IdentityIQ Implementation Training for SailPoint

IdentityIQ Version 6.2

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Section One: Installation, Identity Cubes, and Onboarding Applications

Fundamentals of IdentityIQ Implementation

Training for SailPoint IdentityIQ Version 6.2

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Contents

Course Overview

Introduction

The exercises contained in this document are meant to accompany the Fundamentals of IdentityIQ Implementation training lecture materials.

These exercises are run within a Virtual Machine environment, which contains the following software:

- Oracle/Sun JDK (Version 1.6)
- Tomcat Application Server (Version 6.0.35)
- MySQL Database Server (Version 5.1.58)
- OpenDS LDAP Server (Version 2.2.1)

During these Implementer Training exercises, we will be installing and configuring the following:

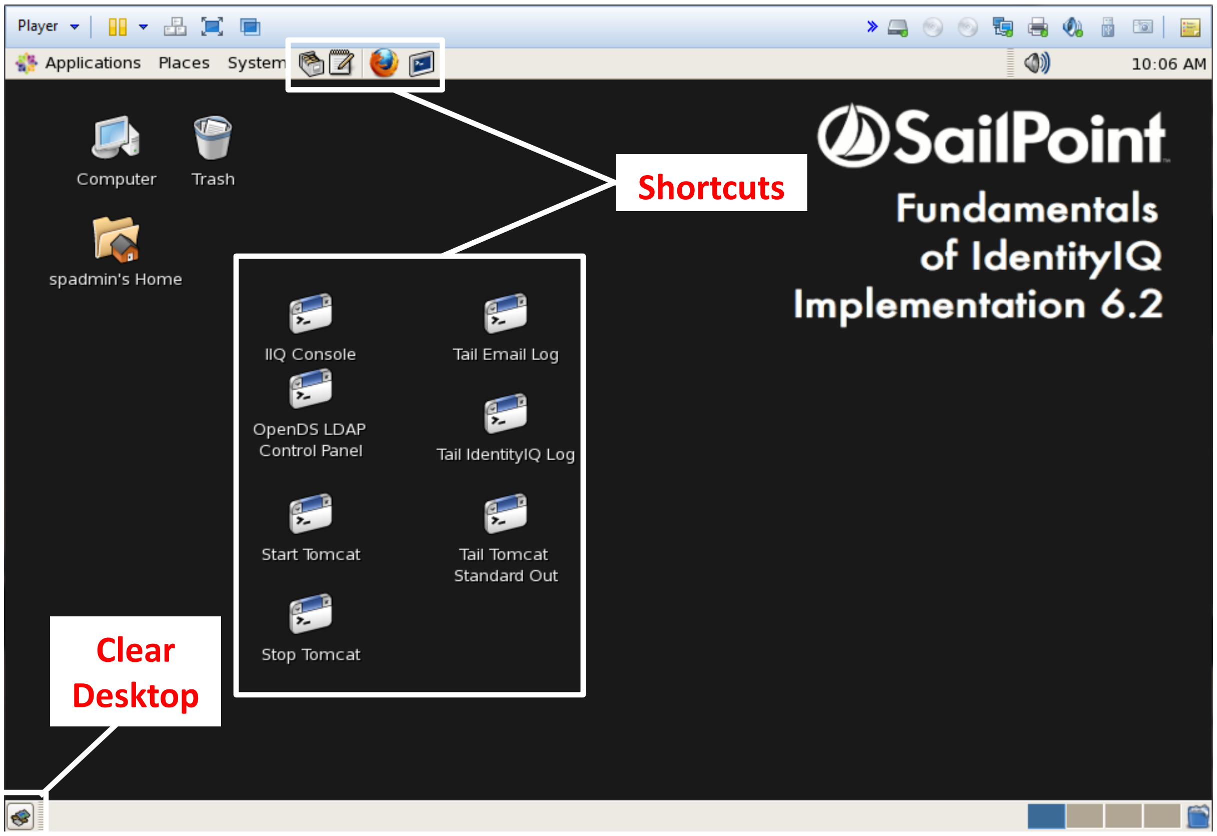
- IdentityIQ Version 6.2

The Virtual Machine Environment

Logins	
Linux Username/Password	spadmin/admin
IIQ Username/Password	spadmin/admin
MySQL Administrator Login/Password	root/root
OpenDS LDAP Login	CN=Directory Manager/password
Install Directories	
IIQ Install Directory	/home/spadmin/tomcat/identityiq
Installer File Location	/home/spadmin/InstallImages
Implementer Training Files	/home/spadmin/ImplementerTraining
LDAP Install Location	/home/spadmin/OpenDS
MySQL Details	
MySQL Database Name	identityiq

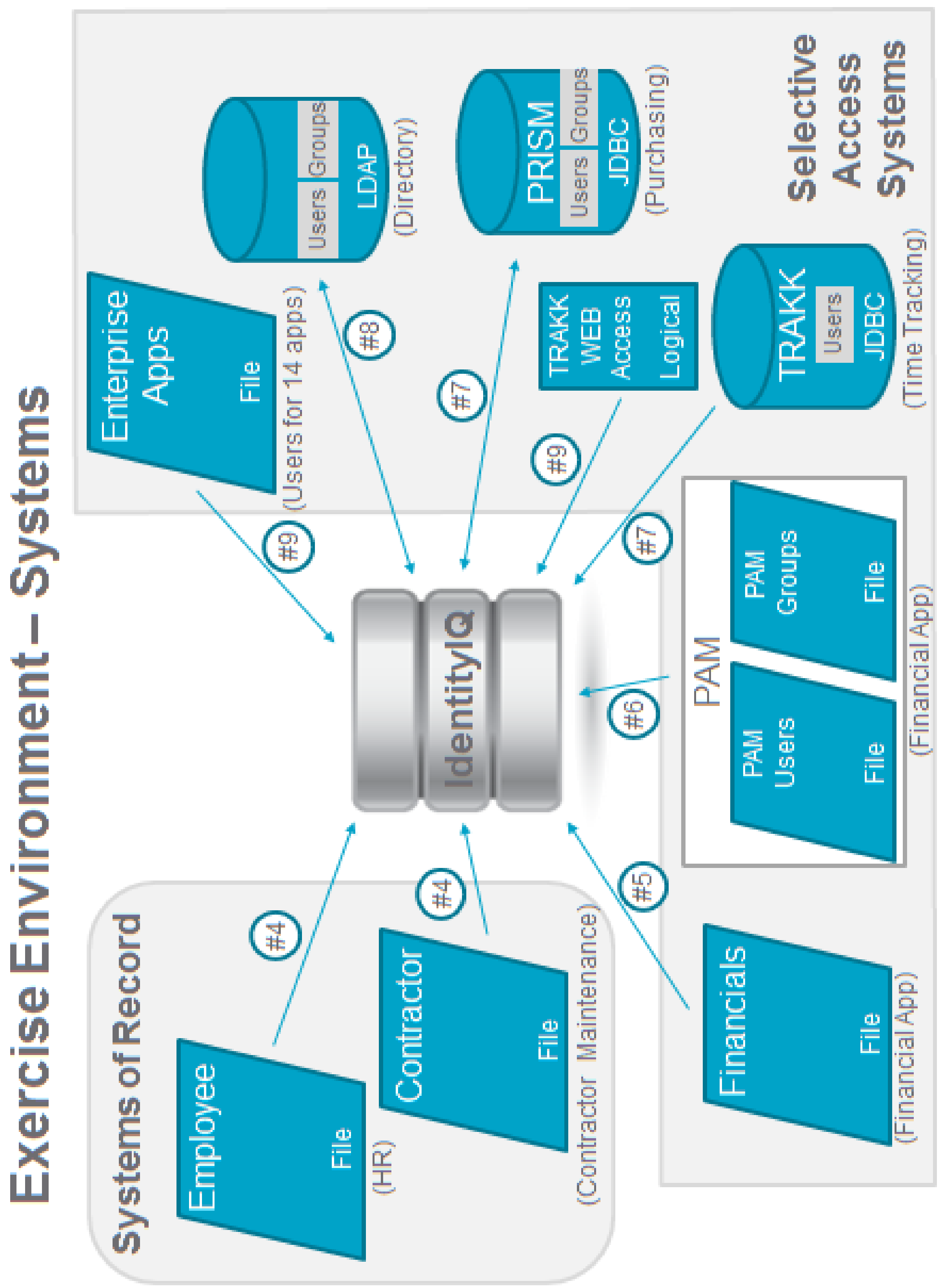
Shortcuts/Applications Provided

The Virtual Machine environment includes several useful shortcuts.



- Application Shortcuts
    - File Browser (Linux utility to browse the file system)
    - Editor (GEdit – A common Linux text editor)
    - Firefox (Web browser)
    - Terminal (Launches a command line terminal)
- Launcher Shortcuts on the Desktop
    - Launchers to Start/Stop Tomcat
    - Launchers to observe the IdentityIQ Logs, IdentityIQ Email Logs, Standard Out Logs
    - Launcher to start OpenDS LDAP Utility
- Clear Desktop – Use this to minimize windows to see the Desktop

Exercise Environment – Systems



Exercise #1: Populating Identity Cubes – Loading Authoritative Data

Objective

The objective of this exercise is to become familiar with creating initial Identity Cubes from authoritative identity sources, mapping Identity Attributes, and manipulating Identity data as it is loaded into IdentityIQ.

Overview

Our client has authoritative identity data stored in two sources. One application, an HR application stores Employee data, and the other application, stores Contractor data. For our purposes, this data will exists in two flat files in comma-separated-values format.

- AuthEmployees.csv
- AuthContractors.csv

Each file has the following data:

- employeeId (unique ID used for our Identity Attribute)
- firstName
- lastName
- managerId
- fullName (friendly name used for our Display Attribute)
- email
- department
- region
- location
- inactiveIdentity
- jobtitle (only present in the employee data)
- costcenter

They would like us to use these attributes from their Employee HR system and Contractor system to form new Identity Cubes within IdentityIQ.

When defining our applications, we will use the "employeeId" field as our Identity Attribute (unique value), and "fullName" as the Display Attribute (user friendly display name for the Identity.)

Additionally, the customer has a few more requirements:

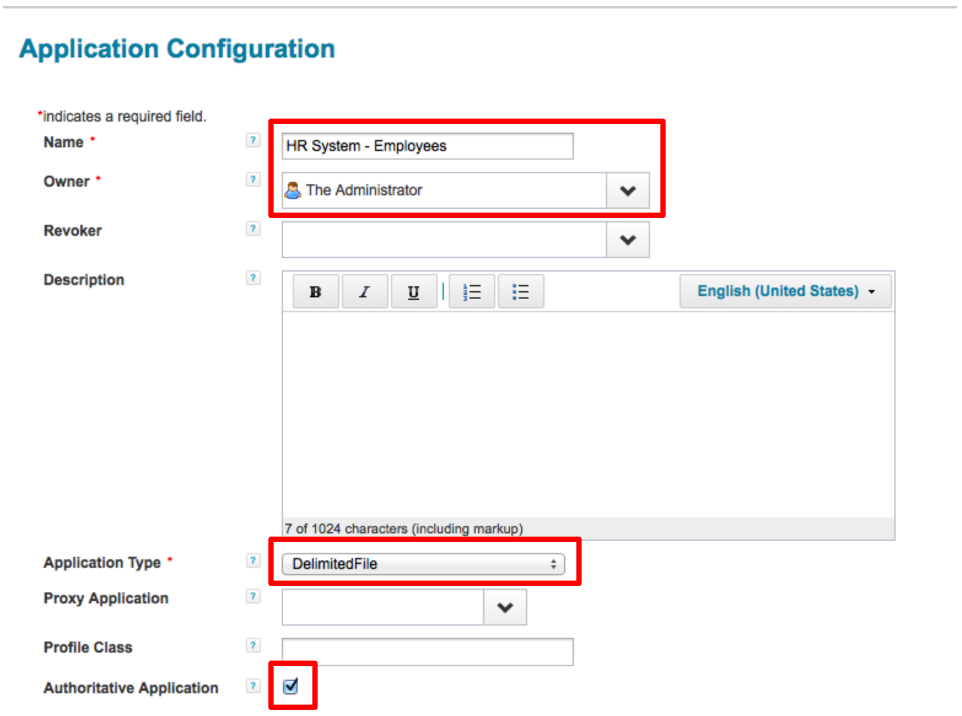
- They want an additional Identity attribute called: **status**. This attribute will be set to "**Employee**" or "**Contractor**" depending on which authoritative source is used to create the identity. This attribute needs to be searchable and a group factory (so that we can easily create groupings of Identities that represent Employees and Contractors)
- For now, they want to set the default password for each identity to be "**xyzzy**" for testing purposes.
- They want the Cost Center attribute to be represented as a multi-value field. Currently, in the source data, Cost Center data is represented as a string such as: "R02, L04, L05, L06". In order for individual Cost Centers to be searchable, we will need to mark this attribute as multi-valued so that the data is stored properly in IdentityIQ.

We will support these additional requirements by doing the following:

- Create an additional Identity Attribute called "Status" that will be sourced using rules that will determine if an Identity is an Employee or Contractor.
- Use a Creation Rule to set a default IdentityIQ password for each user as we create the Identity Cubes.

Define Employee and Contractor Applications

1. Create a new Application definition for the Employee Data
    a. Login to IdentityIQ as **spadmin/admin**
    b. Navigate to **Define → Applications** and select **Add New Application**
    c. Configure the Application as follows:
        i. Name: **HR System - Employees**
        ii. Owner: **spadmin (The Administrator)**
        iii. Application Type: **Delimited File**
        iv. Authoritative Application: **Checked**



Application Configuration

*indicates a required field.

Name * HR System - Employees

Owner * The Administrator

Revoker

Description

7 of 1024 characters (including markup)

Application Type * DelimitedFile

Proxy Application

Profile Class

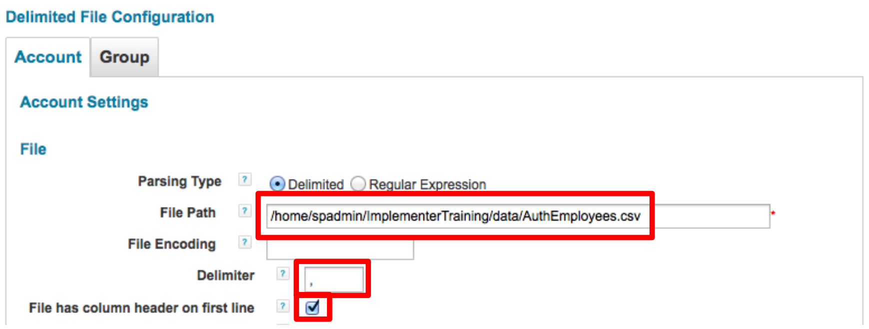
Authoritative Application ✓

d. Under the **Attributes** tab, select **Account** and configure as follows:

   i. File Path: **/home/spadmin/ImplementerTraining/data/AuthEmployees.csv**

   ii. Delimiter: **,**

   iii. File has column header on first line: **Checked**



Delimited File Configuration

Account | Group

Account Settings

File

Parsing Type [✓ Delimited] Regular Expression

File Path /home/spadmin/ImplementerTraining/data/AuthEmployees.csv

File Encoding

Delimiter ,

File has column header on first line ✓

e. Click **Save** to save the application.

2. At this point, we have defined the application, chosen the connector, and defined the connector attributes that define how to gather information about our Employees. We now need to tell the system what attributes we want to read from the file.

   a. Navigate to **Define → Applications** and select the Application definition you just created: **HR System - Employees**

b. Scroll down and select the **Schema** tab

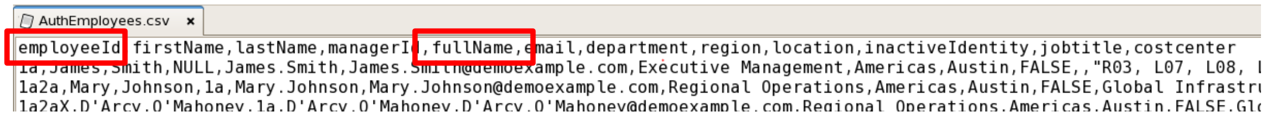
c. Choose **Add Account Schema** and define as follows:

   i. Native Object Type: **account**

   ii. Identity Attribute: **employeeId**

   iii. Display Attribute: **fullName**

d. These fields define which attributes that we are reading in will be used to define uniqueness ("Identity Attribute") and a friendly display name ("Display Attribute"). These attributes must match exactly (including case) with the actual schema attribute names from the file we are reading in.



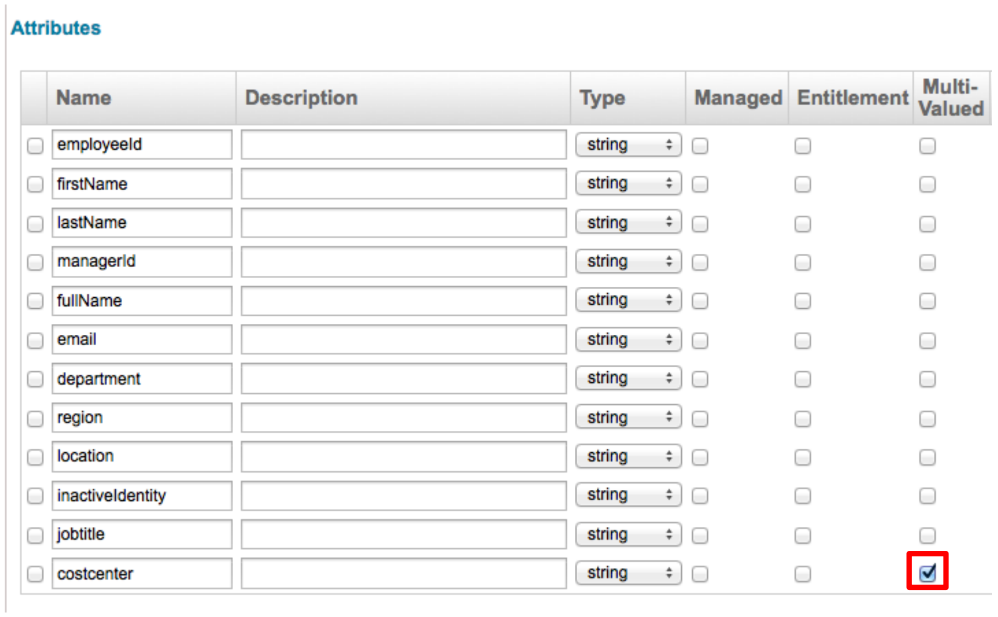
AuthEmployees.csv

```
employeeId,firstName,lastName,managerId,fullName,email,department,region,location,inactiveIdentity,jobtitle,costcenter
1a,James,Smith,NULL,James.Smith,James.Smith@demoexample.com,Executive Management,Americas,Austin,FALSE,,"R03, L07, L08, I
1a2a,Mary,Johnson,1a,Mary.Johnson,Mary.Johnson@demoexample.com,Regional Operations,Americas,Austin,FALSE,Global Infrastru
1a2aX,D'Arcy,O'Mahoney,1a,D'Arcy.O'Mahoney,D'Arcy.O'Mahoney@demoexample.com,Regional Operations,Americas,Austin,FALSE,Glo
```

e. Click the **Discover Schema Attributes** button. This will cause the connector to read just the header fields defining what data is present in the file. The schema attributes discovered should match what is in the actual raw file:

   employeeId,firstName,lastName,managerId,fullName,email,department,region,location,inactiveIdentity,jobtitle,costcenter

f. For the **costcenter** attribute, mark it as **Multi-valued**



Attributes

	Name	Description	Type	Managed	Entitlement	Multi-Valued
☐	employeeId		string	☐	☐	☐
☐	firstName		string	☐	☐	☐
☐	lastName		string	☐	☐	☐
☐	managerId		string	☐	☐	☐
☐	fullName		string	☐	☐	☐
☐	email		string	☐	☐	☐
☐	department		string	☐	☐	☐
☐	region		string	☐	☐	☐
☐	location		string	☐	☐	☐
☐	inactiveIdentity		string	☐	☐	☐
☐	jobtitle		string	☐	☐	☐
☐	costcenter		string	☐	☐	✓

g. Click the **Preview Accounts** button. Preview Accounts iterates over the first 10 accounts and displays the results in a popup instead of loading it into IdentityIQ.

This command is extremely useful when doing initial work onboarding applications to make sure that you are properly reading and manipulating the data and that your schema is correct. We will use this command extensively over the duration of this exercise.

3. We will now create a rule that will set the default password for each new Identity as we create them.

    a. Select the **Rules** tab

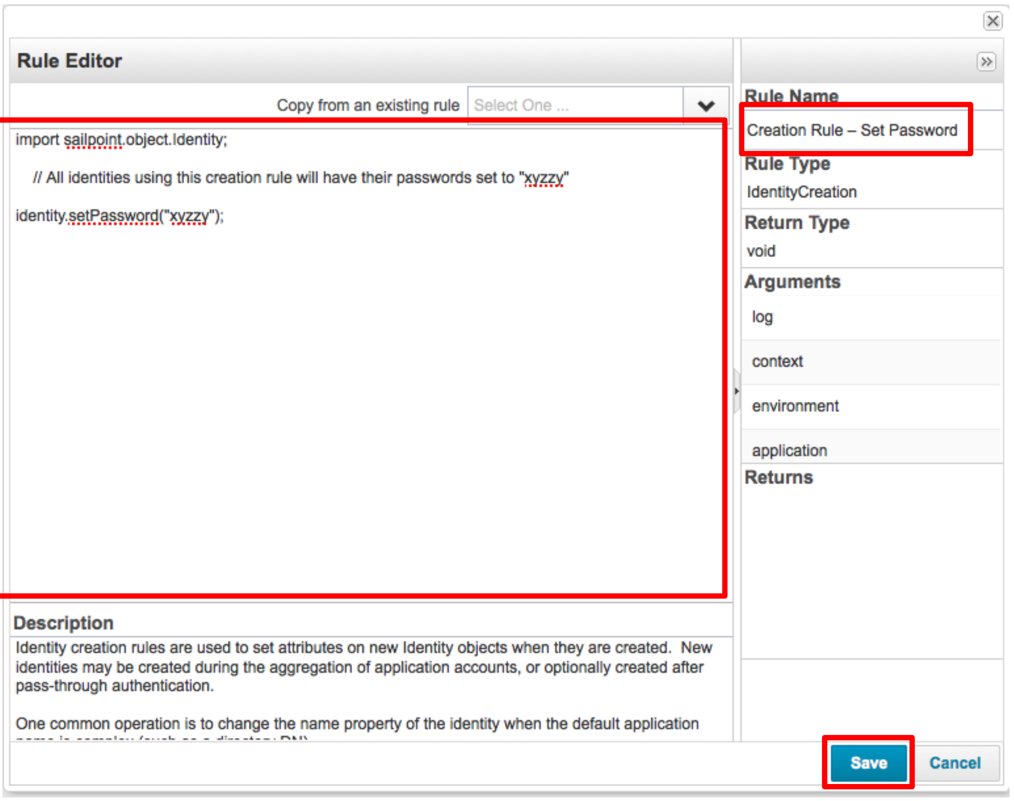
    b. To the right of the **Creation Rule**, select the button with the ellipsis (…)

    c. You will now see the **Rule Editor**

    d. Copy the text from the file **CreationRule-Set Default Passwords.txt** located in the **/home/spadmin/ImplementerTraining/beanshell** directory

    e. Paste the text into the **Rule Editor**

    f. Set the **Rule Name** to **Creation Rule – Set Password** as shown and then select **Save**



```
import sailpoint.object.Identity;

   // All identities using this creation rule will have their passwords set to "xyzzy"

identity.setPassword("xyzzy");
```

Rule Name
Creation Rule – Set Password

Rule Type
IdentityCreation

Return Type
void

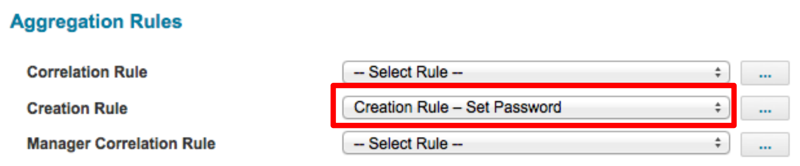
Arguments
log
context
environment
application

Returns

Description
Identity creation rules are used to set attributes on new Identity objects when they are created. New identities may be created during the aggregation of application accounts, or optionally created after pass-through authentication.

One common operation is to change the name property of the identity when the default application

g. Select the rule you just created in the drop down


Aggregation Rules

Correlation Rule	-- Select Rule --
Creation Rule	Creation Rule – Set Password
Manager Correlation Rule	-- Select Rule --

4. Scroll down and select **Save** to save the application.

5. Create a new Application definition for the Contractor Data

   a. Navigate to **Define → Applications** and select **Add New Application**

   b. Configure the Application as follows:

      i. Name: **Contractor Feed**

      ii. Owner: **spadmin**

      iii. Application Type: **Delimited File**

      iv. Authoritative Application: **Checked**

   c. Under the **Attributes** tab, select **Account** and configure as follows:

      i. File Path: **/home/spadmin/ImplementerTraining/data/AuthContractors.csv**

      ii. Delimiter: **,**

      iii. File has column header on first line: **Checked**

   d. Click **Save** to save this application definition.

At this point, we have defined the application and where it will go to gather information about our Contractors. We now need to tell the system what attributes we want to read from the file.

   e. Navigate to **Define → Applications** and select the Application definition you just created: **Contractor Feed**

   f. Scroll down and select the **Schema** tab

   g. Choose **Add Account Schema** and define as follows:

      i. Native Object Type: **account**

      ii. Identity Attribute: **employeeId**

      iii. Display Attribute: **fullName**

h. Click the **Discover Schema Attributes** button. This will cause the connector to read just the header fields defining what data is present in the file. The schema attributes discovered should match what is in the actual raw file:

employeeId,firstName,lastName,managerId,fullName,email,department,region,location,inactiveIdentity,costcenter

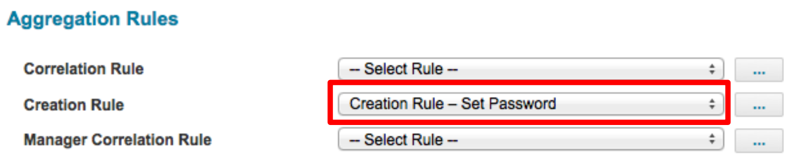
i. For the **costcenter** attribute, mark it as **Multi-valued**

6. Click the **Preview Accounts** button. The first 10 records from the file will be displayed. Remember that **Preview Accounts** does not write any information to the IdentityIQ database, but is very useful to ensure that you are properly reading and manipulating the data and that your schema is correct.

7. We will now use the same Creation Rule we defined before for setting the default password for each identity.

   a. Select the **Rules** tab

   b. Select the rule we created earlier, **Creation Rule - Set Password**



Aggregation Rules

Correlation Rule	-- Select Rule --
Creation Rule	Creation Rule – Set Password
Manager Correlation Rule	-- Select Rule --

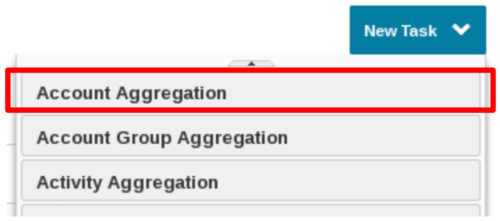
Note: We are using the same rule as we did for the previous application. It is common in IdentityIQ implementations to re-use rules. In this case, the rule applies to loading both Employees and Contractors.

8. Scroll down and select **Save** to save the application.

Aggregate the Employee and Contractor Data

1. Now, we will aggregate (or load) the Employee and Contractor data from the two delimited files by creating an Account Aggregation task. **Note:** We will use the same task for loading both files. *This process of loading account data from Authoritative Applications will generate our initial Identity Cubes*.

   a. Navigate to **Monitor → Tasks** and under **New task...** choose **Account Aggregation**



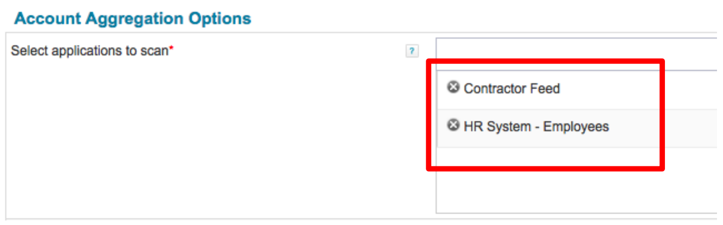
b. Define the Task as follows:

   i. Name: **Aggregate Employees and Contractors**

   ii. Description: **Aggregate Employees from HR Data and Contractors from Contractor Feed.**

   iii. Select applications to scan:

   HR System – Employees
   Contractor Feed



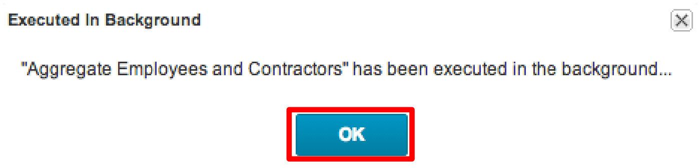
Select applications to scan*

Contractor Feed
HR System - Employees

   iv. Select the **Detect Deleted Accounts** checkbox

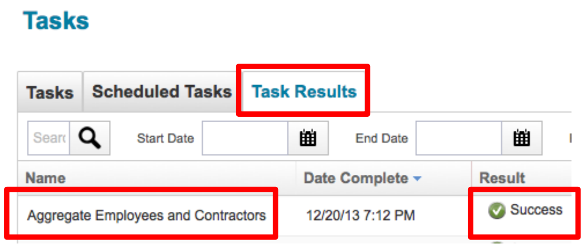
   v. Select the **Disable optimization of unchanged accounts** checkbox

c. Scroll down and choose **Save and Execute** and choose **OK** when prompted.


Executed In Background

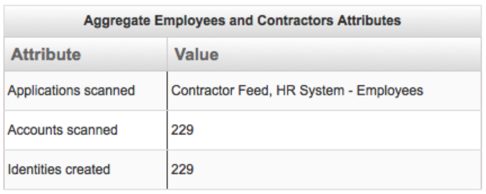
"Aggregate Employees and Contractors" has been executed in the background...

d. Once you are back on the main **Tasks** page, select **Task Results** as shown below. Once the Task is finished, there will be a result for **Aggregate Employees and Contractors.** Click this entry to see the results of the Aggregation.



Name	Date Complete	Result
Aggregate Employees and Contractors	12/20/13 7:12 PM	Success

e. The task output should show that two total applications were scanned, that a number of accounts were scanned, and that identities were created for each account.



Aggregate Employees and Contractors Attributes

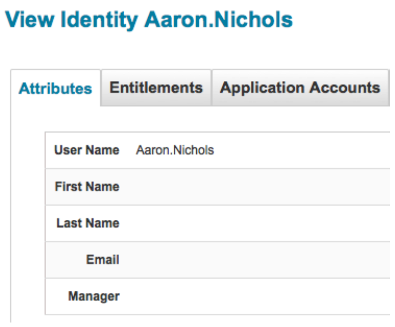
Attribute	Value
Applications scanned	Contractor Feed, HR System - Employees
Accounts scanned	229
Identities created	229

2. Confirm that the aggregation was successful.

   a. View an Identity to confirm that the aggregation was successful

      i. Navigate to **Define → Identities**

      ii. Click any user and confirm that an Identity Cube was created for this user. Note, that all of the Identity Attributes are blank. This is because we haven't defined a mapping between the Identity attributes and the applications that are feeding data into IdentityIQ



View Identity Aaron.Nichols

User Name	Aaron.Nichols
First Name	
Last Name	
Email	
Manager	

   b. Confirm that the Creation Rule was successful

      i. **Logout** of IdentityIQ

      ii. Log in as the employee: **Aaron.Nichols/xyzzy**

      iii. **Logout** of IdentityIQ

      iv. Log in as the contractor: **Allen.Burton/xyzzy**

      v. If you cannot login to both accounts using the names and passwords, then you may have an issue with your Creation Rule. Double check that both applications have the Creation Rule defined properly.

      vi. **Logout** of IdentityIQ

Understanding What We Just Did

There is an exact correspondence between the application schema and the Application Account data stored in IdentityIQ. *During aggregation, IdentityIQ gathers exactly what is specified in the application schema from the source application or calculated fields and stores it as Application Account data*, viewable on the Accounts Tab in the Application definition or on the Application Accounts tab on Identity Cubes.

1. Login to IdentityIQ as **spadmin/admin**
2. Compare the ***application account*** for **HR System - Employees** with the ***schema attributes*** for the **HR System - Employees** application
    a. Navigate to **Define → Identities** and view **Aaron.Nichols**
        i. Which attribute is populated? ______________________________
        ii. What is the name of the field you set for IdentityIQ to populate this attribute? Hint: Look at the application schema.

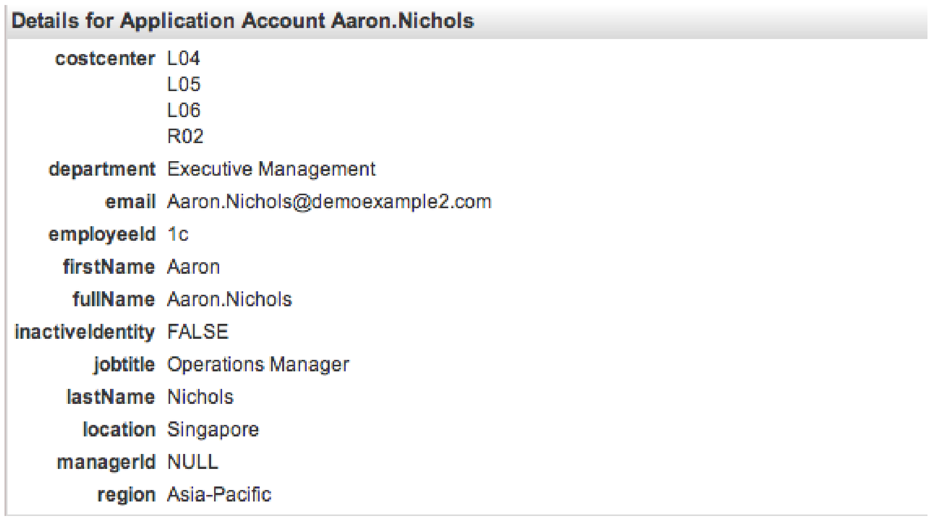
        ____

    b. Select the **Application Account**s tab and view Aaron's account details for the **HR System - Employees** application
        i. How many attributes are listed on the application account? ____________
        ii. How many cost centers are associated with the account? ____________
        Note: If your configuration is correct, there should be one cost center per line.
        iii. What was specified on the schema to include the cost centers as unique items?

        ____

    c. Navigate to **Define → Applications**, select the **HR System - Employees** application and view the schema
        i. How many items are listed on the schema? ____________________
        ii. Compare the schema attributes to the application account items and note that they are the same
        iii. Check your answer to number iii of the previous question. To simplify the comparison, the application account and the schema are included on the following page.

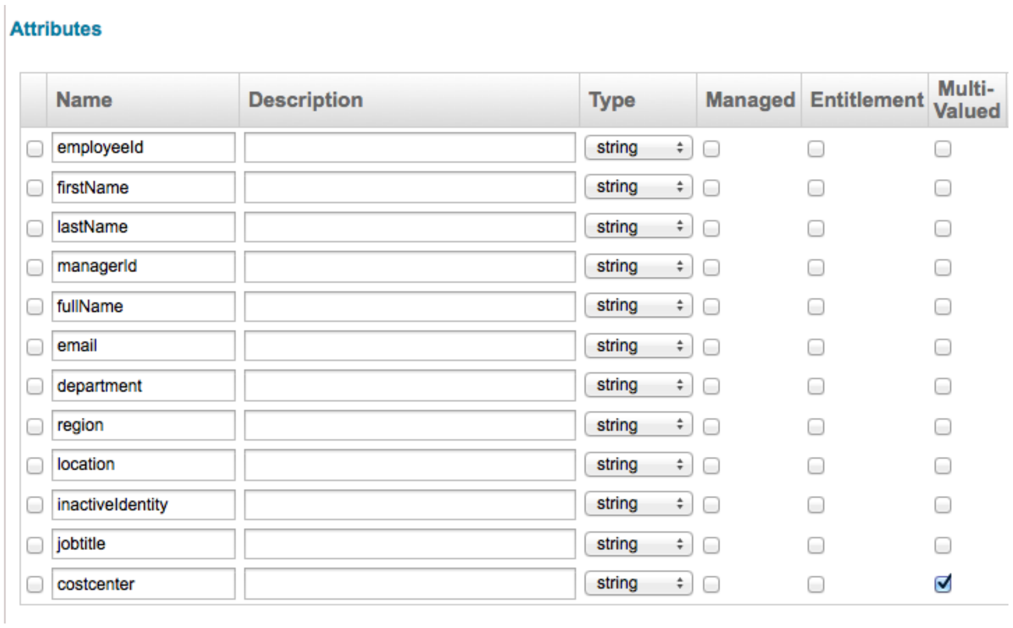
HR System - Employees *Application Account*:



Details for Application Account Aaron.Nichols

costcenter	L04 L05 L06 R02
department	Executive Management
email	Aaron.Nichols@demoexample2.com
employeeId	1c
firstName	Aaron
fullName	Aaron.Nichols
inactiveIdentity	FALSE
jobtitle	Operations Manager
lastName	Nichols
location	Singapore
managerId	NULL
region	Asia-Pacific

HR System - Employees *Application schema*:



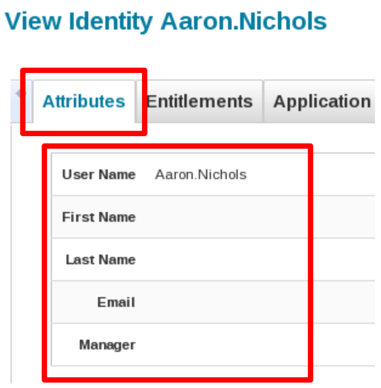
Attributes

	Name	Description	Type	Managed	Entitlement	Multi-Valued
☐	employeeId		string	☐	☐	☐
☐	firstName		string	☐	☐	☐
☐	lastName		string	☐	☐	☐
☐	managerId		string	☐	☐	☐
☐	fullName		string	☐	☐	☐
☐	email		string	☐	☐	☐
☐	department		string	☐	☐	☐
☐	region		string	☐	☐	☐
☐	location		string	☐	☐	☐
☐	inactiveIdentity		string	☐	☐	☐
☐	jobtitle		string	☐	☐	☐
☐	costcenter		string	☐	☐	✓

Configure Identity Mappings for Standard Attributes

We now have two properly configured application definitions that load in account data from our Enterprise Directory. We now must define what data from these authoritative sources we will use to populate our identity data.

Previously we saw that so far only one Identity Attribute has been populated – User Name. User Name is populated by default from the Display Attribute in the schema header.

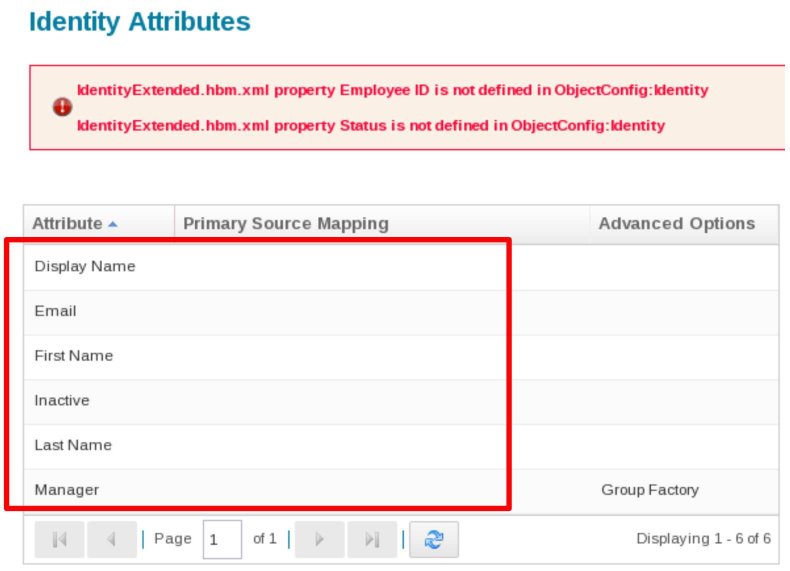

View Identity Aaron.Nichols

User Name	Aaron.Nichols
First Name	
Last Name	
Email	
Manager	

With the exception of User Name, Identity Attributes are only populated when they have an associated mapping. Typically Identity Attributes are populated from the application account information read in from a directory or HR application (an authoritative source) but they can also be populated by a rule. The source for an identity attribute is defined through Identity Mappings.

1. Navigate to **System Setup → Identity Mappings**

2. This is the main interface for configuring Identity Attributes and how they are populated. Earlier you created two extended attributes in the IdentityIQ database. Notice the reminder to define those attributes in IdentityIQ. We will define them later in this exercise. Notice also that the standard attributes are created by default with no source mapping.


Identity Attributes

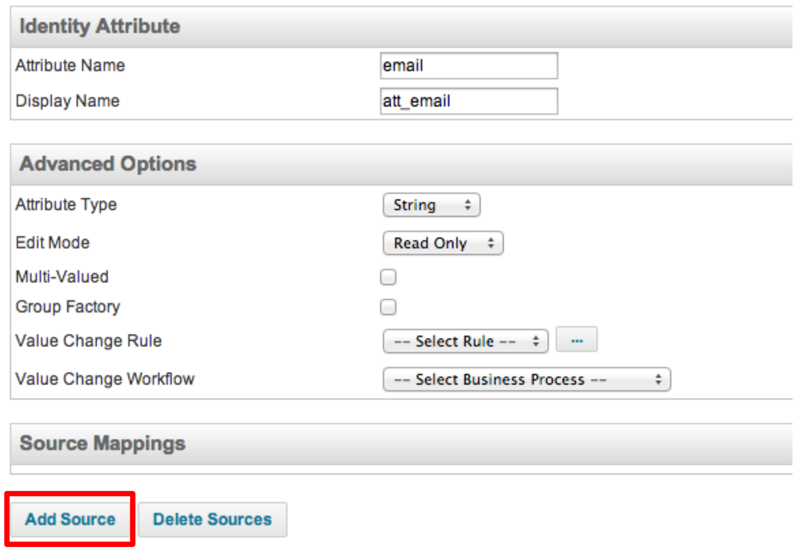
IdentityExtended.hbm.xml property Employee ID is not defined in ObjectConfig:Identity

IdentityExtended.hbm.xml property Status is not defined in ObjectConfig:Identity

Attribute	Primary Source Mapping	Advanced Options
Display Name		
Email		
First Name		
Inactive		
Last Name		
Manager		Group Factory

3. Choose **Email** from the list of identity attributes

   a. Click **Add Source** to configure the source of this Identity Attribute



Identity Attribute

Attribute Name	email
Display Name	att_email

Advanced Options

Attribute Type	String
Edit Mode	Read Only
Multi-Valued	☐
Group Factory	☐
Value Change Rule	-- Select Rule --
Value Change Workflow	-- Select Business Process --

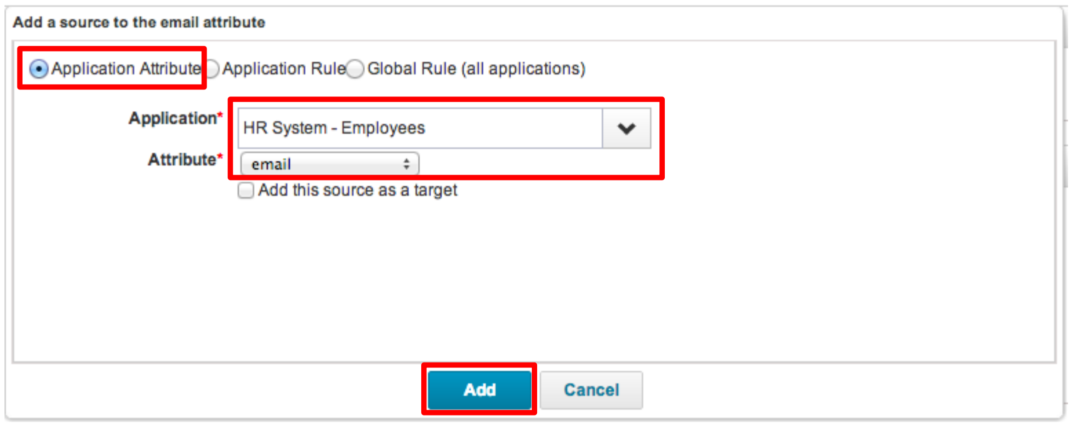
Source Mappings

   b. Choose **Application Attribute**

   c. Application: **HR System - Employees**

   d. Attribute: **email**

   e. Click **Add** to add the source mapping



Add a source to the email attribute

[✓ Application Attribute] Application Rule Global Rule (all applications)

Application*	HR System - Employees
Attribute*	email

☐ Add this source as a target

Note: Attributes can be populated by Application Attributes, or by a Rule (Application or Global.) Also, they can be populated by multiple sources, as we are about to see in the next few steps.

   f. Click **Add Source** again to configure where this attribute will come from for a contractor identity.

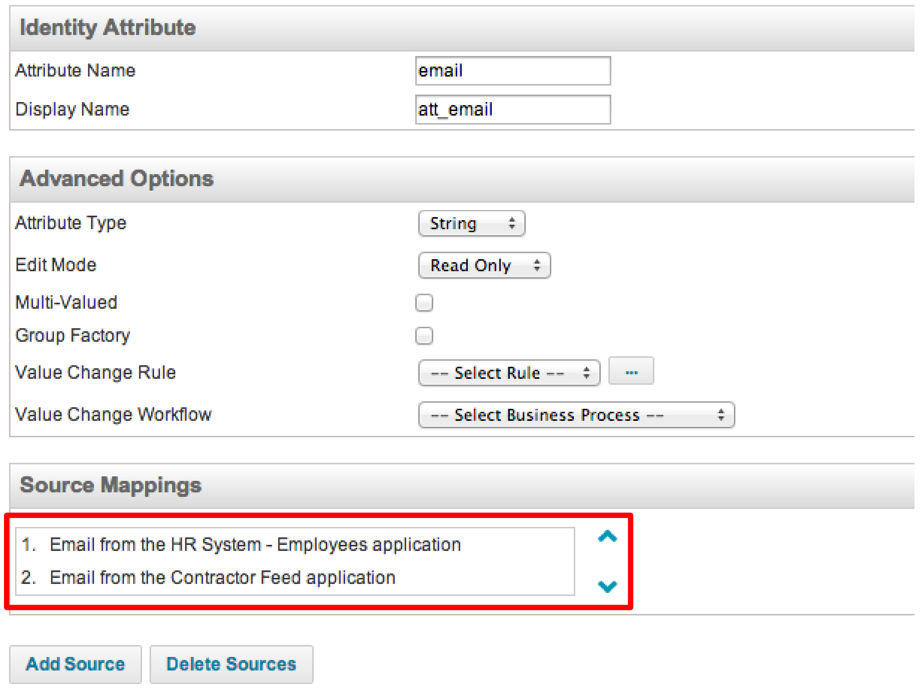
   g. Choose **Application Attribute**

h. Application: **Contractor Feed**

i. Attribute: **email**

j. Click **Add** to add the source mapping

k. Your attribute mapping should look like this when you are done. Note that we have two mappings for where the email Identity Attribute is sourced. For Employees, it will be sourced from the Employee data and for Contractors, it will be sourced from the Contractor data.



Identity Attribute

Attribute Name	email
Display Name	att_email

Advanced Options

Attribute Type	String
Edit Mode	Read Only
Multi-Valued	☐
Group Factory	☐
Value Change Rule	-- Select Rule --
Value Change Workflow	-- Select Business Process --

Source Mappings

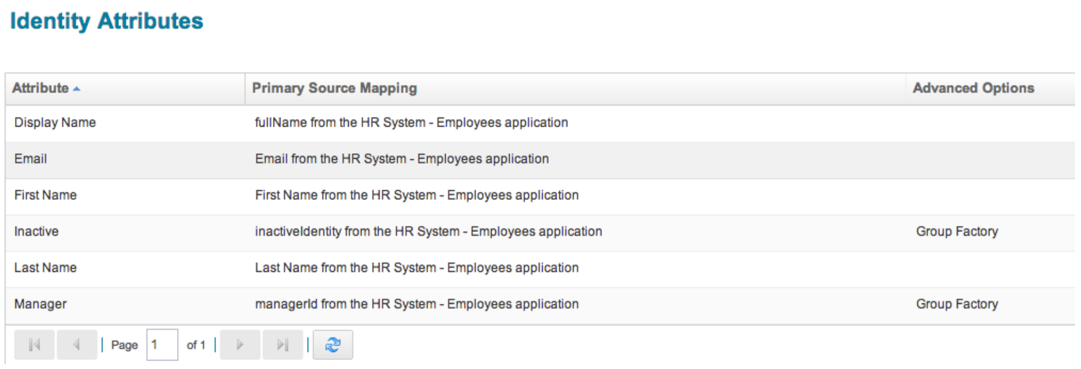
1. Email from the HR System - Employees application
2. Email from the Contractor Feed application

l. Click **Save** to complete the changes to the **email** attribute

m. Repeat the process for the following attributes as shown in the table. **Note:** make sure that you set the Advanced Options from the last column when defining the Identity attributes

Attribute	Primary Source Mapping	Advanced Options
Display Name	fullName from HR System - Employees fullName from Contractor Feed	
First Name	firstName from HR System - Employees firstName from Contractor Feed	
Inactive	inactiveIdentity from HR System - Employees inactiveIdentity from Contractor Feed	Group Factory checked
Last Name	lastName from HR System - Employees lastName from Contractor Feed	
Manager	managerId from HR System - Employees managerId from Contractor Feed	Group Factory checked

n. After editing the default Identity attributes, it should look like this:



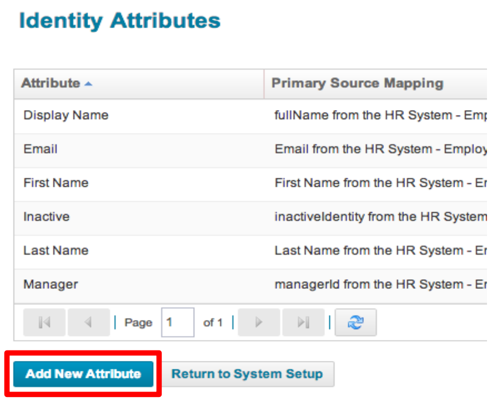
Identity Attributes

Attribute ▲	Primary Source Mapping	Advanced Options
Display Name	fullName from the HR System - Employees application	
Email	Email from the HR System - Employees application	
First Name	First Name from the HR System - Employees application	
Inactive	inactiveIdentity from the HR System - Employees application	Group Factory
Last Name	Last Name from the HR System - Employees application	
Manager	managerId from the HR System - Employees application	Group Factory

Define Extended Identity Attributes

We will now define and configure additional Identity Attributes. These are attributes specific to the implementation that are additional to the out of the box attributes. These attributes are called Extended Identity Attributes.

1. Click the **Add New Attribute** button on the **Identity Attributes** page

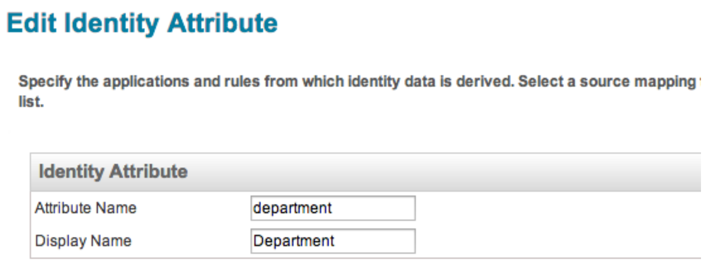


Identity Attributes

Attribute ▲	Primary Source Mapping
Display Name	fullName from the HR System - Emp
Email	Email from the HR System - Employ
First Name	First Name from the HR System - Er
Inactive	inactiveIdentity from the HR System
Last Name	Last Name from the HR System - Er
Manager	managerId from the HR System - Er

a. Attribute Name: **department**

b. Display Name: **Department**



Edit Identity Attribute

Specify the applications and rules from which identity data is derived. Select a source mapping list.

Identity Attribute	
Attribute Name	department
Display Name	Department

c. Under **Source Mapping**, select **Add Source**

i. Choose **Application Attribute**

ii. Application: **HR System - Employees**

iii. Attribute: **department**

iv. Click **Add**

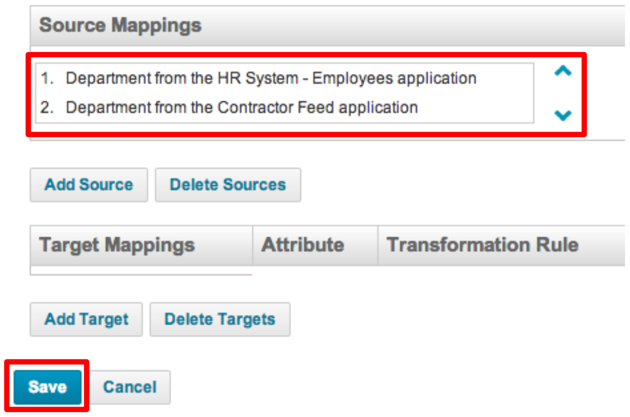
d. Click **Add Source**

i. Choose **Application Attribute**

ii. Application: **Contractor Feed**

iii. Attribute: **department**

iv. Click **Add**


Source Mappings

1. Department from the HR System - Employees application
2. Department from the Contractor Feed application

e. Click **Save** to save all changes to the **department** attribute

2. Repeat the steps above for the following additional Identity Attributes that we will add:

Attribute Name	Display Name	Primary Source Mapping	Advanced Options
location	Location	location from HR System - Employees location from Contractor Feed	Group Factory,Searchable
empId	Employee ID	employeeId from HR System - Employees employeeId from Contractor Feed	Searchable
region	Region	region from HR System - Employees region from Contractor Feed	Group Factory, Searchable
jobtitle	Job Title	jobtitle from HR System - Employees	
costcenter	Cost Center	costcenter from HR System - Employees costcenter from Contractor Feed	Group Factory, Multi-valued (see note)

Note: Multi-valued attributes and all standard attributes are automatically searchable in IdentityIQ. They are not shown as searchable in the summary list because they do not count against your configured set of searchable attributes.

3. Next, we will add an identity attribute that will be derived with a rule.

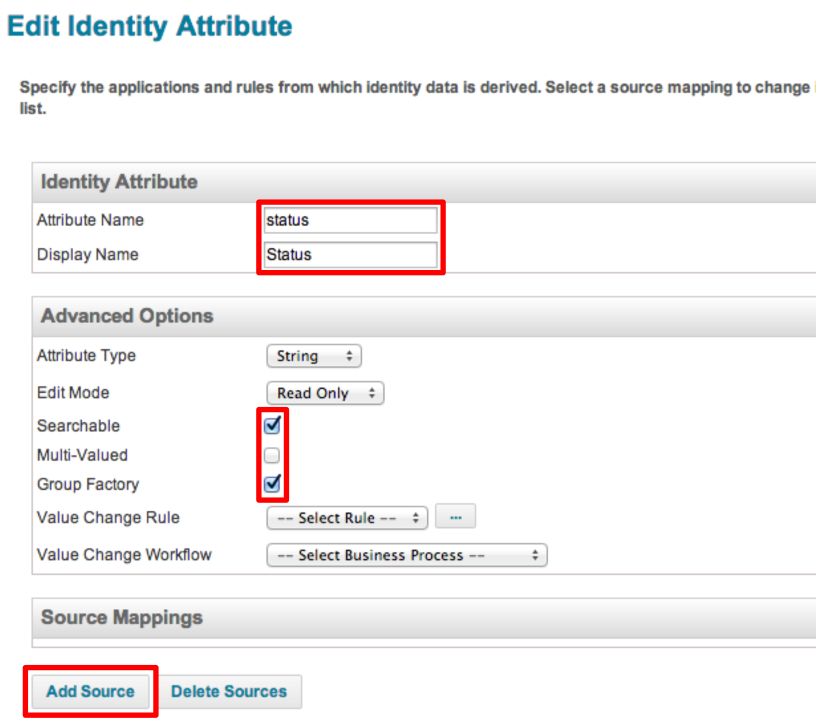
   a. Select **Add New Attribute** and configure the attribute as defined:

      i. Attribute Name: **status**

      ii. Display Name: **Status**

      iii. Searchable: **checked**

      iv. Group Factory: **checked**



Edit Identity Attribute

Specify the applications and rules from which identity data is derived. Select a source mapping to change
list.

Identity Attribute

Attribute Name	status
Display Name	Status

Advanced Options

Attribute Type	String
Edit Mode	Read Only
Searchable	✓
Multi-Valued	
Group Factory	✓
Value Change Rule	-- Select Rule --
Value Change Workflow	-- Select Business Process --

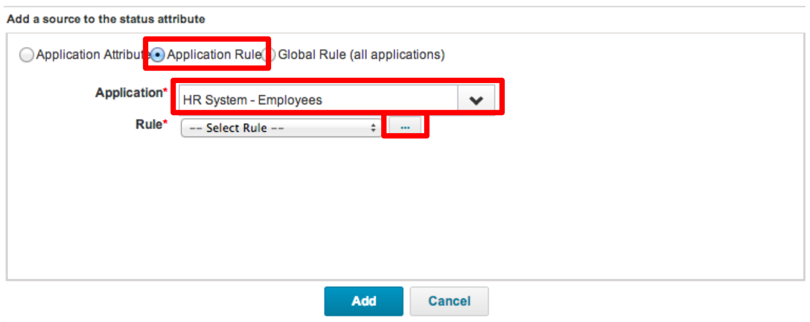
Source Mappings

      v. Under **Source Mapping**, select **Add Source**

         1. Configure the Source Mapping as shown

            a. Application Rule: **Checked**

b. Application: **HR System – Employees**


Add a source to the status attribute

◯ Application Attribute [✓ ◉ Application Rule] ◯ Global Rule (all applications)

Application*: HR System - Employees

Rule*: -- Select Rule --

c. Click the "…" to access the Rule Editor. Edit the Rule as shown here:

i. Rule Name: **Identity Attribute: Employees**

ii. In the Rule Editor, type the Rule Script: **return "Employee";**

d. Click **Save** to save the rule

2. Choose the rule you just created and select **Add.**

vi. Under **Source Mapping**, select **Add Source** again

1. Configure the Source Mapping as shown

a. Application Rule: **Checked**

b. Application: **Contractor Feed**

c. Click the "…" to edit the Rule as shown here:

i. Rule Name: **Identity Attribute: Contractors**

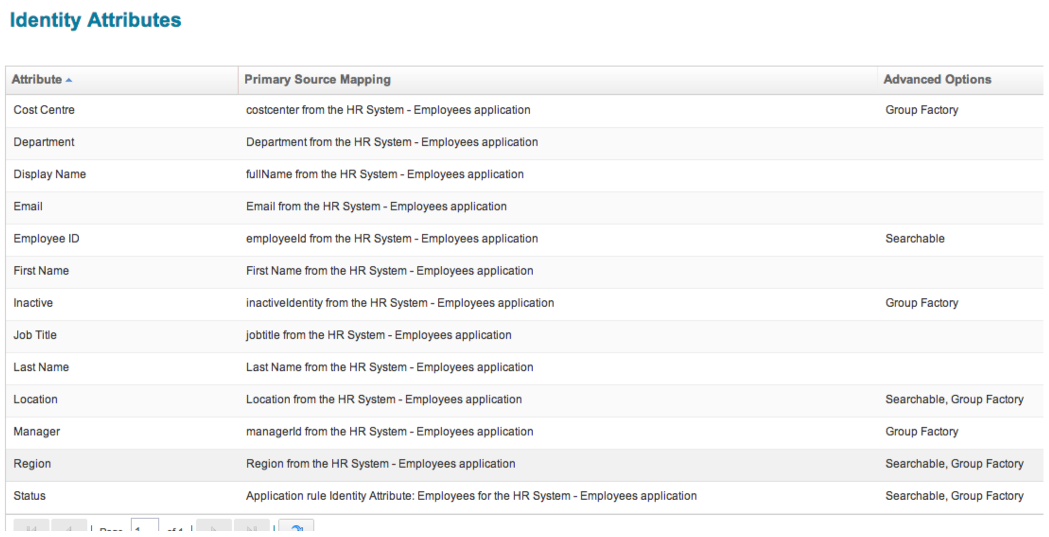
ii. Rule Script: **return "Contractor";**

d. Click **Save** to save the rule

2. Choose the rule you just created and select **Add.**

vii. Click **Save** to save all changes to the **status** attribute

1. After adding these 7 additional Identity Attributes, your Identity Attributes screen should look similar to this:



Identity Attributes

Attribute	Primary Source Mapping	Advanced Options
Cost Centre	costcenter from the HR System - Employees application	Group Factory
Department	Department from the HR System - Employees application	
Display Name	fullName from the HR System - Employees application	
Email	Email from the HR System - Employees application	
Employee ID	employeeId from the HR System - Employees application	Searchable
First Name	First Name from the HR System - Employees application	
Inactive	inactiveIdentity from the HR System - Employees application	Group Factory
Job Title	jobtitle from the HR System - Employees application	
Last Name	Last Name from the HR System - Employees application	
Location	Location from the HR System - Employees application	Searchable, Group Factory
Manager	managerId from the HR System - Employees application	Group Factory
Region	Region from the HR System - Employees application	Searchable, Group Factory
Status	Application rule Identity Attribute: Employees for the HR System - Employees application	Searchable, Group Factory

Note: Certain fields are marked as "Searchable" and/or "Group Factory". A field should be marked as searchable if you will need to use it for account correlation (like Employee ID) or for Analytics (Location, Region). Group Factory identifies those fields from which groups of users may be created (for example, a group of inactive users). You will use these later.

Update Manager Status

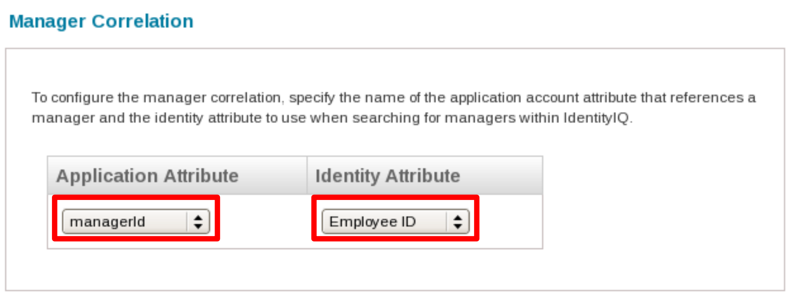
The data we are reading from the delimited files includes manager data. In order to get this manager data to properly be handled by IdentityIQ, we need to define a manager correlation. This correlation will describe which Application Attribute defines a user's manager, and which attribute to map this to in the Identity.

In our case, each managerId from the delimited files maps to a specific Employee ID.

1. Define Manager Correlation for the **HR System - Employees** application.

   a. Navigate to **Define → Applications → HR System - Employees** and go to the **Correlation** tab

b. Under **Manager Correlation**, set the **Application Attribute** to **“managerId”** and the **Identity Attribute** to **“Employee ID”**


Manager Correlation

To configure the manager correlation, specify the name of the application account attribute that references a manager and the identity attribute to use when searching for managers within IdentityIQ.

Application Attribute	Identity Attribute
managerId	Employee ID

c. Select **Save** to save the application definition.

2. Repeat the above steps for the **Contractor Feed** application.

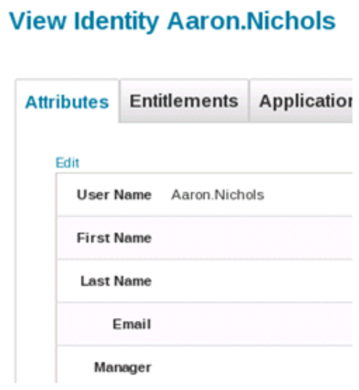
a. Navigate to **Define → Applications → Contractor Feed** and go to the **Correlation** tab

b. Under **Manager Correlation**, Set the **Application Attribute** to **“managerId”** and the **Identity Attribute** to **“Employee ID”**

c. Select **Save** to save your application definition

Configure the UI to Display new Identity Attributes

Another thing we need to do is configure the UI to display all these new identity attributes. By default, IdentityIQ will only display a certain set of attributes as shown here.


View Identity Aaron.Nichols

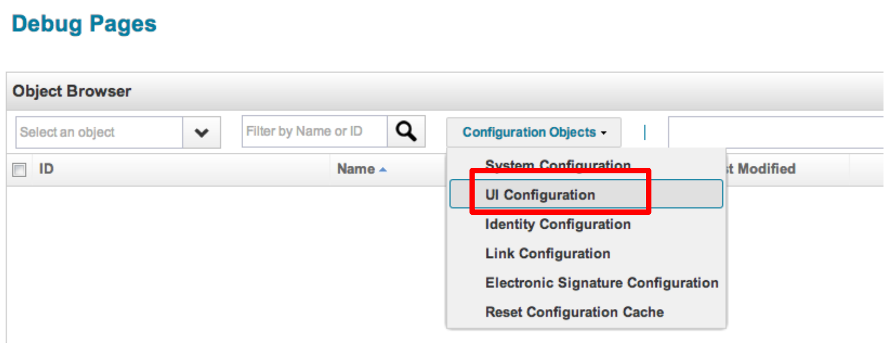
User Name	Aaron.Nichols
First Name	
Last Name	
Email	
Manager	

We want to extend this to show our new identity attributes, like Status, Job Code, Cost Centers, etc.

1. Configure IdentityIQ to display all Identity Attributes

a. Using Firefox, open another tab and browse to **http://localhost:8080/identityiq/debug** or use the Debug shortcut in you Firefox browser

b. The IdentityIQ Debug Pages are used for advanced configuration and for debugging. Click **UI Configuration** as shown:



c. You will now see an XML representation of the UIConfig object within IdentityIQ. Search for entry key with the name: **identityViewAttributes**. The keys are listed alphabetically. It will look like this:

```
<entry key="identityViewAttributes" value="name,firstname,lastname,email,manager"/>
```

d. Edit the entry and change it to reflect the additional fields that we want to display Take care to make sure that you type the names of the attributes accurately:

```
<entry key="identityViewAttributes" value="name,firstname,lastname,email,manager,
department,location,empId,region,jobtitle,costcenter,status"/>
```

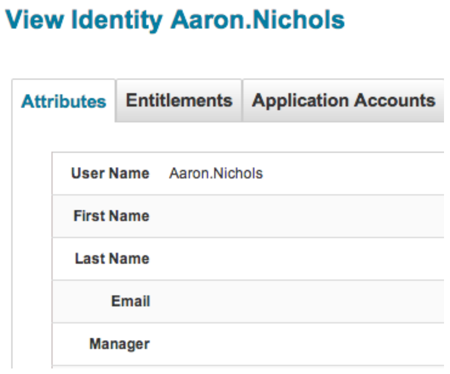
e. Scroll to the bottom of the page and **Save**

f. Navigate to **Define → Identities**, click any identity and confirm that new attributes are displayed. Notice that they are not yet populated with values.

Refresh and Populate the Identity Attributes

An **aggregation** task reads data from an external application, and a **refresh** task acts upon data within IdentityIQ. We aggregated the **HR System – Employees** and **Contractor Feed** applications, which read all of the information specified in each application schema and stored it as Application Account data. Now, based on our mappings, the Application Data will be used to populate the Identity Attributes.

1. Remember that when we aggregated the **HR System – Employees** and **Contractor Feed** applications, the Identity Attributes were not populated. This was because at the time of the aggregation, no mappings were defined. Once mappings are defined, aggregation will also populate the Identity Attributes.



View Identity Aaron.Nichols

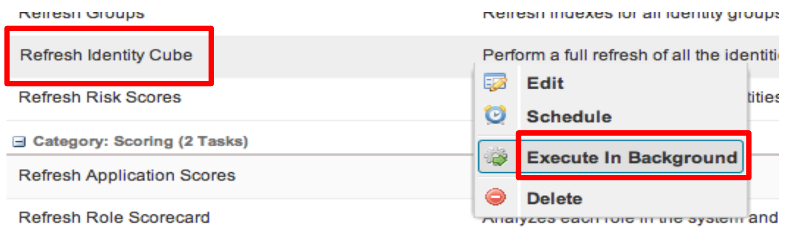
User Name	Aaron.Nichols
First Name	
Last Name	
Email	
Manager	

Note: Aggregation without mappings is often done as part of the exploratory process to view the data prior to promoting it to identity attributes when onboarding an application.

2. Refresh Identities and observe changes to the Identities

   a. Navigate to **Monitor → Tasks** and scroll down looking for the **Refresh Identity Cube** task

   b. Right-Click and choose **Execute in Background**

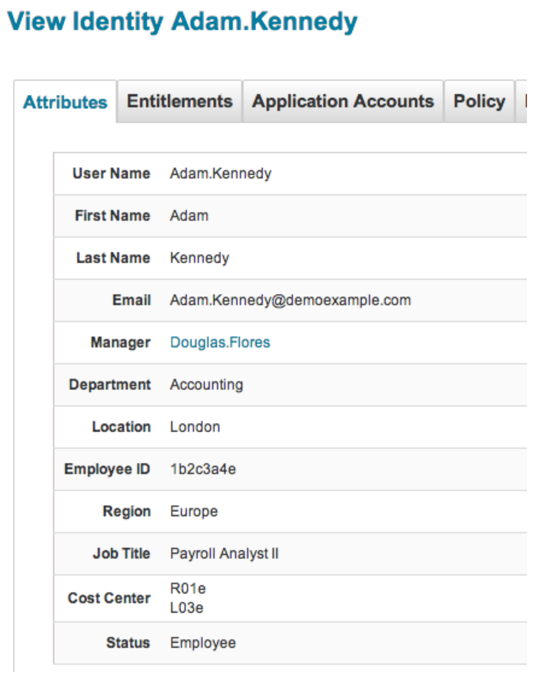


Refresh Groups
Refresh indexes for all identity groups
Refresh Identity Cube
Perform a full refresh of all the identiti
Refresh Risk Scores
tities
Category: Scoring (2 Tasks)
Refresh Application Scores
Refresh Role Scorecard
Analyzes each role in the system and
Edit
Schedule
Execute In Background
Delete

   c. Wait until the task is complete (Visit **Task Results** and refresh to see when it's complete.)

   d. When the refresh is complete, Navigate to **Define → Identities**

e. Click **Adam.Kennedy** and see that this user now has populated values for all attributes, including the Manager and Status. Check a few other identities to see if they were loaded properly and that the Manager and Status fields are set.



User Name	Adam.Kennedy
First Name	Adam
Last Name	Kennedy
Email	Adam.Kennedy@demoexample.com
Manager	Douglas.Flores
Department	Accounting
Location	London
Employee ID	1b2c3a4e
Region	Europe
Job Title	Payroll Analyst II
Cost Center	R01e L03e
Status	Employee

i. Notice the manager name is a link to the manager's cube. IdentityIQ maintains the reporting hierarchy for use in approvals, escalations, etc.

ii. Notice Cost Center. Because we specified the identity attribute as multi-valued, it retains its multi-value representation that was first specified on the application schema.

3. One common thing to do is to customize the Identities page to include new Identity Attributes (like our new "Status" attribute) and whether or not the identity is "Authoritative" or not.

   a. Go to the Debug page (use the shortcut in the Firefox browser.)

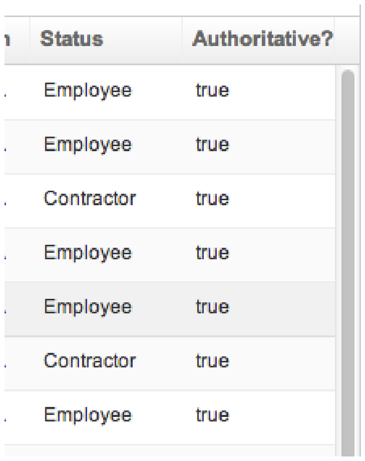
   b. Click the drop down arrow next to **Configuration Objects** and select **UI Configuration**

   c. Search for **identityTableColumns** and select **Next** until you find **<entry key="identityTableColumns">**

d. Add the following two lines to the entry for **identityTableColumns** and click **Save**

```
<ColumnConfig dataIndex="status" headerKey="Status" hideable="true"
property="status" sortProperty="status" sortable="true"/>
<ColumnConfig dataIndex="correlated" headerKey="Authoritative?" hideable="true"
property="correlated" sortProperty="correlated" sortable="true"/>
```

e. Navigate to **Define → Identities** and confirm that your new columns show in the UI.



Status	Authoritative?
Employee	true
Employee	true
Contractor	true
Employee	true
Employee	true
Contractor	true
Employee	true

Note: UI Customizations like those we performed in this section can be useful to customize the look and feel of the IdentityIQ product to reflect additional attributes that you add to the system. There is a Technical White Paper available in the Compass portal that details all the available UI Configuration options available to implementers.

Investigate Your Data

Now that the account data specified in the Identity Mappings has been promoted to Identity Attributes, both the standard and the extended Identity Attributes are available for searching.

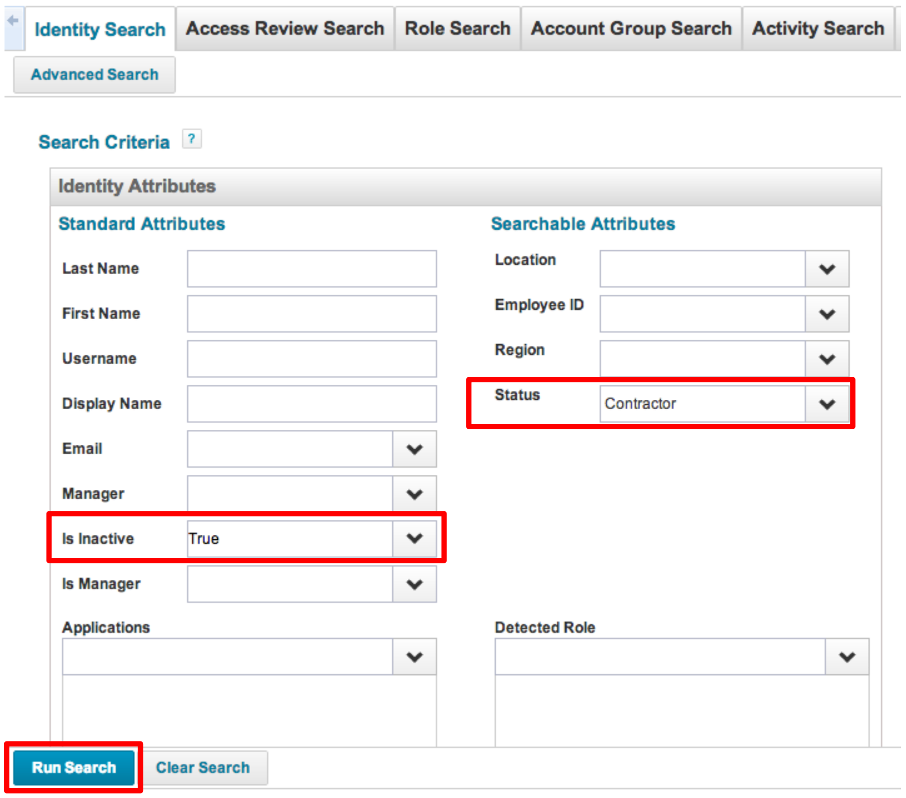
1. Navigate to **Analyze→Advanced Analytics** and select the **Identity Search** tab.
   a. How many Searchable Attributes are now available? ______________
   b. Where did you specify that these attributes are searchable?

   ____

2. Using **Advanced Analytics**, **Identity Search** tab, answer the following questions.
   a. How many *inactive* and contractors are there? ______________

   b. To ensure that no previously defined search parameters impact your search, a good practice is to clear the search parameters prior to searching. At the bottom left, select **Clear Search.**

      i. Set **Is Inactive** to **True**
      ii. Set **Status** to **Contractor**
      iii. Click **Run Search**

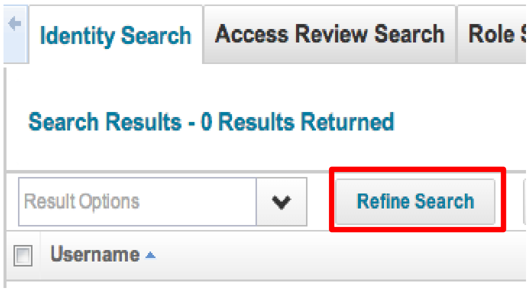


Is Inactive: True

Status: Contractor

   c. From the results page, answer the question above.

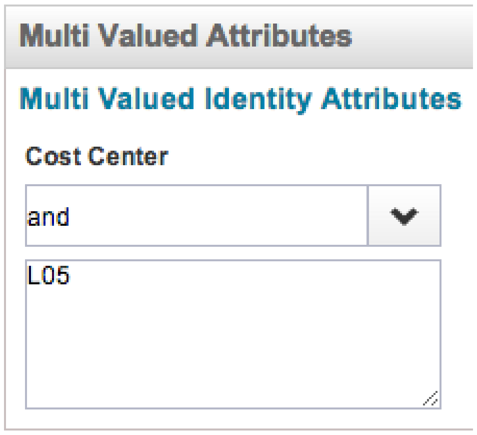
d. Click **Refine Search**, and then click **Clear Search** to reset everything.



e. Now on your own, answer the following question:

How many *inactive employees* are there? _______________

3. You configured Cost Center as a multi-valued attribute and thus, because it is multi-valued, it is also searchable. On the Identity Search tab, scroll down to **Multi Valued Attributes.**



L05

a. Select **Clear Search**, and then in the **Value** box, enter **L05**

b. Select **Run Search**

c. How many identities contain the *L05 cost center*? _______________

Handy Tip: When working through these exercises, it is common to make some mistakes. You can always clear out all the identities in the system by using the IdentityIQ console.

Start the IIQ Consle by using either method:

(1) **./iiq console -j** (from within the /WEB-INF/bin directory)

(2) Use the **IIQ Console** shortcut from the Desktop of the training environment

From within the console, run **delete identity *** to clear out all Identities from the system.

Note: use this option cautiously as this will remove all identities other than **spadmin**, which is identified as a protected identity. If identities are used as values for other fields (such as an Application owner), the field will be emptied and must be reset.

Once you've cleaned everything out, you can always re-execute the aggregation and identity refresh tasks to reload the identity cubes.

Exercise #2: Loading and Correlating the Financials Application

Objective

In this exercise, we will load and correlate the Financials application. This application is used by a subset of people at the company (mainly those in the Finance department.) This application data includes entitlement data as well as account data.

Overview

When loading a non-authoritative application, it is necessary to correlate user accounts from this new application to existing Identity Cubes. We will do this by defining an Account Correlation configuration when configuring each application. Account Correlation can be configured as a simple attribute mapping or, for more complicated examples; we can implement Account Correlation as a rule. In this section we will use an attribute mapping to correlate accounts.

As an example, the data for the Financial application looks like this:

```
employeeId,dbId,app2_privileged,acct_lastLogin,app2_service,app2_inactive,groupmbr,userName
1a2c3a,112,false,04/17/2008 21:26:43,false,false,AcctsPayable,RichardJackson
1a2c3a,112,true,04/17/2008 21:26:43,true,true,AcctsReceivable,RichardJackson
1a2c3a,112,true,04/17/2008 21:26:43,false,false,PayrollAnalyis,RichardJackson
1a2c3a,112,false,04/17/2008 21:26:43,false,false,PlanReview,RichardJackson
1a2c3b,113,false,04/17/2008 21:26:43,false,false,AcctsReceivable,MariaWhite
1a2c3c,114,true,04/17/2008 21:26:43,false,false,DPA,CharlesHarris
1a2c3c,114,false,04/17/2008 21:26:43,false,false,FinancialAnalyis,CharlesHarris
1a2c3c,114,false,04/17/2008 21:26:43,false,false,FinancialPlanning,CharlesHarris
1a2c3c,114,false,04/17/2008 21:26:43,false,false,PlanReview,CharlesHarris
1a2c3c,114,false,04/17/2008 21:26:43,false,false,Strategy&Planning,CharlesHarris
…
```

Notice that there are multiple rows for the same users. Charles Harris has 5 rows in the data because he is a member of five separate groups on the Financial application. Because of this, we will also implement merging of the data when we read in the accounts from this application.

Also, notice the employeeId field. We will use this value as our correlating value to link these accounts to our existing Identity Cubes.

After loading this application, we will see if we have any orphan accounts in the system (those accounts that cannot be linked to existing identity cubes) and will use manual correlation to deal with these accounts appropriately.

Define the Financials Application

1. For all new application definitions, we will not walk you through the process step-by-step, but will provide you with a table detailing the application settings.
    a. Create a new Application using information from the following table:

Application Define → Applications → Add New Application	
Name:	**Financials**
Owner:	**The Administrator**
Description:	**Finance Application**
Application Type (Connector:)	**Delimited File**
Connector Attributes: Attributes Tab	
File Path	**/home/spadmin/ImplementerTraining/data/Finance-users.csv**
Delimiter	**,**
File has column header on first line	**Checked**
Data needs to be Merged	**Checked**
Index Column	**dbId**
Data sorted by the indexColumn(s)?	**Checked**
Which Columns should be merged?	**groupmbr**

    b. Scroll down and click **Save**

2. Next, we will configure the attributes that we will read from the **Financials** application.
    a. Navigate to **Define → Applications** and choose the **Financials** application
    b. Scroll down and choose the **Schema** tab
    c. Choose **Add Account Schema** and then **Discover Schema Attributes.** Configure the schema settings as shown:
        i. Native Object Type: **account**
        ii. Identity Attribute: **dbId**
        iii. Display Attribute: **userName**
        iv. Under attributes, for the **groupmbr** attribute, check **Managed, Entitlement** and **Multi-Valued**

v. Complete the following sentences:

1. When ______________________________ is specified, it indicates that the values of that item will also be included in the Entitlement Catalog.

2. As a result of the ________________________________ designation, the entitlements are also listed on the Entitlements tab on the Identity Cube and will ultimately be available for certification and other usage.

d. Select **Preview Accounts** and notice that the data has been merged (look at the **groupmbr** field). Preview Accounts displays the first ten resource object records.

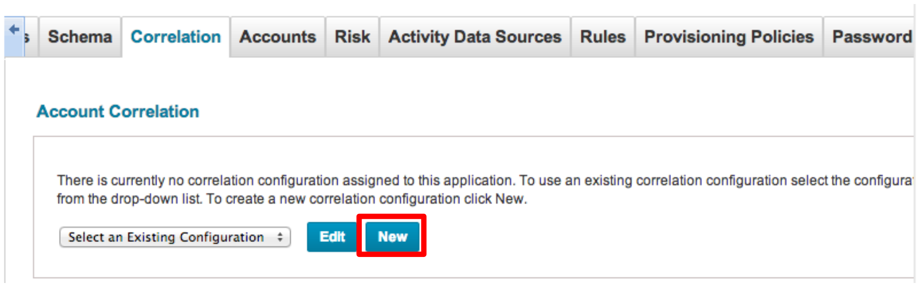
e. Scroll down and click **Save**

3. Define an Account Correlation configuration to match accounts from this application to existing Identity Cubes

a. Navigate to **Define → Applications** and choose the **Financials** application

b. Scroll down and choose the **Correlation** tab

i. Click the **New** button



There is currently no correlation configuration assigned to this application. To use an existing correlation configuration select the configura
from the drop-down list. To create a new correlation configuration click New.

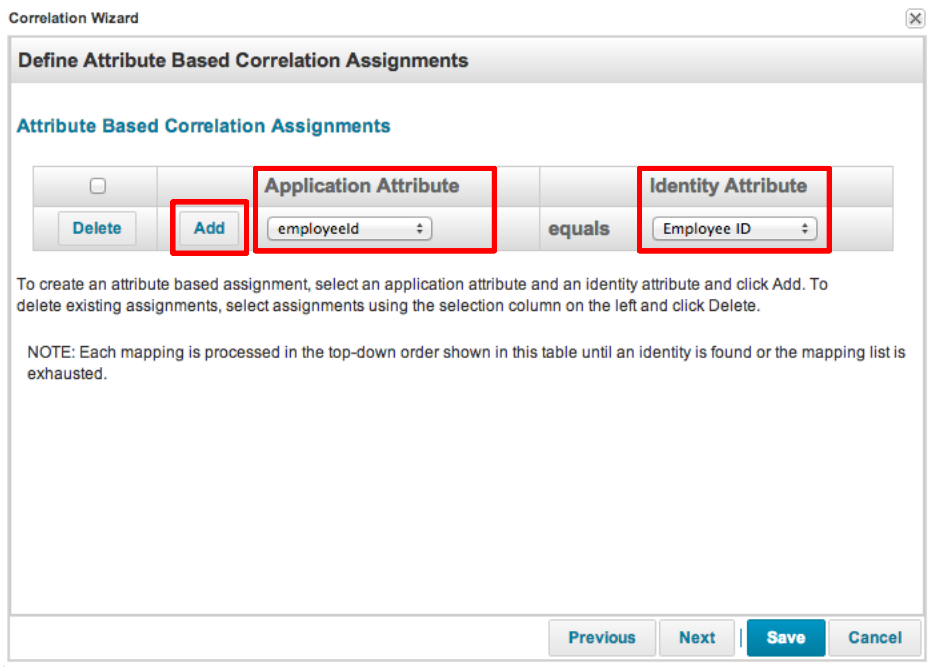
ii. This will bring up the **Correlation Wizard**

iii. Click **Next**

iv. When prompted, enter a name for this configuration: **Financial Correlation**

v. Click **Next** twice

vi. When prompted, configure the **Attribute Based Correlation Assignment** as shown, then click **Add**


Correlation Wizard

Define Attribute Based Correlation Assignments

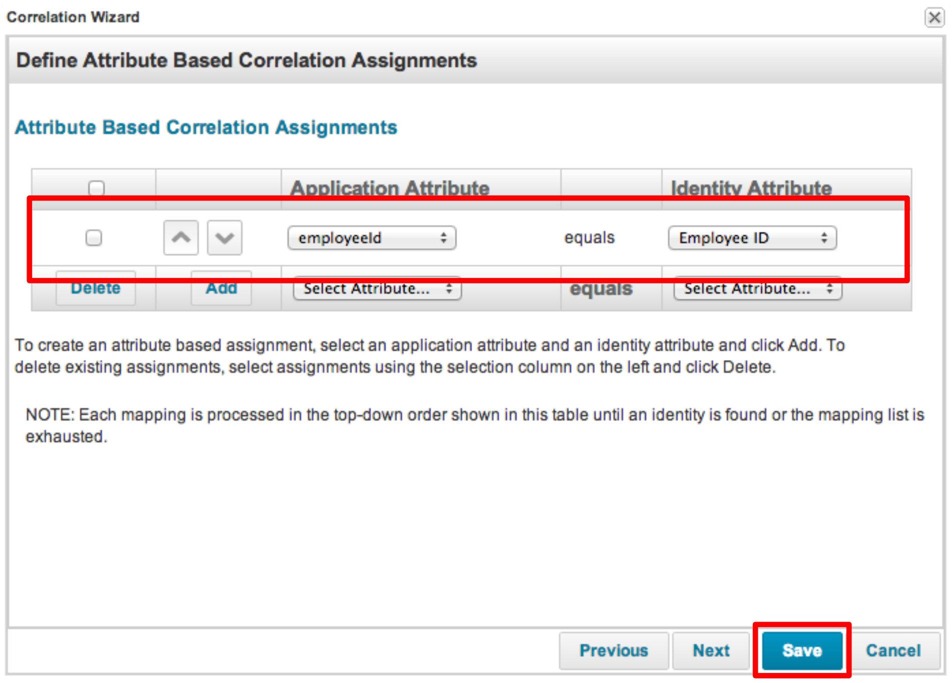
Attribute Based Correlation Assignments

		Application Attribute		Identity Attribute
Delete	Add	employeeId	equals	Employee ID

To create an attribute based assignment, select an application attribute and an identity attribute and click Add. To delete existing assignments, select assignments using the selection column on the left and click Delete.

NOTE: Each mapping is processed in the top-down order shown in this table until an identity is found or the mapping list is exhausted.

vii. Confirm that the mapping is configured as shown below, then click **Save**


Correlation Wizard

Define Attribute Based Correlation Assignments

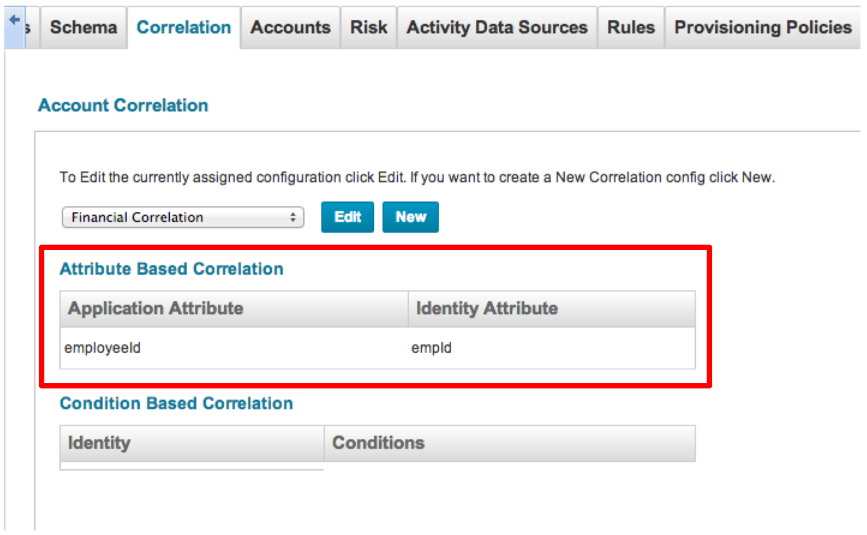
Attribute Based Correlation Assignments

		Application Attribute		Identity Attribute
		employeeId	equals	Employee ID
Delete	Add	Select Attribute...	equals	Select Attribute...

To create an attribute based assignment, select an application attribute and an identity attribute and click Add. To delete existing assignments, select assignments using the selection column on the left and click Delete.

NOTE: Each mapping is processed in the top-down order shown in this table until an identity is found or the mapping list is exhausted.

viii. At this point, your correlation should look like this:



Account Correlation

To Edit the currently assigned configuration click Edit. If you want to create a New Correlation config click New.

Financial Correlation

Attribute Based Correlation

Application Attribute	Identity Attribute
employeeId	empId

Condition Based Correlation

Identity	Conditions

ix. Click **Save** to save the application definition

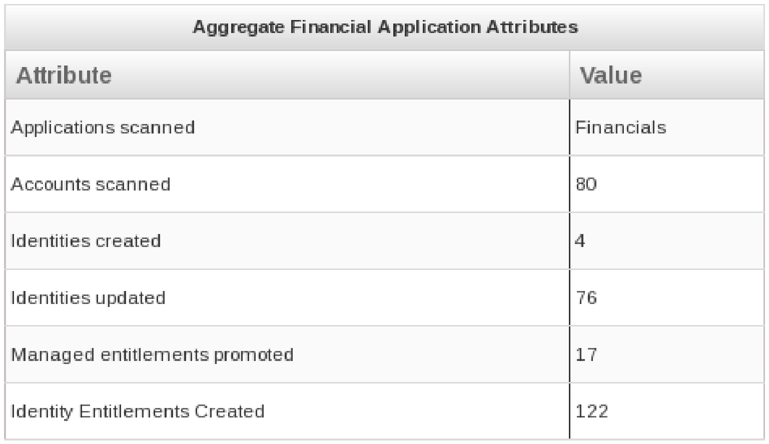
Aggregate from the Financials Application

1. We will now create a task to aggregate accounts from the Financials application. For all new task definitions, we will not walk you through the process step-by-step, but will provide you with a table detailing all the settings:

Task Monitor → Tasks → New Task...	
Type:	**Account Aggregation**
Name:	**Aggregate Financial Application**
Description:	**Task to aggregate accounts from the Financials application.**
Select applications to scan:	**Financials**
Detect deleted accounts:	**Checked**
Disable optimization of unchanged accounts:	**Checked**
Promote managed attributes:	**Checked**

2. Scroll down and select **Save and Execute** and click **OK**

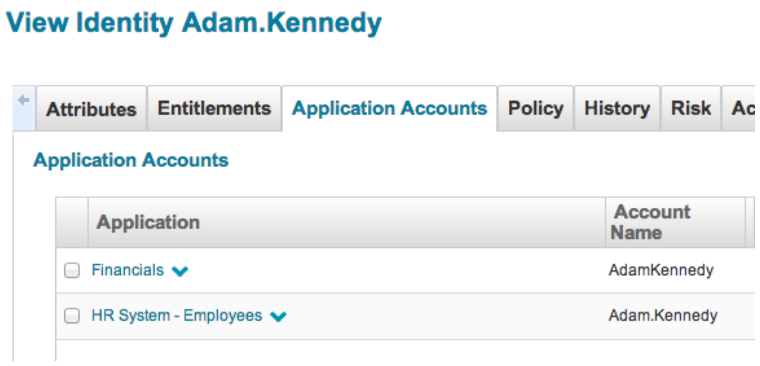
3. Go to **Task Results** and confirm that the results are shown:



Aggregate Financial Application Attributes	
Attribute	**Value**
Applications scanned	Financials
Accounts scanned	80
Identities created	4
Identities updated	76
Managed entitlements promoted	17
Identity Entitlements Created	122

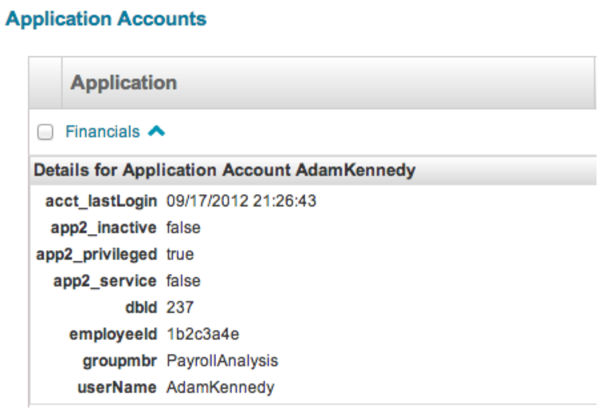
Confirm that Accounts and managed entitlements were properly loaded

1. Navigate to **Define → Identities** and find **Adam.Kennedy**
2. Click **Application Accounts** and check to make sure that the Financials account shows up:



Application	Account Name
Financials	AdamKennedy
HR System - Employees	Adam.Kennedy

3. Click the **Financials** account and check the attributes for the **Financials** application:



Details for Application Account AdamKennedy

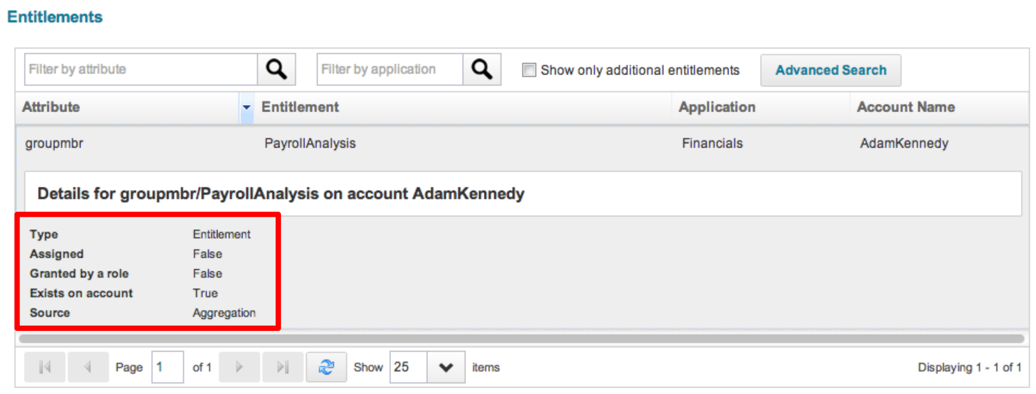
acct_lastLogin	09/17/2012 21:26:43
app2_inactive	false
app2_privileged	true
app2_service	false
dbId	237
employeeId	1b2c3a4e
groupmbr	PayrollAnalysis
userName	AdamKennedy

4. Within the same Identity (Adam.Kennedy), click **Entitlements** and then under **Entitlements,** select the **groupmbr** entitlement to expand the information related to the entitlement.

   a. What is the source of this entitlement?

   ____

   b. Was this entitlement assigned through IdentityIQ? (circle one) YES / NO



Attribute	Entitlement	Application	Account Name
groupmbr	PayrollAnalysis	Financials	AdamKennedy

Details for groupmbr/PayrollAnalysis on account AdamKennedy

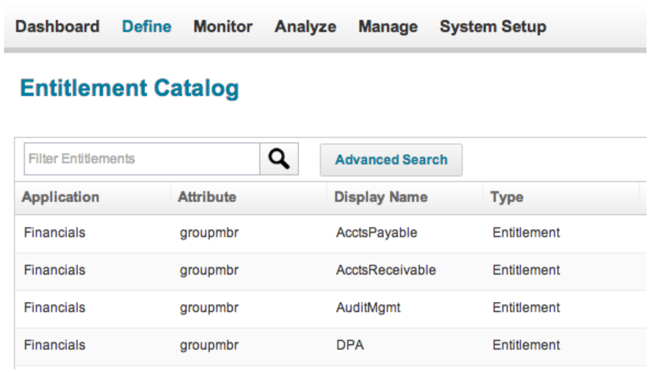
Type	Entitlement
Assigned	False
Granted by a role	False
Exists on account	True
Source	Aggregation

The **Source** is aggregation and **Assigned** is false. This means this is a detected entitlement that we discovered from the IT environment via **Aggregation.**

   c. Complete the following table. When you defined the Financials application, where did you configure IdentityIQ to track this entitlements information?

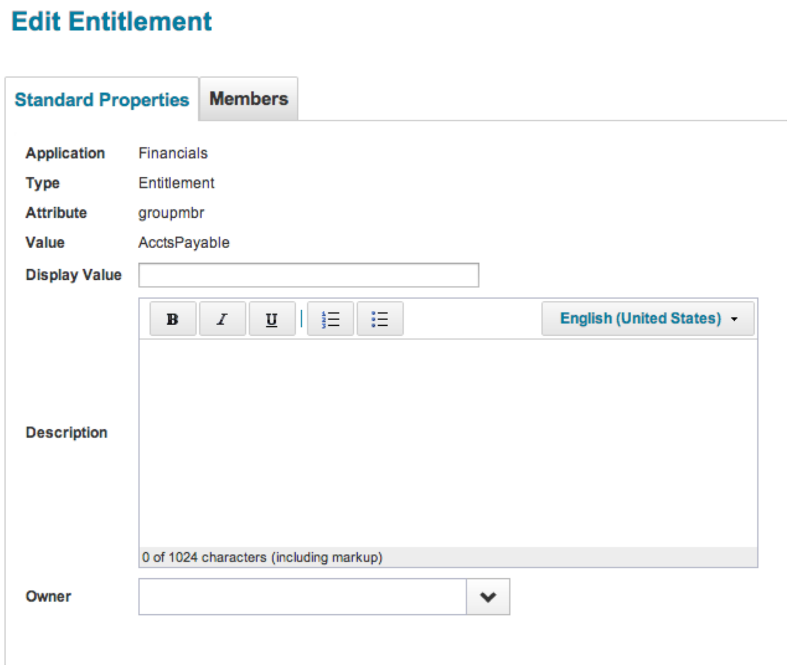
Which Application:	*Financials*
Which Tab:	
Which Attribute:	
Option Selected:	

5. Navigate to **Define → Entitlement Catalog** and notice that the entitlement values from the **Financials** application have been loaded. These values were loaded because we marked the **groupmbr** attribute as **Managed** in the application schema.



Application	Attribute	Display Name	Type
Financials	groupmbr	AcctsPayable	Entitlement
Financials	groupmbr	AcctsReceivable	Entitlement
Financials	groupmbr	AuditMgmt	Entitlement
Financials	groupmbr	DPA	Entitlement

6. In the entitlement catalog, we can assign owners to the entitlements (for approval purposes) and set multi-lingual descriptions. This data is useful during Certifications and for use with Lifecycle Manager as well. When LifeCycle Manager is installed, we can mark items as requestable (used by Lifecycle Manager to determine what can be requested).
   a. Select the **AcctsPayable** entitlement and view the options on the **Standard Properties** tab. You will not see the **Requestable** field because you have not yet installed LifeCycle Manager. Note that **Requestable** is the default.
   b. Select the **Members** tab to view the identities with the Financials AcctsPayable entitlement.



Application	Financials
Type	Entitlement
Attribute	groupmbr
Value	AcctsPayable

Exercise #3: Loading and Correlating the PAM Application

Objective

The objective of this exercise is to load an application that includes a more complicated definition including Accounts, Account Groups and Permissions.

Overview

The client has requested that we load an application that maintains application permissions in account groups. An account group is an indirect method of defining access to a resource. A user will have an account on a system with entitlement to a defined set of account groups. These account groups indirectly define the user's access to the application.

The PAM application data feed consists of two delimited files:

- PAM-users.csv – Contains user Account information for the PAM application. Parts of the account information that we will read are account groups (specifically Permission Groups).
- PAM-group-permissions.csv – Contains information about the Permission Groups themselves including the targets and rights that the Permission Group allows access to

When onboarding the PAM application, we will need to define two schemas, one for the accounts that we are aggregating and another for the account groups that we are aggregating.

Here is an example of what the data is that we will be modeling:

In the PAM-users.csv file, we have a user **Mary.Johnson** who has an account on the PAM application. Her account includes two **Permission Group** values

```
ACCOUNTING
FINANCE
```

In the permissions.csv file, we have permission groups defined as such:

```
"TEST01","20080211","ACCOUNTING","DR System:YY-Function Control:NN-BackupControl:YY"
"TEST01","20080211","FINANCE","DR System:YY-Function Control:NN-BackupControl:YY"
```

These lines define the specific permissions for both the **ACCOUNTING** and **FINANCE** permission groups. The permission data is stored as a single concatenated value, so we will use code (specifically a Build Map rule) to parse this data into individual rights and targets to store as permissions.

Create the Base PAM Application

1. Create a new application definition based on the following table:

Application Define → Applications → New Application	
Name:	**PAM**
Owner:	**Patrick.Jenkins**
Revoker:	**Albert.Woods**
Description:	**Financially significant application**
Application Type (Connector:)	**Delimited File**
Connector Attributes: Attributes Tab	
File Path	**/home/spadmin/ImplementerTraining/data/PAM-users.csv**
Delimiter	**,**
File has column header on first line	**Checked**
Data needs to be Merged	**Checked**
Index Column	**User ID**
Data sorted by the indexColumn(s)?	**Checked**
Which Columns should be merged?	**Permission Group**

   a. Click **Save** to save your work for the PAM Application

Configure Account Schema for PAM Application

1. Navigate to **Define → Applications** and choose the newly created **PAM** application
2. Click the **Schema** tab to define the account schema for the **PAM** application
3. Click **Add Account Schema**

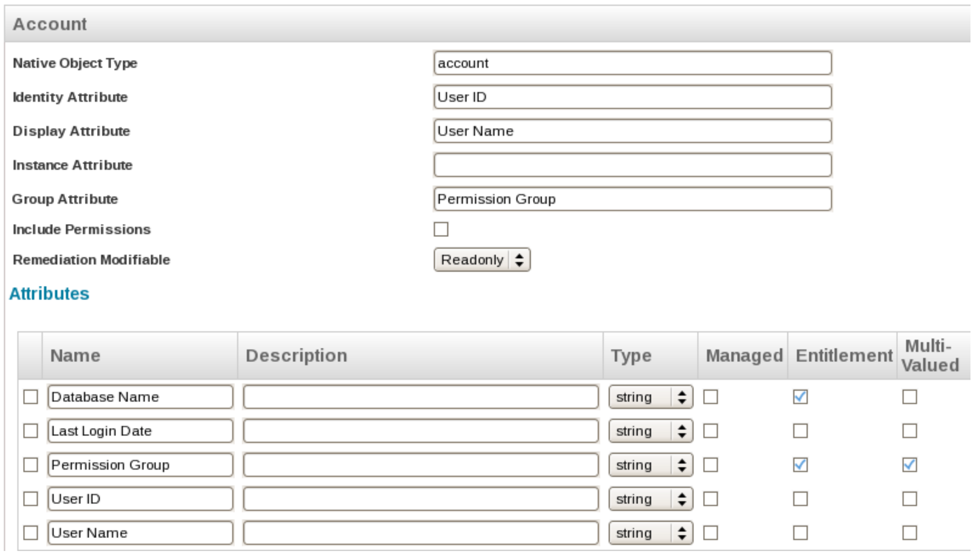
4. Fill in the configuration details:

Name	Value	Description
Native Object Type	account	This is predefined in most connectors. Ensures that the correct information is accessed. For Delimited File you will enter either "account" or "group" as appropriate.
Identity Attribute	User ID	The Identity Attribute defines which attribute will be used to determine the uniqueness of the account. You could think of this as the primary key for the application accounts. In this case, we are using the "User ID" which is unique for each user.
Display Attribute	User Name	A more "friendly" identifier for the account used in the GUI.
Group Attribute	Permission Group	Which attribute contains the definition of the groups that this account belongs to.

5. Fill in the following attributes for the account schema using the table below. To enter each new attribute, use the **Add New Schema Attribute** button.

Name	Type	Entitlement	Multi-Valued
Database Name	String	Checked	
User ID	String		
Permission Group	String	Checked	Checked
User Name	String		
Last Login Date	String		

6. Once finished, your account schema should look like this:



Account

Native Object Type	account
Identity Attribute	User ID
Display Attribute	User Name
Instance Attribute	
Group Attribute	Permission Group
Include Permissions	☐
Remediation Modifiable	Readonly

Attributes

	Name	Description	Type	Managed	Entitlement	Multi-Valued
☐	Database Name		string	☐	✓	☐
☐	Last Login Date		string	☐	☐	☐
☐	Permission Group		string	☐	✓	✓
☐	User ID		string	☐	☐	☐
☐	User Name		string	☐	☐	☐

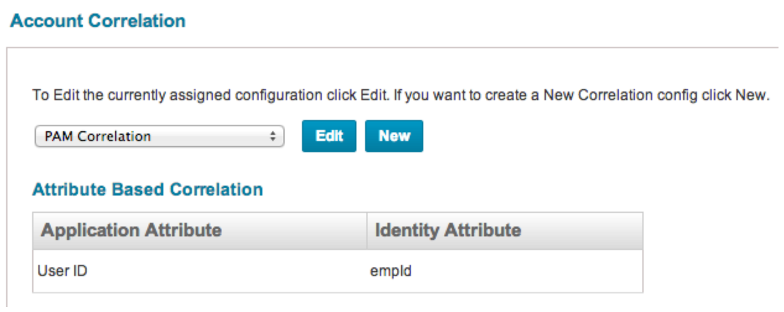
a. Preview the accounts.

b. Scroll to the bottom of the page and select **Save**.

7. On the **Correlation** tab, under **Account Correlation,** configure a new **Account Correlation** based on the following attributes:

Account Correlation	
Name	**PAM Correlation**
User ID	**User ID** equals **Employee ID**

8. Click **Save** once you've configured your account correlation**.** When done, your correlation should look like this.


Account Correlation
To Edit the currently assigned configuration click Edit. If you want to create a New Correlation config click New.
PAM Correlation
Edit
New
Attribute Based Correlation

Application Attribute	Identity Attribute
User ID	empId

9. Scroll to the bottom and **Save** the application definition.

10. Open up the IIQ console by one of the following two methods:

a. Click the **IIQ Console** shortcut on the desktop

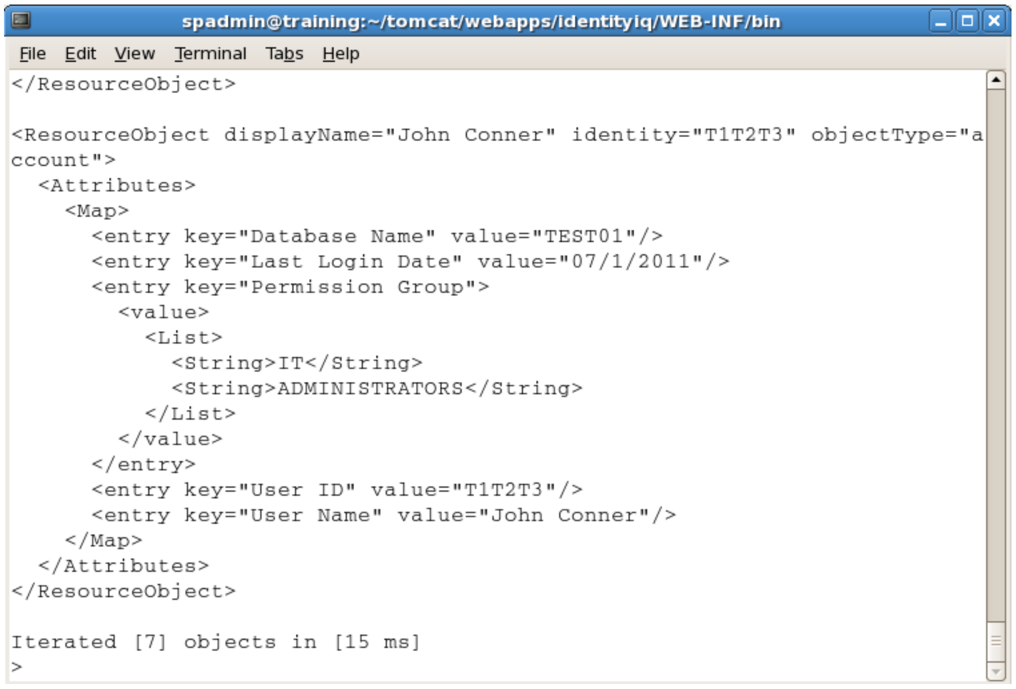
b. Using a Linux terminal window, run ./**iiq console -j** from **/home/spadmin/tomcat/webapps/identityiq/WEB-INF/bin**

11. Within the IIQ Console, run the following command:

```
>connectorDebug PAM iterate
```

12. The **connectorDebug** command iterates over all of the accounts and displays the results of the iteration to the console screen instead of loading it into IdentityIQ. Like the Preview Accounts button, this command can be extremely useful when doing initial work onboarding applications to make sure that you are properly reading and manipulating the data and that your schema is correct. The connectorDebug command displays an XML format of the resource object.

a. In the screen shot, circle the multi-value attribute and all of its values.


spadmin@training:~/tomcat/webapps/identityiq/WEB-INF/bin
File Edit View Terminal Tabs Help

```
</ResourceObject>

<ResourceObject displayName="John Conner" identity="T1T2T3" objectType="a
ccount">
  <Attributes>
    <Map>
      <entry key="Database Name" value="TEST01"/>
      <entry key="Last Login Date" value="07/1/2011"/>
      <entry key="Permission Group">
        <value>
          <List>
            <String>IT</String>
            <String>ADMINISTRATORS</String>
          </List>
        </value>
      </entry>
      <entry key="User ID" value="T1T2T3"/>
      <entry key="User Name" value="John Conner"/>
    </Map>
  </Attributes>
</ResourceObject>

Iterated [7] objects in [15 ms]
>
```

Note: Best practice is to start by using Preview Accounts (the only option for those who do not have console access). The connectorDebug command is useful for debugging problems with multi-valued attributes and when debugging build map rules (you see the output from the rule interspersed with the account information).

Caution: The connectorDebug command will display *all* accounts for the application, whether 200 or 200,000; whereas Preview Accounts displays the first 10 accounts.

Configure the Group Data Source for PAM Application

Now that we have successfully modeled the account schema, we need to model the group schema for the PAM application. This will involve defining the schema and what attributes we will read in from the PAM-group-permissions.csv file.

1. Navigate to **Define → Applications** and choose the **PAM** application

2. Under the **Attributes** tab, select the **Group** tab and configure the connector as shown:

Name	Value	Description
File Path	/home/spadmin/ImplementerTraining/data /PAM-group-permissions.csv	Location of the file containing the groups
Delimiter	,	
File has column header on first line	Checked	

3. Scroll down and select **Save**

Configure Group Schema for PAM Application

1. Navigate to **Define → Applications** and choose the **PAM** application
2. Under the **Schema** tab, scroll down and select **Add Group Schema**
3. Fill in the configuration details:

Name	Value	Description
Native Object Type	group	This is predefined in most connectors. Ensures that the correct information is accessed. For Delimited File you will enter either "account" or "group" as appropriate.
Identity Attribute	Permission Group	The Identity Attribute defines which attribute will be used to determine the uniqueness of the account. You could think of this as the primary key for the application accounts. In this case, we are using the "Permission Group" which is unique for each user.
Display Attribute	Permission Group	In this case, the Permission Group name is acceptable for the Display Attribute
Include Permissions	checked	We will be loading permissions as part of the data loading exercise. This tells the connector to expect them and to include them in the Entitlement Catalog.

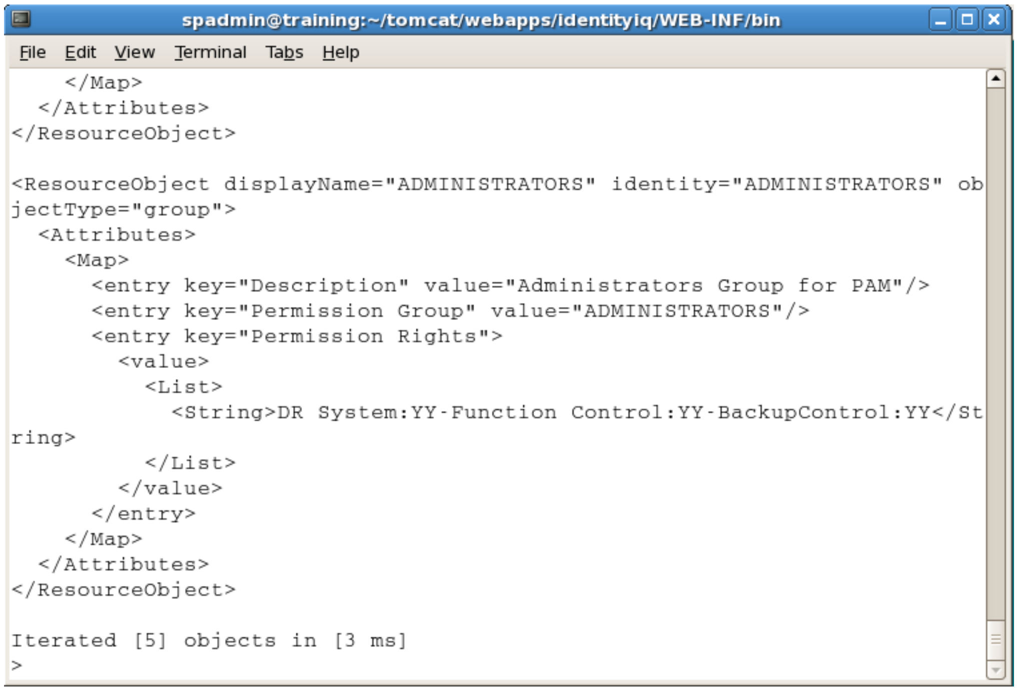
4. Fill in the following attributes for the group schema using the table below. To enter each new attribute, use the **Add New Schema Attribute** button.

Name	Type	Entitlement	Multi-Valued
Permission Group	String		
Permission Rights	String	Checked	Checked
Description	String		

5. Select the **Preview Groups** button. This command will iterate through the group information, and you can confirm that the Groups and Permissions are being extracted from the file correctly.
6. Scroll to the bottom and **Save** the application definition.
7. Go to the IIQ Console and run the following command:

```
>connectorDebug PAM iterate group
```

8. Like **Preview Groups**, running the **connectorDebug** command with the group option will iterate through the group information being read from the input file.


spadmin@training:~/tomcat/webapps/identityiq/WEB-INF/bin
File Edit View Terminal Tabs Help

```
    </Map>
  </Attributes>
</ResourceObject>

<ResourceObject displayName="ADMINISTRATORS" identity="ADMINISTRATORS" ob
jectType="group">
  <Attributes>
    <Map>
      <entry key="Description" value="Administrators Group for PAM"/>
      <entry key="Permission Group" value="ADMINISTRATORS"/>
      <entry key="Permission Rights">
        <value>
          <List>
            <String>DR System:YY-Function Control:YY-BackupControl:YY</St
ring>
          </List>
        </value>
      </entry>
    </Map>
  </Attributes>
</ResourceObject>

Iterated [5] objects in [3 ms]
>
```

Use a Build Map Rule to transform Permission Rights

If we look at the output from the connectorDebug command, we will see that the Permission Rights are being read as a single value similar to this:

```
"DR System:YY-Function Control:NN-BackupControl:YY"
```

This string represents a series of Targets and Rights.

The Targets are "DR System","Function Control" and "BackupControl". The Rights are either "NN" or "YY" where "YY" stands for Create and Update and "NN" stands for Execute

If we want to model this as individual permissions within IdentityIQ, we will need to break these Permission Rights up into something more like this:

- Right="Update" target="DR System"
- Right="Create" target="DR System"
- Right="Execute" target="Function Control"
- Right="Update" target="BackupControl"
- Right="Create" target="BackupControl"

Breaking up the rights and targets into individual entitlements will allow a certifier to make decisions for each Right and Target combination

1. Navigate to **Define → Applications** and select the **PAM** application

2. On the **Attributes** tab, scroll down to the **Connector Rules**, and click the **...** button next to **Build Map Rule**

3. Name the Rule: **Build Map Rule - PAM**

4. Copy the text from **/home/spadmin/ImplementerTraining/beanshell/BuildMapRule-PAM.txt** and paste it into the Rule Editor

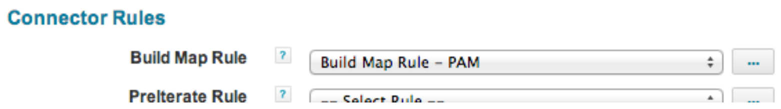
5. Scroll down to the bottom of the rule. Look at the documentation to answer the following question.

   a. What does the ArrayList object returned by the rule represent?

   ____

6. Click **Save**

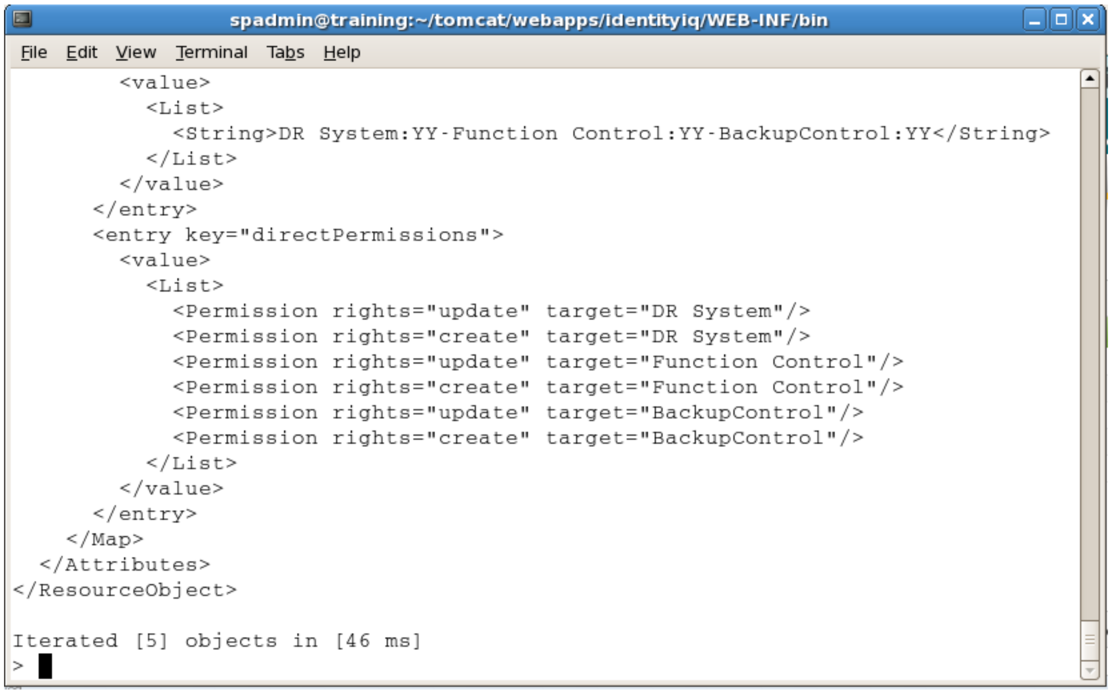
7. After saving the rule, select it from the drop down next to **Build Map Rule:**



8. Scroll down and **Save** the application

9. Go to the IIQ Console and run:

```
>clearCache
>connectorDebug PAM iterate group
```


spadmin@training:~/tomcat/webapps/identityiq/WEB-INF/bin
File Edit View Terminal Tabs Help

```
        <value>
          <List>
            <String>DR System:YY-Function Control:YY-BackupControl:YY</String>
          </List>
        </value>
      </entry>
      <entry key="directPermissions">
        <value>
          <List>
            <Permission rights="update" target="DR System"/>
            <Permission rights="create" target="DR System"/>
            <Permission rights="update" target="Function Control"/>
            <Permission rights="create" target="Function Control"/>
            <Permission rights="update" target="BackupControl"/>
            <Permission rights="create" target="BackupControl"/>
          </List>
        </value>
      </entry>
    </Map>
  </Attributes>
</ResourceObject>

Iterated [5] objects in [46 ms]
> 
```

10. You should see that your Build Map rule is now parsing out the Permission Rights from the file into individually certifiable Permissions. When we run a certification later on this data, we will see how this is presented to the user.
11. Now, we need to aggregate this data into the system. Remember, that the **connectorDebug** command only shows us a debug view of the data; we haven't actually loaded any Account and Account Group data into the system.

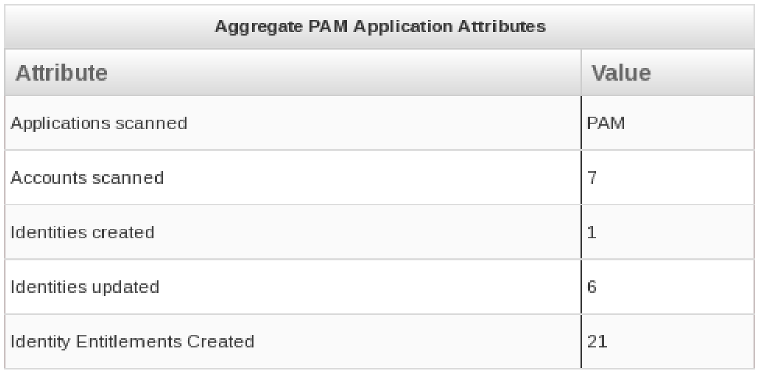
Aggregate PAM Accounts and Groups

1. In order to aggregate Accounts and Groups from the PAM application, we will need two tasks: one to aggregate accounts and the other to aggregate account groups.

2. We will now create a task to aggregate accounts from the PAM application:

Task Monitor → Tasks → New task…	
Type:	**Account Aggregation**
Name:	**Aggregate PAM Application**
Description:	**Task to aggregate accounts from the PAM application.**
Select applications to scan:	**PAM**
Detect deleted accounts:	**Checked**
Disable optimization of unchanged accounts:	**Checked**

3. Scroll down and select **Save and Execute** and click **OK.** Go to **Task Results** and wait for the task to finish. Confirm the results:



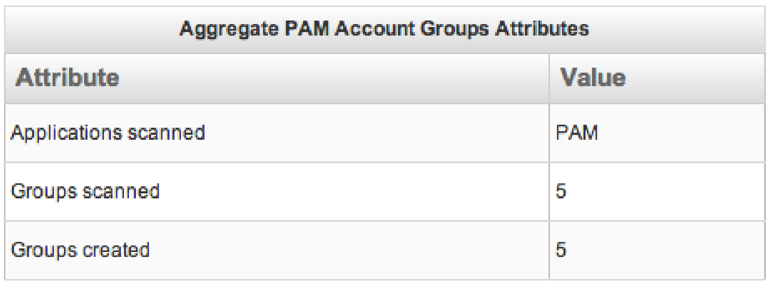
Aggregate PAM Application Attributes

Attribute	Value
Applications scanned	PAM
Accounts scanned	7
Identities created	1
Identities updated	6
Identity Entitlements Created	21

4. Create another task for group aggregation as shown:

Task Monitor → Tasks → New task…	
Type:	**Account Group Aggregation**
Name:	**Aggregate PAM Account Groups**
Description:	**Task to aggregate account groups from the PAM application.**
Select applications to scan:	**PAM**
Automatically promote descriptions to this locale:	**en_US**
Description attribute (default "description")	**Description**

5. Scroll down and select **Save and Execute** and select **OK.** Go to the **Task Results** tab and confirm the results:



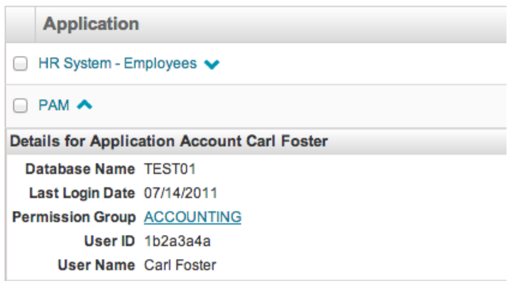
Aggregate PAM Account Groups Attributes

Attribute	Value
Applications scanned	PAM
Groups scanned	5
Groups created	5

6. Confirm that your PAM accounts and groups were loaded properly

   a. Go to **Define → Identities** and look up the user: **Carl.Foster**

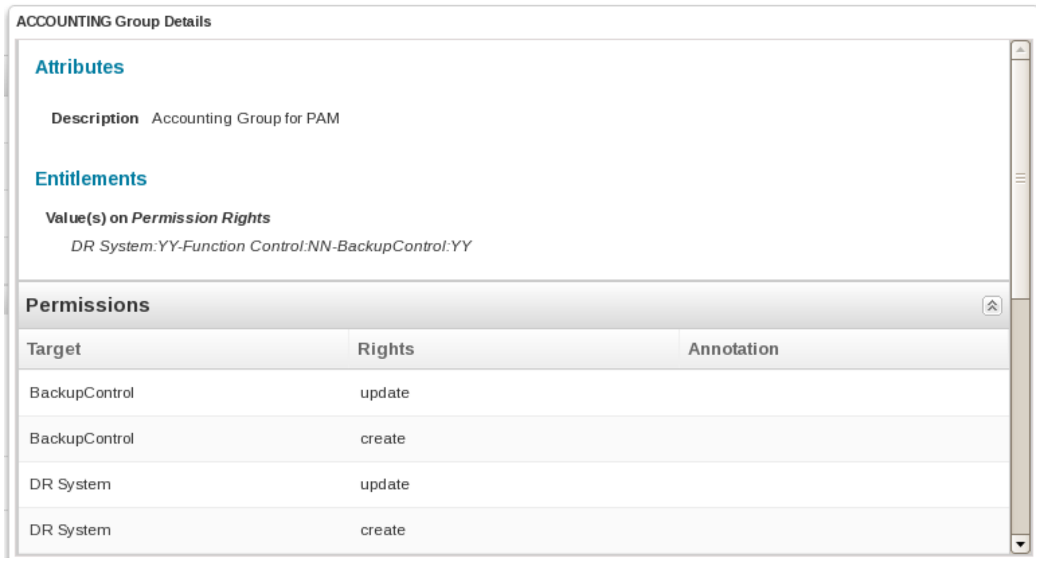
   b. Click **Application Accounts** and select the **PAM** application



Details for Application Account Carl Foster

Database Name	TEST01
Last Login Date	07/14/2011
Permission Group	ACCOUNTING
User ID	1b2a3a4a
User Name	Carl Foster

c. Select **ACCOUNTING** to see the Rights and Targets for the **ACCOUNTING** group and all other members that share the same **ACCOUNTING group**



ACCOUNTING Group Details

Attributes

Description Accounting Group for PAM

Entitlements

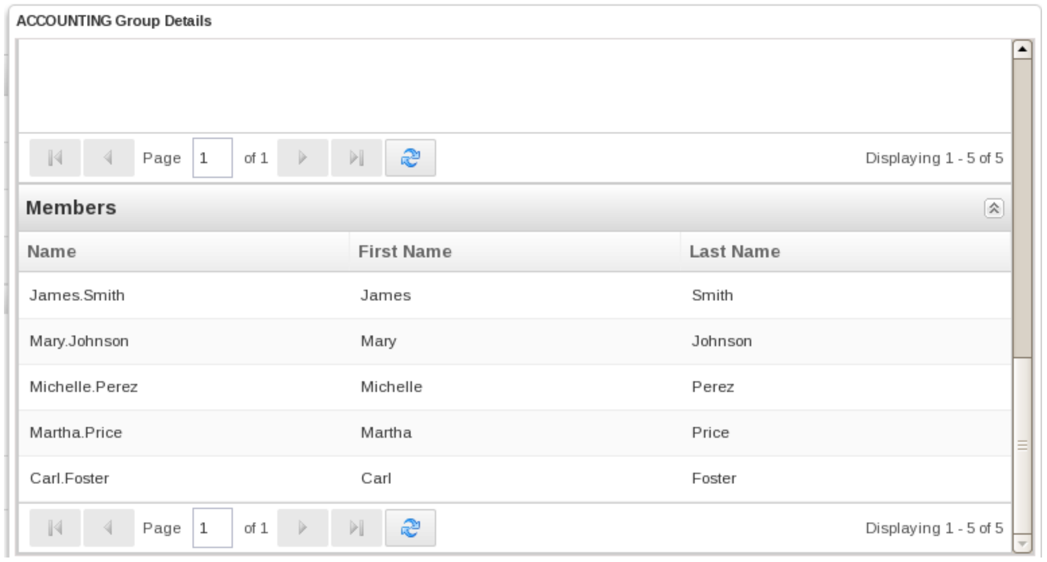
Value(s) on *Permission Rights*

DR System:YY-Function Control:NN-BackupControl:YY

Permissions

Target	Rights	Annotation
BackupControl	update	
BackupControl	create	
DR System	update	
DR System	create	

d. In the ACCOUNTING Group Details window, to see the members, scroll down and expand Members.



ACCOUNTING Group Details

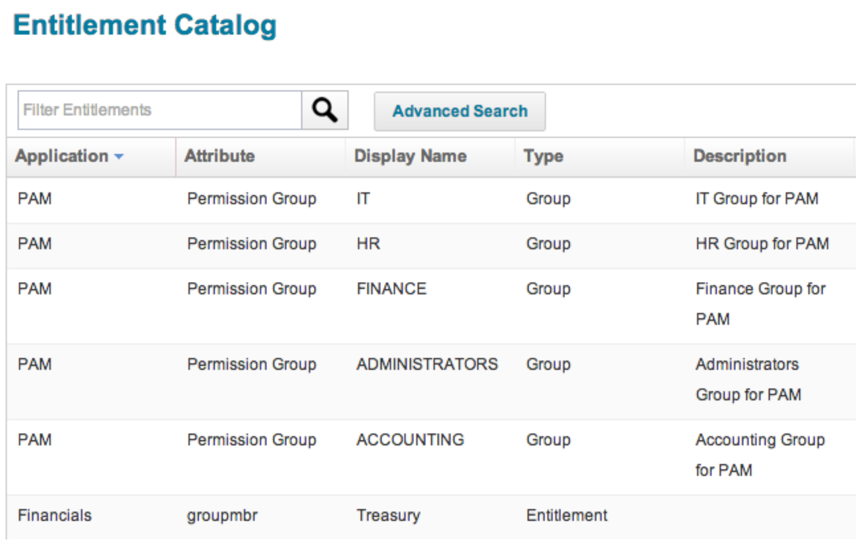
Page 1 of 1 Displaying 1 - 5 of 5

Members

Name	First Name	Last Name
James.Smith	James	Smith
Mary.Johnson	Mary	Johnson
Michelle.Perez	Michelle	Perez
Martha.Price	Martha	Price
Carl.Foster	Carl	Foster

Page 1 of 1 Displaying 1 - 5 of 5

e. Navigate to **Define → Entitlement Catalog** and see all the Account Groups defined for the PAM application. You can sort on the application name column to see them grouped together.


Entitlement Catalog

Application	Attribute	Display Name	Type	Description
PAM	Permission Group	IT	Group	IT Group for PAM
PAM	Permission Group	HR	Group	HR Group for PAM
PAM	Permission Group	FINANCE	Group	Finance Group for PAM
PAM	Permission Group	ADMINISTRATORS	Group	Administrators Group for PAM
PAM	Permission Group	ACCOUNTING	Group	Accounting Group for PAM
Financials	groupmbr	Treasury	Entitlement	

f. You can click any of the Account Groups to see the permissions and members for any of these Account Groups

Exercise #4: Onboarding JDBC Applications

Objective

The objective of this exercise is to onboard account data out of multiple JDBC resources.

Overview

For this application, we will onboard two JDBC applications:

- TRAKK – An application that we will configure completely by hand
- PRISM – An application that we will configure by loading a ready to go XML file. Loading the XML format is a common way to load applications in real environments, especially during migration from development to QA to production

Configure the Application and Connector for the TRAKK Application

1. Create a new application definition based on the following table. Note that you will need to save the application prior to configuring the merging:

Application Define → Applications → Add New Application	
Name:	**TRAKK**
Owner:	**The Administrator**
Description:	**The TRAKK Time Tracking Application**
Application Type (Connector:)	**JDBC**
Connector Attributes: Attributes Tab	
JDBC Connection Settings	
Connection User	**root**
Connection Password	**root**
Database URL	**jdbc:mysql://localhost/trakk**
JDBC Driver	**com.mysql.jdbc.Driver**
Query Settings	
SQL Statement	**select * from users left outer join capabilities on users.id = capabilities.id order by users.username;**
getObjectSQL	**select * from users left outer join capabilities on users.id = capabilities.id where users.username = '$(identity)';**

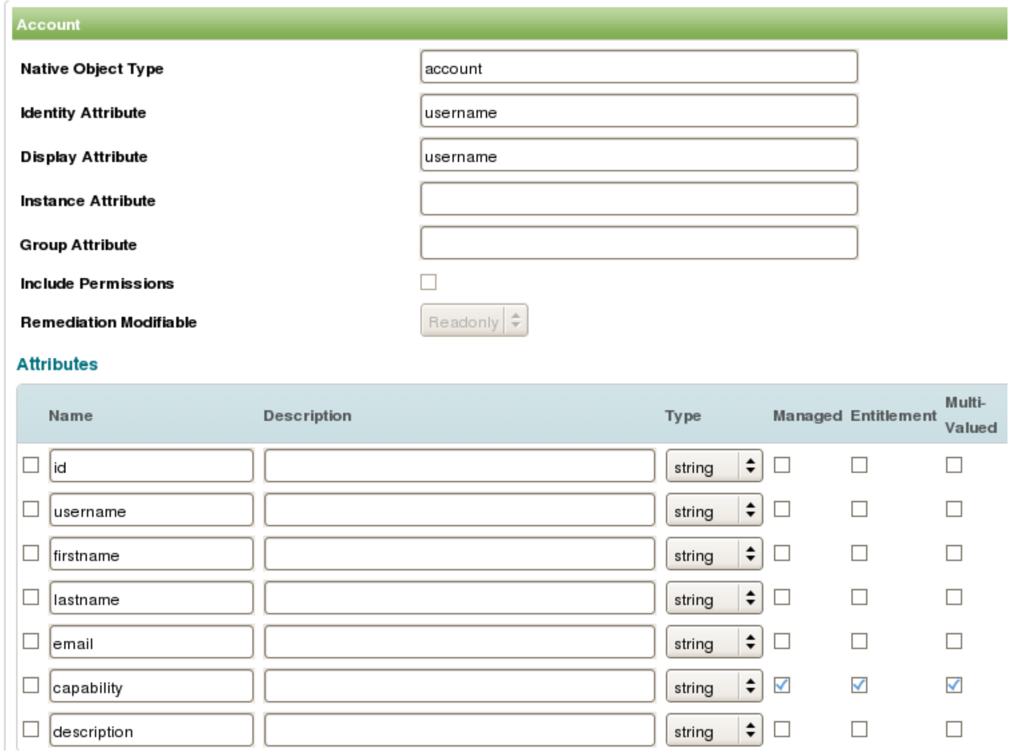
2. Click **Save** to save the application

Configure Account Schema for the TRAKK Application

1. Navigate to **Define → Applications** and select **TRAKK**

2. Under the **Schema** tab, configure the account schema by clicking **Add Account Schema** and then click **Discover Schema Attributes**. Fill out the schema according to the table below:

Account Schema				
Native Object Type	**account**			
Identity Attribute	**username**			
Display Attribute	**username**			
Attributes	**Type**	**Managed**	**Entitlement**	**Multi-Valued**
id	**string**			
username	**string**			
firstname	**string**			
lastname	**string**			
email	**string**			
capability	**string**	**checked**	**checked**	**checked**
description	**string**			


Account

Native Object Type	account
Identity Attribute	username
Display Attribute	username
Instance Attribute	
Group Attribute	
Include Permissions	☐
Remediation Modifiable	Readonly

Attributes

	Name	Description	Type	Managed	Entitlement	Multi-Valued
☐	id		string	☐	☐	☐
☐	username		string	☐	☐	☐
☐	firstname		string	☐	☐	☐
☐	lastname		string	☐	☐	☐
☐	email		string	☐	☐	☐
☐	capability		string	✓	✓	✓
☐	description		string	☐	☐	☐

3. Select **Preview Accounts**.

4. Go back to the **Attributes** tab and complete the merge options.

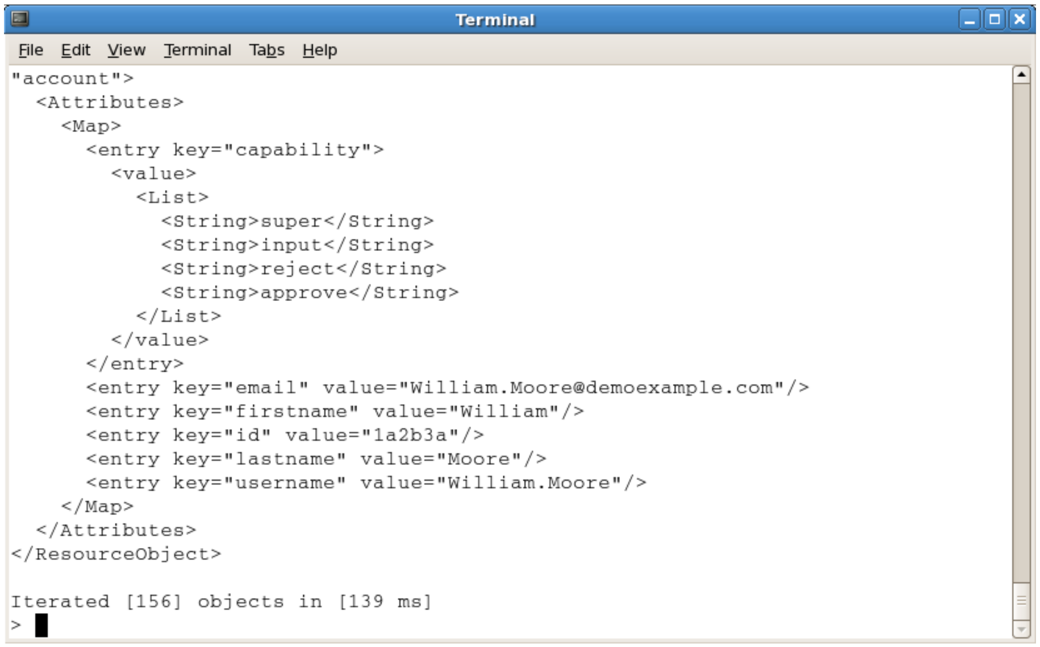
Connector Attributes: Attributes Tab	
Advance Settings, Enable Advance Option	**checked**
Data needs to be merged	**checked**
Index Column	**username**
Which Columns should be merged?	**capability**

5. Scroll down and click **Test Connection**. This option is useful to verify the connection between IdentityIQ and the application without performing an account preview.

6. If the connection is successful, click **Save** to save your work for the TRAKK Application.

7. Next you will test the SQL commands you entered in the JDBC Query Settings. Launch the **IIQ Console** and run the following commands:

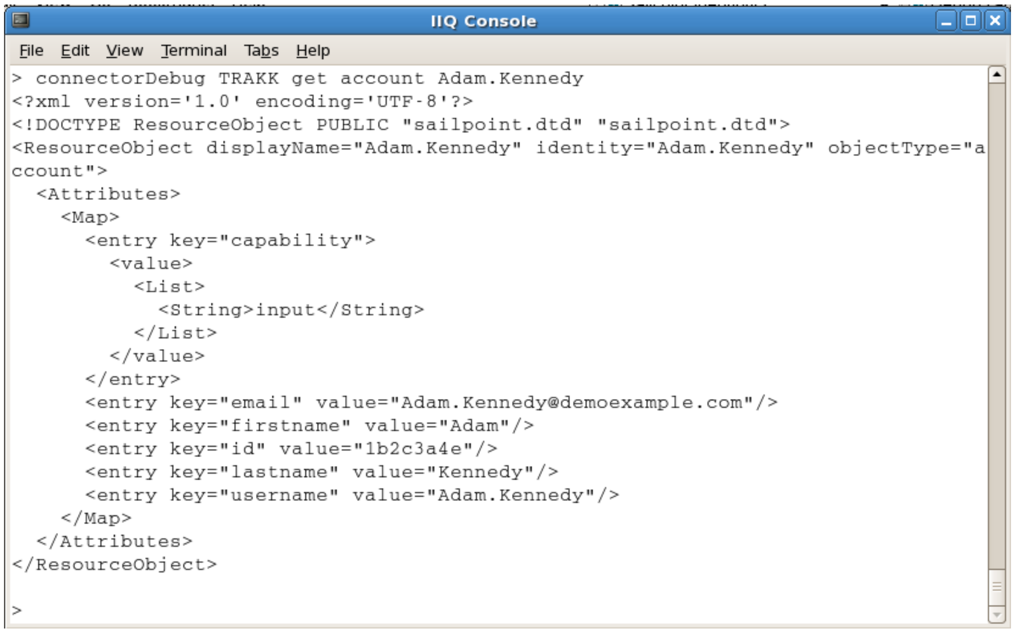
>connectorDebug TRAKK iterate



```
"account">
  <Attributes>
    <Map>
      <entry key="capability">
        <value>
          <List>
            <String>super</String>
            <String>input</String>
            <String>reject</String>
            <String>approve</String>
          </List>
        </value>
      </entry>
      <entry key="email" value="William.Moore@demoexample.com"/>
      <entry key="firstname" value="William"/>
      <entry key="id" value="1a2b3a"/>
      <entry key="lastname" value="Moore"/>
      <entry key="username" value="William.Moore"/>
    </Map>
  </Attributes>
</ResourceObject>

Iterated [156] objects in [139 ms]
> 
```

>connectorDebug TRAKK get account Adam.Kennedy



```
> connectorDebug TRAKK get account Adam.Kennedy
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE ResourceObject PUBLIC "sailpoint.dtd" "sailpoint.dtd">
<ResourceObject displayName="Adam.Kennedy" identity="Adam.Kennedy" objectType="a
ccount">
  <Attributes>
    <Map>
      <entry key="capability">
        <value>
          <List>
            <String>input</String>
          </List>
        </value>
      </entry>
      <entry key="email" value="Adam.Kennedy@demoexample.com"/>
      <entry key="firstname" value="Adam"/>
      <entry key="id" value="1b2c3a4e"/>
      <entry key="lastname" value="Kennedy"/>
      <entry key="username" value="Adam.Kennedy"/>
    </Map>
  </Attributes>
</ResourceObject>

>
```

8. The first connectorDebug command grabbed all the accounts out of the JDBC resource using the **SQL Statement** query that you configured. The second connectorDebug command grabbed a single account from the JDBC resource using the **getObjectSQL** query. Some connectors can support the random access of a single record. For the JDBC connector, the **getObjectSQL** query supports this random access operation.

9. If you run both of the connectorDebug commands successfully, continue, otherwise re-check your configuration of the TRAKK application.

Configure Correlation Rule for the TRAKK Application

1. Configure Correlation for this new application

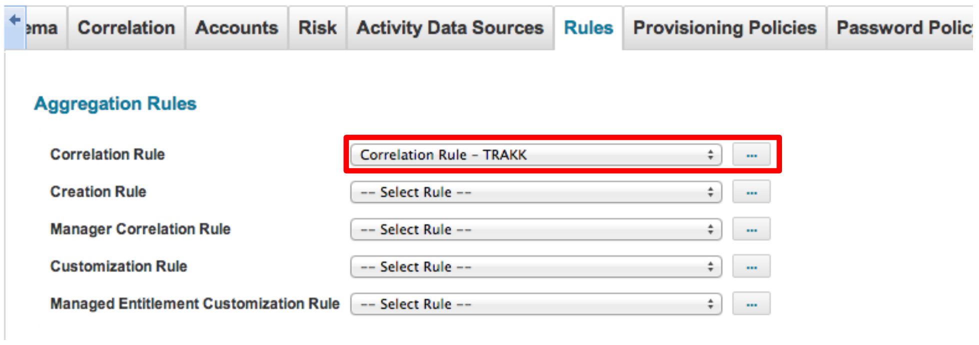
   a. Within the TRAKK application, go to the **Rules** tab and create a new Correlation Rule by clicking the **...** :

      i. Name: **Correlation Rule – TRAKK**

      ii. Rule: copy and paste beanshell from **/home/spadmin/ImplementerTraining/beanshell/Correlation-Rule-Trakk.txt**

      iii. Click **Save**

b. Choose the correlation rule once you save it, by choosing it in the dropdown list.



Aggregation Rules

Correlation Rule	Correlation Rule - TRAKK
Creation Rule	-- Select Rule --
Manager Correlation Rule	-- Select Rule --
Customization Rule	-- Select Rule --
Managed Entitlement Customization Rule	-- Select Rule --

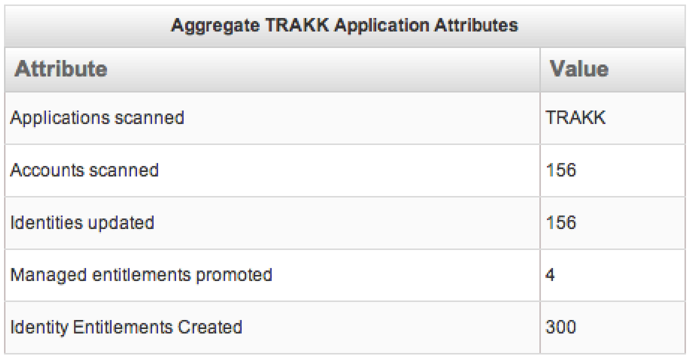
c. Click **Save** to save the TRAKK application.

Aggregate Accounts from TRAKK

1. Configure a new task using the information from the table below

Task Monitor → Tasks → New task…	
Type:	**Account Aggregation**
Name:	**Aggregate TRAKK Application**
Description:	**Task to aggregate accounts from the TRAKK application.**
Select applications to scan:	**TRAKK**
Promote managed attributes:	**Checked**
Detect deleted accounts:	**Checked**
Disable optimization of unchanged accounts:	**Checked**

2. Scroll down and select **Save and Execute** click **OK** and go to the **Task Results** tab and check the results:



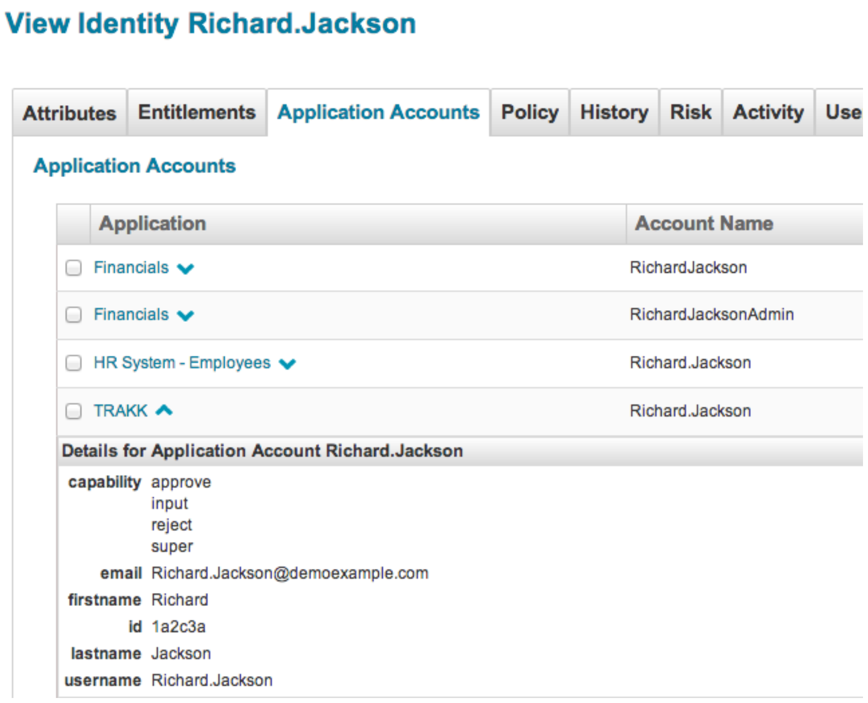
Aggregate TRAKK Application Attributes

Attribute	Value
Applications scanned	TRAKK
Accounts scanned	156
Identities updated	156
Managed entitlements promoted	4
Identity Entitlements Created	300

3. Verify Account Attributes and Entitlements

   a. Navigate to **Define → Identities** and look for Richard Jackson

   b. Click **Application Accounts** and **TRAKK** to verify that Richard has an account on TRAKK:



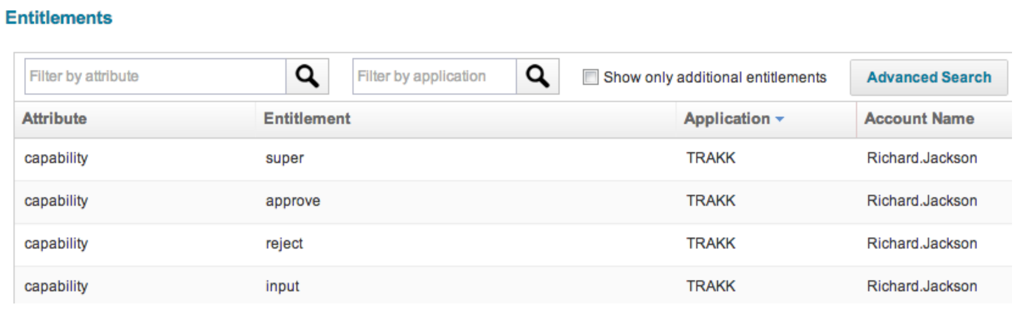
Application Accounts

Application	Account Name
Financials	RichardJackson
Financials	RichardJacksonAdmin
HR System - Employees	Richard.Jackson
TRAKK	Richard.Jackson

Details for Application Account Richard.Jackson

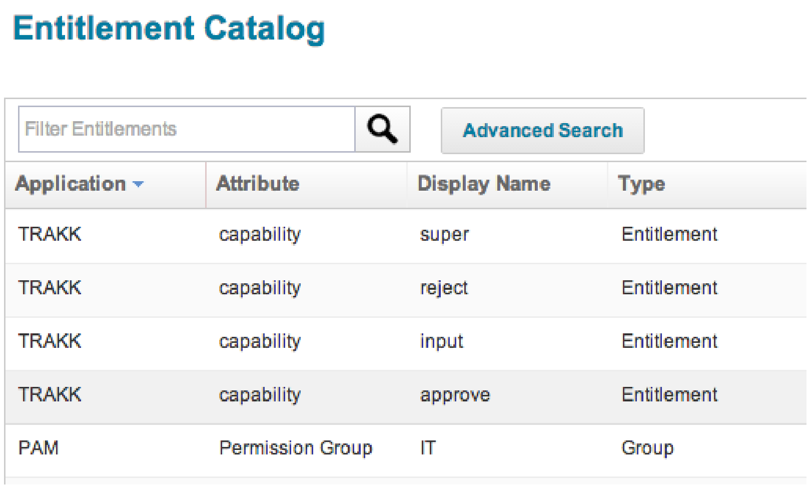
capability	approve input reject super
email	Richard.Jackson@demoexample.com
firstname	Richard
id	1a2c3a
lastname	Jackson
username	Richard.Jackson

   c. Click the **Entitlements** tab to verify that the entitlements were properly created for **Richard.Jackson**



Attribute	Entitlement	Application	Account Name
capability	super	TRAKK	Richard.Jackson
capability	approve	TRAKK	Richard.Jackson
capability	reject	TRAKK	Richard.Jackson
capability	input	TRAKK	Richard.Jackson

d. Click **Define → Entitlement Catalog** to confirm that the managed entitlements for the **TRAKK** application were loaded:



Application	Attribute	Display Name	Type
TRAKK	capability	super	Entitlement
TRAKK	capability	reject	Entitlement
TRAKK	capability	input	Entitlement
TRAKK	capability	approve	Entitlement
PAM	Permission Group	IT	Group

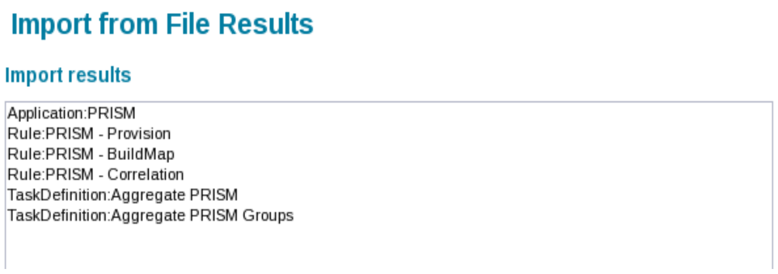
Loading the PRISM Application

The PRISM application will be loaded as a pre-defined XML file that contains the entire application definition for the PRISM application. Take a look at the XML file using the editor provided in the VM. Note that the XML file is one large XML file containing 6 individual SailPoint objects.

1. Navigate to **System Setup → Import from File** and where it says **Import Objects**, click **Browse…** and import the following file:

   /home/spadmin/ImplementerTraining/config/PRISM/PRISM.xml

2. Once the file is done loading, check the output to confirm that everything loaded ok.



```
Application:PRISM
Rule:PRISM - Provision
Rule:PRISM - BuildMap
Rule:PRISM - Correlation
TaskDefinition:Aggregate PRISM
TaskDefinition:Aggregate PRISM Groups
```

3. This single XML file contained the following:
   a. An Application definition
   b. Rules for Correlation, Buildmap and Provisioning
   c. Tasks to Aggregate Accounts and Account Groups

4. Navigate to **Define → Applications** and spot check the PRISM application.
   a. Who is the owner for the PRISM application?

      ____

      We also want IdentityIQ administrators to be able to act as owners for the PRISM application. We'll note that we need to create a workgroup to use for ownership.

   b. Which connector is used by the PRISM application?

      ____

   c. Is PRISM an authoritative application? ____Yes ___No

   d. How are we correlating the accounts? (circle one)

      Correlation Configuration   Correlation Rule

e. Look at the schema. Which attribute will be managed in the Entitlement Catalog?

____

5. Check the **Entitlement Catalog**.

   a. Are there any PRISM entitlements listed? ____Yes ___No
   As you continue with this exercise, think about why or why not PRISM entitlements are listed. It will become clear as you work through the next few instructions.

6. Create a workgroup for PRISM ownership.

   a. Navigate to **Define→Groups**, select the **Workgroups** tab, and click **Create Workgroup**.

   b. Define the workgroup as follows:

      i. Name: **PRISM Application Owners**

      ii. Owner: **spadmin**

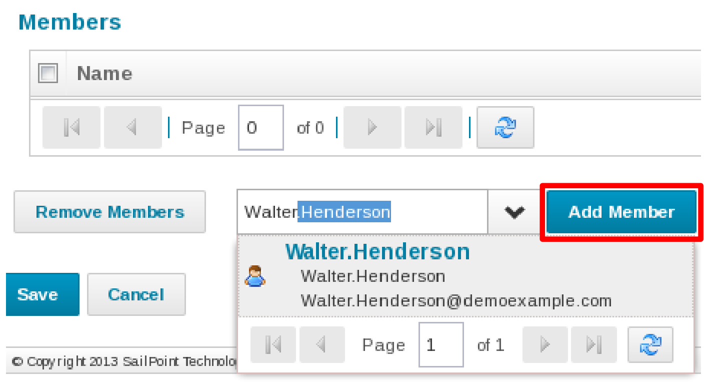
      iii. Description: **Group for all users with ownership for the PRISM application.**

      iv. Group Email**: prism_owners@example.com**

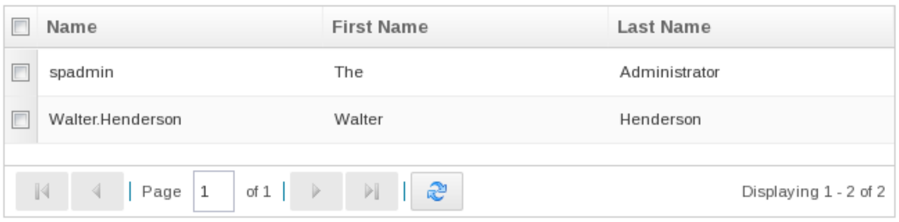
      v. Rights: **Application Administrator**

   c. Add members to the workgroup:

      i. Search for **Walter Henderson** and click **Add Member**



ii. Add one more member: **spadmin**

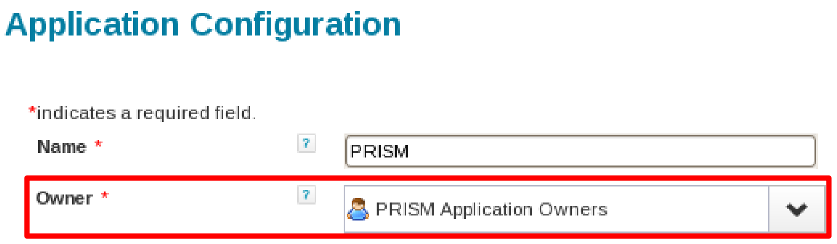


	Name	First Name	Last Name
☐	spadmin	The	Administrator
☐	Walter.Henderson	Walter	Henderson

Page 1 of 1 — Displaying 1 - 2 of 2

d. **Save** the workgroup.

e. Navigate to the PRISM application, change the owner to the **PRISM Application Owners** workgroup, and **Save**.



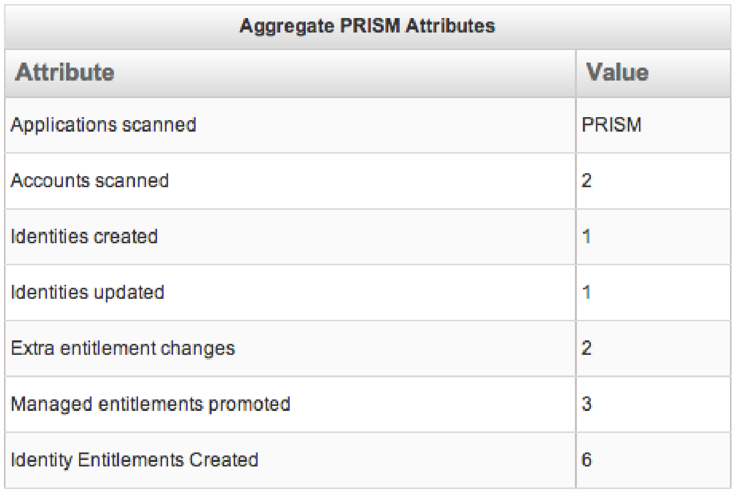
Application Configuration

*indicates a required field.

Name *	PRISM
Owner *	PRISM Application Owners

7. Next, aggregate the PRISM application by running the following tasks in order. Wait for each to finish before running the next:

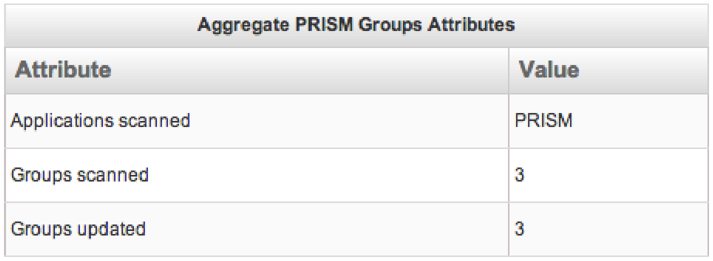
a. **Aggregate PRISM**



Aggregate PRISM Attributes

Attribute	Value
Applications scanned	PRISM
Accounts scanned	2
Identities created	1
Identities updated	1
Extra entitlement changes	2
Managed entitlements promoted	3
Identity Entitlements Created	6

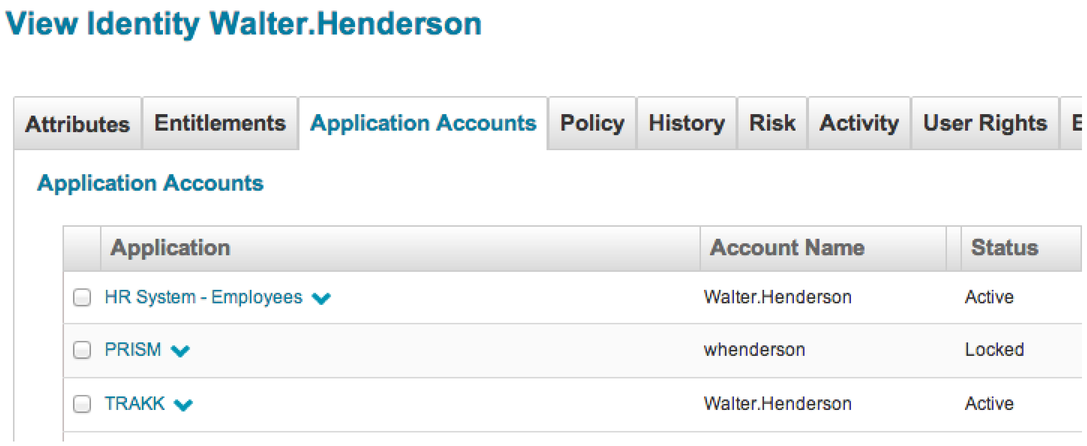
b. **Aggregate PRISM Groups**



Aggregate PRISM Groups Attributes	
Attribute	**Value**
Applications scanned	PRISM
Groups scanned	3
Groups updated	3

8. Once the Aggregations are complete, check the following to make sure everything went smoothly

   a. Check **Walter.Henderson** to make sure he has an account on PRISM.

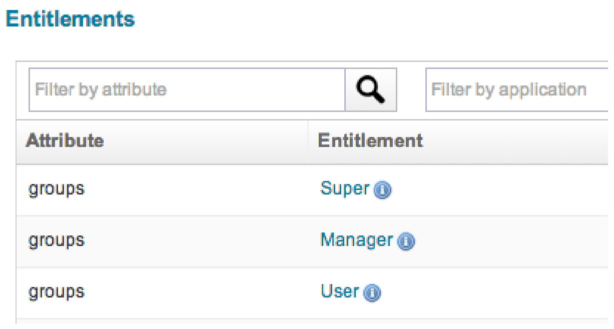


View Identity Walter.Henderson

Application Accounts

Application	Account Name	Status
HR System - Employees	Walter.Henderson	Active
PRISM	whenderson	Locked
TRAKK	Walter.Henderson	Active

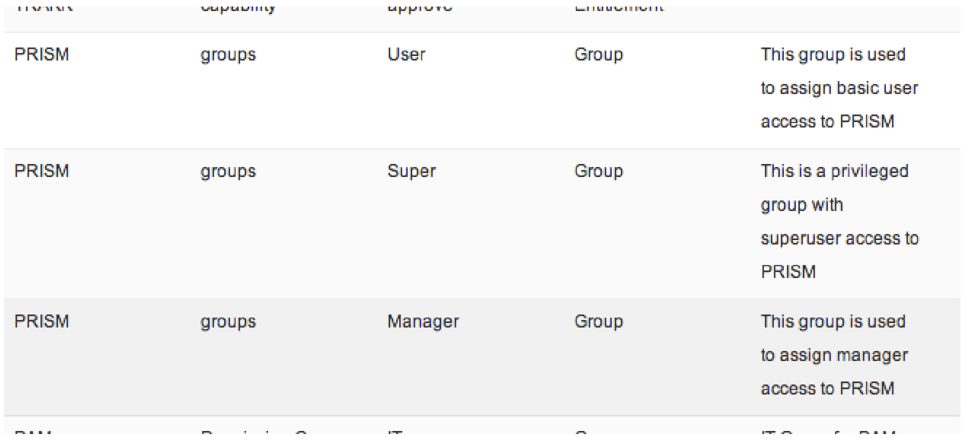
   b. Check **Walter.Henderson** to make sure he has entitlements for PRISM.



Entitlements

Attribute	Entitlement
groups	Super
groups	Manager
groups	User

c. Check the **Entitlement Catalog** to make sure that the PRISM account groups were loaded properly.



TRAKK	capability	approve	Entitlement	
PRISM	groups	User	Group	This group is used to assign basic user access to PRISM
PRISM	groups	Super	Group	This is a privileged group with superuser access to PRISM
PRISM	groups	Manager	Group	This group is used to assign manager access to PRISM

Exercise #5: Onboarding an LDAP Application

Objective

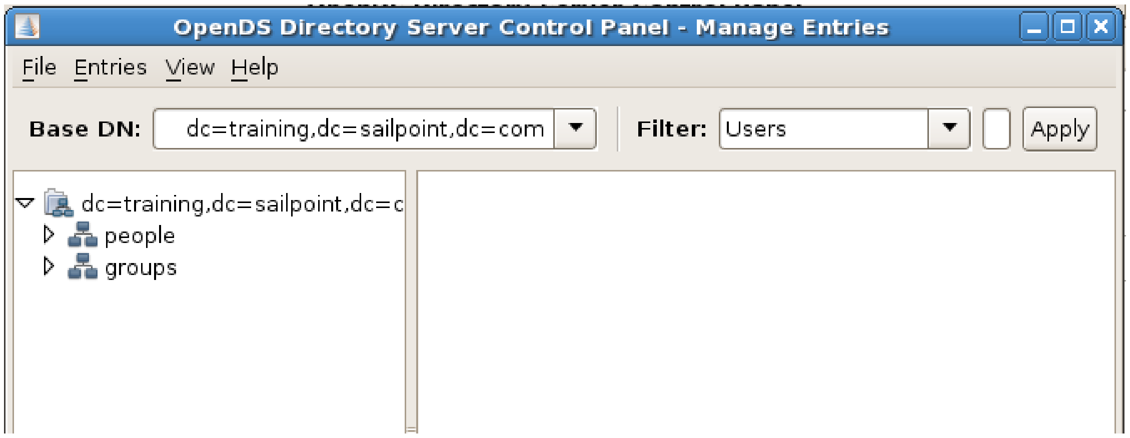
The objective of this exercise is to onboard account and group data out of an LDAP application.

Overview

For this application, we will onboard an LDAP application using the LDAP direct connector.

Start the local LDAP Server

1. Double click the **OpenDS LDAP Control Panel** shortcut on the desktop of the VM
2. Click **OK** when the LDAP client starts up.
3. Under Server Status, click **Start**
4. When prompted, enter the password: **password**
5. Confirm that the Server Status shows **Started**.
6. View the current **people** and **groups** in LDAP.
    a. Under **Directory Data**, select **Manage Entries**
    b. With the Filter set to Users, expand dc=training,dc=sailpoint,dc=…



Base DN: dc=training,dc=sailpoint,dc=com

Filter: Users

dc=training,dc=sailpoint,dc=c

    c. Expand and view the **people**.
    d. Expand and list the **groups**: ________________________ ________________________
    e. Close the Server Control Panel.

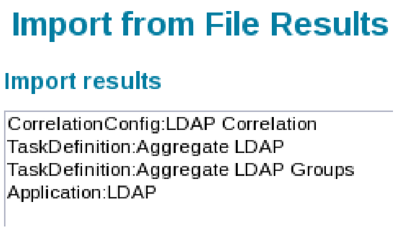
Loading the LDAP Application

The LDAP application will be loaded as a pre-defined XML file that contains the entire application definition for the LDAP application. Take a look at the XML file using the editor provided in the VM. Note that the XML file is one large XML file containing 4 individual SailPoint objects.

1. Navigate to **System Setup → Import from File** and where it says **Import File**, click **Browse…** and import the following file:

   /home/spadmin/ImplementerTraining/config/LDAP/LDAP.xml

2. Once the file is done loading, check the output to confirm that everything loaded ok



Import from File Results

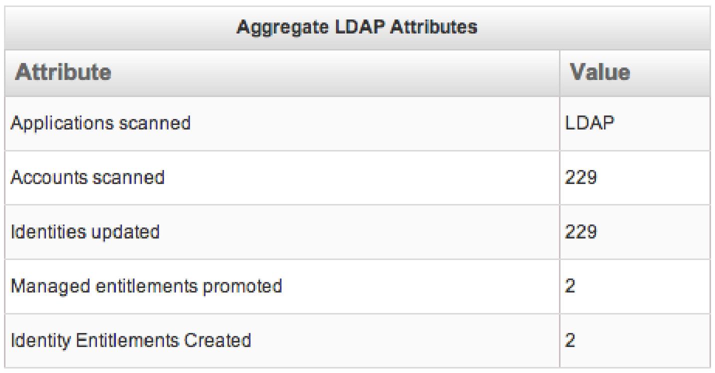
Import results

```
CorrelationConfig:LDAP Correlation
TaskDefinition:Aggregate LDAP
TaskDefinition:Aggregate LDAP Groups
Application:LDAP
```

3. This single XML file contained the LDAP application definition, Correlation Configuration, and Tasks to aggregate both LDAP Accounts and Groups.

4. Next, aggregate the LDAP application by running the following tasks in order and confirming the output:

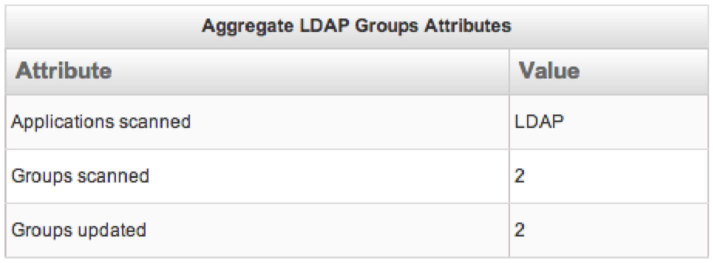
   a. **Aggregate LDAP**



Aggregate LDAP Attributes

Attribute	Value
Applications scanned	LDAP
Accounts scanned	229
Identities updated	229
Managed entitlements promoted	2
Identity Entitlements Created	2

   b. **Aggregate LDAP Groups**

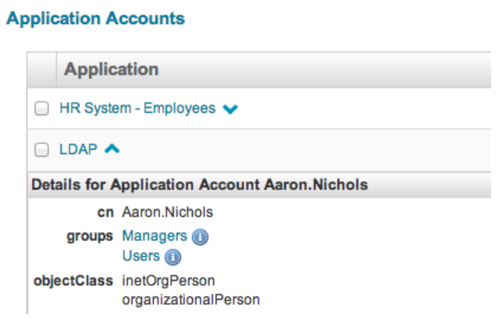


Aggregate LDAP Groups Attributes

Attribute	Value
Applications scanned	LDAP
Groups scanned	2
Groups updated	2

5. Once the Aggregations are complete, check the following to make sure everything went smoothly

   a. Check **Aaron.Nichols** to make sure he has an account and the appropriate entitlements for LDAP

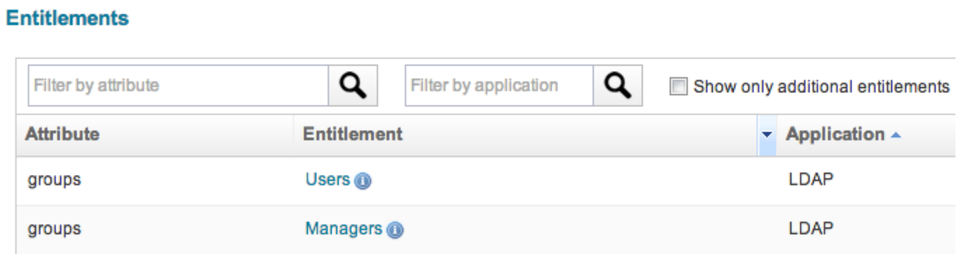


Application Accounts

	Application
☐	HR System - Employees
☐	LDAP

Details for Application Account Aaron.Nichols

cn	Aaron.Nichols
groups	Managers Users
objectClass	inetOrgPerson organizationalPerson

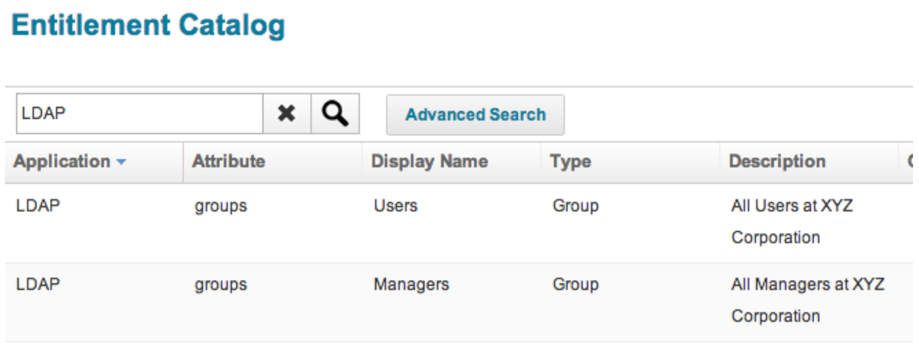


Entitlements

Filter by attribute | Filter by application | ☐ Show only additional entitlements

Attribute	Entitlement	Application
groups	Users	LDAP
groups	Managers	LDAP

   b. Check the **Entitlement Catalog** to make sure that the LDAP account groups were loaded properly along with descriptions.



Entitlement Catalog

LDAP | Advanced Search

Application	Attribute	Display Name	Type	Description
LDAP	groups	Users	Group	All Users at XYZ Corporation
LDAP	groups	Managers	Group	All Managers at XYZ Corporation

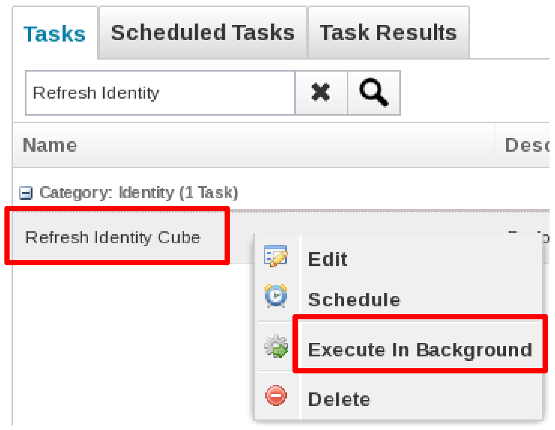
Refresh Identities

Once aggregations are complete, an identity refresh is required to fully promote all identity attributes. Though aggregations result in entitlement attributes appearing on the Identity Cube Application Accounts and Entitlements tabs, one more step (a refresh,) is required to fully promote entitlements and make them usable by other processes.

1. Run the task: **Refresh Identity Cube**.

   a. On the **Monitor→Tasks** tab, search for and right click the **Refresh Identity Cube** task.

b. Select **Execute In Background**


Tasks
Scheduled Tasks
Task Results
Refresh Identity
Name
Desc
Category: Identity (1 Task)
Refresh Identity Cube
Edit
Schedule
Execute In Background
Delete