the training image will have problems with time differences between components, leading to events sitting in queues or JDBC commit problems.

If the Status is Success but the ERC Status is in Error and there is a Trace message, there may be a problem with the connector in the Enterprise Connectors module or the adapter itself. You should first check, and perhaps restart, the connector in Enterprise Connectors. With that ok, try to re-execute the events (Monitor view, select the event(s) and Actions > Re-execute). If there is still an issue, you may need to look in the Enterprise Connector, Identity Brokerage or agent logs.

To confirm the provisioning worked as expected:

- Log into the **Windows Server UI** (NetworkAdmin/Passw0rd)
- Select **Active Directory Users and Computers** from the taskbar
- Expand the tree to go to the **Users** folder
- Open the **Domain Administrators** group
- Select the **Members** tab

Name	Active Directory Domain Services Folder
A231873	IAMIGIAD.local/Users
A251333	IAMIGIAD.local/Users
Administrator	IAMIGIAD.local/Users
NetworkAdmin	IAMIGIAD.local/Users

You should see our two users (Margie A251333, and Marissa A231873) listed there.

You can also check the User entries to confirm each are a member of the Domain Admins account.

We have demonstrated part of the provisioning use case. If we were to create a new user in the Systems Administration org unit in IGI, or move an existing user to there, they would automatically be assigned to the Domain Admins group. This is how IGI implements RBAC. In the next section we will setup Access Requests.

3.3.4 Configure Access Request Management Workflow

The standard IGI model is that if someone requests an entitlement for a target where they don't already have an account then IGI will generate the event to create the account as well as the event to add the permission to the user. We will leverage this in the provisioning use case.

We need to find an existing workflow that meets our needs or build a new one and configure it to support the attribute mapping we defined earlier.

3.3.4.1 Exploring Access Request Workflows

We are after a simple access request workflow where a user requests an access and their manager approves. There should be one like that in the training environment.

To explore:

- Log into the Admin Console (`admin/admin`) and go to the **Process Designer** module
- Go to the **Manage** tab
- Filter on a **Context** of User Access Change

Type	Article	Name	Context
Workflow	💻	Access Request [Personal]	User Access Change
Workflow	💻	Access Request [SoD]	User Access Change
Workflow	💻	Access Request [Enterprise Roles]	User Access Change

There are three there that may suit.

- Select the Access Request [Personal] workflow process and go to the **Configuration** tab

This certainly looks like what we need; a generate activity ("Self Create Request"), an authorize activity ("Auth Request [Manager]") and an execute request.

- To confirm the participants of this workflow, go to the **Assign** tab and check the **Admin Role** assigned to both the “Self Create Request” and “Auth Request [Manager]” activities.

The screenshot shows the IBM Security interface with the 'Process' tab selected. In the 'Assign' tab, there are two rows of assignments:

Name	Application
Employee	ACCESSREQUESTS

You should see Employee assigned to the Self Create Request activity, and User Manager assigned to the Auth Request [Manager] activity.

This looks to be an appropriate workflow to use for this scenario.

You can check the other two workflows. You will see that they have similar activities but are assigned to User Manager and Application Manager roles, which is not what we want. We will use the Access Request [Personal] workflow.

3.3.4.2 Configure Workflow

Before changing the workflow, we need to put the workflow into maintenance mode.

- Select the Access Request [Personal] process and Actions > Maintenance
- There are some workflow settings that can be changed with the workflow still online, but it's not clear what these are. It's safest to just put the workflow into maintenance mode, make the changes and then bring it back online.
- Select the **Configuration** tab and click the **Self Create Request** activity
 - Check the **Beneficiary** and **Application** tabs. There is nothing to change here.
 - Click the **Required Data** tab
 - Scroll down the list of settings to find the **Enable Account Creation** item (you may want to use the horizontal slider to make the lower part of the dialog larger)

Beneficiary	Application	Required Data	Entity Scope
	Enable Like View	true	Enable the Like View capability
	Enable dashboard	false	Enable the Dashboard view of the
	Show business activities of the user	false	Set to True to show the business
	Enable Account Creation	true	Enable the Account Creation ste
	Applicant's password	false	The applicant is required to ente
	Change password mode	Entered by applicant	Select the change password mod
	Show Current/Doctors data	false	Show the Current/Doctors con

- Change **Enable Account Creation** to true

This setting will show an extra form in the access request flow specifying account attributes. This will allow us to see the person-account attribute mapping working.

- Click the **Entity Scope** tab
- In the **Account Configuration** pull-down list, select the `Training AD` application

Activity

Type	WorkFlow	Mode	Generation
<u>Activity scope</u>			
Beneficiary	Application	Required Data	<u>Entity Scope</u>
Account Configuration 		Training AD	Load Restore Default

- Click the **Load** button to define the attributes to be presented in the account creation form

Activity

Type	WorkFlow	Mode	Generation																																																								
<u>Activity scope</u>																																																											
Beneficiary	Application	Required Data	<u>Entity Scope</u>																																																								
Account Configuration 		Training AD	Load Restore Default																																																								
<u>Target Attributes</u> <u>Details</u> <table border="1"> <thead> <tr> <th>Mandat...</th> <th>Visible</th> <th>Edita...</th> <th>Or...</th> <th>Localized field</th> <th>Field</th> <th>UI Rendering</th> <th>Default Value</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td>Email Addr</td> <td>mail</td> <td>Textfield</td> <td>{Email}</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td>Zip/Postcode</td> <td>postalCode</td> <td>Textfield</td> <td>{Zip/Postal Code}</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td>Street</td> <td>street</td> <td>Textfield</td> <td>{Address}</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td>Last Name</td> <td>sn</td> <td>Textfield</td> <td>{Last Name}</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td>Phone Number</td> <td>telephoneNumber</td> <td>Textfield</td> <td>{Phone Number}</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td>Title</td> <td>title</td> <td>Textfield</td> <td>{ATTR10}</td> </tr> </tbody> </table>				Mandat...	Visible	Edita...	Or...	Localized field	Field	UI Rendering	Default Value	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Email Addr	mail	Textfield	{Email}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Zip/Postcode	postalCode	Textfield	{Zip/Postal Code}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Street	street	Textfield	{Address}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Last Name	sn	Textfield	{Last Name}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Phone Number	telephoneNumber	Textfield	{Phone Number}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Title	title	Textfield	{ATTR10}
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OK Cancel																																																											

We could change the order of attributes displayed and whether they are visible and editable or not. We won't change anything.

- Click **OK** to save the changes and return to the workflow configuration screen

- Select the Auth Request [Manager] activity and have a look at the **Beneficiary**, **Application**, **Entitlement** and **Required Data** tabs

There is nothing to be changed for the beneficiary, applications or entitlements. On the Required Data tab, there is an option to allow the reviewer to edit the account attributes ("Editing of the Account Attributes"). We will leave it set to false.

- Repeat the step above in the **Entity Scope** tab to import all of the attributes for Training AD
- Leave the settings as they are.
- Click **OK**

There is nothing to do for the Exec Request activity. As this application (Training AD) is set for Automatic Fulfillment, then the Exec Request node will never be called.

Also, we do not need to change the Reminder or Assignment settings for this workflow.

- Select the **workflow** and select **Actions > Online** to bring the workflow back online.

It is now ready to be used to request Training AD access. This completes the configuration required for the provisioning scenario.

3.3.5 Configure User Modify Rule (for Attribute Enforcement)

This is the last bit of configuration and is used for the reconciliation (with attribute enforcement) use cases.

As we have seen in earlier sections, we can configure Target Attribute mapping in the Account Configuration so account attributes default to person attribute values, strings or combinations of them. If we create an account in the Service Center or request a permission that also needs a new account, the account attribute values will default to the linked person attribute values (or strings or combinations).

We can also flag those mapped Target Attributes as enforced ("Enforce User value" setting for each Target Attribute). This means that if a user is modified in the Admin Console or Service Center, IGI will re-evaluate any enforced mapping and send a modify event for that account to the target system.

For this user scenario, we want any enforced mapping when we run a reconciliation. Say that we have an attribute set from the user driven by a HR feed (such as title or office location) and we want that user value to be applied to our AD system, even if someone changes the account attribute value on the target system. In an ideal world (and hopefully in some future version) IGI would re-evaluate any attribute mapping policy on an account recon (like ISIM does).

In the current version of IGI we have to trick it into doing the attribute re-evaluation, and we do that by creating a rule that will run when the modified account is reconciled into IGI. This rule will update a person attribute and trigger that re-evaluation. Note that this is currently unreliable – the mechanism sometimes works and sometimes doesn't. There is a fix being developed to resolve it.

To enable this functionality we need to setup a new attribute on the person as our dummy field for update, map it to an unused attribute in AD and setup the rule to modify this attribute.

3.3.5.1 Configure an Additional UserERC Attribute

We need an attribute that we can update in a rule to trigger the re-evaluation of attribute policy. We could reuse a currently defined attribute but that carries a risk of breaking something else. You could also add a new attribute to the UserERC schema. However, it is safer and easier to use one of the unused generic ATTRnn attributes. We will use ATTR12.

To do this:

- Log into the Admin Console (`admin/admin`) and go to **Access Governance Core**
- Go to **Settings > Core Configuration > User Virtual Attributes**
- Select the `UserErc` database and click the **Attribute Mapping** tab in the right pane

Enabled	Name	Type	Visible	Position	Requi...	Key	Name	Label
<input checked="" type="checkbox"/>	UserErc	Database	<input type="checkbox"/>			<input type="checkbox"/>	OU	OU
<input checked="" type="checkbox"/>	S_User	Database	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	ID	id
<input checked="" type="checkbox"/>	Swim_UserErc	Database	<input checked="" type="checkbox"/>			<input type="checkbox"/>	PM_CODE	_CODE
<input checked="" type="checkbox"/>	UserRegistration	Database	<input checked="" type="checkbox"/>			<input type="checkbox"/>	USER_TYPE	_PERSONTYPE_NAME
			<input checked="" type="checkbox"/>			<input type="checkbox"/>	GIVEN_NAME	_NAME
			<input checked="" type="checkbox"/>			<input type="checkbox"/>	SURNAME	_SURNAME
			<input checked="" type="checkbox"/>			<input type="checkbox"/>	GENDER	SEX

This shows the user attributes currently defined, along with their visibility, order, labels, lookup values, default values and UI rendering. Most of these settings are for user virtual views and workflows, not for the core User ERC view.

ATTR12 is not currently defined so we will define it:

- In the right pane select **Actions > Add**
- On the **Add Attribute** dialog, find and select ATTR12 and click **OK**

The attribute is now in the list. You may want to re-arrange the order of the attribute, but it's not necessary for the lab.

- Select the new attribute and enter a **Label**. This will be used in the rule and appear on the UI. I would suggest "AcctLastRecon" (as we will set a date in the rule).
- Click **Save** and click **OK** on the Information dialog box

Enabled	Name	Type	Visible	Position	Requi...	Key	Name	Label
<input checked="" type="checkbox"/>	UserErc	Database	<input checked="" type="checkbox"/>			<input type="checkbox"/>	ATTR12	AcctLastRecon
<input checked="" type="checkbox"/>	S_User	Database	<input type="checkbox"/>			<input type="checkbox"/>	OU	OU
<input checked="" type="checkbox"/>	Swim_UserErc	Database	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	ID	id
<input checked="" type="checkbox"/>	UserRegistration	Database	<input checked="" type="checkbox"/>			<input type="checkbox"/>	PM_CODE	_CODE
			<input checked="" type="checkbox"/>			<input type="checkbox"/>	USER_TYPE	_PERSONTYPE_NAME

With the new attribute defined, we also need to map it to an unused adapter attribute.

3.3.5.2 Map New Person Attribute to Account Attribute

For this workaround to function, we need to map our new IGI Person attribute to an unused AD account attribute and flag it for enforcement.

As you did earlier:

- Go into **AGC > Manage > Accounts**
- Select the Training AD account
- Go to the **Target Attribute** tab
- Select **Actions > Discover Account attributes from Target**

The screenshot shows the 'Identity Governance and Intelligence' section of the Access Governance Core interface. In the top navigation bar, 'Manage' is selected under 'Configure'. Below the navigation, there are tabs for 'Users', 'Groups', 'Roles', 'Applications', 'Accounts', and 'Resources'. The 'Accounts' tab is active. On the left, there's a 'Filter' button and an 'Actions' dropdown. A modal dialog titled 'Discover Account attributes from Target' is open, containing a table with columns: Name, Description, Required, Visible, Editable, Position, Name, and Multiple. One row is visible: 'Training AD'. At the bottom of the dialog are 'Save', 'Cancel', and 'Actions' buttons.

- On the **Discover Attributes from Target** dialog, find and select `erADEExtension1`, then click Import

I am assuming for the lab that this attribute isn't used. For a production deployment you would need to evaluate what free/unused attributes you have in AD.

- With the new attribute showing in the **Target Attributes** list, check/set the following
 - **Visible** – you may want to hide it from any Service Center data entry workflows
 - **Editable** – disable
 - **Label** – you may want to use the ellipses button [...] to set a label that makes sense if you leave it visible (like "Account Last Recon date/time")
 - **Default value** – "{ATTR12}"
 - **Enforce User value** – enabled
- Save** the Target Attributes

We can now create a rule to use this attribute.

3.3.5.3 Create the Account Modify Rule

We need to create a new rule that will run when a modified account is reconciled into IGI. Note the code is supplied – you don't need to know Java to do this part of the lab.

To setup the rule

- Go to **AGC > Configure > Rules**
- In the left pane select **Rule Class = Live Events**, **Queue = TARGET**, **Rule Flow = ACCOUNT_MODIFY**
- Expand the **ACCOUNT_MODIFY** twisty in the bottom of the left pane (if not already expanded)
- Expand the **Rules Package** section in the right pane (the + icon beside Rules Package)

Name	Description
Find account attributes	[V1.0 - 2016-09-30]
Modify Account	[V1.0 - 2015-09-25]

The Live Events / TARGET queue is where the connectors and adapters write all events into IGI, such as changes from a reconciliation. The ACCOUNT_MODIFY flow rules are run for each Modify Account event. For example, if one of our AD accounts was modified in AD, then next recon would send that account to IGI as a Modify Account event.

Whilst there are two rules sitting in the Rules Package (a library of rules for this event type) only the Modify Account rule is actually run (as shown in the left pane). This rule will perform the actual account modification in IGI (and thus cannot be removed).

We need to add a new rule after this rule to modify the person attribute:

- In the right pane, expand the **Package Imports** section
- Have a look at the code there – it is defining all of the includes for the rules
- Add import com.engiweb.profilemanager.common.bean.ExternalInfo **after the import com.engiweb.profilemanager.common.bean.UserBean**
- Add the following lines **after the import common.direct.DirectFactory and before the first global statement; import java.text.SimpleDateFormat and import java.util.Calendar**

The resulting package imports should look like:

```

import com.engiweb.logger.impl.Log4JImpl
import com.engiweb.profilemanager.backend.dao.db.SQLH
import com.engiweb.pm.entity.BeanList
...
import com.engiweb.profilemanager.common.bean.OrgUnitBean
import com.engiweb.profilemanager.common.bean.UserBean
import com.engiweb.profilemanager.common.bean.ExternalInfo
import com.engiweb.profilemanager.common.bean.entitlement.EntitlementBean
import com.engiweb.profilemanager.common.bean.event.EntStateBean
...
import com.engiweb.toolkit.interfaces.JndiNames
import com.engiweb.profilemanager.common.bean.targetattr.PwdManagementAttrValBean
import common.direct.DirectFactory
import java.text.SimpleDateFormat
import java.util.Calendar

global com.engiweb.profilemanager.backend.dao.db.SQLH sql
global com.engiweb.logger.impl.Log4JImpl logger

```

Note, the order doesn't really matter.

The screenshot shows the 'Rules Sequence' section of the IBM Security interface. On the left, there are filter and action buttons ('Before', 'Run', 'After'). Below these are sections for 'Rule Class' (Live Events), 'Queue' (TARGET), and 'Rule Flow' (ACCOUNT_MODIFY). A 'Hide Filter' button is also present. On the right, there's a sidebar with options for 'Rule Concept', 'Rules Package', and 'Package Imports'. At the bottom right of the sidebar are 'Save' and 'Cancel' buttons. The main area contains Java code for a rule package:

```

import com.engiweb.profilemanager.common.bean.AccountBean
import com.engiweb.profilemanager.common.bean.Block
import com.engiweb.profilemanager.common.bean.OrgUnitBean
import com.engiweb.profilemanager.common.bean.UserBean
import com.engiweb.profilemanager.common.bean.ExternalInfo
import com.engiweb.profilemanager.common.bean.entitlement.EntitlementBean
import com.engiweb.profilemanager.common.bean.event.EvtStateBean
import com.engiweb.profilemanager.common.bean.event.EvtTargetBean
import com.engiweb.profilemanager.common.bean.rule.SynStateBean
import com.engiweb.profilemanager.common.management.action.EntitlementAction
import com.engiweb.profilemanager.common.management.action.OrgUnitAction
import com.engiweb.profilemanager.common.management.action.UserAction
import com.engiweb.profilemanager.common.DBMSException
import com.engiweb.profilemanager.common.bean.AccountAttrValueList
import com.engiweb.profilemanager.common.interfaces.IAccountDirect
import com.engiweb.profilemanager.common.interfaces.IJndiNames
import com.engiweb.profilemanager.common.bean.targetattr.PwdManagementAttrValBean
import common.direct.DirectFactory
import java.text.SimpleDateFormat
import java.util.Calendar
|
global com.engiweb.profilemanager.backend.dao.db.SOLH sal
global com.engiweb.logger.impl.Log4JImpl logger

```

- Click **Save** and click **OK** on the Informational dialog
- Expand the **Rules Package** section
- Click **Actions > Create** to create a new rule package
- On the **Replace With...** dialog provide a rule name such as “Enforce Attribute Policy” and optionally a description
- In the large box, replace the “when then” with the following code:

```

when
    event : EventTargetBean( )
    userBean : UserBean( )
    orgUnitBean : OrgUnitBean( )
    accountBean : AccountBean( )
    accountAttrValue : AccountAttrValueList( )
then
//
// UserERC key attribute used for fake enforce!
final String ENFORCE_KEY = "AcctLastRecon";

// If Identity not found exit
if (userBean == null || userBean.getId() == null) {
    logger.info("No Identity found for account: " + accountBean.getCode());
    return;
}

logger.info("Identity to update to push Enforcing :" + userBean.getCode());

// Get Identity ExternalInfo
ExternalInfo userExternalInfo = UserAction.findExternalInfo(sql, userBean);

// Get todays date and time
Calendar currentTime = Calendar.getInstance();
String stringDate = new SimpleDateFormat("dd-MM-yyyy
HH:mm:ss").format(currentTime.getTime());

logger.info("!!! Current Time: " + stringDate);

// Get Current Key value
try {
    String value = (String) userExternalInfo.getAttribute(ENFORCE_KEY);
    logger.info("Previous Recon Date :" + value);
} catch (Exception ex) {
    // Skip and set 0
}

// Set the new value
userExternalInfo.setAttribute(ENFORCE_KEY, stringDate);

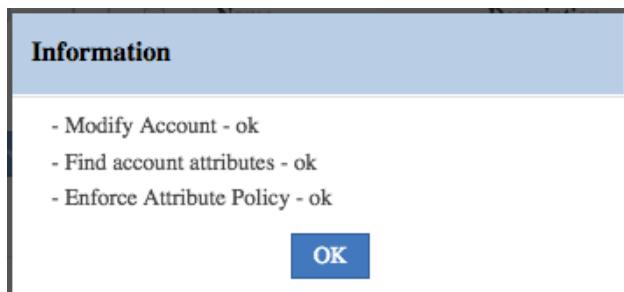
// Update all user attributes
UserAction.modifyUser(sql, userBean, userExternalInfo);

logger.info("Identity Updated!");

```

Make sure you get all of the code. We will explain what the code does in the next section.

- If you didn't give ATTR12 the "AcctLastRecon" label, you need to change the highlighted code to your label
- Click **Save**
- Click **Actions > Verify** to check the code is syntactically correct and the objects/methods can be resolved



If you get errors relating to strings or quotes, it may be the copy and paste. Try pasting the rule code into notepad and then copying to the Rules editor page.

- Click **OK** on the Information dialog
- Now select the **ACCOUNT_MODIFY** in the lower left pane and the new Enforce Attribute Policy rule in the **Rules Package** section and click **Actions > Add**

Name	Description
Enforce Attribute Policy	Update ATTR12 ("AcctLastRecon") with the current date/time to trigger a re-evaluation of the attribute policy.
Find account attributes	[V1.0 - 2016-09-30]
Modify Account	[V1.0 - 2015-09-25]

This should have placed the new rule below the existing one.

This rule is now active and awaiting the next account modify event in the TARGET queue. This completes the IGI configuration for the two lab scenarios. The next section describes the rule we added but is included for information only.

3.3.5.4 Understanding the New Enforce Attribute Policy Rule

This rule will set the current system date/time into ATTR12 which will trigger IGIs re-evaluation of the attribute policy.

The first bit of code checks for the existence of a number of beans that will have been setup by the IGI event processing and store them in local beans we can use in the rule. The rule shouldn't run if all of these beans aren't present.

We have access to the event information (limited value), the user, the OU of the user, the (generic) account and the extended account attributes (in that order below).

```

when
    event : EventTargetBean(  )
    userBean : UserBean(  )
    orgUnitBean : OrgUnitBean(  )
    accountBean : AccountBean(  )
    accountAttrValue : AccountAttrValueList(  )
then
    //
    // UserERC key attribute used for fake enforce!
    final String ENFORCE_KEY = "AcctLastRecon";

```

The ENFORCE_KEY string sets the attribute to be used. Notice that it's using the label of the attribute, not the attribute name itself.

```
// If Identity not found exit
if (userBean == null || userBean.getId() == null) {
    logger.info("No Identity found for account: " + accountBean.getCode());
    return;
}

logger.info("Identity to update to push Enforcing :" + userBean.getCode());

// Get Identity ExternalInfo
ExternalInfo userExternalInfo = UserAction.findExternalInfo(sql, userBean);
```

It then checks that the user bean has been setup by IGI and that the ID is not null. Theoretically this rule shouldn't run if there is no user (i.e. the account is unmatched or an orphan).

The last bit of code will get the external info (the extended person attributes) and store them for use.

The rest of the rule will get the current date+time from the Calendar object, format it into “dd-MM-yyyy HH:mm:ss” (e.g. 31-12-2017 12:01:01) and write it to the ENFORCE_KEY attribute specified above (in our case ATTR12 (which is AcctLastRecon). The try/catch loop is a bit pointless (copied from another example).

```
// Get todays date and time
Calendar currentTime = Calendar.getInstance();
String stringDate = new SimpleDateFormat("dd-MM-yyyy
HH:mm:ss").format(currentTime.getTime());

logger.info("!!! Current Time: " + stringDate);

// Get Current Key value
try {
    String value = (String) userExternalInfo.getAttribute(ENFORCE_KEY);
    logger.info("Previous Recon Date :" + value);
} catch (Exception ex) {
    // Skip and set 0
}

// Set the new value
userExternalInfo.setAttribute(ENFORCE_KEY, stringDate);

// Update all user attributes
UserAction.modifyUser(sql, userBean, userExternalInfo);

logger.info("Identity Updated!");
```

This rule is ready to go and doesn't need any more configuration.

If you later need to change the rule, you need to ensure that the rules engine cache is configured to load it quickly. To check the cache settings, go into Process Designer, select the Rules Engine task and look at the Jobs associated with it. The cacheTime argument shows the cache time (default is 120mins). You can set it to a lower number if you're working on rules. You will need to stop the task, modify the setting, then restart the task for the change to be applied.

When testing, you can check the `accessgovernancecore_event_target.log` (IGI VA LMI, Manage > Custom File Management, log > iga_core folder) for the logger messages from the rule.

3.3.6 Running the Lab Scenarios

As the reconciliation was performed during the adapter setup, there is no need to rerun it (it won't show anything anyway). There are two scenarios we want to run through; Provisioning with account creation, and reconciliation with attribute policy enforcement.

3.3.6.1 Demonstrating Provisioning with New Account Creation

You need to identify a user who doesn't already have an AD account for this. We will use Helen Fang, but any user who doesn't have a Training AD account would work.

To run this scenario:

- Log into the **Service Center** as Helen Fang (HFang/Passw0rd)
- Go to **Access Requests** and note that Helen only has a QA role & JohnsonControls permission (no AD)
- Click on the **Permissions** tab and select Training AD as the application
- Add one of the AD permissions, such as Schema Admins

User Details	User ID	First Name	Last Name	Group	User Type	Risk Status
(i) HFang	HFang	Helen	Fang	CUSTOMER SERVICE	Employee	Low Risk

Actions	Application	Details	Entitlement Name	Entitlement Description	Ow...	VV	Permission T...	Group Name
Add	(i) Training AD	(i)	Schema Admins	Designated administrators of the schema		0	ADGroupProfile	CUSTOMER SERVICE
Add	(i) Training AD	(i)	Enterprise Admins	Designated administrators of the enterprise		0	ADGroupProfile	CUSTOMER SERVICE
Add	(i) Training AD	(i)	Domain Admins	Designated administrators of the domain		0	ADGroupProfile	CUSTOMER SERVICE

- Click **Next**
- On the **Account Attributes** page select the Training AD account

Name
Training AD

Details	
Account ID *	<input type="text"/>
Expiration	<input type="text"/>

Target Attributes	
Common Name *	<input type="text" value="HFang"/>
Description	<input type="text" value="AD Account provisioned"/>
Display Name	<input type="text" value="Helen Fang"/>
Employee ID	<input type="text"/>
Full Name	<input type="text"/>
Company	<input type="text"/>

This page is shown because we enabled the “Enable Account Creation” flag to true in the workflow activity. If we had left it as false, this page would not be displayed and IGI would generate the account with attribute values in the background.

The page allows specification of the Account ID. It is a mandatory field.

Note, there is currently a limitation in IGI such that this field cannot be pre-populated. Whilst the policy for UserID creation is in the Account configuration (in this case the ID is equal to the Ideas account id), IGI must be evaluating it later in the flow. You just have to enter a value in to proceed past this screen.

The page also shows the Target Attributes we configured above. They are in the same order as defined in the workflow activity (we didn't change the order). Most of the attributes are read only, except for Description, Company and Department that we left editable. Note how the values have been created from the person attributes (or blank if there is no corresponding person attribute value).

Right at the bottom of the page is the Password section. This specifies the account password and must be set.

- Enter a **New Password** and **Confirm Password** (any password, we won't use it)

Notice that the password policy is evaluated as you type the new password.

- Click **Next**

The screenshot shows the 'Personal Access Request' tab selected. At the top, there are tabs for 'Personal Access Request', 'Access Delegation Request', and 'My Requests'. Below these are navigation links for 'Catalog', 'Account Attributes', and 'Shopping Cart (1)'. The main area displays a user profile table:

User Details	User ID	First Name	Last Name	Group	User Type	Risk Status
	HFang	Helen	Fang	CUSTOMER SERVICE	Employee	

Below the profile table are two input fields: 'Priority' (set to 'Unassigned') and 'Request Notes' (an empty text box). At the bottom of the page is a table showing a single row of entitlements:

Operation	Name	Value	Application	Group Name	Hierarchy	Description	VV
		Schema Admins	Training AD	CUSTOMER SERVICE		ORGANIZATIONAL_UNIT	Designated administrators of the schema

Notice that the new permission has the Visibility Violation flag set (VV orange icon). This is because we set Visibility Violation on the entitlement when we associated it with the org tree. The use of VV allows us to flag entitlements that we want to flag as possible risks (we could also create Sensitive Access risks and map them to these permissions, but that is more work – use of VV is a simpler approach).

- Click **Submit** and **OK** on the Request Submitted dialog

We need to approve this change as the manager:

- Log out and back into the Service Center as `DFox (Passw0rd)` – Helen's manager
- Go the **Access Requests**
- Go to the **User Manager** tab and **Authorize Employee Request**
- Select the **sub-request ID** for the `Role Assign` request for Helen (it should be at the top)
- In the top panel on the right is an Accounts to assign label with an information icon. Click the icon.

This view shows all of the account attributes for the new account. Note that they are all read-only.

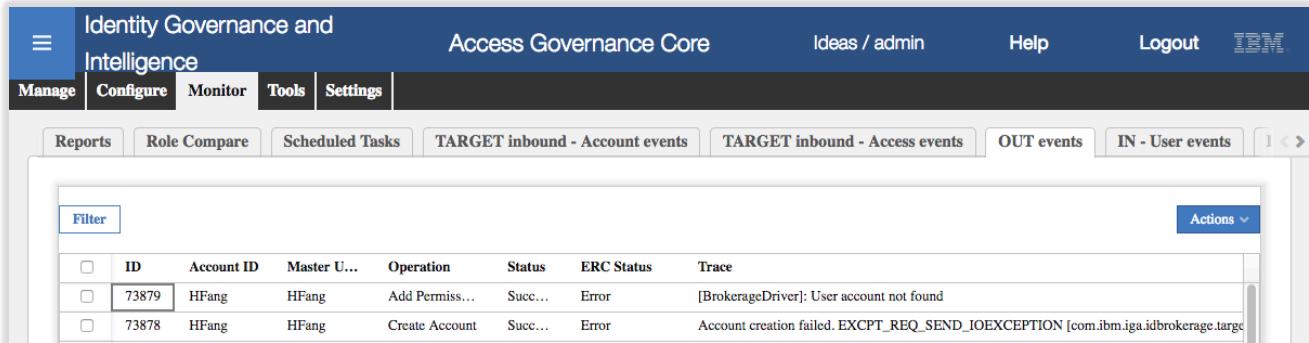
- Click **Close**
- On the request pane click **Approve**
- Click **OK** on the Details dialog

The request has disappeared off David's request list.

Next, we will check that the changes have been applied:

- Log out of the Service Center and log into the **Admin Console** (admin/admin)
- Go to **AGC > Monitor > OUT events**

You should see two events for HFang, a Create Account and an Add Permission event.



ID	Account ID	Master U...	Operation	Status	ERC Status	Trace
73879	HFang	HFang	Add Permiss...	Succ...	Error	[BrokerageDriver]: User account not found
73878	HFang	HFang	Create Account	Succ...	Error	Account creation failed. EXCPT_REQ_SEND_IOEXCEPTION [com.ibm.iga.idbrokerage.targe

If the Status is Success, then all of the internal IGI processing of the event (including any rules) completed successfully. If not, there may be some problem with the rules.

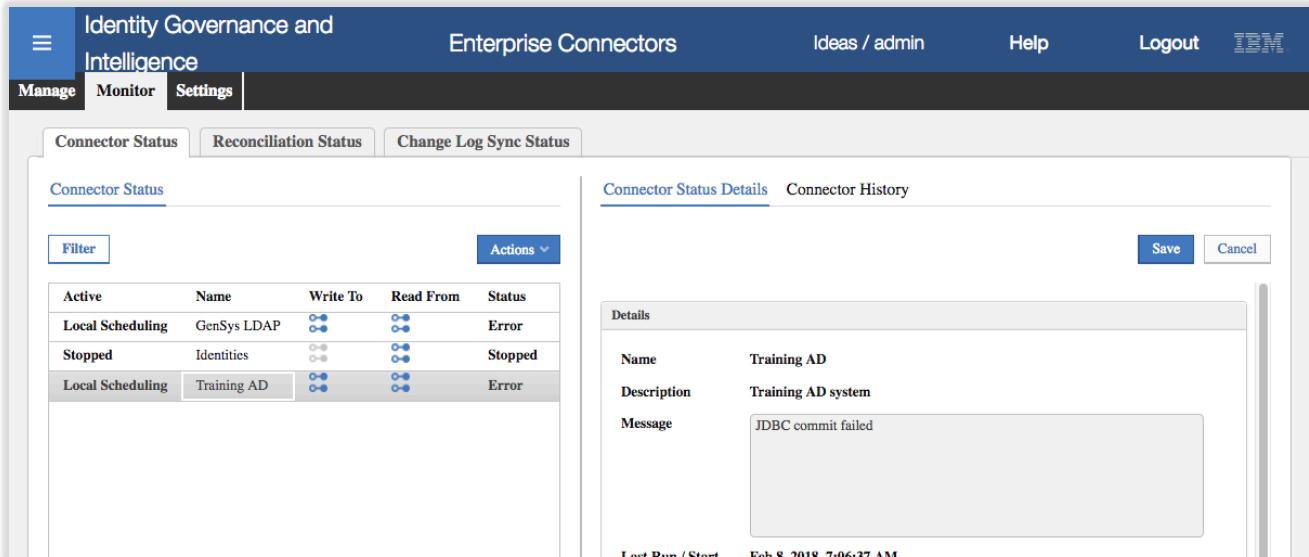
If the ERC Status is Success, then the provisioning to AD worked. If not, there was a problem with the provisioning. That could mean a problem with the connector in the Enterprise Connectors module, a problem in the Identity Brokerage, or a problem with the adapter/agent code itself.

Obviously, you should check that the AD system is running.

The first place to check is the connector in Enterprise Connectors (sometimes in the training system when the VA has been connected, the connectors fail) and if there is an error, restart the connector.

To do this:

- Go to **Enterprise Connectors** and look at the **Connector Status**



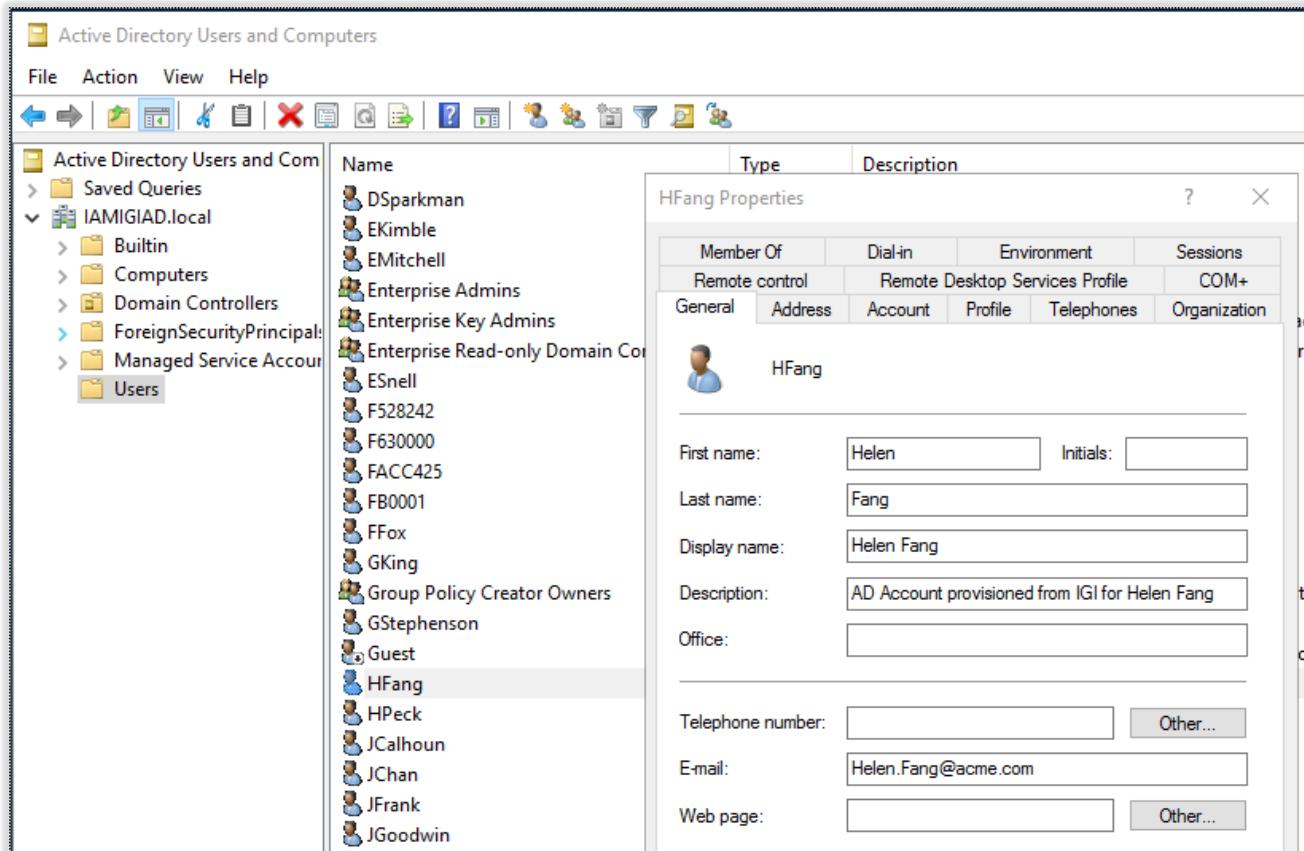
Active	Name	Write To	Read From	Status
Local Scheduling	GenSys LDAP	○○○	○○○	Error
Stopped	Identities	○○○	○○○	Stopped
Local Scheduling	Training AD	○○○	○○○	Error

- If it is in error, use **Actions > Stop** and **Actions > Start** to restart, then go back to **AGC > Monitor > OUT Events**, select the two events and click **Actions > Re-execute**

If this is not the problem, you may need to check the connector logs, the identity brokerage logs and the agent logs. We don't cover debugging in this lab.

When the events are successfully processed we can go into AD and check the results.

- Log into the **AD** system (NetworkAdmin/Passw0rd)
- Open **Active Directory User and Computers** (it's in the task bar/system tray)
- Expand the **Users** folder and look for Helen Fang (will be towards the bottom)
- Double click Helen to see the account details

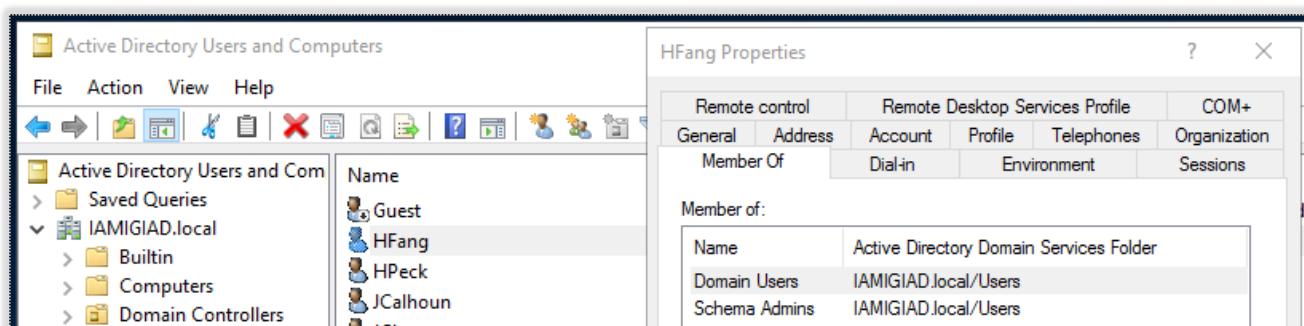


The screenshot shows the 'HFang Properties' dialog box in the foreground, overlaid on the ADUC interface. The dialog box displays various account details for the user HFang. In the background, the left pane shows the navigation tree with 'IAMIGIAD.local' expanded, and the 'Users' folder selected. The right pane lists a large number of users, with HFang highlighted. The properties dialog includes tabs for General, Address, Account, Profile, Telephones, and Organization, with the General tab selected.

You can see the account details based on the mapping we defined in IGI.

- Click on the **Member Of** tab

You should see Helen is a member of Domain Users and Schema Admins.



The screenshot shows the 'HFang Properties' dialog box with the 'Member Of' tab selected. The 'Member of:' section displays two groups: 'Domain Users' and 'Schema Admins', both mapped to 'IAMIGIAD.local/Users'. The background shows the standard ADUC interface with the navigation tree and user list.

This completes this scenario. We have demonstrated that we can create an AD account just by selecting an entitlement in IGI and control the account attribute values based on user attribute values, fixed strings or combinations. We can expose or hide the mapping of these in the access request workflow. These values are carried down through the connector and agent and applied to Active Directory.

In the next section we will look at the reconciliation with attribute policy enforcement use case.

3.3.6.2 Demonstrating Reconciliation with Attribute Policy Enforcement

This flow is a bit more complex than the previous. We want to show that attribute policy enforcement works when a reconciliation is performed.

For this you will need a person who has an account on the AD (perhaps the one from above, like HFang, or one of the ones from the first recon, like PWhiteman/Passw0rd). We will use PWhiteman.

You will also need to select one of the attributes you flagged for enforcement in the target attribute configuration. We will use Title (ATTR10).

The first step is to check/set the person attribute in IGI:

- Log into the **Admin Console** (admin/admin) and go to **AGC** (default view is Manage > Users which we want)
- Find and select **Patricia Whiteman**
- Expand the **Data** section in the right pane to see the extended attributes
- Find the **Title** attribute

The screenshot shows the IGI Admin Console interface. On the left, the 'Users' tab is selected under the 'Manage' menu. The main panel displays a list of users, with one row selected for Patricia Whiteman. The right panel is titled 'Details' and shows the 'Data' tab. The 'Data' tab lists various attributes with their values, including:

Name	Value
City	San Diego
Education - Certification	Tertiary
Manager	DFox
Position	I
Is Dep. Manager	N
Department	ACME Engineering Ltd.
Cod Subarea	
LAST_MOD_USER	
LAST_MOD_TIME	Nov 13, 2015
ACCOUNT_EXPIRY_DATE	
NATION	CA
Title	Auditor
Changed	
ISN	
CREATED_ON	Nov 13, 2015

Buttons for 'Save' and 'Cancel' are visible at the bottom of the data entry panel.

You can see Patricia has a title of Auditor. So, in this scenario we're assuming this value has been set from a HR Feed. In this training environment you will see (next step) that Patricia's AD account does not have that Title value as the account was created and reconciled before we setup the target attribute mapping. However, we want this value to stand no matter what value is set in AD.

Next, we need change the title in AD

- Log into the **AD server** (NetworkAdmin/Passw0rd)
- Open **Active Directory User and Computers** (it's in the task bar/system tray)
- Expand the **Users** folder and look for **Patricia Whiteman** (will be towards the bottom)
- Double click **Patricia** to see the account details
- Go to the **Organization** tab and notice that the **Job Title** is blank
- Enter a new title, like "Supervisor" and click **OK**

The screenshot shows the Windows Active Directory Users and Computers interface. On the left, the navigation pane shows 'Active Directory Users and Computers' under 'Active Directory Users and Computers'. Under 'IAMIGIAD.local', several objects are listed: 'Saved Queries', 'Builtin', 'Computers', 'Domain Controllers', 'ForeignSecurityPrincipals', and 'Managed Service Accounts'. In the center, the properties of a user account named 'PWWhiteman' are displayed. The 'Name' section shows 'Protected Users' and 'PWWhiteman' as members. The 'General' tab is selected in the properties dialog, which contains fields for 'Job Title' (Supervisor), 'Department' (NORTH), and 'Company'.

We now need to either wait for a reconciliation cycle to run, or force. You may be lucky to have the Change Log Sync and Read-From Channel sync occur soon after the change.

We will force it:

- Log into the **IGI Admin Console** (`admin/admin`) and go to **Enterprise Connectors**
- Go to **Monitor > Change Log Sync Status**
- Select the Training AD connector and click **Actions > Sync Now**

The screenshot shows the IBM Identity Governance and Intelligence (IGI) Admin Console. The top navigation bar includes 'Identity Governance and Intelligence', 'Enterprise Connectors', 'Ideas / admin', 'Help', 'Logout', and the IBM logo. The main menu tabs are 'Manage', 'Monitor' (which is selected), and 'Settings'. Below the tabs, there are three buttons: 'Connector Status', 'Reconciliation Status', and 'Change Log Sync Status'. The 'Change Log Sync Status' tab is active. On the left, a 'Connectors' table lists two entries: 'GenSys LDAP' (Status: Stopped) and 'Training AD' (Status: Pending). A 'Filter' button is available. On the right, a 'Status Details' panel shows the connector name 'Training AD'. A 'Sync History' tab is also present. A context menu is open over the 'Training AD' row, with 'Sync Now' highlighted. Buttons for 'Save' and 'Cancel' are visible at the bottom right of the panel.

- Go to the **Sync History** tab and wait for the Sync to complete

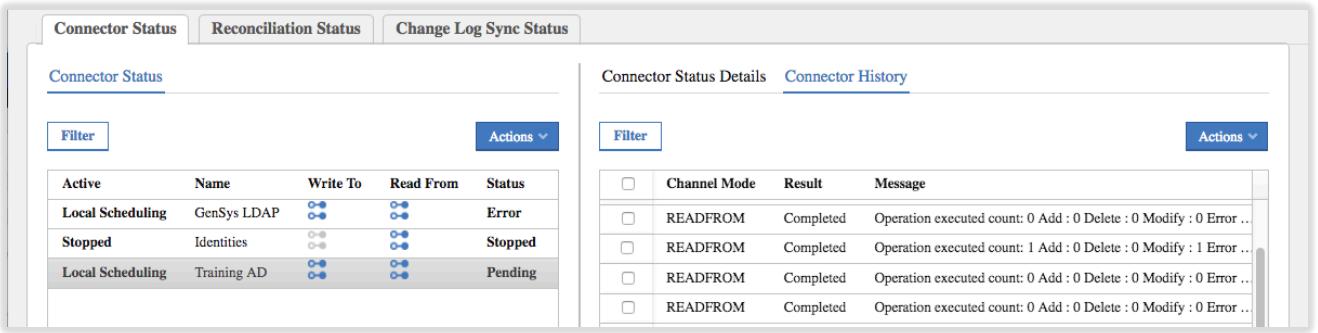
The screenshot shows the 'Sync History' tab for the 'Training AD' connector. The table displays the following data:

Status	Request ID	Started	Completed	Request Details
Success	4479236891	Feb 9, 2018, 5:31:04 AM	Feb 9, 2018, 5:32:17 AM	4479236891 - Feb 9, 2018, 5:31:04 AM - Feb 9, 2018, 5:32:17 AM
Success	4962427740	Feb 9, 2018, 5:25:35 AM	Feb 9, 2018, 5:26:47 AM	4962427740 - Feb 9, 2018, 5:25:35 AM - Feb 9, 2018, 5:26:47 AM
Success	7238805495	Feb 9, 2018, 5:20:34 AM	Feb 9, 2018, 5:21:46 AM	7238805495 - Feb 9, 2018, 5:20:34 AM - Feb 9, 2018, 5:21:46 AM

This means the agent has run a recon and the Identity Brokerage has written and changes to the delta table.

- Go to the **Connector Status** tab and look at the connector history view for Training AD

When we configured the connector earlier we set the changelog sync to every five minutes, whereas the Read From sync for every minute. There should be an event in the history that is newer than the changelog sync and shows one (1) Add operation.

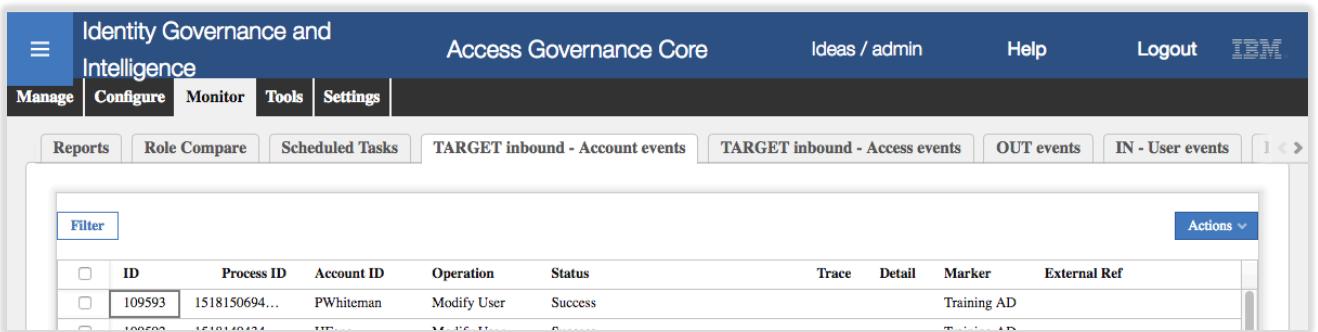


The screenshot shows two main sections. On the left, under 'Connector Status', there are three connectors listed: 'Local Scheduling' (GenSys LDAP, Error), 'Stopped' (Identities, Stopped), and 'Local Scheduling' (Training AD, Pending). On the right, under 'Connector Status Details', a table lists connector status history with rows for READFROM operations completed with various results and messages.

If not, just wait a minute. Note you can force an immediate sync by stopping and starting the connector.

We can now see if the incoming account modify event has triggered the rule and expectant behavior:

- Go to **AGC > Monitor > TARGET inbound – Account events**

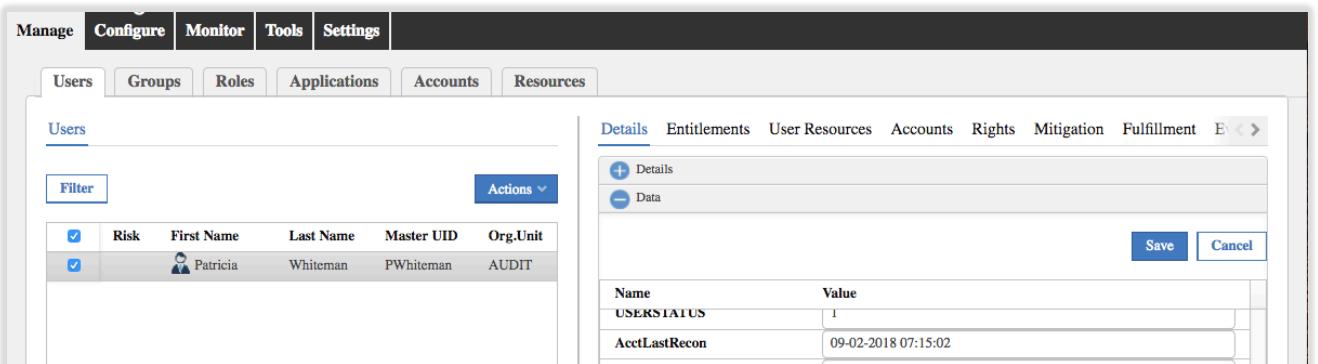


The screenshot shows the 'TARGET inbound - Account events' page. A recent event is listed: ID 109593, Process ID 1518150694..., Account ID PWhiteman, Operation Modify User, Status Success, Trace Training AD. This indicates the rule ran successfully.

There should be a recent Modify User (actually a Modify Account) event for PWhiteman.

If the Status is success, that means that all of the Modify Account rules have run successfully. To confirm:

- Go to **AGC > Manage > Users**
- Find and select Patricia Whiteman and expand the **Data** section in the right pane
- Look for the AcctLastRecon attribute



The screenshot shows the 'Manage > Users' page with Patricia Whiteman selected. In the details panel, the 'Data' section is expanded, showing the 'AcctLastRecon' attribute with a value of '09-02-2018 07:15:02'. This matches the timestamp of the recent Modify User event.

If the attribute is set to a recent date+time, then the rule has executed successfully.

To see if the attribute enforcement worked:

- Go back to **AGC > Monitor > OUT events**

If the enforcement worked there should be a Modify Account event present for PWhiteman.

The screenshot shows the IBM Access Governance Core interface. At the top, there's a navigation bar with tabs for 'Identity Governance and Intelligence' (selected), 'Access Governance Core', 'Ideas / admin', 'Help', 'Logout', and the 'IBM' logo. Below the navigation bar is a secondary menu with tabs for 'Manage', 'Configure', 'Monitor', 'Tools', and 'Settings'. Underneath these are more specific tabs: 'Reports', 'Role Compare', 'Scheduled Tasks', 'TARGET inbound - Account events' (selected), 'TARGET inbound - Access events', 'OUT events', 'IN - User events', and some navigation icons. The main content area contains a table with the following columns: ID, Account ID, Master U..., Operation, Status, ERC Sta..., I, I, Marker, Application, Operati..., ATTR1, and ATTR2. There is one row visible with the values: ID 73883, Account ID PWhiteman, Master U... PWhiteman, Operation Modify Acco..., Status Success, ERC Sta... Success, I, I, Marker Training AD, Application Training AD, Operati... 27dd96..., ATTR1 PWhiteman, and ATTR2.

The account title should be changed to Auditor in AD.

There seems to be a bug in the current training system. Sometimes the attribute re-evaluation works as expected, sometimes you see the person attribute modified (ATTR12/AcctLastRecon) but no re-evaluation occurs nor is there a change sent back to the AD system.

This completes Lab 1.

4 Lab 2 – A User Dept. Move Triggers a Continuous Campaign

This lab is built around the requirement for a manager to review any access after a person changes their department. It will involve configuration and use of:

- Continuous campaigns
- User modify event rules
- User modify workflow and ARM in the Service Center

This Lab only needs the IGI VAand Data Server VMs. It does not need the Windows Server VM.

4.1 Overview of Scenario

This scenario is summarized in the following table. This is just for your information.

Summary	Configuring a continuous campaign and dataset, and java rules for feeding the dataset (based on the Rules guide) and then run some user moves (with contractor management in the service center)
Requirement statement	<p>Users belong to departments, defined in the organizational structure.</p> <p>There are default/enforced permissions associated with each department, along with some optional ones that users can request.</p> <p>When a user moves department their access for that new department must be reviewed by their manager.</p>
Demonstration requirements	<p>Must be able to demonstrate:</p> <ul style="list-style-type: none"> • User move operation • Manager reviews new access in cert campaign
Implementation notes	<p>This will require configuration of the following:</p> <ul style="list-style-type: none"> • Certification - a continuous user entitlement campaign and dataset setup with manager as the reviewer. • Event Rule - rule to add an entry to the cont. campaign dataset hooked into the User Move event • Workflow - user modify workflow enabled with some user attributes, including the org unit <p>Assume: GenSys LDAP is the target, admin roles are there (user manager etc.)</p>
Skills required	<p>Students should have a good grasp of the following:</p> <ol style="list-style-type: none"> 1. Cert campaigns and datasets (B100 trg module) 2. Rules (Rules Guide with cont. campaign examples and D2** trg modules) 3. Workflow (B300/301/B330 trg modules)

You should be able to use the demo/training data in the training image to test this, such as DFox (manager) and PWhiteman (user) both with Passw0rd in the Service Center. The administrator is admin with password admin.

4.2 Lab2 – Detailed Lab Instructions

The following instructions will walk you through the lab setup and execution.

The lab will configure a number of items in IGI to support the following flow:

1. A user manager logs into the Service Center and accesses the User Modify workflow
2. They select the user and change their department
3. This triggers a User Move operation in IGI
4. In response to this operation a custom rule collects all of the entitlements and writes them to a continuous campaign dataset
5. The user manager logs into the Service Center and sees an outstanding Campaign activity for the user change and reviews the changed access.

This involves configuring:

- A certification dataset and campaign
- A user virtual view and workflow process and activities
- A Move User rule

The steps for these are covered in the following section, followed by steps to test the flow.

4.2.1 Configuring the Certification Dataset and Campaign

The following steps describe creating the Campaign Dataset and Certification Campaign. Both are fairly standard IGI configurations, so the following sections won't go into a lot of detail.

4.2.1.1 Create Campaign Dataset

- Create a new certification dataset in **Access Governance Core (Configure > Certification Dataset)**.

The key properties to be specified:

- Type: "User Assignment"
- Name: this can be anything, but will be used in a rule later
- Description: optional

An example is shown below.

The screenshot shows the 'Identity Governance and Intelligence' interface with the 'Access Governance Core' tab selected. Under 'Configure', the 'Certification Datasets' tab is active. On the left, a table lists existing datasets: Target Assignment OOB, Continuous Campaign User Entitlement, Top Relevant Access, AD-SAP, Day Sixty, and Day Seven. On the right, a detailed configuration form is displayed for a new dataset. The 'Type' dropdown is set to 'User Assignment'. The 'Name' field contains 'User Move Dataset'. The 'Description' field contains 'Continuous campaign dataset'. Below the form, a table titled 'Associated Certification Reviews' is partially visible.

- Don't forget to **Save** the dataset

You do not need to specify any of the normal whitelists/blacklists (e.g. Groups, Users, Applications).

The dataset is complete.

4.2.1.2 Create Certification Campaign

- Create a new certification campaign in **Access Governance Core (Configure > Certification Campaigns)**. Unless specified, you can leave the settings as default. The details to be specified are:
 - Campaign name: This can be anything
 - Description: Optional
 - Campaign Type: “User Assignment”
 - Certification Dataset: the name for the dataset from the previous step

An example is shown below.

The screenshot shows the 'Identity Governance and Intelligence' dashboard with the 'Access Governance Core' tab selected. In the top navigation bar, there are links for 'Ideas / admin', 'Help', 'Logout', and the 'IBM' logo. Below the navigation, a secondary menu bar has tabs for 'Manage', 'Configure' (which is selected), 'Monitor', 'Tools', and 'Settings'. Under 'Configure', there are sub-tabs: 'Certification Campaigns' (selected), 'Certification Datasets', 'Admin Roles', 'Rules', 'Notifications', 'Rights Lookup', and 'Hierarchy'. On the left, a 'Certification Search' panel includes a 'Filter' button and an 'Actions' dropdown. A table lists various certification types with icons and names: Enterprise Role Review, Top Applications Access Review, Violation Mitigation Review, Department Access Visibility Review, Departmental Access Review, Company Wide Access Review - Full, Company Wide Access Review, Target Assignments Review, User Transfer Review, Continuous Outlier Review, and Exception Review. On the right, a 'Details' panel for a 'User Move Campaign' is displayed. It includes fields for 'Campaign name' (User Move Campaign), 'Description' (Continuous campaign to review entitlements following a user move), 'Campaign Type' (User Assignment), 'Certification Dataset' (User Move Dataset), and 'Sign off' (Automatic). There are also checkboxes for 'Exclude reviewed since' (set to 1 week), 'Revocation notes mandatory', and 'Allow bulk operations'. At the bottom right of the details panel are 'Save' and 'Cancel' buttons.

- Save** the campaign
- On the **Supervisors** tab, assign a **Supervisor** (Myriam Brewer will be the only one available) and **Save**
- On the **Reviewers** tab, set:
 - The **Scope** as User Hierarchy, Managers
 - The **Default Reviewer** as Shirley Chang
- Leave everything else as is and **Save** the reviewers
- On the **Fulfillment** tab, set to Physical deletion and **Grace Period** to zero days, and **Save**
- On the **Scheduling** tab, set the **Duration** to Continuous (very important!) and **Save**
- We are not using email notification in this lab, but for completeness, on the **Notifications** tab enable the Continuous Review for Reviewer notification, select the Campaign Started template and the **Include review details** checkbox.

The screenshot shows a configuration dialog titled 'Continuous Review for Reviewer'. It includes an 'Enable' checkbox, an 'Email template' dropdown set to 'Campaign Started', a 'Sample' button, and a checked 'Include review details' checkbox.

- Save** the campaign
- Launch the campaign (**Actions > Launch**)

There is no need to View Configuration. The campaign and dataset are now ready to be used in the scenario.

4.2.2 Configuring the User Virtual View and User Modify Workflow

To allow the manager to modify one of their people in the service center, we need to define the appropriate workflow in the process designer. The generate activity in the process will require a user virtual view defined.

4.2.2.1 Define a User Virtual View

A user virtual view defines the user attributes available to user workflows.

- Go to **Access Governance Core > Settings > Core Configurations > User Virtual Attributes**
- Create a new repository (user virtual view) with the following Details:
 - Name: specify a unique name (no spaces)
 - Description: optional
 - Type: DB
 - Connection: External
 - Connection Type: Custom
 - Driver: com.ibm.db2.jcc.DB2Driver
 - URL: jdbc:db2://192.168.42.65:50000/IGI_DB
 - User ID: igacore
 - Password: ideas
 - Table Name: USER_ERC
 - User Database: igacore
 - Key Column: USERERC
 - Query File: ideas_usererc.xml

It should look similar to the following:

The screenshot shows the 'Core Configurations' section of the Access Governance Core interface. On the left, there's a sidebar with 'Identity Governance and Intelligence' and a navigation bar with 'Manage', 'Configure', 'Monitor', 'Tools', and 'Settings'. The 'Configure' tab is selected. In the main area, the 'User Virtual Attributes' tab is active. A table on the left lists existing repositories: 'UserErc' (Database), 'S_User' (Database), 'Swim_UserErc' (Database), and 'UserRegistration' (Database). On the right, a form is displayed for creating a new repository. The 'Details' tab is selected. The form fields are as follows:

Name	UserMoveView
Description	Virtual view for User Move operations
Type	DB
Connection	External
Connection Type	Custom
Driver	com.ibm.db2.jcc.DB2Driver
User ID	igacore
Table Name	USER_ERC
Key Column	USERERC
URL	//192.168.42.65:50000/IGI_DB
Password	*****
User Database	igacore
Query File	ideas_usererc.xml

At the bottom right of the form are 'Save' and 'Cancel' buttons. There is also an 'Enabled' checkbox which is unchecked.

- Do NOT select **Enabled** (the virtual view must be disabled)
- Save** the virtual view

Next, we will set the attributes that can be managed in the user workflow.

- Go to the **Attribute Mapping** tab and select **Actions > Add**

- Select the ID, PM_CODE, OU, GIVEN_NAME and SURNAME attributes and click OK

With the attributes in the **Attribute Mapping** view:

- Make all the attributes **visible**
- Use the position arrows to sort the fields into the following **order**: ID, PM_CODE, GIVEN_NAME, SURNAME and OU **last**
- Click the ellipses button [...] beside the **Label** field for each of PM_CODE, GIVEN_NAME, SURNAME and OU and set the English values to "UserID", "First Name", "Surname", and "Department" (note that these do not show in the Attribute Mapping display)
- Click the ellipses button [...] beside the **Lookup** field for the OU attribute and select Internal and Organization Unit for the **Lookup Options**
- Make the OU the only **Editable** field
- Save**

The attribute list should look like the following:

Details		Attribute Mapping					
		<input type="button" value="Save"/> <input type="button" value="Cancel"/> <input type="button" value="Actions ▾"/>					
	Visible	Position	Required	Key	Name	Label	Lookup
<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		ID	<input type="button" value="..."/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="checkbox"/>		PM_CODE	<input type="button" value="..."/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="checkbox"/>		GIVEN_NAME	<input type="button" value="..."/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="checkbox"/>		SURNAME	<input type="button" value="..."/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="checkbox"/>		OU	<input type="button" value="..."/> Organization Unit

	Default Value	Editable	UI Rendering
	<input type="button" value="..."/>	<input type="checkbox"/>	<input type="button" value="▼"/>
	<input type="button" value="..."/>	<input type="checkbox"/>	<input type="button" value="▼"/>
	<input type="button" value="..."/>	<input type="checkbox"/>	<input type="button" value="▼"/>
	<input type="button" value="..."/>	<input type="checkbox"/>	<input type="button" value="▼"/>
	<input type="button" value="..."/>	<input checked="" type="checkbox"/>	<input type="button" value="▼"/>

We can now define the workflow.

4.2.2.2 Define a User Move Workflow

We will create a new workflow for the user move, involving just the generate step (User Manager) and an execute step (Operator).

- Go to **Process Designer > Manage > Process**

Notice that there is already a Modify User workflow. We will ignore that and create a new one.

- Create a new workflow process (**Actions > Add**) with the following settings:
- Name: Give it a unique name (like Move User)
 - Code: leave blank
 - Description: optional
 - Type: Workflow
 - Status: leave offline for now

This should look similar to the following:

The screenshot shows the IBM Security Process Designer interface. The top navigation bar includes 'Identity Governance and Intelligence' and 'Process Designer'. The 'Configure' tab is selected. The main area has tabs for 'Process' and 'Activity', with 'Process' selected. On the left, there's a table of WorkFlows with columns for Type, Article, and Name. On the right, a 'Details' panel shows fields for Name (Move User), Code, Context, Description (Workflow for manager to change a users department), Type (WorkFlow), and Status (Off Line).

- Click **Next**
- On the **Configuration** tab, click the **Generation** icon (boxes and plus sign icon)
- Select (click) the icon that is now in the workspace
- On the **Activity** dialog, select a **Context** of User Management
- Select the Modify User activity and select **Create**
- On the **Insert Activity** dialog
 - Give it a Name (such as "Request Move User") and Description
 - Select Update User as the Functionality
 - In the Activity Scope > Beneficiary section select All Users Belonging to logged Hierarchy of Managers

Insert Activity

Type	WorkFlow	Mode	Generation
Name	Request Move User	Description	Request the user move
Context	User Management	Context description	This context contains the following functionalities used to manage the users: create and update.
Functionality	Update User	Functionality description	Update User Request

Activity scope

Beneficiary Entity Scope

User Set ...

All Users
 Actor
 All Users belonging to an OU
 Including hierarchy

All Users belonging to logged OU
 Including hierarchy

All Users belonging to logged Hierarchy
 Managers

- Go to the **Entity Scope** tab and click the **Filter** button
- Change the repository to the user virtual view you created above (e.g. `UserMoveView`) and click to link icon to the right

Activity scope

Beneficiary Entity Scope

Repository `UserMoveView`

- Click **Hide Filter** to see all the attributes
- We don't need to change anything, so click **OK**
- Click on the **Execution** icon (pulley wheel icon) to create an **Execution** activity in the workspace
- Click the activity and on the **Activity** dialog, select `Exe User Modify` and click **Create**
- Give it a **Name, Description** and **Functionality** of `Execute Update User`
- As there is nothing else to set, click **OK**
- Click **Next**
- Ignore the **Reminder** settings and click Next
- On the **Assign** tab assign `User Manager` to the generate activity and `Operator` to the execution activity
- Click **Save** to save the workflow process
- Go back to the assignments and check the menu settings

The Assign tab for the generation activity should look similar to the following.

The screenshot shows the IBM Security Process Designer interface. The top navigation bar includes 'Identity Governance and Intelligence', 'Process Designer', 'Ideas / admin', 'Help', 'Logout', and the IBM logo. Below the navigation is a menu bar with 'Manage', 'Configure', 'Monitor', and 'Settings'. The main area has tabs for 'Process' and 'Activity', with 'Process' selected. On the left, there's a list of workflow processes under 'Type' (e.g., WorkFlow) and 'Name' (e.g., Move User, Modify Account). A 'Filter' and 'Actions' dropdown are also present. The right side shows a detailed view of the 'Request Move User' process, including its configuration, reminder, and assignee ('User Manager'). A sidebar lists various user manager actions.

- Set the workflow process status to **On Line** and **Save**.

You can check this process by the following steps:

- Logging into the **Service Center** (as DFox/Passw0rd),
- Go to **Access Requests** and select the **User Manager** tab
- Tab to the right and select the **Request Move User** tab
- Select a user, say Helen Fang, and click **Next**

You should see a User Update form with the five attributes we specified in the user virtual view; ID, PM_CODE, GIVEN_NAME, SURNAME and OU. They should have the labels we set in the virtual view.

The screenshot shows the IBM Security Access Requests interface. The top navigation bar includes 'Identity Governance and Intelligence', 'Access Requests', 'IDEAS / DFox', 'Help', 'Logout', and the IBM logo. Below the navigation is a menu bar with 'Employee' and 'User Manager'. The main area has tabs for 'Authorize Employee Delegation', 'Delegate My Admin Role', 'View Requests', 'Daily Work', 'New Hire', and 'Request Move User', with 'Request Move User' selected. Under 'User Manager', it shows 'Users' and 'User Update'. The 'User Update' form for user 'HFang' (ID: 259) is displayed, showing fields for Priority (Unassigned), First Name (Helen), Surname (Fang), and Department (CUSTOMER SERVICE | CUSTOMER).

The only field that can be changed is the OU. You can click on the ellipses button [...] and select a different OU. We will not do this now. Just logout from the Service Center without submitting the change.

We have defined the workflow to change a user's OU and the campaign to be triggered on the move. The last step is to code the User Move event rule to write to the campaign dataset when a user is moved.

4.2.3 Configuring the Move User Rule

There is already an existing rule for the Move User to trigger a continuous campaign. We will modify that to use our campaign dataset. We will also need to change the rule engine task for the IN queue to reduce the rule cache time down so the changes are applied immediately.

4.2.3.1 Modify User Move Ruleflow

- Go to ACG > Configure > Rules
- Select **Rule Class** = Live Events, **Queue** = IN, **Rule Flow** = USER_MOVE
- In the bottom pane expand Move User to Default Group
- Then expand the **Rule Package** in the right pane

Your view should look similar to the following.

Name	Description
Add To Campaign	[V1.3 - 2015-04-22]
Create Org Unit	[V1.2 - 2016-09-30] - Create the OU if it doesn't exist
Move User (if null 'root' is used as default)	[V1.2 - 2016-09-30] - Move the user to a new OU. If new OU is null
Move User (if null skip event)	[V1.0 - 2016-09-30] - Move the user to a new OU. If new OU is null, e

It's showing that there are already three rules run when a USER_MOVE event is processed; a Create Org Unit rule (to create the new org unit if it doesn't exist), an Add to Campaign rule (which we will modify) and a Move User (if null 'root' is used as default) to actually perform the move.

- In the **Rules Package** section in the right pane, select the Add to Campaign rule and **Actions > Modify** to edit the rule.

This is one of the supplied rules. We will briefly explore the logic before modifying it.

```

when
    userBean : UserBean(  )
    orgUnitBean : OrgUnitBean(  )
then
// [ v1.3 - 2015-04-22 ]

// Templatename --> DefaultEmptyTemplate included in User Transfer Campaign

String tName = "DefaultEmptyTemplate";

```

The first part is the standard when/then clause of the Drools rules engine. It will run when there is a UserBean (i.e. object with the user details) and an orgUnitBean (object with the org unit details). The first line of logic will set the name of the campaign dataset. Note that in the rules and EJB implementation, the term “template” is used to refer to a campaign dataset.

This is the bit of code we will change for our new dataset.

```

TemplateBean templateBean = new TemplateBean();
templateBean.setName(tName);
TemplateDAO templateDAO = new TemplateDAO(logger);
templateDAO.setDAO(sql);

BeanList blTemplateBean = templateDAO.find(templateBean, new Paging(4));
if (blTemplateBean.size()==0) {
    throw new Exception("Template does not exists!");
}
templateBean = (TemplateBean) blTemplateBean.get(0);

```

The next section of code will check to see if the dataset (template) exists and if it doesn't it will throw an exception with the message “Template does not exists!”.

Note that this rule uses the older Data Access Object (DAO) implementation which is being deprecated in preference to the published Direct methods and Actions.

```

BeanList entitlements = UserAction.findJobRoles(sql, userBean);

BeanList listBean = new BeanList();
for (int i = 0; i < entitlements.size(); i++) {
    AbstractBean[] element = new AbstractBean[2];
    element[0] = userBean;
    element[1] = (EntitlementBean) entitlements.get(i);
    listBean.add(element);
}

if (listBean.size() > 0) {
    templateDAO.addEntity(listBean, AttestationRes.TEMPLATE_ENTITY_USERENT, templateBean,
    AttestationTypes.PERSON_ENTITLEMENT.getValue());
}

```

The last bit of code will get the list of entitlements for the user and write them into the certification dataset.

- With the code open in the editor (“**Replace With...**” dialog), change the name of the template to your template name (in the example it is “User Move Dataset”).

Replace With...

Name	Add To Campaign
Description	[V1.3 - 2015-04-22]

```

when
  userBean : UserBean( )
  orgUnitBean : OrgUnitBean( )
then
// [ V1.3 - 2015-04-22 ]

// TemplateName --> DefaultEmptyTemplate included in User Transfer Campaign

String Name = "User Move Dataset";

TemplateBean templateBean = new TemplateBean();
templateBean.setName(Name);

TemplateDAO templateDAO = new TemplateDAO(logger);
templateDAO.setDAO(sql);

BeanList bITemplateBean = templateDAO.find(templateBean, new Paging(4));

```

Click **Save** to close

We could have created a new rule and copied all of the code over to it, but this will do for the lab.

We now need to go fix the rules engine cache setting.

4.2.3.2 Set Rules Engine Cache

- Go to the **Task Planner** module
- Select the `RuleEngine` job and stop it (**Actions > Stop**)
- Go to the **Jobs** tab in the right pane
- Select the `Event IN Dispatcher` job and find the `cacheTime` setting
- Change it from `120` (mins) to `1`
- Save** the change

The job and task should look like the following.

The screenshot shows the IBM Security Task Planner interface. The top navigation bar includes 'Identity Governance and Intelligence', 'Task Planner', 'Ideas / admin', 'Help', 'Logout', and the IBM logo. Below the navigation, there are tabs for 'Manage', 'Monitor', and 'Settings'. The 'Jobs' tab is selected. On the left, a sidebar lists various tasks: AccessRiskControls4SAP, AccessRiskControls4SAPSync, Advanced Rules [Set Default Password], ARMXternalAuthorization, Connectors, EmailService, Feedback, Hierarchies and Reviewers Refresh [De...], Hierarchies Refresh, Housekeeping, HousekeepingAccessRiskControls4SAP, and HousekeepingOptimizer. The main panel shows the 'Event IN Dispatcher' job configuration. The 'Details' tab is selected, showing the following details:

Name	Event IN Dispatcher
Job class	EventInDispatcherJob
Identifier	(empty)
Execution type	Start if parent OK

Below these details is a table of settings:

Mandatory	Name	Type	Value
X	cacheTime	Long	1
X	isDeferred	Integer	0
X	threadNum...	Integer	3

Start the Job

This will mean that the rule cache will be emptied every minute. This is useful for testing where you want your changes to be compiled and available almost immediately. In production the cache setting of 120 minutes means rules will be compiled and loaded once every two hours, which provides better performance.

We are now ready to test the flow end-to-end.

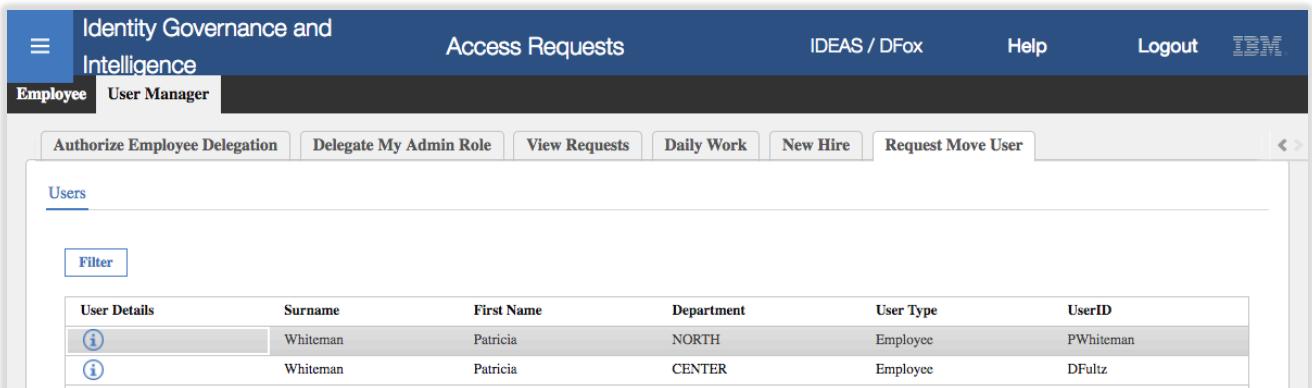
4.2.4 Testing

There are two parts to testing this; perform the user move, then check the recent campaign.

4.2.4.1 Testing the User Move

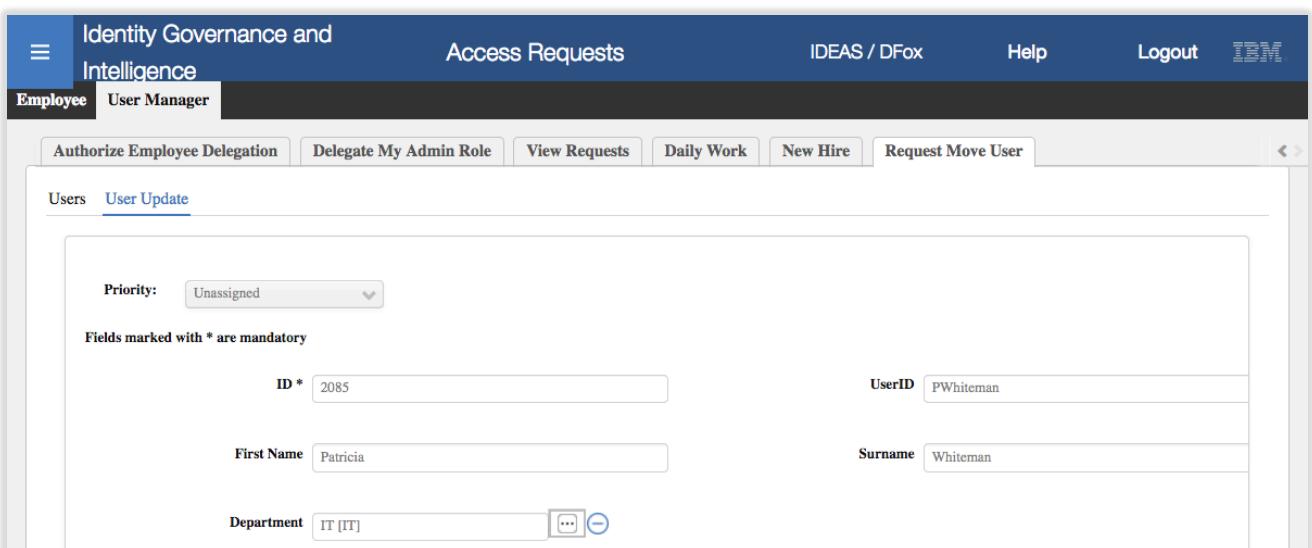
Log into the Service Center as DFox

- Go to the **Access Requests**, select the **User Manager** tab and the **Request Move User** sub-tab
- Find and select Patricia Whiteman (careful, there are two, we want the one in NORTH)

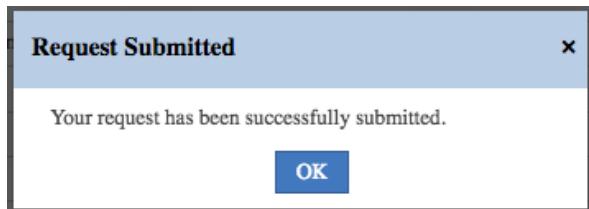


User Details	Surname	First Name	Department	User Type	UserID
(i) Whiteman	Whiteman	Patricia	NORTH	Employee	PWhiteman
(i) Whiteman	Whiteman	Patricia	CENTER	Employee	DFultz

- Click **Next**
- On the **User Update** form, check the fields and then use the ellipses button ([...]) beside **department** to change to **IT** (under **CORPORATE**)



- Click **Submit**



- Click **OK** on the Request Submitted dialog

You can check on the request as follows

- Log into the **Admin Console** (`admin/admin`)
- Go to **Access Governance Core > Monitor > IN – User Events**

You should see two new events, a Move User event and a Modify User event. Unfortunately, neither shows the user details.

ID	User ERC	Operation	Status	Detail	Iden...	OU Code	Action T...	Action Reason	Event Date
7771	2085	Modify User	Success			IT	0	0	Jan 31, 2018 6:45:25 AM
7770	2085	Move User	Success			IT	0	0	Jan 31, 2018 6:45:25 AM

Both should have a status of Success.

If they are still Unprocessed, refresh the screen. If they remain unprocessed for some time (a few minutes) you can check that the time between the VA and data server is in synch (see the time drift problem in the Lab Setup Guide).

For this and other issues, see the later section on debugging issues.

4.2.4.2 Testing the Certification Campaign

- Log back into the **Service Center** as `DFox`

On the dashboard you should see an Access certification status section listing your new campaign.

Type	Campaign Name	Sta...	Supervisor
User Assignment	User Transfer Review	Active	Myriam Brewer [MBr]
User Assignment	User Move Campaign	Active	Myriam Brewer [MBr]

Entitlement Name	Entitlement Type	Applicati...
Employee	Business Role	
User Manager	Business Role	
Networking Role	IT Role	AD

- Click on the new campaign (like User Move Campaign).

You should see Patricia showing.

The screenshot shows the 'Identity Governance and Intelligence' section of the Access Certifier interface. The 'Campaign Management' tab is selected. Below it, the 'Summary' tab is active. The main area displays a table for 'User View' with one row for Patricia Whiteman. The columns include Actions, U..., Master U..., Type, First Name, Last Name, SOD, User Details, OU Name, and % Completion. The user details show Patricia Whiteman as the master user, an employee type, and assigned to the IT OU with 0% completion. A 'Filter' button is also visible.

Actions	U...	Master U...	Type	First Name	Last Name	SOD	User Details	OU Name	% Completion
		PWhiteman	Employee	Patricia	Whiteman		IT		0% [0/ 7]

- Click the **Inspect** icon (spyglass)

You should see all of Patricia's entitlements.

The screenshot shows the 'Campaign Management' tab selected. The 'Details' tab is active. The main area displays a table titled 'User View' with one row for Patricia Whiteman. The columns include Actions, Application Name, Entitlement Name, Group Name, Hierarchy, and Entitlement Description. The table lists various entitlements such as Auditor, Employee, AD, WebConference_MeetingOrganizer, ZSTWEAK, ZSTPERM, ZSLEARNR, and JohnsonControls-P2000, all associated with the IT group and hierarchy. Buttons for 'Back' and 'Filter' are visible at the bottom left.

Actions	Application Name	Entitlement Name	Group Name	Hierarchy	Entitlement Description
Approve Revoke		Auditor	IT		ORGANIZATIONAL_UNIT Auditor
Approve Revoke		Employee	IT		ORGANIZATIONAL_UNIT
Approve Revoke		WebConference_MeetingOrganizer	IT		ORGANIZATIONAL_UNIT Allows the employee to crea
Approve Revoke		ZSTWEAK	IT		OWNER OF TARGET USE
Approve Revoke		ZSTPERM	IT		OWNER OF TARGET USE
Approve Revoke		ZSLEARNR	IT		GROUP FOR LEARNERS
Approve Revoke		Building 10 - Main Entrance	IT		ORGANIZATIONAL_UNIT Building 2000 - Main Entr

You could approve/revoke access from here to complete the process. As there are issues with the account configuration you will not see the changes sent to the target.

4.2.4.3 Diagnosing Issues

This section lists some of the issues you may encounter testing this scenario and how to investigate them.

Recall that the technical flow is:

- Manager logs into the Service Center and accesses the workflows available to him/her based on the workflow activities assigned to their Admin Role in the Access Requests module.
- Manager selects the new Request Move User tab, which is running the generate activity in the User Move workflow process. The form presented is based on the activity configuration which is using the user virtual view we setup.
- Manager changes the department (OU) and submits the request. As there is no approval activity (authorization) in the workflow, IGI processes the request and writes it to the IN queue as User Move and User Modify events.

- The rules engine runs and processes each event. In our case the user move rule flow will write the user and their entitlements to the campaign dataset and move the user. Once the rule flow has run successfully, the status of the events is set to Success.
- The manager logs into the Service Center and sees the user/entitlements in the Move User certification campaign. They can then approve/revoke access.

Looking at this flow, if you can select the user and request the department change in the Service Center, then the workflow and user virtual view are working. If you didn't see the menu tab or the user attribute view on your request user modify tab isn't correct, you should re-check your workflow or user virtual view configuration.

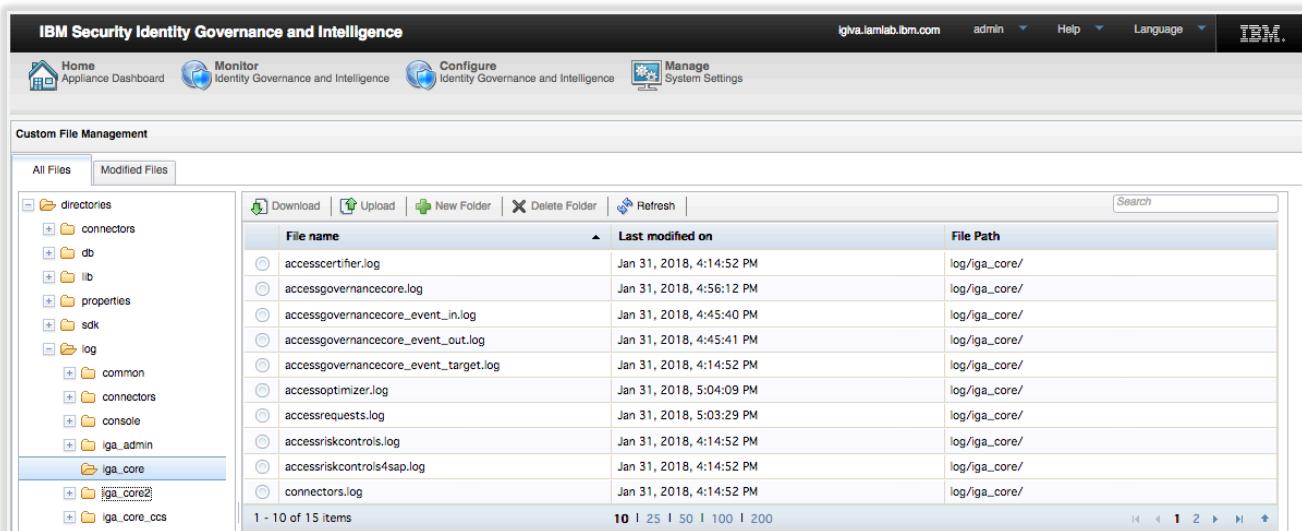
If the event appears in the IN – User Events monitor view, then IGI has written the event.

- If the Status is Unprocessed, then there may be a timing issue with the VA or the rules engine may still be down. Check for the time drift issue, and that the Rules engine is running
- If the Status is Error, then there may have been an unexpected or unhandled error in the rule flow.
- If the Status is Success, then IGI has run the rules for this event. If you're not seeing the user in the campaign, the rule flow may have had a problem that was handled.

If the event is in error or was successful, you will need to go look at the relevant IGI logs. To do so:

- Open the IGI VA LMI (<https://192.168.42.61:9443>) with admin/Passw0rd! (note the exclamation mark)
- Go to Configure > Custom File Management
- Expand the tree to log > iga_core

You should see the IGI application log files



File name	Last modified on	File Path
accesscertifier.log	Jan 31, 2018, 4:14:52 PM	log/iga_core/
accessgovernancecore.log	Jan 31, 2018, 4:56:12 PM	log/iga_core/
accessgovernancecore_event_in.log	Jan 31, 2018, 4:45:40 PM	log/iga_core/
accessgovernancecore_event_out.log	Jan 31, 2018, 4:45:41 PM	log/iga_core/
accessgovernancecore_event_target.log	Jan 31, 2018, 4:14:52 PM	log/iga_core/
accessoptimizer.log	Jan 31, 2018, 5:04:09 PM	log/iga_core/
accessrequests.log	Jan 31, 2018, 5:03:29 PM	log/iga_core/
accessriskcontrols.log	Jan 31, 2018, 4:14:52 PM	log/iga_core/
accessriskcontrols4sap.log	Jan 31, 2018, 4:14:52 PM	log/iga_core/
connectors.log	Jan 31, 2018, 4:14:52 PM	log/iga_core/

1 - 10 of 15 items

There is a common AGC log, `accessgovernancecore.log`, and one for each of the queues, such as `accessgovernancecore_event_in.log`. You can select and download each log.

For the scenario we have here, the `accessgovernancecore_event_in.log` and `accessgovernancecore.log` are likely to give the best information.

For example, the event_in log will show details of the two events (USER_MOVE and USER MODIFY).

```

Jan 31, 2018, 6:45:35 AM INFO AGC:? - ****
*****
Jan 31, 2018, 6:45:35 AM INFO AGC:? - START
    - Event propagation MP_IN_7770_2085
Jan 31, 2018, 6:45:35 AM INFO AGC:? - Evento: [ID=7770, OPERATION=12, TRACE=null, STATE=-1,
DATEPROCESS=2018-01-31 06:45:25.0, DATEEVENT=2018-01-31 06:45:25.0, EXTTABLE=2085, ERC=user_erc,
EXTATTR1=null, EXTATTR2=IT, EXTATTR3=0, EXTATTR4=0, EXTATTR5=null, EXTATTR6=null, EXTATTR7=null,
EXTATTR8=null, EXTATTR9=null, EXTATTR10=null, OWNERSHIP=IGACORE ]
Jan 31, 2018, 6:45:35 AM INFO AGC:? - START
Jan 31, 2018, 6:45:38 AM INFO AGC:? - START
    RuleFlow -> SYSTEM/IN/USER_BEFORE/RUN
Jan 31, 2018, 6:45:38 AM INFO AGC:? - Inserito oggetto
com.engiweb.ruleengine.common.bean.ContainerBean: {}
Jan 31, 2018, 6:45:38 AM INFO AGC:? - Inserito oggetto
com.engiweb.profilemanager.common.bean.event.EventInBean: [ID=7770, OPERATION=12, TRACE=null, STATE=-1,
DATEPROCESS=2018-01-31 06:45:25.0, DATEEVENT=2018-01-31 06:45:25.0, EXTTABLE=2085, ERC=user_erc,
EXTATTR1=null, EXTATTR2=IT, EXTATTR3=0, EXTATTR4=0, EXTATTR5=null, EXTATTR6=null, EXTATTR7=null,
EXTATTR8=null, EXTATTR9=null, EXTATTR10=null, OWNERSHIP=IGACORE ]
Jan 31, 2018, 6:45:38 AM INFO AGC:? - Inserito oggetto
com.engiweb.profilemanager.common.bean.UserErcBean: {EMAIL=pwhite@igi.ibm.com, NATION=CA,
ACTION_TYPE_LAST=null, COUNTRY=null, ID=2085, SCHEDULE=0, BIRTHDAY=null, ACTION_CAUSE=0,
GIVEN_NAME=Patricia, BIRTH_COUNTRY=null, DISABLED=0, POST_EVENT=0, CURRENTOU=null,
USER_TYPE=Employee, AD_OU=null, ADDRESS=null, PHONE_NUMBER=null, ACCOUNT_EXPIRY_DATE=null,
IDENTIFICATION_NUMBER=null, LAST_MOD_TIME=2015-11-13, LAST_MOD_USER=null, DELETED=0, ATTR9=null,
ATTR4=ACME Engineering Ltd., SKIP=0, GENDER=null, ATTR3=Tertiary, BIRTH_PLACE=null, ATTR2=N,
ATTR1=DFox, ATTR8=null, PM_CODE=PWhite, ATTR7=I, ATTR6=null, ACTION_TYPE=0, ATTR5=null,
ATTR12=null, ATTR56=null, ATTR13=null, SURNAME=White, ATTR10=Auditor, ATTR11=null, OU=IT,
ATTR14=null, ZIPCODE=null, ATTR15=null, ACTION_CAUSE_LAST=null, CITY=San Diego, PROCESSED=0}
Jan 31, 2018, 6:45:38 AM INFO AGC:? - STOP
    Process IN/USER BEFORE/RUN
Jan 31, 2018, 6:45:38 AM INFO AGC:? - STOP
Jan 31, 2018, 6:45:38 AM INFO AGC:? - START
Jan 31, 2018, 6:45:38 AM INFO AGC:? - START
    RuleFlow -> SYSTEM/IN/USER_MOVE/BEFORE
Jan 31, 2018, 6:45:38 AM INFO AGC:? - STOP
    Process IN/USER MOVE/BEFORE

```

This is showing the rule flow setup and USER_BEFORE. You can see details of the eventInBean and UserErcBean.

```

Jan 31, 2018, 6:45:39 AM INFO AGC:? - START
    RuleFlow -> SYSTEM/IN/USER_MOVE/RUN
Jan 31, 2018, 6:45:39 AM INFO AGC:? - Inserito oggetto
com.engiweb.ruleengine.common.bean.ContainerBean: {}
Jan 31, 2018, 6:45:39 AM INFO AGC:? - Inserito oggetto
com.engiweb.profilemanager.common.bean.event.EventInBean: [ID=7770, OPERATION=12, TRACE=null,
STATE=1, DATEPROCESS=2018-01-31 06:45:25.0, DATEEVENT=2018-01-31 06:45:25.0, EXTTABLE=2085,
ERC=user_erc, EXTATTR1=null, EXTATTR2=IT, EXTATTR3=0, EXTATTR4=0, EXTATTR5=null, EXTATTR6=null,
EXTATTR7=null, EXTATTR8=null, EXTATTR9=null, EXTATTR10=null, OWNERSHIP=IGACORE ]
Jan 31, 2018, 6:45:39 AM INFO AGC:? - Inserito oggetto
com.engiweb.profilemanager.common.bean.UserErcBean: {EMAIL=pwhite@igi.ibm.com, NATION=CA,
ACTION_TYPE LAST=null, COUNTRY=null, ID=2085, SCHEDULE=0, BIRTHDAY=null, ACTION_CAUSE=0,
GIVEN_NAME=Patricia, BIRTH_COUNTRY=null, DISABLED=0, POST_EVENT=0, CURRENTOU=null,
USER_TYPE=Employee, AD_OU=null, ADDRESS=null, PHONE_NUMBER=null, ACCOUNT_EXPIRY_DATE=null,
IDENTIFICATION_NUMBER=null, LAST_MOD_TIME=2015-11-13, LAST_MOD_USER=null, DELETED=0, ATTR9=null,
ATTR4=ACME Engineering Ltd., SKIP=0, GENDER=null, ATTR3=Tertiary, BIRTH_PLACE=null, ATTR2=N,
ATTR1=DFox, ATTR8=null, PM_CODE=PWhite, ATTR7=I, ATTR6=null, ACTION_TYPE=0, ATTR5=null,
ATTR12=null, ATTR56=null, ATTR13=null, SURNAME=White, ATTR10=Auditor, ATTR11=null, OU=IT,
ATTR14=null, ZIPCODE=null, ATTR15=null, ACTION_CAUSE_LAST=null, CITY=San Diego, PROCESSED=0}
Jan 31, 2018, 6:45:39 AM INFO AGC:? - Inserito oggetto
com.engiweb.profilemanager.common.bean.UserBean: [ID=2089, DN=null, ATTR1=null, ATTR2=null,
ATTR3=null, ATTR4=null, ATTR5=null, VALUE=null, CODE=PWhite, SURNAME=White, NAME=Patricia,
EMAIL=pwhite@igi.ibm.com, PASSWORD=null, CODFISC=null, SEX=null, DATEOFBIRTH=null,
PLACEOFBIRTH=null, ADDRESS=null, LOCALITY=null, REGISTER=null, DESCRIPTION=null, STATE=0,
LASTMODUSER=null, LASTMODTIME=Sun Feb 19 05:11:23 CET 2017, PWDMANAGEMENT_DISABLED=0,
PWDMANAGEMENT_EXPIRE=null, PWDMANAGEMENT_ID=2089, ORGANIZATIONALUNIT_ID=118,
ORGANIZATIONALUNIT_CODE=AUDIT, ORGANIZATIONALUNIT_NAME=AUDIT, HIERARCHY_ID=1, HIERARCHY_CODE=null,
HIERARCHY_NAME=null, PERSONTYPE_ID=100, PERSONTYPE_NAME=Employee, PERSONTYPE_DESCRIPTION=Identity
registered in ISIM, MASTER_CODE=null, MASTER_ID=null, UMETYPE=None]
Jan 31, 2018, 6:45:39 AM INFO AGC:? - Inserito oggetto
com.engiweb.profilemanager.common.bean.ExternalInfo: [[name=OU value=IT objectValue=IT
required=null], [name=id value=2085 objectValue=2085 required=null], [name=City value=San Diego
objectValue=San Diego required=null], [name=Education - Certification value=Tertiary
objectValue=Tertiary required=null], [name=Manager value=DFox objectValue=DFox required=null],
[name=Position value=I objectValue=I required=null], [name=Is Dep. Manager value=N objectValue=N
required=null], [name=Department value=ACME Engineering Ltd. objectValue=ACME Engineering Ltd.
required=null], [name=Cod Subarea value=null objectValue=null required=null], [name=LAST_MOD_USER
value=null objectValue=null required=null], [name=LAST_MOD_TIME value=2015-11-13 objectValue=2015-11-
13 required=null], [name=ACCOUNT_EXPIRY_DATE value=null objectValue=null required=null], [name=NATION
value=CA objectValue=CA required=null], [name=Title value=Auditor objectValue=Auditor required=0],
[name=Changed value=null objectValue=null required=0]]
Jan 31, 2018, 6:45:39 AM INFO AGC:? - Inserito oggetto
com.engiweb.profilemanager.common.bean.OrgUnitBean: [ = COPYRIGHT = null, = serialVersionUID = -,
= id = 112, = name = IT, = code = IT, = description = IT Department, = parent = null, = value =
null, = state = null, = attr1 = null, = attr2 = null, = attr3 = null, = attr4 = null, = attr5 =
null, = lastModUser = null, = lastModTime = Fri Nov 13 15:14:28 CET 2015, = enableSOD = 0, =
organizationalunittype_description = null, = organizationalunittype_name = null, =
organizationalunittype_id = null, = organizationalunittype_code = null, = reviewState = null,
= person_name = null, = person_surname = null, = person_code = null, = person_email = null, =
person_id = null, = adminList = null, = adminByDelegationList = null, = ownerCode = null, =
hierarchy_id = 1, = hierarchy_name = null, ]
Jan 31, 2018, 6:45:39 AM INFO AGC:? - STOP
    Process IN/USER_MOVE/RUN
Jan 31, 2018, 6:45:39 AM INFO AGC:? - START
    RuleFlow -> SYSTEM/IN/USER_MOVE/AFTER
Jan 31, 2018, 6:45:39 AM INFO AGC:? - STOP
    Process IN/USER_MOVE/AFTER
Jan 31, 2018, 6:45:39 AM INFO AGC:? - STOP
Jan 31, 2018, 6:45:40 AM INFO AGC:? - STOP
*****
*****
```

This section of log is showing the rule flow for USER_MOVE. You can see the contents of the EventInBean, UserErcBean, UserBean, ExternalInfo, and OrgUnit beans. The above example shows Patricia Whiteman being moved to IT. Notice that you don't see the names of the rules being executed, just the rule flow.

This concludes this lab.

[End of Document](#)

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