NetIQ Directory and Resource Administrator

Product Customization

May 2020

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Contents

1 **About this Guide** **5**

2 **Product Customization Scenario Details** **6**

Active Directory Configuration Script: 6

User Personas 6

3 **Customizing NRC Reports** **8**

Create a User Defined (UD) Context for report filtering 9
Scope 9
Step-by-step Guide 9

Creating a "Collections Status for the last seven days" Report 14
Scope 14
Step-by-step Guide 14

Creating a "Temporary Group Assignment" Report 17
Scope 17
Step-by-step Guide 17

Creating a "Virtual Attribute Associations" Report 19
Scope 19
Step-by-step Guide 19

Modify an Existing Report, SQL column addition 22
Scope 22
Step-by-step Guide 22

Modify an Existing Report, SQL where clause 23
Scope 23
Step-by-step Guide 23

Process for Modifying the "General Report" in NRC 26
Scope 26
Step-by-step Guide 26

Working with Custom Virtual Attributes 29
Scope 29
Step-by-Step Guide 29

Database Schema 30
DRA Reporting Database 30

4 **Custom Triggers** **71**

Collect Additional Virtual Attributes and Extend Object Property Page 71
Scope 71
Step-by-step Guide 71

Enable or disable an Exchange Online user's Outlook web access when they are enabled or disabled in Active Directory 78
Scope 78

Step-by-step Guide 78
Launch Workflow from Trigger 81
Scope 81
Step-by-step Guide 81
Move a user to a new OU when their Office property is changed 84
Scope 84
Step-by-step Guide 84
5 **Web Client Customization 88**
Custom Property Page Examples; 88
Add Virtual Attributes to Custom Forms 89
Step-by-step Guide 89
Indicate Field (A) is Required When Field (B) has a Value at Runtime 93
Step-by-step Guide 93
On Form Submit, Validate Field (A) has a Value When Field (B) has a Value 94
Step-by-step Guide 94
Populate selection values for a field based on previous field selection 96
Step-by-step Guide 96
Pre-populate Value (A) Based on Value (B) Using Built-in Attribute Setting 101
Step-by-step Guide 101
Pre-populate value automatically based on custom handler 103
Step-by-step Guide 103
Validate input using a regular expression 105
Built-in example regular expressions: 105
Step-by-step Guide 106
Validate Name Uniqueness for a Specified Field Value at Run-time 108
Step-by-step Guide 108
Validate Name Uniqueness for a Specified Field Value When a Form is Submitted 113
Step-by-step Guide 113
6 **Workflow Customization 117**
Custom Form Workflow to delete a user 119
Lab Data Setup 122
HumanResources Database 122
IQMail setup 122
Load HR DB to DRA 124
ServiceNow Event Trigger 126

About this Guide

The *Product Customization* reference provides several examples of the capability to customize reports, triggers, object property forms, and automated workflow processes using NetIQ Directory and Resource Administrator (DRA) and its integrated components.

Intended Audience

This guide provides information for anyone using the customization features in the DRA Web Console.

Additional Documentation

This guide is part of the NetIQ Directory and Resource Administrator documentation set. For the most recent version of this guide and other DRA documentation resources, visit the DRA Documentation website (https://www.netiq.com/documentation/directory-and-resource-administrator/index.html).

Contact Information

We want to hear your comments and suggestions about this book and the other documentation included with this product. You can use the **comment on this topic** link at the bottom of each page of the online documentation, or send an email to Documentation-Feedback@microfocus.com.

For specific product issues, contact Micro Focus Customer Care at https://www.microfocus.com/support-and-services/.

Product Customization Scenario Details

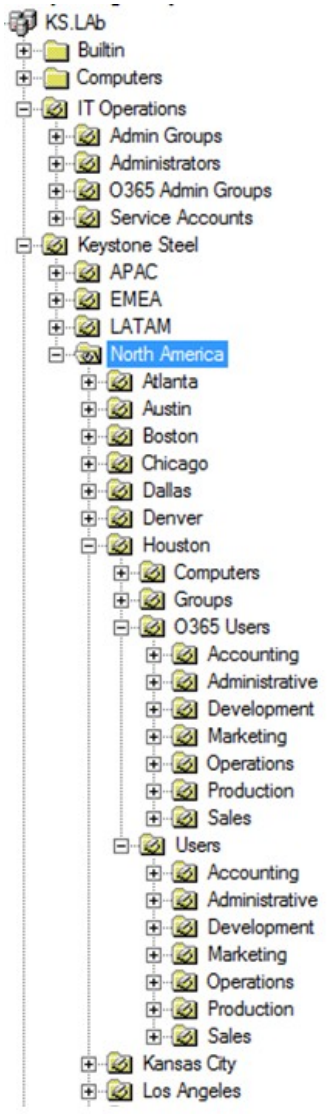
The examples in this document are all based on a simulated company, "Keystone Steel". This page contains information about the company, network environment, and users that will be referenced in the customizations to follow.

Active Directory Configuration Script:

Use the files below from the resource kit to load the OUs. This script will load all of the OUs defined in the Keystone Steel domain. The Resource Kit is available with this document on the DRA Documentation page.

- PowerShell Script
- OU CSV File

Active Directory Structure Reference:



User Personas

Philip Jensen	CIO
Daniel Altaner the Architect	Daniel Altaner owns the "big picture" design of IAS for a large organization, providing the foundation for individual colleagues to focus on security, identity, and/or access requirements. In smaller organizations, Daniel might be the sole architect for the combined IAS solution.
Adam Mandari the Administrator	Adam Mandari takes requirements from Daniel Altaner, the IT architect, to set up and maintain the IAS solution and ensure that the infrastructure for IAS works. He helps configure the system so the enterprise knows who has access to what and the methods for ensuring security or analyzing events that might represent breaches in security. He installs and configures the backend agents and services.
Danita Olivarez in DevOps Director	Danita Olivarez is the Director of DevOps / DevSecOps
Devin in DevOps	Devin Merrill, DevOps engineer / operator
Arvanti Rana the Application/Resource Owner	Arvanti Rana is responsible for a specific application, service, or resource, such as a database or the SAP financial module. She is considered both a technical expert (SME) and business user. Arvanti administers her application, but might not understand the nuts and bolts of the organization's IAS solutions. Arvanti needs information from and provides information to the IAS solutions. She maintains and configures the applications, services, and resources that form a part of the iAS solution.

Arturo Perez the Auditor	Arturo Perez is responsible for verifying that the organization complies with established internal control procedures by examining records, reports, operating practices, and documentation. He might delegate certain tasks to his staff to ensure that the work is performed efficiently.
Ken Nagai in Compliance	Ken Nagai is responsible for architecting the IAS governance policies for an organization. He understands both the benefits and limitations of identity and access review solutions and owns the results of access certification reviews.
Isaac in IT	Isaac Torek is the IT Manager.
Mandy the Analyst	Mandy Rabani is responsible for the forensic analysis of alerts and incidents, based on information supplied by Oskar the Operator and the SIEM solution. She performs the situational assessment of what's going on based on the details that she gathers. She is also responsible for preventing data loss and service interruptions by researching new technologies that will effectively protect a network.
Oskar the Operator	Oskar Yegorov is responsible for identifying incoming alerts in the security software. He performs an initial analysis to determine whether the alerts should be escalated to a higher level of investigation. He might complete that investigation or forward it to a system or security analyst. He helps coordinate responses to computer security incidents and recommends actions for each incident to ensure that they are properly tracked, escalated, and reported.
Helen Winzen on the Help Desk	Helen Winzen provides the first line of support when an end user, such as Maria Belafonte, runs into identity, access, or software/hardware problems. She is technically astute and understand the nuts and bolts of identity and access review solutions. She also understands and works to ensure that users follow the organization's security policies.
Sarah the Supervisor / Business Line Manager	Sarah Gibson directly manages a team, and is sometimes responsible for requesting or granting access to resources for her team. Sarah needs information from and provides information to access certification reviews. She can supervise one of several departments, such as Marketing or Help Desk. Sarah ensures that her employees understand and comply with business and government regulations, and that they use the appropriate applications, resources, and services.
Maria in Marketing / End User	Maria Belafonte represents an end user on the corporate network. An end user could be any employee with a corporate identity who requires access to resources. She needs prompt access to resources with a minimum of thought or effort. Sometimes she is required to act on behalf of her Supervisor to approve or deny requests for access.

Customizing NRC Reports

This section contains customization examples and the database schema for NetIQ Reporting Center reports.

Definition of terms and components:

Term/Components	Definition
General Report	Contains the definition of all the reports available in NRC.
User Defined Context	Filter for adjusting the report results for a specific report execution.
Custom Virtual Attribute	Custom DRA extension attribute
Data Model	Available objects and attributes
Collectors	Component/Jobs for periodically collecting reporting data from DRA, Auditing, AD, and O365

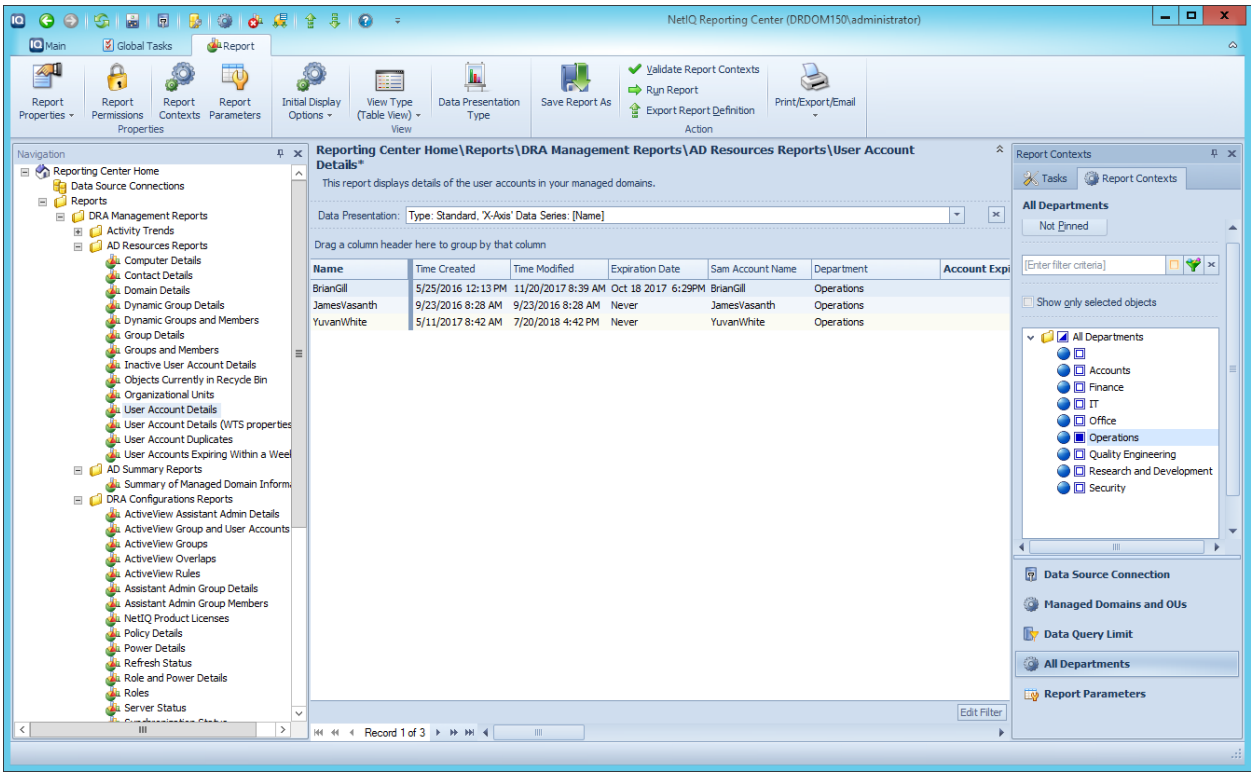
Examples:

Use Case	Components for Example
Extend an existing report with new filter (UDContext) to add additional filter to fetch the data. Example	• UD Contexts
Create a new report to show all collectors runs with job collection type, start/end time and status of the job within the last 7 days. Example	• New report templates
Create a new report to list all temporary group details and its associated members. Example	• New report templates
Create a new report to list all the VA attributes and their associated object types. Example	• New report templates
Extend a default report with an additional virtual attribute Example	• Virtual Attribute Configuration • Updating report template (Columns returned)
Modify the existing report that fetches user account data that expires within a week to instead fetch user accounts expiring within the next 30 days. Example	• Updating report template (SQL Where clause)
Put together a database schema reference Reference	

Create a User Defined (UD) Context for report filtering

Scope

The NetIQ Reporting Center (NRC), allows for reports to be designed to accept user input at report execution time to dynamically filter and sort the information returned through the use of **"User Defined Contexts"**. In this example we will demonstrate the steps to create a new User Defined Context for filtering on the User object attribute "Department". Then we will extend the "User Accounts Details" report to use the new User Defined Context to allow filtering the returned results by department.



Step-by-step Guide

1. Follow the Process for Modifying the "General Report" in NRC up to the uploading section.
2. Create a SQL query to filter Users returned by Department.

   SQL Statement

   ```
   SELECT   DISTINCT DEPARTMENT
   FROM     USERS
   ORDER BY DEPARTMENT
   ```

   NOTE:
   You can use SQL Server Management Studio against the DRAReporting database to test the SQL statement to make sure it returns the desired results.

3. Create a `DRA.Custom.UDContext.XML` file if it does not exist. Update the Checkin batch file if needed.

DRA.Custom.UDContext.xml

```
<?xml version="1.0" encoding="utf-8"?>
<UDCONTEXTS>
</UDCONTEXTS>
```

Checkin Batch File

```
@echo off
REM Checkin DRA NRC Reports
if Exist "%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe" goto Checkin
echo ""%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe not found, check
path of NetIQ Reporting Center"
Goto End

:Checkin
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.DataSourceType.XML"
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.UDContext.xml"
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.ExtDataSource.XML"
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Report.XML"

if not exist "%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Custom.UDContext.xml"
goto SkipToReport
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Custom.UDContext.xml"

:SkipToReport
if not exist "%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Custom.Reports.XML" goto
End
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Custom.Reports.XML"



:End
echo DRA NRC Reporting setup Done!
```

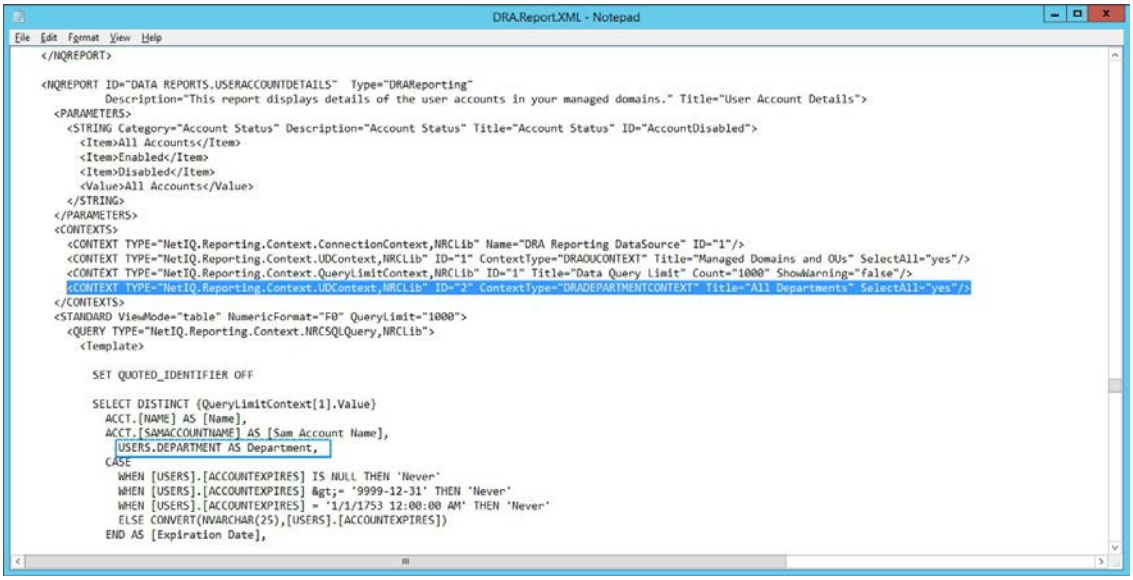
4. Next, in the DRA.Custom.UDContext.XML file and add a User Defined Context definition that specifies how this configuration will be exposed in the report and then save the file.

SQL Statement

```
<UDCONTEXT ID="DRADEPARTMENTCONTEXT" DataTarget="SQL" Type="DRAReporting">
    <SQLQUERY>
        <![CDATA[
            CREATE TABLE #tmpud
            (
            [udLevel] NVARCHAR(max) NULL,
            [udObject] NVARCHAR(max) NULL ,
            [udObjectParent] NVARCHAR(max) NULL,
            [udObjectName] NVARCHAR(max) NULL,
            [udObjectUIName]NVARCHAR(max) NULL,
            [udOutput] NVARCHAR(max) NULL,
            [udIcon] NVARCHAR(max) NUll,
            [udSortOrder] NVARCHAR(max) Null
            )
            INSERT #tmpud (udLevel, udObject, udObjectParent, udObjectName, udObjectUIName,
udOutput, udIcon, udSortOrder)
            SELECT DISTINCT
            [udLevel] = 0,
            [udObject] = 'AllDepartments',
            [udObjectParent]= NULL,
            [udObjectName] =  'All Departments',
            [udObjectUIName]=  'All Departments',
            [udOutput]=  'All Departments',
            [udIcon] = 0,
            [udSortOrder] = 0

            INSERT #tmpud (udLevel, udObject, udObjectParent, udObjectName, udObjectUIName,
udOutput, udIcon, udSortOrder)
            SELECT DISTINCT
            [udLevel] = 1,
            [udObject] = DEPARTMENT,
            [udObjectParent]= 'AllDepartments',
            [udObjectName] =  DEPARTMENT,
            [udObjectUIName]=  DEPARTMENT,
            [udOutput]=  DEPARTMENT,
            [udIcon] = 0,
            [udSortOrder] = 0
            FROM [dbo].[Users]
            ORDER BY DEPARTMENT
```

```
            SELECT * FROM #tmpud
            ORDER BY [udLevel],[udObjectName]


            DROP TABLE #tmpud
        ]]>
    </SQLQUERY>
    <RETURNDATA Type="SQL" Format="Set" ColumnName=""/>
</UDCONTEXT>
```

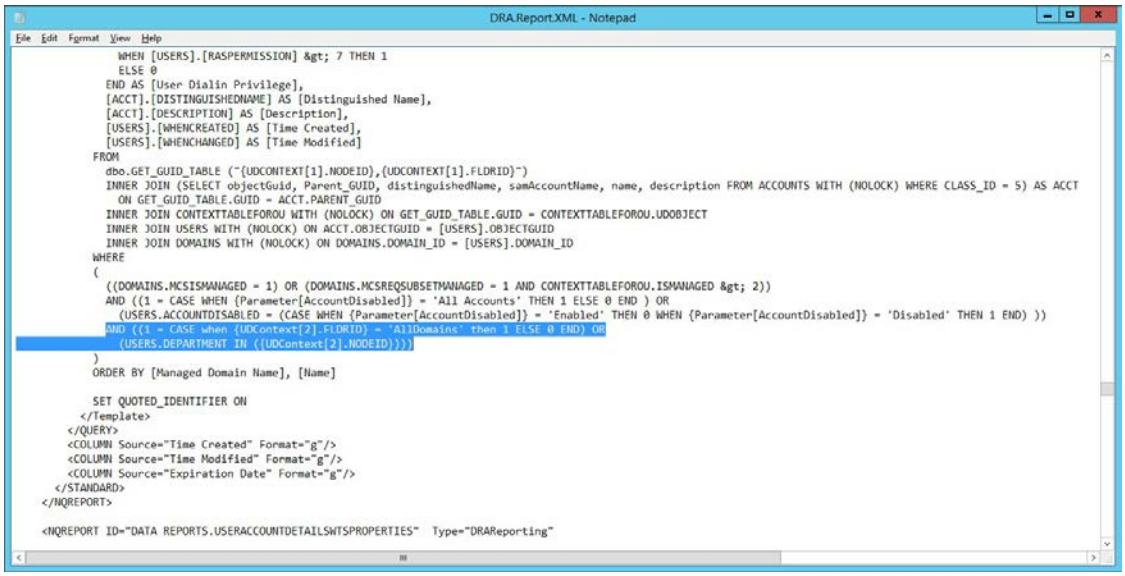
5. Now open the `.\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Report.XML` file and extract the section for the "User Account Details" report to the custom report file. We will update the report definition to include the new User Defined Context that we created in the previous step.



Edit Report

Make the following changes to the report definition:

- Add the new context inside the <CONTEXTS> tags: **<CONTEXT TYPE="NetIQ.Reporting.Context.UDContext,N RCLib" ID="2" ContextType="DRADEPARTMENTCONTEXT"**
- **Title="All Departments" SelectAll="yes"/>** Add the following line to the SQL statement as outlined in the blue box in the screenshot to the left: **USERS.DEPARTMENT AS Department, just below the ACCT.[SAMACCOUNTNAME] as [Sam Account Name],**
- Add the following line to the WHERE clause of the SQL statement as outlined in the blue box in the screenshot to the left: **AND ((1 = CASE when**
- **{UDContext[2].FLDRID} = 'AllDomains' then 1 ELSE 0 END) OR (USERS.DEPARTMENT IN ({UDContext[2].NODEID}))))**



NOTE:

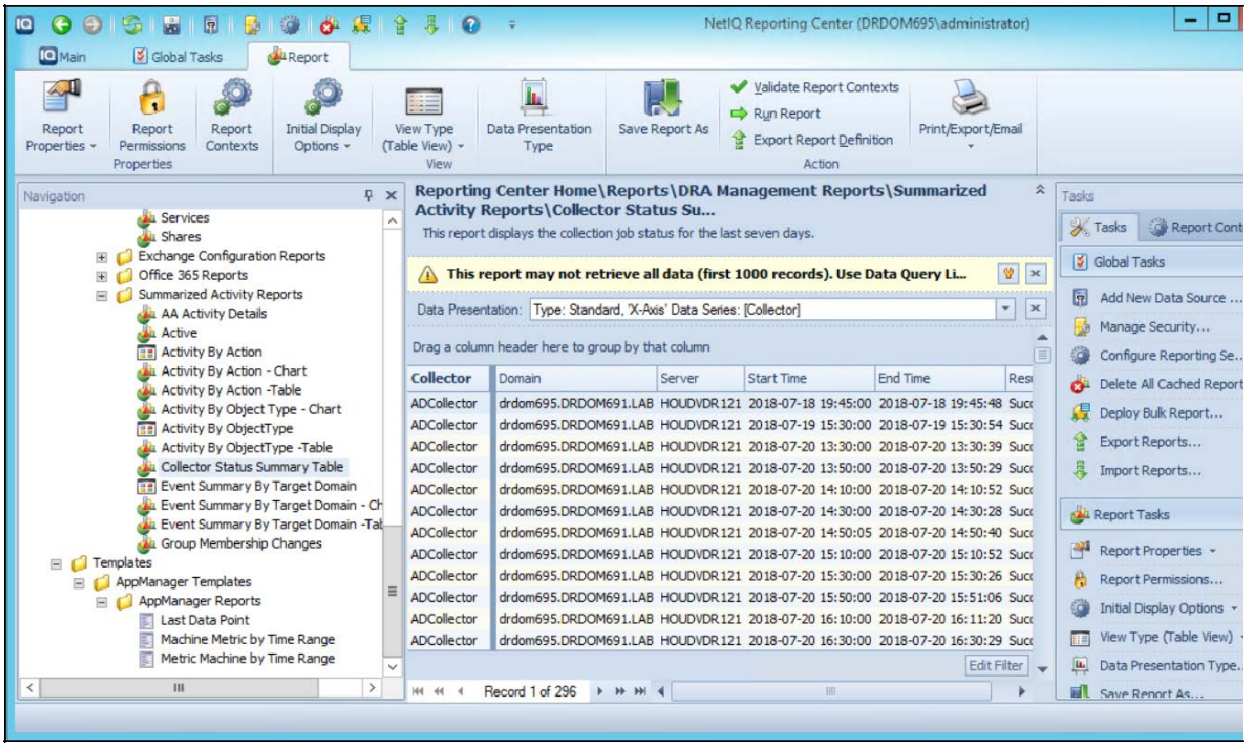
The UDContext we are adding in this step has an ID="2". Later, when the context is executed, it will be referenced as UDContext[2].

6. Save the master report file to the `.\Program Files (x86)\NetIQ\DRA\DRA` folder. Follow the final step in Process for Modifying the "General Report" in NRC uploading section.

Creating a "Collections Status for the last seven days" Report

Scope

The NetIQ Reporting Center, NRC, provides a set of standard reports that can be run to retrieve data from the SQL database. Additionally, NRC allows for the modification and addition of reports to provide a custom solution. In this example we will demonstrate the steps to create a new report that shows the status of all collector jobs executed within the last seven days.



Step-by-step Guide

1. Follow the Process for Modifying the "General Report" in NRC up to the uploading section.
2. You can use SQL Server Management Studio against the DRAReporting database to test the SQL statement we will use for his report to make sure it returns the desired results.

SQL Statement

```
SELECT   J1.Job_Name AS Collector,
                JH.Collector_Info AS Domain,
                JH.DRA_Server_Name AS Server,
                CONVERT(NVARCHAR(35), JH.Start_Time, 120) AS [Start Time],
                CONVERT(NVARCHAR(35), JH.End_Time, 120) AS [End Time],
               CASE WHEN JH.Result_Id = 1 THEN 'Success'
                         WHEN JH.Result_Id = 2 THEN 'Failed'
                         ELSE 'Aborted'
                END AS [Result]
```

```
FROM     JOB as J1 INNER JOIN
               JOBS_HISTORY AS JH ON J1.Job_Id = JH.Job_Id
WHERE  (JH.Job_Id <> 3) AND (JH.Start_Time >= DATEADD(DD, - 7, GETDATE())
UNION ALL
SELECT J2.Job_Name,
               RJ.Collector_Info,
               RJ.DRA_Server_Name,
               CONVERT(NVARCHAR(35), RJ.Start_Time, 120),
               NULL AS End_Time,
              'Running' AS [Result]
FROM   JOB AS J2 INNER JOIN
              RUNNING_JOBS AS RJ ON J2.Job_Id = RJ.Job_Id
WHERE  (J2.Job_Id <> 3)
ORDER BY Domain, Server, Collector, [Start Time] DESC
```

3. Open the `.\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Report.XML` file and locate the section for the "Summarized Activity Reports" group and extract it to the custom report file. Add the definition for the new report inside this section of the XML:
<REPORTSET FOLDER="DRA Management Reports\Summarized Activity Reports">

Report Definition

```
<NQREPORT ID="SUMMARIZED ACTIVITY REPORTS.COLLECTOR STATUS SUMMARY TABLE"
      Type="DRAReporting"
      Description="This report displays the collection job status for the last seven days."
      Title="Collector Status Summary Table">
      <PARAMETERS/>
      <CONTEXTS>
        <CONTEXT TYPE="NetIQ.Reporting.Context.ConnectionContext,NRCLib" Name="DRA Reporting
DataSource" ID="1"/>

 <CONTEXT TYPE="NetIQ.Reporting.Context.QueryLimitContext,NRCLib"
ID="1" Title="Data Query Limit" Count="1000" ShowWarning="false"/>
      </CONTEXTS>
      <STANDARD ViewMode="table" NumericFormat="F0" QueryLimit="1000">
        <QUERY TYPE="NetIQ.Reporting.Context.NRCSQLQuery,NRCLib">
          <Template>
            SELECT   {QueryLimitContext[1].Value}
                     J1.Job_Name AS Collector,
                     JH.Collector_Info AS Domain,
                     JH.DRA_Server_Name AS Server,
```

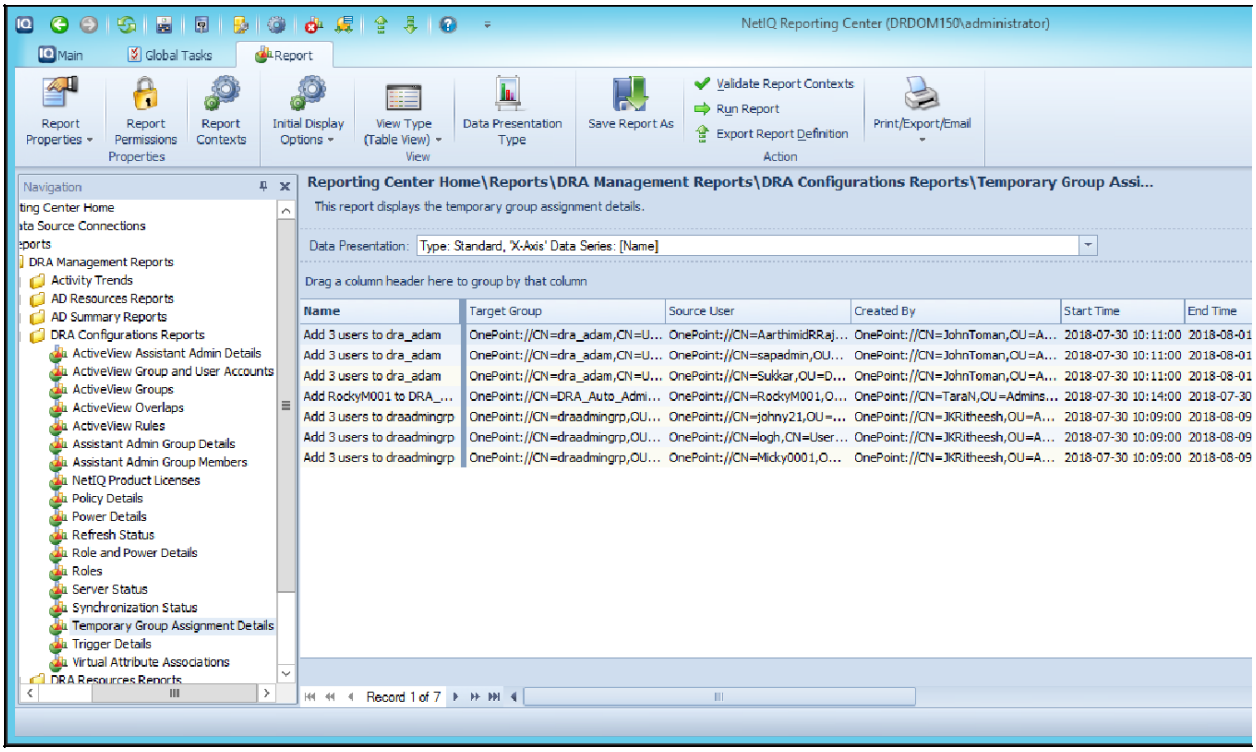
```
                    CONVERT(NVARCHAR(35), JH.Start_Time, 120) AS [Start Time],
                    CONVERT(NVARCHAR(35), JH.End_Time, 120) AS [End Time],
                CASE WHEN JH.Result_Id = 1 THEN 'Success'
                        WHEN JH.Result_Id = 2 THEN 'Failed'
                         ELSE 'Aborted'
                    END AS [Result]
            FROM    JOB as J1 INNER JOIN
                    JOBS_HISTORY AS JH ON J1.Job_Id = JH.Job_Id
            WHERE   (JH.Job_Id &lt;&gt; 3) AND (JH.Start_Time &gt;= DATEADD(DD, - 7,
GETDATE()))
            UNION ALL
            SELECT  J2.Job_Name,
                    RJ.Collector_Info,
                    RJ.DRA_Server_Name,
                    CONVERT(NVARCHAR(35), RJ.Start_Time, 120),
                    NULL AS End_Time,
                    'Running' AS [Result]
            FROM    JOB AS J2 INNER JOIN
                    RUNNING_JOBS AS RJ ON J2.Job_Id = RJ.Job_Id
            WHERE   (J2.Job_Id &lt;&gt; 3)
            ORDER BY Domain, Server, Collector, [Start Time] DESC
          </Template>
        </QUERY>
      </STANDARD>
    </NOREPORT>
```

4. Save the report file to the `.\Program Files (x86)\NetIQ\DRA\DRA` folder. Follow the final step in Process for Modifying the "General Report" in NRC uploading section. You will see the new report located under the folder "Summarized Activity Report".

Creating a "Temporary Group Assignment" Report

Scope

The NetIQ Reporting Center, NRC, provides a set of standard reports that can be run to retrieve data from the SQL database. Additionally, NRC allows for the modification and addition of reports to provide a custom solution. In this example we will demonstrate the steps to create a new report that shows the list of temporary group assignment details.



Step-by-step Guide

1. Follow the Process for Modifying the "General Report" in NRC up to the uploading section.
2. You can use SQL Server Management Studio against the DRAReporting database to test the SQL statement we will use for his report to make sure it returns the desired results.

SQL Statement

```
SELECT TGA.NAME AS Name,
                TGA.TARGET_GROUP AS [Target Group],
                TGM.USER_PATH AS [Source User],
                TGA.ASSISTANT_ADMIN AS [Created By],
                CONVERT(NVARCHAR(35), TGA.START_TIME, 120) AS [Start Time],
                CONVERT(NVARCHAR(35), TGA.END_TIME, 120) AS [End Time],
                TGA.STATUS_MESSAGE AS Status,
                TGA.DESCRIPTION AS Description,
                TGA.CREATION_TIME as [Creation Time]
```

```
                INNER JOIN TGA_GROUP_MEMBERSHIP TGM ON TGA.TGA_ID=TGM.TGA_ID
            ORDER BY TGA.TARGET_GROUP, TGM.USER_PATH
```

3. Open the report file and locate the section for the "DRA Configurations Reports" group and extract the section to the custom report file. Place it under this section of the XML:

Report Definition

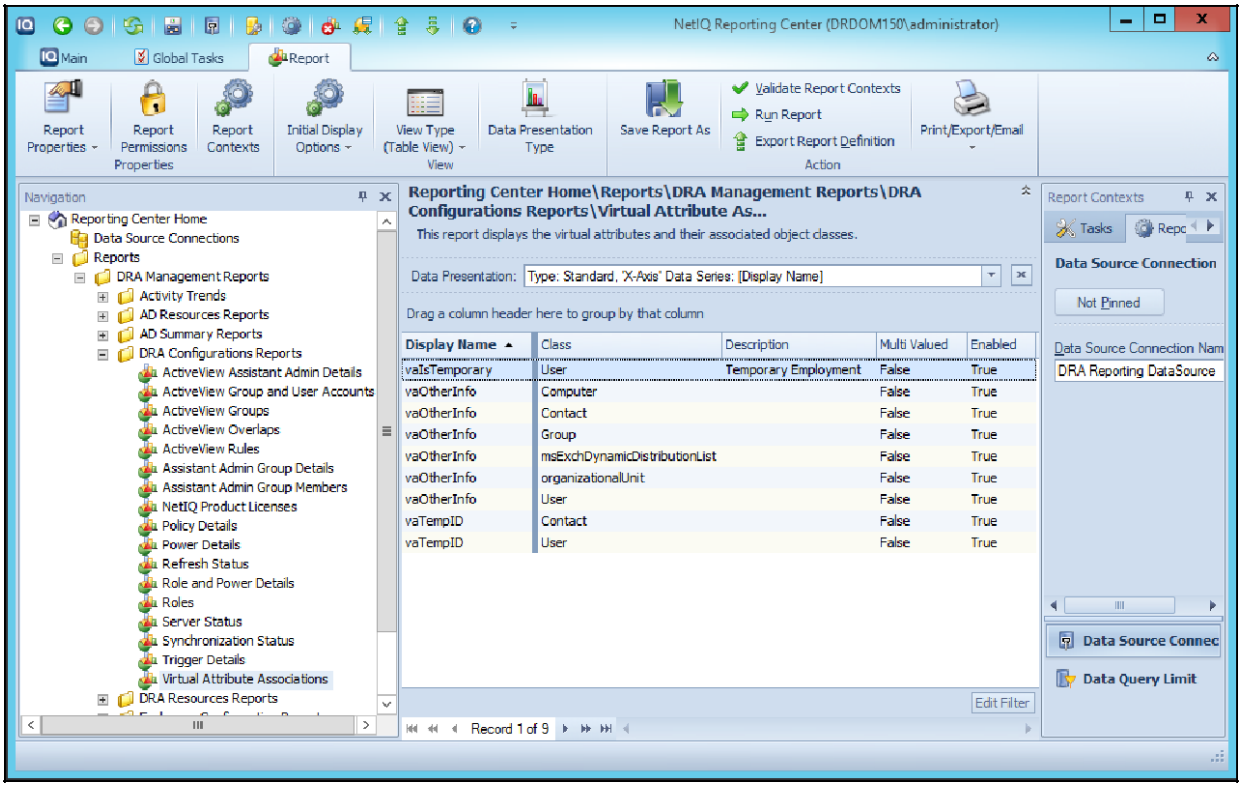
```
<NQREPORT ID="DRA CONFIGURATION REPORTS.TGADETAILS" Type="DRAReporting"
           Description="This report displays the temporary group assignment details."
           Title="Temporary Group Assignment Details">
      <PARAMETERS/>
      <CONTEXTS>
          <CONTEXT TYPE="NetIQ.Reporting.Context.ConnectionContext,NRCLib" Name="DRA
Reporting DataSource" ID="1"/>

          <CONTEXT
TYPE="NetIQ.Reporting.Context.QueryLimitContext,NRCLib" ID="1"
Title="Data Query Limit" Count="1000" ShowWarning="false"/>
      </CONTEXTS>
      <STANDARD ViewMode="table" NumericFormat="F0" QueryLimit="1000">
          <QUERY TYPE="NetIQ.Reporting.Context.NRCSQLQuery,NRCLib">
              <Template>
                  SELECT {QueryLimitContext[1].Value}
                      TGA.NAME AS Name,
                      TGA.TARGET_GROUP AS [Target Group],
                      TGM.USER_PATH AS [Source User],
                      TGA.ASSISTANT_ADMIN AS [Created By],
                      CONVERT(NVARCHAR(35), TGA.START_TIME, 120) AS [Start Time],
                      CONVERT(NVARCHAR(35), TGA.END_TIME, 120) AS [End Time],
                      TGA.STATUS_MESSAGE AS Status,
                      TGA.DESCRIPTION AS Description,
                      TGA.CREATION_TIME as [Creation Time]
                  FROM TGA
                  INNER JOIN TGA_GROUP_MEMBERSHIP TGM ON TGA.TGA_ID=TGM.TGA_ID
                  ORDER BY TGA.TARGET_GROUP, TGM.USER_PATH
              </Template>
          </QUERY>
      </STANDARD>
  </NQREPORT>
```

4. Save the report file to the `.\Program Files (x86)\NetIQ\DRA\DRA` folder. Follow the final step in Process for Modifying the "General Report" in NRC uploading section. You will see the new report located under the folder "DRA Configurations Reports".

Creating a "Virtual Attribute Associations" Report

Scope

The NetIQ Reporting Center, NRC, provides a set of standard reports that can be run to retrieve data from the SQL database. Once the report has been created, it can be sorted and/or filtered as needed. Additionally, NRC allows for the modification and addition of reports to provide a custom solution. This procedure will demonstrate the steps to create a new report that shows the list of virtual attributes and their association with classes.



Step-by-step Guide

1. Follow the Process for Modifying the "General Report" in NRC up to the uploading section.
2. You can use SQL Server Management Studio against the DRAReporting database to test the SQL statement we will use for his report to make sure it returns the desired results.

SQL Statemement

```
SELECT
    VA.DisplayName as [Display Name],
    CLASS.CLASS AS [Class],
    VA.Description,
    VA.IsMultiValued AS [Multi Valued],
    VA.Enabled
```

```
FROM VIRTUAL_ATTRIBUTE VA
    INNER JOIN  VA_CLASS VC ON VA.VIRTUAL_ATTRIBUTE_ID=VC.VIRTUAL_ATTRIBUTE_ID
    INNER JOIN CLASS ON CLASS.CLASS_ID=VC.CLASS_ID
ORDER BY VA.DisplayName, CLASS.CLASS
```

3. Open the custom report file and locate the section for the "DRA Configurations Reports" group and add the definition for the new report inside this section of the XML:

<REPORTSET FOLDER="DRA Management Reports\Summarized Activity Reports">

Report Definition

```
  <NQREPORT ID="DRA CONFIGURATION REPORTS.VAASSOCIATIONDETAILS"  Type="DRAReporting"

 Description="This report displays the virtual attributes and their
associated object classes." Title="Virtual Attribute Associations">
      <PARAMETERS/>
      <CONTEXTS>
        <CONTEXT TYPE="NetIQ.Reporting.Context.ConnectionContext,NRCLib" Name="DRA Reporting
DataSource" ID="1"/>

 <CONTEXT TYPE="NetIQ.Reporting.Context.QueryLimitContext,NRCLib"
ID="1" Title="Data Query Limit" Count="1000" ShowWarning="false"/>
      </CONTEXTS>
      <STANDARD ViewMode="table" NumericFormat="F0" QueryLimit="1000">
        <QUERY TYPE="NetIQ.Reporting.Context.NRCSQLQuery,NRCLib">
          <Template>
            SELECT {QueryLimitContext[1].Value}
                VA.DisplayName as [Display Name],
                CLASS.CLASS AS [Class],
                VA.Description,
                VA.IsMultiValued AS [Multi Valued],
                VA.Enabled
            FROM VIRTUAL_ATTRIBUTE VA
                INNER JOIN  VA_CLASS VC ON VA.VIRTUAL_ATTRIBUTE_ID=VC.VIRTUAL_ATTRIBUTE_ID
                INNER JOIN CLASS ON CLASS.CLASS_ID=VC.CLASS_ID
            ORDER BY VA.DisplayName, CLASS.CLASS
          </Template>
        </QUERY>
      </STANDARD>
    </NQREPORT>
```

4. Save the report file to the `.\Program Files (x86)\NetIQ\DRA\DRA` folder. Follow the final step in Process for Modifying the "General Report" in NRC uploading section. You will see the new report located under the folder "DRA Configurations Reports".

Modify an Existing Report, SQL column addition

Scope

The NetIQ Reporting Center (NRC), provides a set of standard reports that can be run to retrieve data from the DRA SQL reporting database. Additionally, NRC allows for the modification and addition of reports to provide a custom solution. In this example we will add an additional column to be returned in the report.

Step-by-step Guide

1. Follow the Process for Modifying the "General Report" in NRC up to the uploading section.
2. Open the `.\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Report.XML` file and locate the section for the "User Accounts Expiring Within a Week" report. Extract a copy to the custom report file.
3. Next, update the SQL database query return the extra column.

   Edit SQL Query
   Make the following changes to the SQL query:

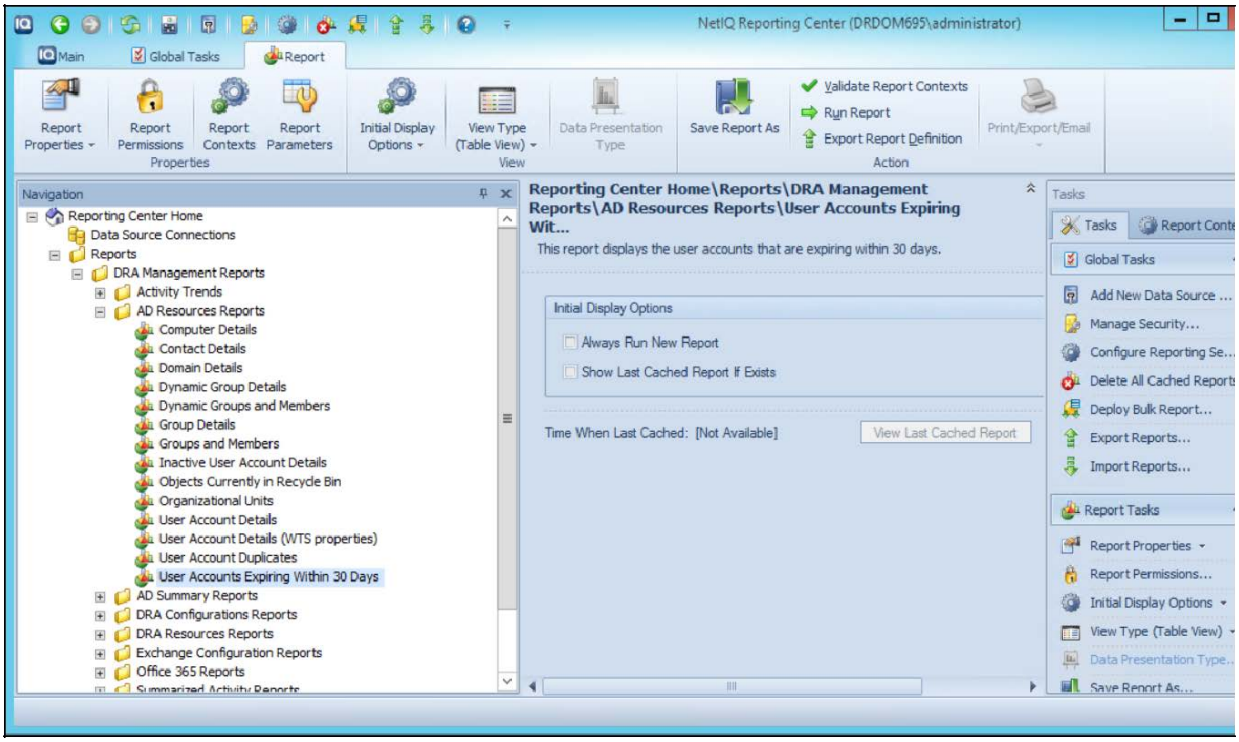
   Add [USERS].[DeskLocation] AS [Desk Location],

4. Save the report file. Follow the final step in Process for Modifying the "General Report" in NRC uploading section.

Modify an Existing Report, SQL where clause

Scope

The NetIQ Reporting Center (NRC), provides a set of standard reports that can be run to retrieve data from the DRA SQL reporting database. Additionally, NRC allows for the modification and addition of reports to provide a custom solution. In this example we will modify the existing " User Accounts Expiring Within a Week" with a new custom date range of 30 days to convert the report to "User Accounts Expiring Within 30 Days".



Step-by-step Guide

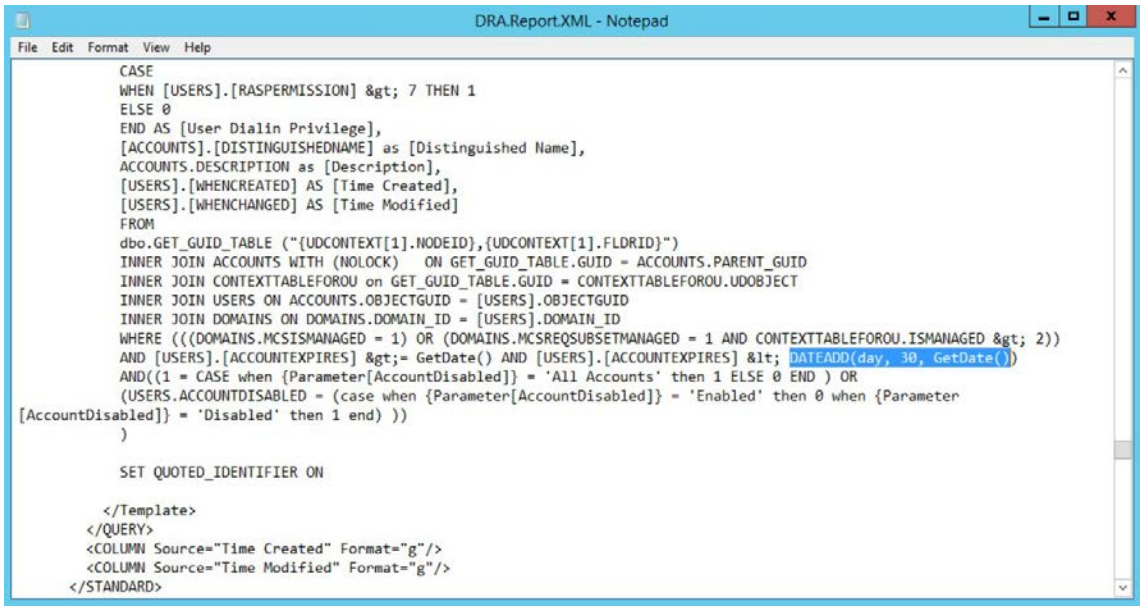
1. Follow the Process for Modifying the "General Report" in NRC up to the uploading section.
2. Open report file and locate the section for the "User Accounts Expiring Within a Week" report and extract a copy to the custom report file. First we will update the contextual information for the report.

Edit Report

Make the following changes to the report definition:

- Change the entry for "Description" to **Description="This report displays the user accounts that are expiring within 30 days"**
- Change the entry to "Title" to **Title="User Accounts Expiring Within 30 Days"**

3. Next, update the SQL database query to look for accounts expiring in 30 days instead of 7 days.



Edit SQL Query
Make the following changes to the SQL query:

Change ***DATEADD(day, 7, GetDate())*** to ***DATEA DD(day, 30, GetDate())***

4. Save the file. Follow the final step in Process for Modifying the "General Report" in NRC uplo ading section.

Process for Modifying the "General Report" in NRC

Scope

NetIQ Reporting Center (NRC), provides a set of standard reports that can be run to retrieve data from the SQL database. Once the report has been created, it can be sorted and/or filtered as needed. Additionally, NRC allows for the modification and addition of new reports to provide a custom solution. This procedure will cover the general mechanics of making custom reports.

Step-by-step Guide

1. Back up XML files.
2. Edit the Checkin batch file to appear like the example.

Checkin Batch File

```
@echo off
REM Checkin DRA NRC Reports
if Exist "%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe" goto Checkin
echo ""%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe not found, check
path of NetIQ Reporting Center"
Goto End

:Checkin
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting

\DRA.DataSourceType.XML"
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting

\DRA.UDContext.xml"
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting

\DRA.ExtDataSource.XML"
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting

\DRA.Report.XML"

if not exist "%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Custom.UDContext.xml"
goto SkipToReport
```

```
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting

\DRA.Custom.UDContext.xml"

:SkipToReport
if not exist "%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting\DRA.Custom.Reports.XML" goto
End
"%~d0\Program Files\NetIQ\Reporting Center\Utilities\XmlCheckIn.exe"  /S localhost
"%~d0\Program Files (x86)\NetIQ\DRA\DRA Reporting

\DRA.Custom.Reports.XML"
```

3. Create a DRA.Custom.Report.xml file in the directory if one does not exist.

```
<?xml version="1.0" encoding="utf-8"?>
<REPORTSETS>
  <REPORTSET FOLDER="DRA Management Reports\Summarized Activity Reports">
  </REPORTSET>
  <REPORTSET FOLDER="DRA Management Reports\Activity Trends">
  </REPORTSET>
  <REPORTSET FOLDER="DRA Management Reports\Exchange Configuration Reports">
  </REPORTSET>
  <REPORTSET FOLDER="DRA Management Reports\DRA Configurations Reports">
  </REPORTSET>
  <REPORTSET FOLDER="DRA Management Reports\AD Resources Reports">
  </REPORTSET>
  <REPORTSET FOLDER="DRA Management Reports\Office 365 Reports">
  </REPORTSET>
  <REPORTSET FOLDER="DRA Management Reports\AD Summary Reports">
  </REPORTSET>
  <REPORTSET FOLDER="DRA Management Reports\DRA Resources Reports">
  </REPORTSET>
</REPORTSETS>
```

4. Edit the `DRA.Custom.Report.xml` file with the report to be customized.

   `{QueryLimitContext[x].Value}` - Text like this may be in the query. It is a API (like TOP 1000) that will be filled in by NRC when the query is sent to SQL.

`> or <` - Html rules apply in this XML file. These will be converted to > (greater than) and < (less than) prior being sent to SQL.

`UDContext` - User description context used for working with data from the controls. Each UDContext used must have a unique id. Please don't modify the existing controls. See the section below for a list of existing contexts.

5. Upload report definitions by running Checkin batch file.

Working with Custom Virtual Attributes

Scope

DRA allows the extension of objects (User, Contact, Computer, Group, Organizational Unit, & Dynamic Distribution Group) though the use of custom virtual attributes. These attributes may be created and manage with custom interface pages, collected from ADLDS to a SQL database, and displayed as part of a report. This walkthrough gives end to end guidance on the process of how to setup, mange, collect, and report custom virtual attributes.

For this example, the Keystone Steel Company needs a new custom virtual attribute, DeskLocation. It will be added as a string attribute for the USER object. We will start by defining the new virtual attribute, creating a custom interface, and then adding data.

Step-by-Step Guide

1. Create new virtual attribute DeskLocation.
2. Assigned DeskLocation to USER.
3. Add User page to collect data
4. Assign data to DeskLocation.
5. Setup AD Collector to collect data.
6. Follow the Process for Modifying the "General Report" in NRC up to the section titled "Uploading the Updated Master Report File".
7. Follow the Modify an Existing Report, SQL column addition to add new DeskLocation column in report.

Database Schema

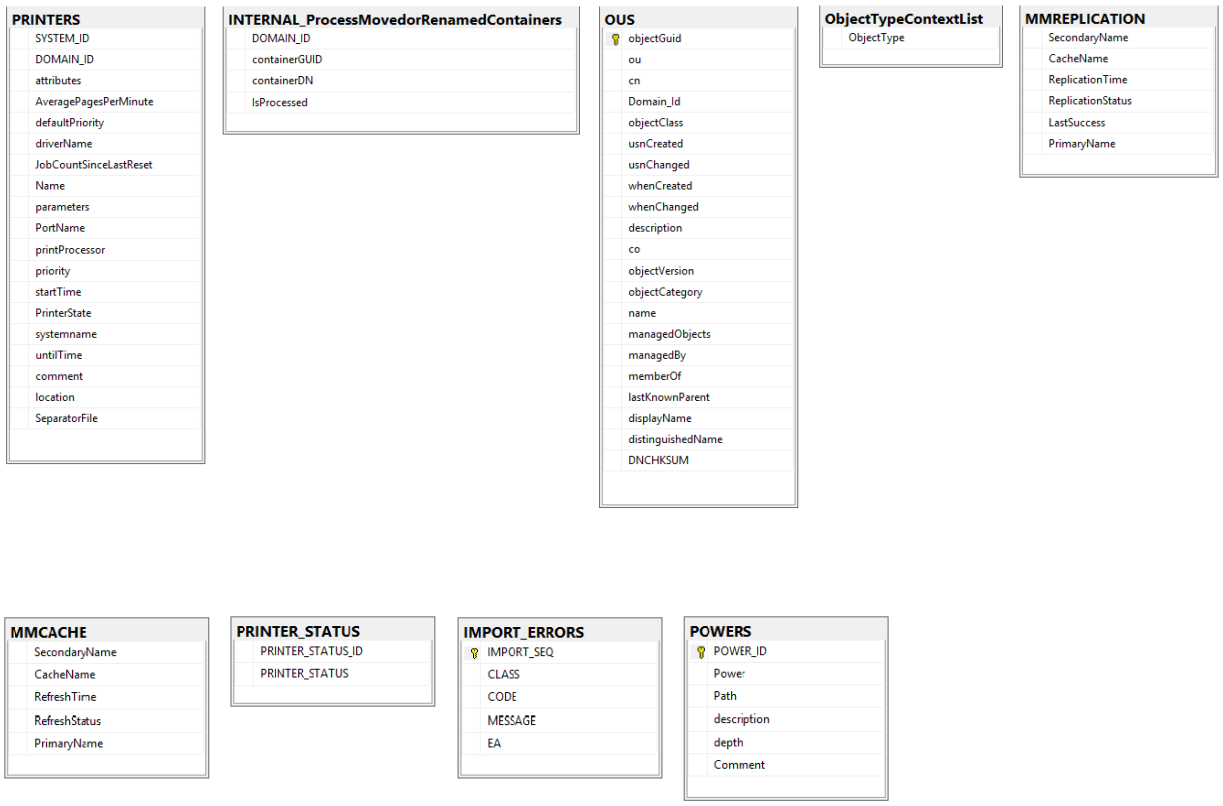
- DRA Reporting Database
  - Visual Layout
  - Tables
  - Stored Procedures
  - Functions

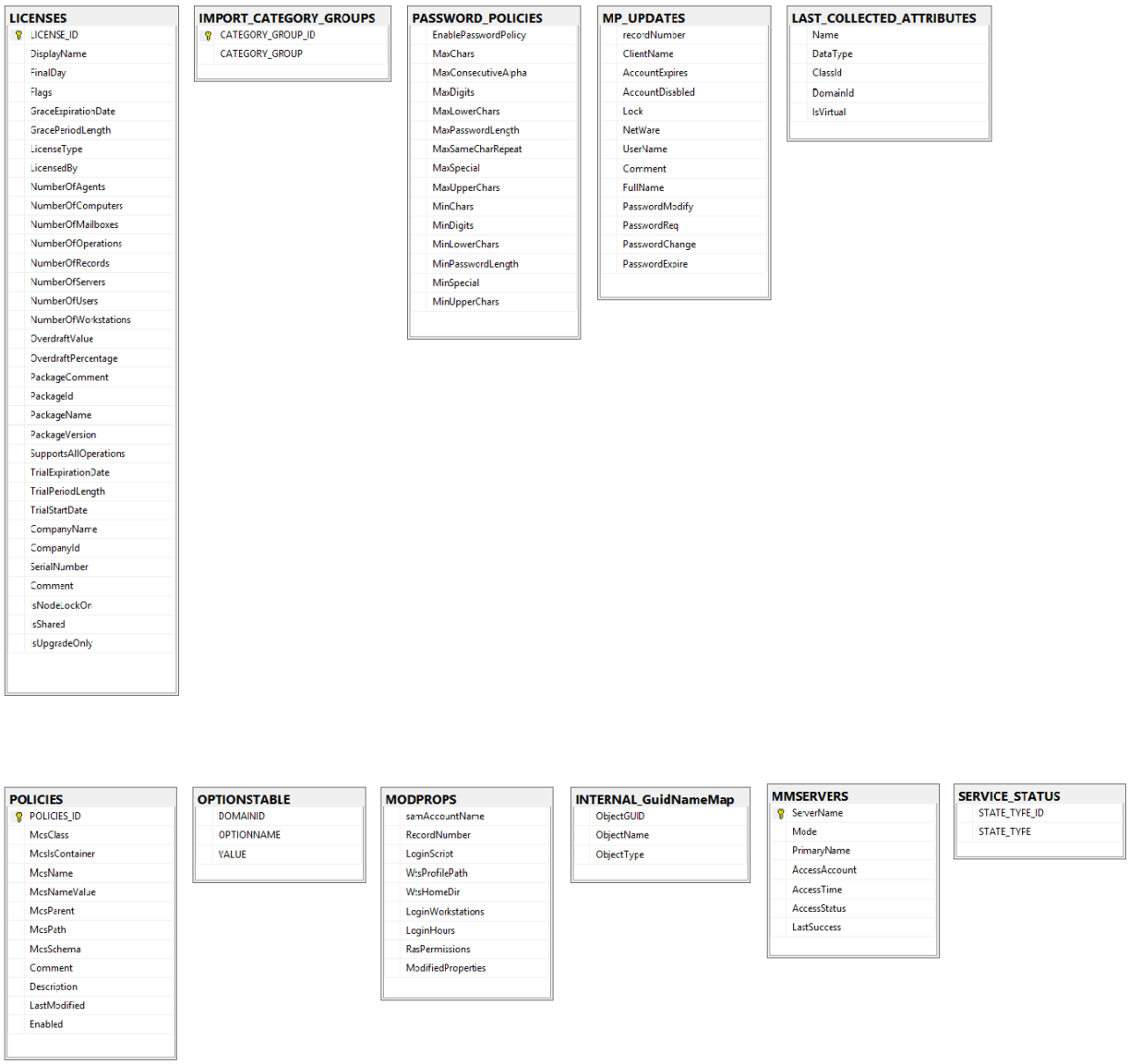
DRA Reporting Database

This section includes a visual layout, tables, stored procedures, and functions of the database.

Visual Layout

The DRA Reporting Database stores the data collected by the DRA collectors.




LICENSES
LICENSE_ID
DisplayName
FinalDay
Flags
GraceExpirationDate
GracePeriodLength
LicenseType
LicensedBy
NumberOfAgents
NumberOfComputers
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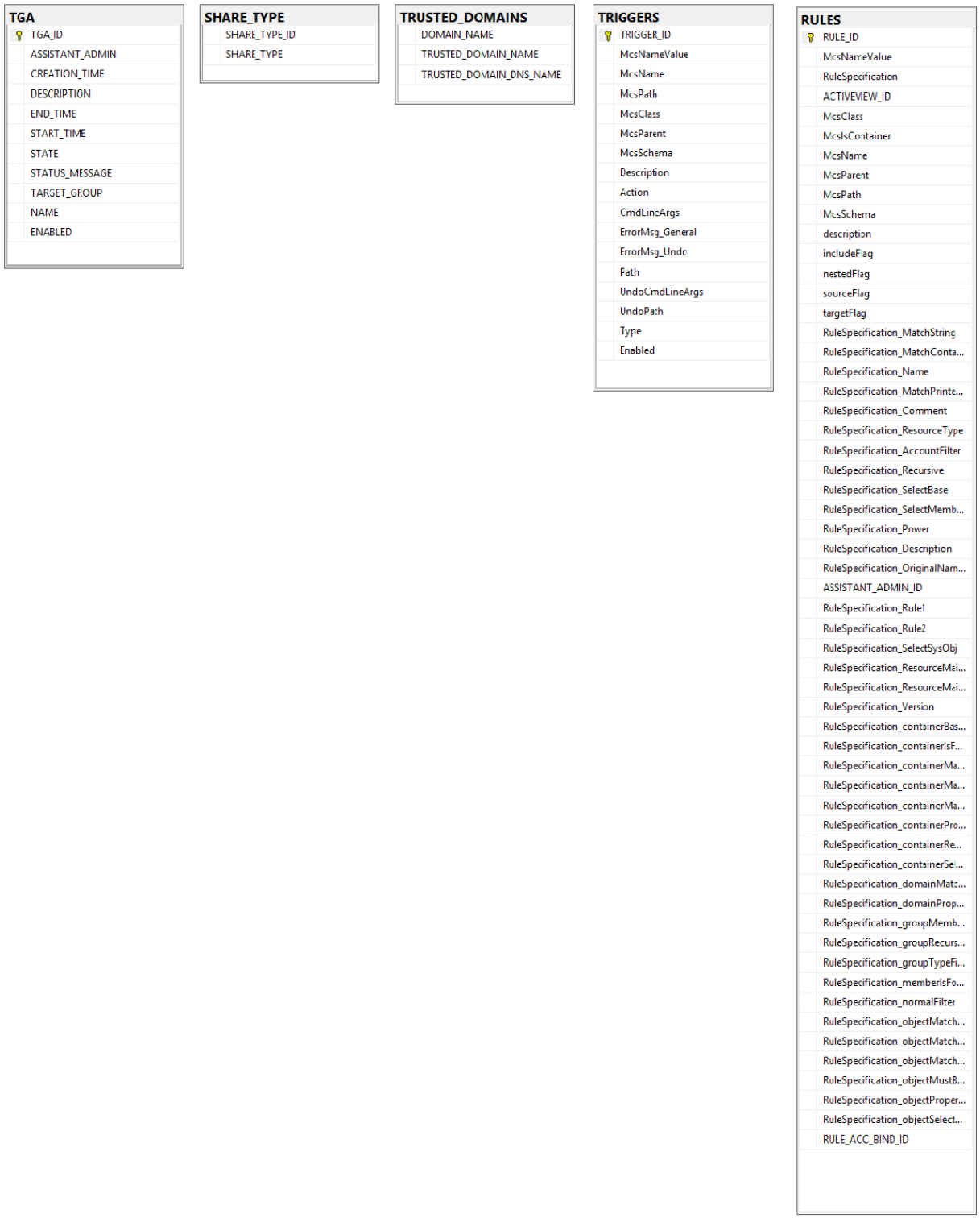
NumberOfOperations
NumberOfRecords
NumberOfServers
NumberOfUsers
NumberOfWorkstations
OverdraftValue
OverdraftPercentage
PackageComment
PackageId
PackageName
PackageVersion
SupportsAllOperations
TrialExpirationDate
TrialPeriodLength
TrialStartDate
CompanyName
CompanyId
SerialNumber
Comment
sNodeLockOr
sShared
sUpgradeOnly
IMPORT_CATEGORY_GROUPS
CATEGORY_GROUP_ID
CATEGORY_GROUP
PASSWORD_POLICIES
EnablePasswordPolicy
MaxChars
MaxConsecutiveAlpha
MaxDigits
MaxLowerChars
MaxPasswordLength
MaxSameCharRepeat
MaxSpecial
MaxUpperChars
MinChars
MinDigits
MinLowerChars
MinPasswordLength
MinSpecial
MinUpperChars
MP_UPDATES
recordNumber
ClientName
AccountExpires
AccountDisabled
Lock
NetWare
UserName
Comment
FullName
PasswordModify
PasswordReq
PasswordChange
PasswordExpire
LAST_COLLECTED_ATTRIBUTES
Name
DataType
ClassId
DomainId
IsVirtual
POLICIES
POLICIES_ID
McsClass
McsIsContainer
McsName
McsNameValue
McsParent
McsPath
McsSchema
Comment
Description
LastModified
Enabled
OPTIONSTABLE
DOMAINID
OPTIONNAME
VALUE
MODPROPS
samAccountName
RecordNumber
LoginScript
WtsProfilePath
WtsHomeDir
LoginWorkstations
LoginHours
RasPermissions
ModifiedProperties
INTERNAL_GuidNameMap
ObjectGUID
ObjectName
ObjectType
MMSERVERS
ServerName
Mode
PrimaryName
AccessAccount
AccessTime
AccessStatus
LastSuccess
SERVICE_STATUS
STATE_TYPE_ID
STATE_TYPE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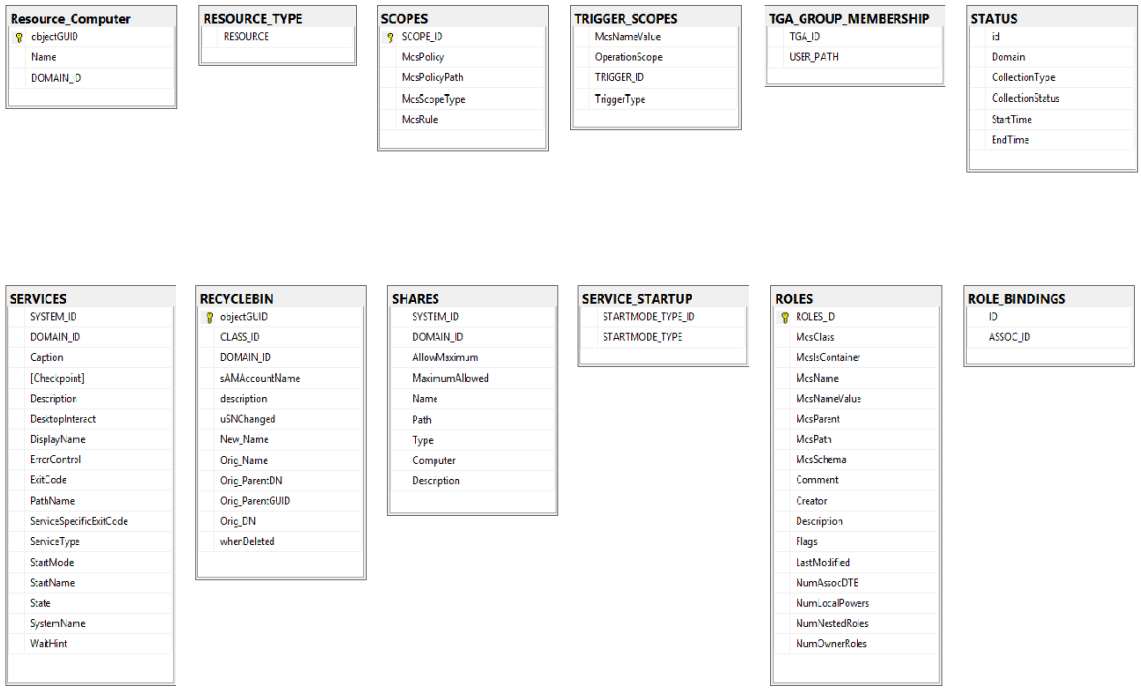
END_TIME
START_TIME
STATE
STATUS_MESSAGE
TARGET_GROUP
NAME
ENABLED
SHARE_TYPE
SHARE_TYPE_ID
SHARE_TYPE
TRUSTED_DOMAINS
DOMAIN_NAME
TRUSTED_DOMAIN_NAME
TRUSTED_DOMAIN_DNS_NAME
TRIGGERS
TRIGGER_ID
McsNameValue
McsName
McsPath
McsClass
McsParent
McsSchema
Description
Action
CmdLineArgs
ErrorMsg_General
ErrorMsg_Undo
Path
UndoCmdLineArgs
UndoPath
Type
Enabled
RULES
RULE_ID
McsNameValue
RuleSpecification
ACTIVEVIEW_ID
McsClass
McsIsContainer
McsName
McsParent
McsPath
McsSchema
description
includeFlag
nestedFlag
sourceFlag
targetFlag
RuleSpecification_MatchString
RuleSpecification_MatchConta...
RuleSpecification_Name
RuleSpecification_MatchPrinte...
RuleSpecification_Comment
RuleSpecification_ResourceType
RuleSpecification_AccountFilter
RuleSpecification_Recursive
RuleSpecification_SelectBase
RuleSpecification_SelectMemb...
RuleSpecification_Power
RuleSpecification_Description
RuleSpecification_OriginalNam...
ASSISTANT_ADMIN_ID
RuleSpecification_Rule1
RuleSpecification_Rule2
RuleSpecification_SelectSysObj
RuleSpecification_ResourceMai...
RuleSpecification_ResourceMai...
RuleSpecification_Version
RuleSpecification_containerBas...
RuleSpecification_containerIsF...
RuleSpecification_containerMa...
RuleSpecification_containerMa...
RuleSpecification_containerMa...
RuleSpecification_containerPro...
RuleSpecification_containerRe...
RuleSpecification_containerSe...
RuleSpecification_domainMat:...
RuleSpecification_domainProp...
RuleSpecification_groupMemb...
RuleSpecification_groupRecurs...
RuleSpecification_groupTypeFi...
RuleSpecification_memberIsFo...
RuleSpecification_normalFilter
RuleSpecification_objectMatch...
RuleSpecification_objectMatch...
RuleSpecification_objectMatch...
RuleSpecification_objectMustB...
RuleSpecification_objectProper...
RuleSpecification_objectSelect...
RULE_ACC_BIND_ID


Resource_Computer
objectGUID
Name
DOMAIN_D
RESOURCE_TYPE
RESOURCE
SCOPES
SCOPE_ID
McsPolicy
McsPolicyPath
McsScopeType
McsRule
TRIGGER_SCOPES
McsNameValue
OperationScope
TRIGGER_ID
TriggerType
TGA_GROUP_MEMBERSHIP
TGA_ID
USER_PATH
STATUS
id
Domain
CollectionType
CollectionStatus
StartTime
EndTime
SERVICES
SYSTEM_ID
DOMAIN_ID
Caption
[Checkpoint]
Description
DesktopInteract
DisplayName
ErrorControl
ExitCode
PathName
ServiceSpecificExitCode
ServiceType
StartMode
StartName
State
SystemName
WaitHint
RECYCLEBIN
objectGUID
CLASS_ID
DOMAIN_ID
sAMAccountName
description
uSNChanged
New_Name
Orig_Name
Orig_Parent:DN
Orig_Parent:GUID
Orig_DN
wheerDeleted
SHARES
SYSTEM_ID
DOMAIN_ID
AllowMaximum
MaximumAllowed
Name
Path
Type
Computer
Descrption
SERVICE_STARTUP
STARTMODE_TYPE_ID
STARTMODE_TYPE
ROLES
ROLES_D
McsClass
McsIsContainer
McsName
McsNameValue
McsParent
McsPath
McsSchema
Comment
Creator
Description
Flags
LastModified
NumAssocDTE
NumLocalPowers
NumNestedRoles
NumOwnerRoles
ROLE_BINDINGS
ID
ASSOC_ID

USERS
objectGuid
cn
Domain_Id
objectClass
usnCreated
usnChanged
HasMailbox
MailboxVersion
homeMDB
accountExpires
name
memberOf
manager
managedObjects
mail
mailNickname
homeDrive
homeDirectory
givenName
displayName
whenCreated
description
canonicalName
AccountDisabled
AccountLockedOut
AccountNotDelegated
DontRequirePreauth
EncryptedTextPasswordAllowed
EpnwEnabled
HomeDirectoryRequired
InterDomainTrustAccount
NormalAccount
PasswordDoesNotExpire
PasswordExpired
PasswordNotRequired
Script
ServerTrustAccount
SmartCardRequired
TempDuplicateAccount
TrustedForDelegation
TrustedToAuthenticateForDele...
UseDesKeyOnly
UserAccountControl
WorkstationTrustAccount
whenChanged
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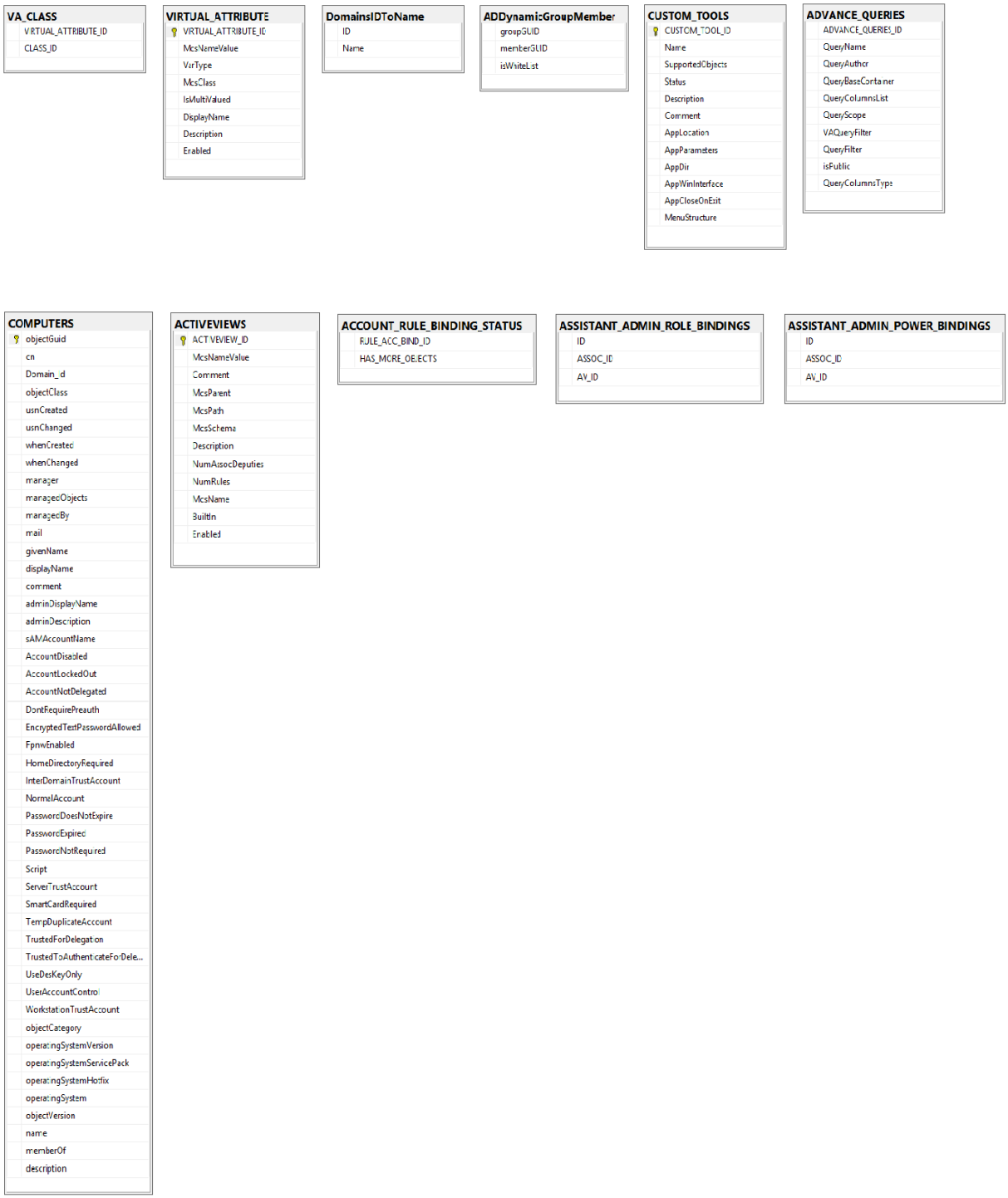
sAMAccountName
sAMAccountType
RasPermission
RasPhonenumber
WtsAllowLogon
WtsBrokenTimeoutSettings
WtsDeviceClientDefaultPrinter
WtsDeviceClientDrives
WtsDeviceClientPrinters
WtsHomeDir
WtsHomeDirDrive
WtsInheritInitialProgram
WtsInitialProgram
WtsModemCallbackPhoneNu...
WtsModemCallbackSettings
WtsProfilePath
WtsReconnectSettings
WtsRemoteHomeDir
WtsShadowingSettings
WtsTimeoutSettingsConnectio...
WtsTimeoutSettingsDisconnec...
WtsTimeoutSettingsIdle
WtsWorkingDirectory
ou
objectCategory
lastLogonTimestamp
MailBoxType
RECYCLE_BIN
RecycleBinID
McsDaysInRecycleBin
McsClass
samAccountName
Domain
McsPath
McsFriendlyName
McsOrigParentOfRecycledObj
USER_MAILBOXES
IMPORT_TIME
MiniMB_DistinguishedName
MiniMB_FirstName
MiniMB_Initials
MiniMB_LastName
MiniMB_DisplayName
MiniMB_Alias
MiniMB_HomeServer
MiniMB_HomeSite
MiniMB_MsgOutgoingLimit
MiniMB_MsgIncomingLimit
MiniMB_UseISDefaults
MiniMB_StoreLimitWarn
MiniMB_StoreLimitProhibit
MiniMB_ProhibitSendReceive
MiniMB_DeliveryMechanism
MiniMB_DeletedItemRetention
MiniMB_RID
McsPath
Domain
USER_INTERFACE_EXTENTIONS
McsName
McsPath
Status
TRUSTING_DOMAINS
DOMAIN_NAME
TRUSTING_DOMAIN_NAME
TRUSTING_DOMAIN_DNS_NA...
ROLE_POWER_BINDINGS
ID
POWER_NAME


VA_CLASS
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CLASS_ID
VIRTUAL_ATTRIBUTE
VIRTUAL_ATTRIBUTE_ID
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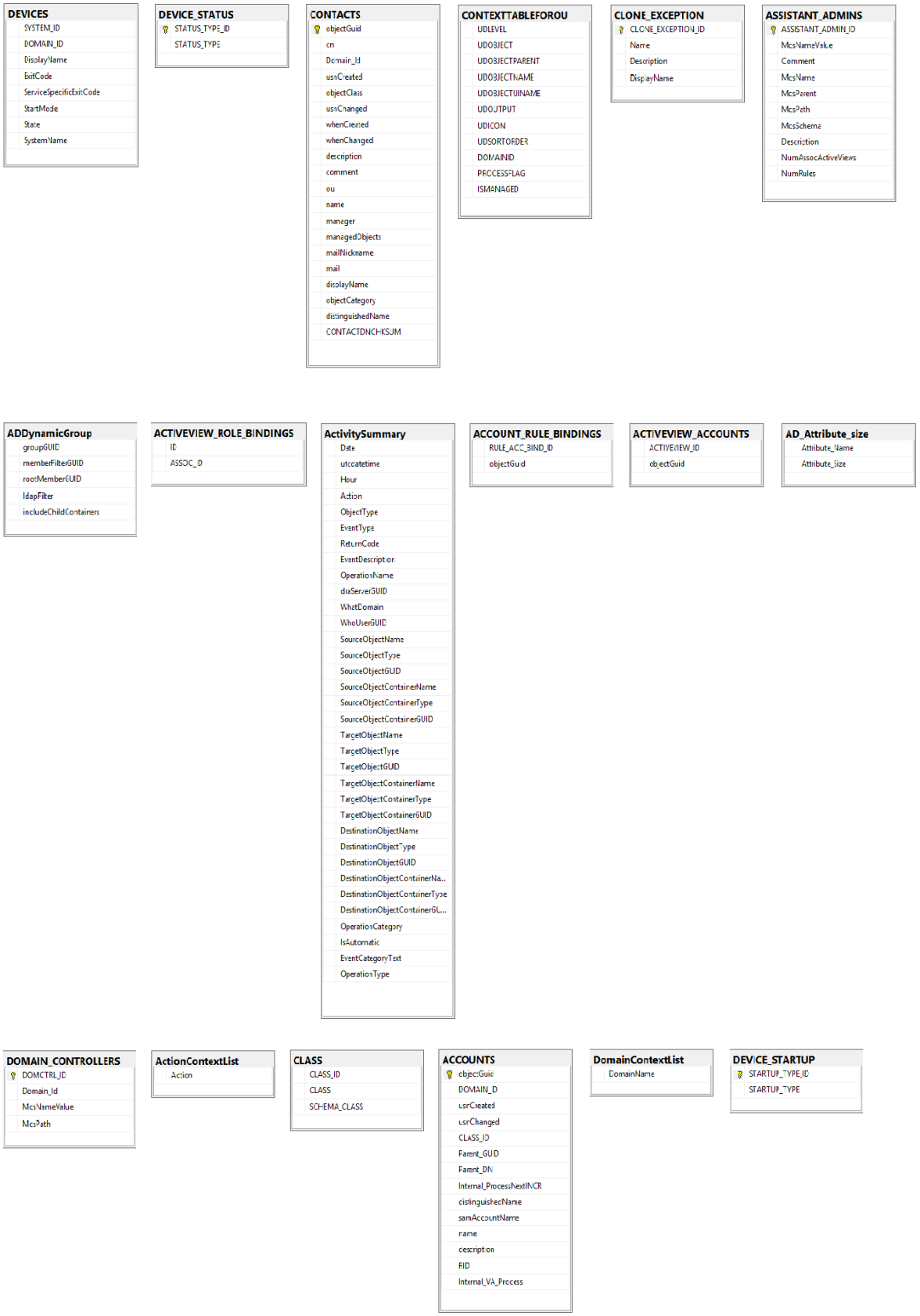
VarType
MesClass
IsMultiValued
DisplayName
Description
Enabled
DomainsIDToName
ID
Name
ADDynamicGroupMember
groupGUID
memberGUID
isWriteList
CUSTOM_TOOLS
CUSTOM_TOOL_ID
Name
SupportedObjects
Status
Description
Comment
AppLocation
AppParameters
AppDir
AppWinInterface
AppCloseOnExit
MenuStructure
ADVANCE_QUERIES
ADVANCE_QUERIES_ID
QueryName
QueryAuthor
QueryBaseContainer
QueryColumnsList
QueryScope
VAQueryFilter
QueryFilter
isPublic
QueryColumnsType
COMPUTERS
objectGuid
cn
Domain_d
objectClass
usnCreated
usnChanged
whenCreated
whenChanged
manager
managedObjects
managedBy
mail
givenName
displayName
comment
adminDisplayName
adminDescription
sAMAccountName
AccountDisabled
AccountLockedOut
AccountNotDelegated
DontRequirePreauth
EncryptedTextPasswordAllowed
FpnwEnabled
HomeDirectoryRequired
InterDomainTrustAccount
NormalAccount
PasswordDoesNotExpire
PasswordExpired
PasswordNotRequired
Script
ServerTrustAccount
SmartCardRequired
TempDuplicateAccount
TrustedForDelegation
TrustedToAuthenticateForDele...
UseDesKeyOnly
UserAccountControl
WorkstationTrustAccount
objectCategory
operatingSystemVersion
operatingSystemServicePack
operatingSystemHotfix
operatingSystem
objectVersion
name
memberOf
description
ACTIVEVIEWS
ACTIVEVIEW_ID
MesNameValue
Comment
MesParent
MesPath
MesSchema
Description
NumAssocDeputies
NumRules
MesName
BuiltIn
Enabled
ACCOUNT_RULE_BINDING_STATUS
RULE_ACC_BIND_ID
HAS_MORE_OBJECTS
ASSISTANT_ADMIN_ROLE_BINDINGS
ID
ASSOC_ID
AV_ID
ASSISTANT_ADMIN_POWER_BINDINGS
ID
ASSOC_ID
AV_ID


DEVICES
SYSTEM_ID
DOMAIN_ID
DisplayName
ExitCode
ServiceSpecificExitCode
StartMode
State
SystemName
DEVICE_STATUS
STATUS_TYPE_ID
STATUS_TYPE
CONTACTS
objectGuid
cn
Domain_Id
usnCreated
objectClass
usnChanged
whenCreated
whenChanged
description
comment
ou
name
manager
managedObjects
mailNickname
mail
displayName
objectCategory
distinguishedName
CONTACTDNCHKSUM
CONTEXTTABLEFOROU
UDLEVEL
UDOBJECT
UDOBJECTPARENT
UDOBJECTNAME
UDOBJECTUINAME
UDOUTPUT
UDICON
UDSORTORDER
DOMAINID
PROCESSFLAG
ISMANAGED
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CLONE_EXCEPTION_ID
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Description
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Comment
McsName
McsParent
McsPath
McsSchema
Description
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NumRules
ADDynamicGroup
groupGUID
memberFilterGUID
rootMemberGUID
ldapFilter
includeChildContainers
ACTIVEVIEW_ROLE_BINDINGS
ID
ASSOC_ID
ActivitySummary
Date
utccatetime
Hour
Action
ObjectType
EventType
ReturnCode
EventDescription
OperationName
draServerGUID
WhatDomain
WhoUserGUID
SourceObjectName
SourceObjectType
SourceObjectGUID
SourceObjectContainerName
SourceObjectContainerType
SourceObjectContainerGUID
TargetObjectName
TargetObjectType
TargetObjectGUID
TargetObjectContainerName
TargetObjectContainerType
TargetObjectContainerGUID
DestinationObjectName
DestinationObjectType
DestinationObjectGUID
DestinationObjectContainerNa...
DestinationObjectContainerType
DestinationObjectContainerGU...
OperationCategory
IsAutomatic
EventCategoryText
OperationType
ACCOUNT_RULE_BINDINGS
RULE_ACC_BIND_ID
objectGuid
ACTIVEVIEW_ACCOUNTS
ACTIVEVIEW_ID
objectGuid
AD_Attribute_size
Attribute_Name
Attribute_Size
DOMAIN_CONTROLLERS
DOMCTRL_ID
Domain_Id
McsNameValue
McsPath
ActionContextList
Action
CLASS
CLASS_ID
CLASS
SCHEMA_CLASS
ACCOUNTS
objectGuid
DOMAIN_D
usrCreated
usrChanged
CLASS_ID
Parent_GUID
Parent_DN
Internal_ProcessNextINCR
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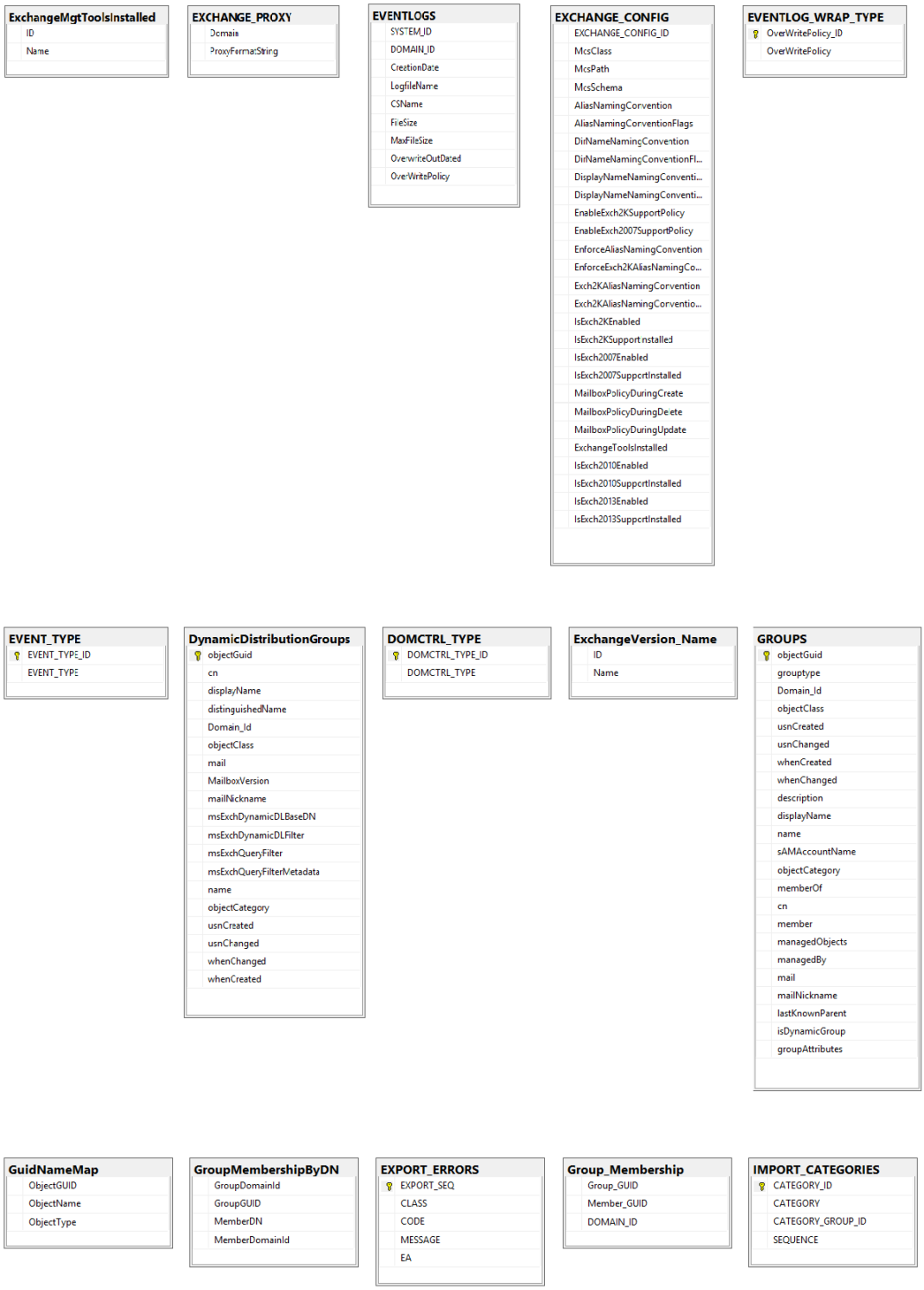
name
description
RID
Internal_VA_Process
DomainContextList
DomainName
DEVICE_STARTUP
STARTUP_TYPE_ID
STARTUP_TYPE


ExchangeMgtToolsInstalled
ID
Name
EXCHANGE_PROXY
Domain
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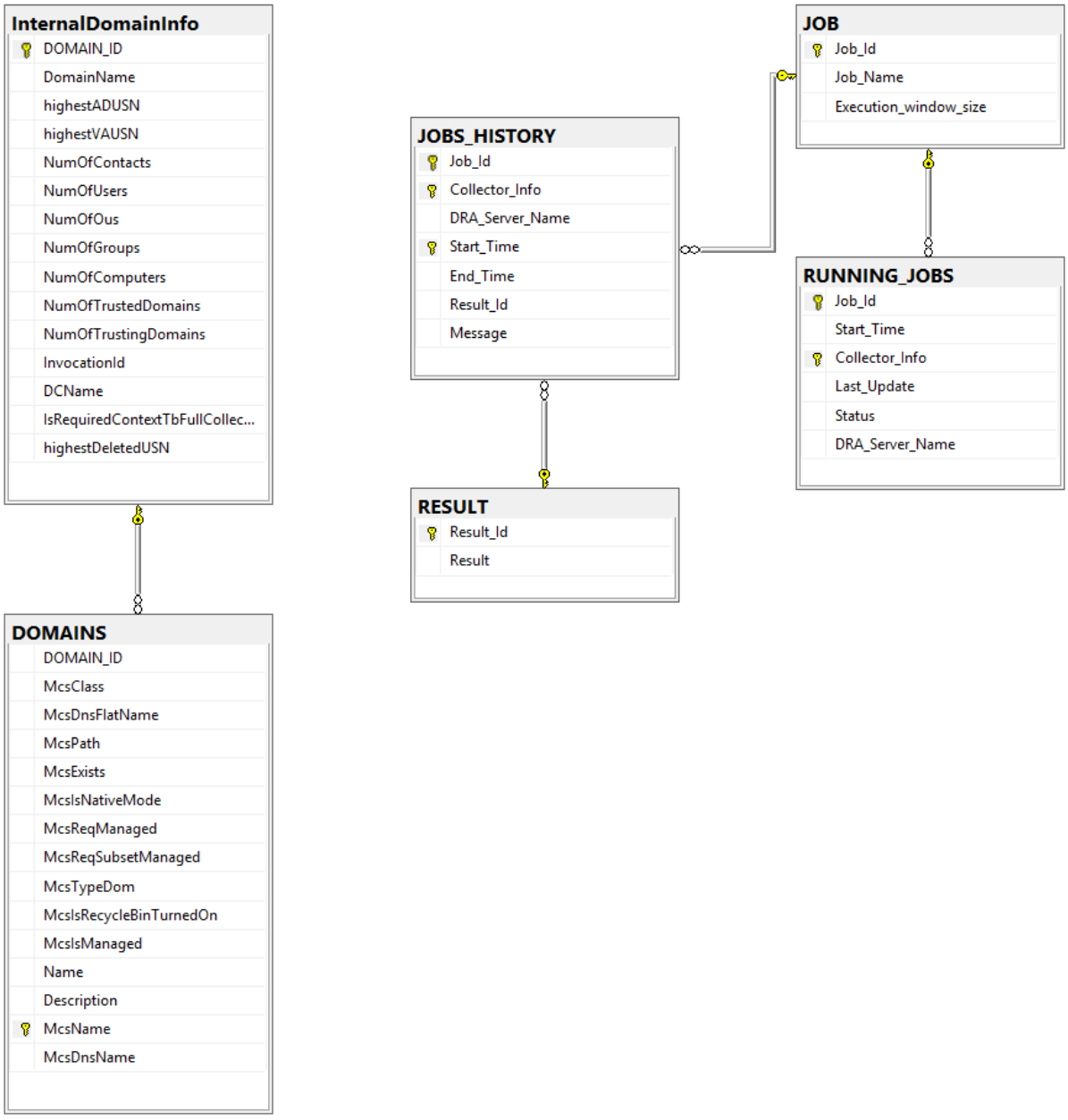
SYSTEM_ID
DOMAIN_ID
CreationDate
LogfileName
CSName
FileSize
MaxFileSize
OverwriteOutDated
OverWritePolicy
EXCHANGE_CONFIG
EXCHANGE_CONFIG_ID
McsClass
McsPath
McsSchema
AliasNamingCorvention
AliasNamingCorventionFlags
DirNameNamingConvention
DirNameNamingConventionFl...
DisplayNameNamingConventi...
DisplayNameNamingConventi...
EnableExch2KSupportPolicy
EnableExch2007SupportPolicy
EnforceAliasNamingConvention
EnforceExch2KAliasNamingCo...
Exch2KAliasNamingCorvention
Exch2KAliasNamingCorventio...
IsExch2KEnabled
IsExch2KSupportInstalled
IsExch2007Enabled
IsExch2007SupportInstalled
MailboxPolicyDuringCreate
MailboxPolicyDuringDelete
MailboxPolicyDuringUpdate
ExchangeToolsInstalled
IsExch2010Enabled
IsExch2010SupportInstalled
IsExch2013Enabled
IsExch2013SupportInstalled
EVENTLOG_WRAP_TYPE
OverWritePolicy_ID
OverWritePolicy
EVENT_TYPE
EVENT_TYPE_ID
EVENT_TYPE
DynamicDistributionGroups
objectGuid
cn
displayName
distinguishedName
Domain_Id
objectClass
mail
MailboxVersion
mailNickname
msExchDynamicDLBaseDN
msExchDynamicDLFilter
msExchQueryFilter
msExchQueryFilterMetadata
name
objectCategory
usnCreated
usnChanged
whenChanged
whenCreated
DOMCTRL_TYPE
DOMCTRL_TYPE_ID
DOMCTRL_TYPE
ExchangeVersion_Name
ID
Name
GROUPS
objectGuid
grouptype
Domain_Id
objectClass
usnCreated
usnChanged
whenCreated
whenChanged
description
displayName
name
sAMAccountName
objectCategory
memberOf
cn
member
managedObjects
managedBy
mail
mailNickname
lastKnownParent
isDynamicGroup
groupAttributes
GuidNameMap
ObjectGUID
ObjectName
ObjectType
GroupMembershipByDN
GroupDomainId
GroupGUID
MemberDN
MemberDomainId
EXPORT_ERRORS
EXPORT_SEQ
CLASS
CODE
MESSAGE
EA
Group_Membership
Group_GUID
Member_GUID
DOMAIN_ID
IMPORT_CATEGORIES
CATEGORY_ID
CATEGORY
CATEGORY_GROUP_ID
SEQUENCE


InternalDomainInfo
DOMAIN_ID
DomainName
highestADUSN
highestVAUSN
NumOfContacts
NumOfUsers
NumOfOus
NumOfGroups
NumOfComputers
NumOfTrustedDomains
NumOfTrustingDomains
InvocationId
DCName
IsRequiredContextTbFullCollec...
highestDeletedUSN
DOMAINS
DOMAIN_ID
McsClass
McsDnsFlatName
McsPath
McsExists
McsIsNativeMode
McsReqManaged
McsReqSubsetManaged
McsTypeDom
McsIsRecycleBinTurnedOn
McsIsManaged
Name
Description
McsName
McsDnsName
JOBS_HISTORY
Job_Id
Collector_Info
DRA_Server_Name
Start_Time
End_Time
Result_Id
Message
RESULT
Result_Id
Result
JOB
Job_Id
Job_Name
Execution_window_size
RUNNING_JOBS
Job_Id
Start_Time
Collector_Info
Last_Update
Status
DRA_Server_Name

Tables

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
ACCOUNT_RULE_BINDING_STATUS	HAS_MORE_OBJECTS	bit		Yes
	RULE_ACC_BIND_ID	int		No
ACCOUNT_RULE_BINDINGS	objectGuid	uniqueidentifier		Yes
	RULE_ACC_BIND_ID	int		No
ACCOUNTS	CLASS_ID	int		Yes
	description	nvarchar	1024	Yes
	distinguishedName	nvarchar	-1	Yes
	DOMAIN_ID	int		Yes
	Internal_ProcessNextINCR	bit		Yes
	Internal_VA_Process	bit		Yes
	name	nvarchar	255	Yes
	objectGuid	uniqueidentifier		No
	Parent_DN	nvarchar	-1	Yes
	Parent_GUID	uniqueidentifier		Yes
	RID	int		Yes
	samAccountName	nvarchar	255	Yes
	usnChanged	bigint		Yes
	usnCreated	bigint		Yes
ActionContextList	Action	nvarchar	50	No
ACTIVEVIEW_ACCOUNTS	ACTIVEVIEW_ID	int		No
	objectGuid	uniqueidentifier		Yes
ACTIVEVIEW_ASSISTANT_ADMIN_BINDINGS	ASSOC_ID	int		Yes
	ID	int		No
ACTIVEVIEW_ROLE_BINDINGS	ASSOC_ID	int		Yes
	ID	int		No
ACTIVEVIEWS	ACTIVEVIEW_ID	int		No
	BuiltIn	int		Yes
	Comment	ntext	1073741823	Yes
	Description	ntext	1073741823	Yes
	Enabled	bit		Yes
	McsName	nvarchar	255	Yes
	McsNameValue	nvarchar	255	Yes
	McsParent	nvarchar	255	Yes
	McsPath	ntext	1073741823	Yes
	McsSchema	ntext	1073741823	Yes
	NumAssocDeputies	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	NumRules	int		Yes
ActivityCounts	Action	nvarchar	64	Yes
	Count	int		Yes
	Date	datetime		Yes
	DestinationObjectContainerName	nvarchar	255	Yes
	DestinationObjectContainerType	nvarchar	100	Yes
	draServerGUID	uniqueidentifier		Yes
	EventType	int		Yes
	Hour	int		Yes
	ObjectType	nvarchar	50	Yes
	OperationName	nvarchar	100	Yes
	TargetObjectContainerName	nvarchar	255	Yes
	TargetObjectContainerType	nvarchar	100	Yes
	WhatDomain	nvarchar	250	Yes
	WhoUserGUID	uniqueidentifier		Yes
ActivitySummary	Action	nvarchar	64	Yes
	Date	datetime		Yes
	DestinationObjectContainerGUID	uniqueidentifier		Yes
	DestinationObjectContainerName	nvarchar	255	Yes
	DestinationObjectContainerType	nvarchar	100	Yes
	DestinationObjectGUID	uniqueidentifier		Yes
	DestinationObjectName	nvarchar	255	Yes
	DestinationObjectType	nvarchar	255	Yes
	draServerGUID	uniqueidentifier		Yes
	EventCategoryText	nvarchar	50	Yes
	EventDescription	nvarchar	512	Yes
	EventType	int		Yes
	Hour	int		Yes
	IsAutomatic	bit		Yes
	ObjectType	nvarchar	50	Yes
	OperationCategory	nvarchar	50	Yes
	OperationName	nvarchar	100	Yes
	OperationType	int		Yes
	ReturnCode	int		Yes
	SourceObjectContainerGUID	uniqueidentifier		Yes
	SourceObjectContainerName	nvarchar	255	Yes
	SourceObjectContainerType	nvarchar	100	Yes
	SourceObjectGUID	uniqueidentifier		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	SourceObjectName	nvarchar	255	Yes
	SourceObjectType	nvarchar	255	Yes
	TargetObjectContainerGUID	uniqueidentifier		Yes
	TargetObjectContainerName	nvarchar	255	Yes
	TargetObjectContainerType	nvarchar	100	Yes
	TargetObjectGUID	uniqueidentifier		Yes
	TargetObjectName	nvarchar	255	Yes
	TargetObjectType	nvarchar	100	Yes
	utcdatetime	datetime		Yes
	WhatDomain	nvarchar	250	Yes
	WhoUserGUID	uniqueidentifier		Yes
AD_Attribute_size	Attribute_Name	nvarchar	255	Yes
	Attribute_Size	int		Yes
ADDynamicGroup	groupGUID	uniqueidentifier		No
	includeChildContainers	bit		No
	ldapFilter	ntext	1073741823	No
	memberFilterGUID	uniqueidentifier		No
	rootMemberGUID	uniqueidentifier		No
ADDynamicGroupMember	groupGUID	uniqueidentifier		No
	isWhiteList	bit		No
	memberGUID	uniqueidentifier		No
ADVANCE_QUERIES	ADVANCE_QUERIES_ID	int		No
	isPublic	nvarchar	20	Yes
	QueryAuthor	nvarchar	-1	Yes
	QueryBaseContainer	nvarchar	-1	Yes
	QueryColumnsList	nvarchar	-1	Yes
	QueryColumnsType	int		Yes
	QueryFilter	nvarchar	-1	Yes
	QueryName	nvarchar	-1	Yes
	QueryScope	int		Yes
	VAQueryFilter	nvarchar	-1	No
ASSISTANT_ADMIN_POWER_BINDINGS	ASSOC_ID	int		Yes
	AV_ID	int		Yes
	ID	int		No
ASSISTANT_ADMIN_ROLE_BINDINGS	ASSOC_ID	int		Yes
	AV_ID	int		Yes
	ID	int		No
ASSISTANT_ADMINS	ASSISTANT_ADMIN_ID	int		No

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	Comment	ntext	1073741823	Yes
	Description	ntext	1073741823	Yes
	McsName	nvarchar	255	Yes
	McsNameValue	nvarchar	255	Yes
	McsParent	nvarchar	255	Yes
	McsPath	ntext	1073741823	Yes
	McsSchema	ntext	1073741823	Yes
	NumAssocActiveViews	int		Yes
	NumRules	int		Yes
CLASS	CLASS	nvarchar	-1	No
	CLASS_ID	int		No
	SCHEMA_CLASS	nvarchar	-1	No
CLONE_EXCEPTION	CLONE_EXCEPTION_ID	int		No
	Description	nvarchar	2048	Yes
	DisplayName	nvarchar	512	Yes
	Name	nvarchar	50	Yes
COMPUTERS	AccountDisabled	int		Yes
	AccountLockedOut	int		Yes
	AccountNotDelegated	int		Yes
	adminDescription	nvarchar	2048	Yes
	adminDisplayName	nvarchar	512	Yes
	cn	nvarchar	128	Yes
	comment	nvarchar	2048	Yes
	description	nvarchar	2048	Yes
	displayName	nvarchar	512	Yes
	Domain_Id	int		Yes
	DontRequirePreauth	int		Yes
	EncryptedTextPasswordAllowed	int		Yes
	FpnwEnabled	int		Yes
	givenName	nvarchar	128	Yes
	HomeDirectoryRequired	int		Yes
	InterDomainTrustAccount	int		Yes
	mail	nvarchar	512	Yes
	managedBy	nvarchar	-1	Yes
	managedObjects	nvarchar	-1	Yes
	manager	nvarchar	-1	Yes
	memberOf	nvarchar	-1	Yes
	name	nvarchar	255	Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	NormalAccount	int		Yes
	objectCategory	nvarchar	-1	Yes
	objectClass	nvarchar	-1	Yes
	objectGuid	uniqueidentifier		No
	objectVersion	int		Yes
	operatingSystem	nvarchar	-1	Yes
	operatingSystemHotfix	nvarchar	-1	Yes
	operatingSystemServicePack	nvarchar	-1	Yes
	operatingSystemVersion	nvarchar	-1	Yes
	PasswordDoesNotExpire	int		Yes
	PasswordExpired	int		Yes
	PasswordNotRequired	int		Yes
	sAMAccountName	nvarchar	255	Yes
	Script	int		Yes
	ServerTrustAccount	int		Yes
	SmartCardRequired	int		Yes
	TempDuplicateAccount	int		Yes
	TrustedForDelegation	int		Yes
	TrustedToAuthenticateForDelegation	int		Yes
	UseDesKeyOnly	int		Yes
	UserAccountControl	int		Yes
	usnChanged	bigint		Yes
	usnCreated	bigint		Yes
	whenChanged	datetime		Yes
	whenCreated	datetime		Yes
	WorkstationTrustAccount	int		Yes
CONTACTS	cn	nvarchar	128	Yes
	comment	nvarchar	2048	Yes
	CONTACTDNCHKSUM	int		Yes
	description	nvarchar	2048	Yes
	displayName	nvarchar	512	Yes
	distinguishedName	nvarchar	-1	Yes
	Domain_Id	int		Yes
	mail	nvarchar	512	Yes
	mailNickname	nvarchar	-1	Yes
	managedObjects	nvarchar	-1	Yes
	manager	nvarchar	-1	Yes
	name	nvarchar	255	Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	objectCategory	nvarchar	-1	Yes
	objectClass	nvarchar	-1	Yes
	objectGuid	uniqueidentifier		No
	ou	nvarchar	128	Yes
	usnChanged	bigint		Yes
	usnCreated	bigint		Yes
	whenChanged	datetime		Yes
	whenCreated	datetime		Yes
CONTEXTTABLEFOROU	DOMAINID	int		Yes
	ISMANAGED	int		Yes
	PROCESSFLAG	bit		Yes
	UDICON	int		Yes
	UDLEVEL	int		Yes
	UDOBJECT	nvarchar	-1	Yes
	UDOBJECTNAME	nvarchar	-1	Yes
	UDOBJECTPARENT	nvarchar	-1	Yes
	UDOBJECTUINAME	nvarchar	-1	Yes
	UDOUTPUT	nvarchar	-1	Yes
	UDSORTORDER	int		Yes
CUSTOM_TOOLS	AppCloseOnExit	bit		Yes
	AppDir	nvarchar	-1	Yes
	AppLocation	nvarchar	-1	Yes
	AppParameters	nvarchar	-1	Yes
	AppWinInterface	bit		Yes
	Comment	ntext	1073741823	Yes
	CUSTOM_TOOL_ID	int		No
	Description	ntext	1073741823	Yes
	MenuStructure	nvarchar	-1	Yes
	Name	nvarchar	-1	Yes
	Status	nvarchar	10	Yes
	SupportedObjects	nvarchar	120	Yes
DEVICE_STARTUP	STARTUP_TYPE	nvarchar	10	Yes
	STARTUP_TYPE_ID	smallint		No
DEVICE_STATUS	STATUS_TYPE	nvarchar	20	Yes
	STATUS_TYPE_ID	int		No
DEVICES	DisplayName	nvarchar	255	Yes
	DOMAIN_ID	int		No
	ExitCode	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	ServiceSpecificExitCode	int		Yes
	StartMode	int		Yes
	State	int		Yes
	SYSTEM_ID	uniqueidentifier		No
	SystemName	nvarchar	255	Yes
DOMAIN_CONTROLLERS	Domain_Id	int		Yes
	DOMCTRL_ID	int		No
	McsNameValue	nvarchar	255	Yes
	McsPath	nvarchar	255	Yes
DomainContextList	DomainName	nvarchar	250	No
DOMAINS	Description	ntext	1073741823	Yes
	DOMAIN_ID	int		No
	McsClass	nvarchar	255	Yes
	McsDnsFlatName	nvarchar	255	Yes
	McsDnsName	nvarchar	255	Yes
	McsExists	bit		Yes
	McsIsManaged	bit		Yes
	McsIsNativeMode	bit		Yes
	McsIsRecycleBinTurnedOn	bit		Yes
	McsName	nvarchar	255	No
	McsPath	nvarchar	255	Yes
	McsReqManaged	bit		Yes
	McsReqSubsetManaged	bit		Yes
	McsTypeDom	int		Yes
	Name	nvarchar	255	Yes
DomainsIDToName	ID	int		No
	Name	nvarchar	50	Yes
DOMCTRL_TYPE	DOMCTRL_TYPE	nvarchar	50	Yes
	DOMCTRL_TYPE_ID	int		No
draview_AA_GuidNameMap	ObjectGUID	uniqueidentifier		No
	ObjectName	nvarchar	255	No
draview_Activeview_Accounts	ACCOUNT_DESCRIPTION	nvarchar	1024	Yes
	ACCOUNT_FULLNAME	nvarchar	255	Yes
	ACCOUNT_NAME	nvarchar	255	Yes
	ACCOUNT_TYPE	nvarchar	-1	No
	ACTIVEVIEW_NAME	nvarchar	255	Yes
	DOMAIN_NAME	nvarchar	255	Yes
	ISMANAGED	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	McsIsManaged	bit		Yes
	MCSREQSUBSETMANAGED	bit		Yes
draview_Server_GuidNameMap	ObjectGUID	uniqueidentifier		No
	ObjectName	nvarchar	255	No
DynamicDistributionGroups	cn	nvarchar	512	Yes
	displayName	nvarchar	512	Yes
	distinguishedName	nvarchar	-1	Yes
	Domain_Id	int		Yes
	mail	nvarchar	512	Yes
	MailboxVersion	int		Yes
	mailNickname	nvarchar	-1	Yes
	msExchDynamicDLBaseDN	nvarchar	-1	Yes
	msExchDynamicDLFilter	nvarchar	-1	Yes
	msExchQueryFilter	nvarchar	-1	Yes
	msExchQueryFilterMetadata	nvarchar	-1	Yes
	name	nvarchar	512	Yes
	objectCategory	nvarchar	-1	Yes
	objectClass	nvarchar	-1	Yes
	objectGuid	uniqueidentifier		No
	usnChanged	bigint		Yes
	usnCreated	bigint		Yes
	whenChanged	datetime		Yes
	whenCreated	datetime		Yes
EVENT_TYPE	EVENT_TYPE	nvarchar	15	Yes
	EVENT_TYPE_ID	int		No
EVENTLOG_WRAP_TYPE	OverWritePolicy	nvarchar	50	Yes
	OverWritePolicy_ID	smallint		No
EVENTLOGS	CreationDate	datetime		Yes
	CSName	nvarchar	-1	Yes
	DOMAIN_ID	int		No
	FileSize	int		Yes
	LogfileName	nvarchar	-1	Yes
	MaxFileSize	int		Yes
	OverwriteOutDated	int		Yes
	OverWritePolicy	int		Yes
	SYSTEM_ID	uniqueidentifier		No
EXCHANGE_CONFIG	AliasNamingConvention	nvarchar	255	Yes
	AliasNamingConventionFlags	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	DirNameNamingConvention	nvarchar	255	Yes
	DirNameNamingConventionFlags	int		Yes
	DisplayNameNamingConvention	nvarchar	255	Yes
	DisplayNameNamingConventionFlags	int		Yes
	EnableExch2007SupportPolicy	int		Yes
	EnableExch2KSupportPolicy	int		Yes
	EnforceAliasNamingConvention	int		Yes
	EnforceExch2KAliasNamingConvention	int		Yes
	Exch2KAliasNamingConvention	nvarchar	255	Yes
	Exch2KAliasNamingConventionFlags	int		Yes
	EXCHANGE_CONFIG_ID	int		No
	ExchangeToolsInstalled	int		Yes
	IsExch2007Enabled	int		Yes
	IsExch2007SupportInstalled	int		Yes
	IsExch2010Enabled	int		Yes
	IsExch2010SupportInstalled	int		Yes
	IsExch2013Enabled	int		Yes
	IsExch2013SupportInstalled	int		Yes
	IsExch2KEnabled	int		Yes
	IsExch2KSupportInstalled	int		Yes
	MailboxPolicyDuringCreate	int		Yes
	MailboxPolicyDuringDelete	int		Yes
	MailboxPolicyDuringUpdate	int		Yes
	McsClass	nvarchar	255	Yes
	McsPath	nvarchar	255	Yes
	McsSchema	ntext	1073741823	Yes
EXCHANGE_PROXY	Domain	nvarchar	150	Yes
	ProxyFormatString	nvarchar	-1	Yes
ExchangeMgtToolsInstalled	ID	int		Yes
	Name	nvarchar	50	Yes
ExchangeVersion_Name	ID	int		Yes
	Name	nvarchar	50	Yes
EXPORT_ERRORS	CLASS	nvarchar	30	Yes
	CODE	int		Yes
	EA	nvarchar	255	Yes
	EXPORT_SEQ	int		No
	MESSAGE	ntext	1073741823	Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
Group_Membership	DOMAIN_ID	int		Yes
	Group_GUID	uniqueidentifier		No
	Member_GUID	uniqueidentifier		Yes
GroupMembershipByDN	GroupDomainId	int		No
	GroupGUID	uniqueidentifier		No
	MemberDN	nvarchar	-1	No
	MemberDomainId	int		No
GROUPS	cn	nvarchar	128	Yes
	description	nvarchar	2048	Yes
	displayName	nvarchar	512	Yes
	Domain_Id	int		Yes
	groupAttributes	int		Yes
	grouptype	int		Yes
	isDynamicGroup	bit		Yes
	lastKnownParent	nvarchar	-1	Yes
	mail	nvarchar	512	Yes
	mailNickname	nvarchar	-1	Yes
	managedBy	nvarchar	-1	Yes
	managedObjects	nvarchar	-1	Yes
	member	nvarchar	-1	Yes
	memberOf	nvarchar	-1	Yes
	name	nvarchar	255	Yes
	objectCategory	nvarchar	-1	Yes
	objectClass	nvarchar	-1	Yes
	objectGuid	uniqueidentifier		No
	sAMAccountName	nvarchar	255	Yes
	usnChanged	bigint		Yes
	usnCreated	bigint		Yes
	whenChanged	datetime		Yes
	whenCreated	datetime		Yes
GuidNameMap	ObjectGUID	uniqueidentifier		No
	ObjectName	nvarchar	255	No
	ObjectType	nvarchar	50	Yes
IMPORT_CATEGORIES	CATEGORY	nvarchar	30	Yes
	CATEGORY_GROUP_ID	smallint		Yes
	CATEGORY_ID	smallint		No
	SEQUENCE	smallint		Yes
IMPORT_CATEGORY_GROUPS	CATEGORY_GROUP	nvarchar	50	Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	CATEGORY_GROUP_ID	smallint		No
IMPORT_ERRORS	CLASS	nvarchar	200	Yes
	CODE	int		Yes
	EA	ntext	1073741823	Yes
	IMPORT_SEQ	int		No
	MESSAGE	ntext	1073741823	Yes
INTERNAL_ActivitySummary	Action	nvarchar	64	Yes
	Date	datetime		Yes
	DestinationObjectContainerGUID	uniqueidentifier		Yes
	DestinationObjectContainerName	nvarchar	255	Yes
	DestinationObjectContainerType	nvarchar	100	Yes
	DestinationObjectGUID	uniqueidentifier		Yes
	DestinationObjectName	nvarchar	255	Yes
	DestinationObjectType	nvarchar	255	Yes
	draServerGUID	uniqueidentifier		Yes
	EventCategoryText	nvarchar	50	Yes
	EventDescription	nvarchar	512	Yes
	EventType	int		Yes
	Hour	int		Yes
	IsAutomatic	bit		Yes
	ObjectType	nvarchar	50	Yes
	OperationCategory	nvarchar	50	Yes
	OperationName	nvarchar	100	Yes
	OperationType	int		Yes
	ReturnCode	int		Yes
	SourceObjectContainerGUID	uniqueidentifier		Yes
	SourceObjectContainerName	nvarchar	255	Yes
	SourceObjectContainerType	nvarchar	100	Yes
	SourceObjectGUID	uniqueidentifier		Yes
	SourceObjectName	nvarchar	255	Yes
	SourceObjectType	nvarchar	255	Yes
	TargetObjectContainerGUID	uniqueidentifier		Yes
	TargetObjectContainerName	nvarchar	255	Yes
	TargetObjectContainerType	nvarchar	100	Yes
	TargetObjectGUID	uniqueidentifier		Yes
	TargetObjectName	nvarchar	255	Yes
	TargetObjectType	nvarchar	100	Yes
	utcdatetime	datetime		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	WhatDomain	nvarchar	250	Yes
	where_draserver_name	nvarchar	255	Yes
	Who_Name	nvarchar	255	Yes
	WhoUserGUID	uniqueidentifier		Yes
INTERNAL_GuidNameMap	ObjectGUID	uniqueidentifier		No
	ObjectName	nvarchar	255	No
	ObjectType	nvarchar	50	Yes
INTERNAL_ProcessMovedorRenamedContainers	containerDN	nvarchar	-1	No
	containerGUID	uniqueidentifier		No
	DOMAIN_ID	int		Yes
	IsProcessed	bit		Yes
InternalDomainInfo	DCName	nvarchar	255	Yes
	DOMAIN_ID	int		No
	DomainName	nvarchar	-1	No
	highestADUSN	bigint		Yes
	highestDeletedUSN	bigint		Yes
	highestVAUSN	bigint		Yes
	InvocationId	binary	16	Yes
	IsRequiredContextTbFullCollection	bit		Yes
	NumOfComputers	bigint		Yes
	NumOfContacts	bigint		Yes
	NumOfGroups	bigint		Yes
	NumOfOus	bigint		Yes
	NumOfTrustedDomains	bigint		Yes
	NumOfTrustingDomains	bigint		Yes
	NumOfUsers	bigint		Yes
InternalOUStructure	CONTAINER_GUID	uniqueidentifier		No
	DOMAIN_ID	int		No
JOB	Execution_window_size	int		Yes
	Job_Id	int		No
	Job_Name	nvarchar	50	Yes
JOBS_HISTORY	Collector_Info	nvarchar	400	No
	DRA_Server_Name	nvarchar	400	No
	End_Time	datetime		Yes
	Job_Id	int		No
	Message	ntext	1073741823	Yes
	Result_Id	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	Start_Time	datetime		No
LAST_COLLECTED_ATTRIBUTES	ClassId	int		No
	DataType	int		No
	DomainId	int		No
	IsVirtual	bit		No
	Name	nvarchar	50	No
LICENSES	Comment	ntext	1073741823	Yes
	CompanyId	nvarchar	255	Yes
	CompanyName	nvarchar	255	Yes
	DisplayName	nvarchar	150	Yes
	FinalDay	datetime		Yes
	Flags	int		Yes
	GraceExpirationDate	datetime		Yes
	GracePeriodLength	int		Yes
	IsNodeLockOn	bit		Yes
	IsShared	bit		Yes
	IsUpgradeOnly	bit		Yes
	LICENSE_ID	int		No
	LicensedBy	int		Yes
	LicenseType	int		Yes
	NumberOfAgents	int		Yes
	NumberOfComputers	int		Yes
	NumberOfMailboxes	int		Yes
	NumberOfOperations	int		Yes
	NumberOfRecords	int		Yes
	NumberOfServers	int		Yes
	NumberOfUsers	int		Yes
	NumberOfWorkstations	int		Yes
	OverdraftPercentage	int		Yes
	OverdraftValue	int		Yes
	PackageComment	nvarchar	255	Yes
	PackageId	int		Yes
	PackageName	nvarchar	255	Yes
	PackageVersion	nvarchar	50	Yes
	SerialNumber	nvarchar	255	Yes
	SupportsAllOperations	bit		Yes
	TrialExpirationDate	datetime		Yes
	TrialPeriodLength	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	TrialStartDate	datetime		Yes
MANAGED_DOMAINS	ID	int		No
	McsDnsName	nvarchar	255	Yes
ManagedContainers	DOMAIN_ID	int		Yes
	objectGUID	uniqueidentifier		Yes
MEMBERS	GROUP_ID	int		Yes
	MEMBER_ID	int		Yes
MMCACHE	CacheName	nvarchar	255	No
	PrimaryName	nvarchar	255	Yes
	RefreshStatus	int		Yes
	RefreshTime	datetime		Yes
	SecondaryName	nvarchar	255	No
MMREPLICATION	CacheName	nvarchar	255	No
	LastSuccess	datetime		Yes
	PrimaryName	nvarchar	255	Yes
	ReplicationStatus	int		Yes
	ReplicationTime	datetime		Yes
	SecondaryName	nvarchar	255	No
MMSERVERS	AccessAccount	nvarchar	255	Yes
	AccessStatus	int		Yes
	AccessTime	datetime		Yes
	LastSuccess	datetime		Yes
	Mode	int		Yes
	PrimaryName	nvarchar	255	Yes
	ServerName	nvarchar	255	No
MODPROPS	LoginHours	int		Yes
	LoginScript	int		Yes
	LoginWorkstations	int		Yes
	ModifiedProperties	ntext	1073741823	Yes
	RasPermissions	int		Yes
	RecordNumber	int		No
	samAccountName	nvarchar	255	Yes
	WtsHomeDir	int		Yes
	WtsProfilePath	int		Yes
MP_UPDATES	AccountDisabled	bit		No
	AccountExpires	bit		No
	ClientName	nvarchar	255	No
	Comment	bit		No

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	FullName	bit		No
	Lock	bit		No
	NetWare	bit		No
	PasswordChange	bit		No
	PasswordExpire	bit		No
	PasswordModify	bit		No
	PasswordReq	bit		No
	recordNumber	int		Yes
	UserName	bit		No
ObjectTypeContextList	ObjectType	nvarchar	50	Yes
OPTIONSTABLE	DOMAINID	int		Yes
	OPTIONNAME	nvarchar	255	Yes
	VALUE	nvarchar	-1	Yes
OUS	cn	nvarchar	128	Yes
	co	nvarchar	256	Yes
	description	nvarchar	2048	Yes
	displayName	nvarchar	512	Yes
	distinguishedName	nvarchar	-1	Yes
	DNCHKSUM	int		Yes
	Domain_Id	int		Yes
	lastKnownParent	nvarchar	-1	Yes
	managedBy	nvarchar	-1	Yes
	managedObjects	nvarchar	-1	Yes
	memberOf	nvarchar	-1	Yes
	name	nvarchar	255	Yes
	objectCategory	nvarchar	-1	Yes
	objectClass	nvarchar	-1	Yes
	objectGuid	uniqueidentifier		No
	objectVersion	int		Yes
	ou	nvarchar	128	Yes
	usnChanged	bigint		Yes
	usnCreated	bigint		Yes
	whenChanged	datetime		Yes
	whenCreated	datetime		Yes
PASSWORD_POLICIES	EnablePasswordPolicy	bit		Yes
	MaxChars	int		Yes
	MaxConsecutiveAlpha	int		Yes
	MaxDigits	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	MaxLowerChars	int		Yes
	MaxPasswordLength	int		Yes
	MaxSameCharRepeat	int		Yes
	MaxSpecial	int		Yes
	MaxUpperChars	int		Yes
	MinChars	int		Yes
	MinDigits	int		Yes
	MinLowerChars	int		Yes
	MinPasswordLength	int		Yes
	MinSpecial	int		Yes
	MinUpperChars	int		Yes
POLICIES	Comment	ntext	1073741823	Yes
	Description	ntext	1073741823	Yes
	Enabled	bit		No
	LastModified	nvarchar	50	Yes
	McsClass	nvarchar	255	Yes
	McsIsContainer	bit		No
	McsName	nvarchar	255	Yes
	McsNameValue	nvarchar	255	No
	McsParent	nvarchar	255	Yes
	McsPath	ntext	1073741823	Yes
	McsSchema	ntext	1073741823	Yes
	POLICIES_ID	int		No
POWERS	Comment	ntext	1073741823	Yes
	depth	int		Yes
	description	ntext	1073741823	Yes
	Path	nvarchar	255	Yes
	Power	nvarchar	255	No
	POWER_ID	int		No
PRINTER_STATUS	PRINTER_STATUS	nvarchar	50	Yes
	PRINTER_STATUS_ID	int		Yes
PRINTERS	attributes	int		Yes
	AveragePagesPerMinute	int		Yes
	comment	ntext	1073741823	Yes
	defaultPriority	int		Yes
	DOMAIN_ID	int		No
	driverName	nvarchar	255	Yes
	JobCountSinceLastReset	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	location	nvarchar	255	Yes
	Name	nvarchar	-1	Yes
	parameters	nvarchar	255	Yes
	PortName	nvarchar	255	Yes
	PrinterState	int		Yes
	printProcessor	nvarchar	255	Yes
	priority	int		Yes
	SeparatorFile	nvarchar	255	Yes
	startTime	datetime		Yes
	SYSTEM_ID	uniqueidentifier		No
	systemname	nvarchar	-1	Yes
	untilTime	datetime		Yes
RECYCLE_BIN	Domain	nvarchar	255	Yes
	McsClass	nvarchar	255	Yes
	McsDaysInRecycleBin	int		Yes
	McsFriendlyName	nvarchar	255	Yes
	McsOrigParentOfRecycledObj	ntext	1073741823	Yes
	McsPath	nvarchar	255	Yes
	RecycleBinID	int		No
	samAccountName	nvarchar	255	Yes
RECYCLEBIN	CLASS_ID	int		No
	description	nvarchar	1024	Yes
	DOMAIN_ID	int		No
	New_Name	nvarchar	255	Yes
	objectGUID	uniqueidentifier		No
	Orig_DN	nvarchar	-1	Yes
	Orig_Name	nvarchar	255	Yes
	Orig_ParentDN	nvarchar	-1	Yes
	Orig_ParentGUID	uniqueidentifier		Yes
	sAMAccountName	nvarchar	255	Yes
	uSNChanged	bigint		No
	whenDeleted	datetime		Yes
Resource_Computer	DOMAIN_ID	int		No
	Name	nvarchar	-1	No
	objectGUID	uniqueidentifier		No
RESOURCE_TYPE	RESOURCE	nvarchar	10	Yes
RESULT	Result	nvarchar	50	Yes
	Result_Id	int		No

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
ROLE_BINDINGS	ASSOC_ID	int		Yes
	ID	int		Yes
ROLE_POWER_BINDINGS	ID	int		Yes
	POWER_NAME	nvarchar	255	Yes
ROLES	Comment	ntext	1073741823	Yes
	Creator	nvarchar	255	Yes
	Description	ntext	1073741823	Yes
	Flags	int		Yes
	LastModified	nvarchar	50	Yes
	McsClass	nvarchar	255	Yes
	McsIsContainer	bit		Yes
	McsName	nvarchar	255	Yes
	McsNameValue	nvarchar	255	Yes
	McsParent	nvarchar	255	Yes
	McsPath	ntext	1073741823	Yes
	McsSchema	ntext	1073741823	Yes
	NumAssocDTB	int		Yes
	NumLocalPowers	int		Yes
	NumNestedRoles	int		Yes
	NumOwnerRoles	int		Yes
	ROLES_ID	int		No
RULES	ACTIVEVIEW_ID	nvarchar	150	Yes
	ASSISTANT_ADMIN_ID	nvarchar	150	Yes
	description	ntext	1073741823	Yes
	includeFlag	bit		Yes
	McsClass	nvarchar	255	Yes
	McsIsContainer	bit		Yes
	McsName	nvarchar	255	Yes
	McsNameValue	nvarchar	255	Yes
	McsParent	nvarchar	255	Yes
	McsPath	ntext	1073741823	Yes
	McsSchema	ntext	1073741823	Yes
	nestedFlag	bit		Yes
	RULE_ACC_BIND_ID	int		Yes
	RULE_ID	int		No
	RuleSpecification	nvarchar	255	Yes
	RuleSpecification_AccountFilter	nvarchar	255	Yes
	RuleSpecification_Comment	nvarchar	255	Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	RuleSpecification_containerBaseFilter	int		Yes
	RuleSpecification_containerIsFocus	bit		Yes
	RuleSpecification_containerMatchAny	bit		Yes
	RuleSpecification_containerMatchMethod	int		Yes
	RuleSpecification_containerMatchvalue	nvarchar	255	Yes
	RuleSpecification_containerProperty	nvarchar	255	Yes
	RuleSpecification_containerRecursive	bit		Yes
	RuleSpecification_containerSelectBase	bit		Yes
	RuleSpecification_Description	nvarchar	255	Yes
	RuleSpecification_domainMatchValue	nvarchar	255	Yes
	RuleSpecification_domainProperty	nvarchar	255	Yes
	RuleSpecification_groupMemberFilter	int		Yes
	RuleSpecification_groupRecursive	bit		Yes
	RuleSpecification_groupTypeFilter	int		Yes
	RuleSpecification_MatchContainerString	nvarchar	255	Yes
	RuleSpecification_MatchPrinterString	nvarchar	255	Yes
	RuleSpecification_MatchString	nvarchar	255	Yes
	RuleSpecification_memberIsFocus	bit		Yes
	RuleSpecification_Name	nvarchar	255	Yes
	RuleSpecification_normalFilter	int		Yes
	RuleSpecification_objectMatchAny	bit		Yes
	RuleSpecification_objectMatchMethod	int		Yes
	RuleSpecification_objectMatchvalue	nvarchar	255	Yes
	RuleSpecification_objectMustBeInContainer	bit		Yes
	RuleSpecification_objectProperty	nvarchar	255	Yes
	RuleSpecification_objectSelectBase	bit		Yes
	RuleSpecification_OriginalNameOfObject	nvarchar	255	Yes
	RuleSpecification_Power	nvarchar	255	Yes
	RuleSpecification_Recursive	nvarchar	255	Yes
	RuleSpecification_ResourceMaiboxType	nvarchar	255	Yes
	RuleSpecification_ResourceMailboxSelect	int		Yes
	RuleSpecification_ResourceType	nvarchar	255	Yes
	RuleSpecification_Rule1	nvarchar	255	Yes
	RuleSpecification_Rule2	nvarchar	255	Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	RuleSpecification_SelectBase	nvarchar	255	Yes
	RuleSpecification_SelectMembers	nvarchar	255	Yes
	RuleSpecification_SelectSysObj	bit		Yes
	RuleSpecification_Version	int		Yes
	sourceFlag	bit		Yes
	targetFlag	bit		Yes
RUNNING_JOBS	Collector_Info	nvarchar	400	No
	DRA_Server_Name	nvarchar	400	Yes
	Job_Id	int		No
	Last_Update	datetime		Yes
	Start_Time	datetime		Yes
	Status	nvarchar	20	Yes
SCOPES	McsPolicy	nvarchar	255	No
	McsPolicyPath	nvarchar	255	No
	McsRule	nvarchar	255	No
	McsScopeType	nvarchar	255	No
	SCOPE_ID	int		No
SERVICE_STARTUP	STARTMODE_TYPE	nvarchar	20	Yes
	STARTMODE_TYPE_ID	int		Yes
SERVICE_STATUS	STATE_TYPE	nvarchar	20	No
	STATE_TYPE_ID	int		No
SERVICES	Caption	nvarchar	512	Yes
	Checkpoint	int		Yes
	Description	ntext	1073741823	Yes
	DesktopInteract	bit		Yes
	DisplayName	nvarchar	255	Yes
	DOMAIN_ID	int		No
	ErrorControl	nvarchar	255	Yes
	ExitCode	int		Yes
	PathName	nvarchar	255	Yes
	ServiceSpecificExitCode	bigint		Yes
	ServiceType	nvarchar	150	Yes
	StartMode	int		Yes
	StartName	nvarchar	255	Yes
	State	int		Yes
	SYSTEM_ID	uniqueidentifier		No
	SystemName	nvarchar	255	Yes
	WaitHint	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
SHARE_TYPE	SHARE_TYPE	nvarchar	50	Yes
	SHARE_TYPE_ID	bigint		Yes
SHARES	AllowMaximum	bit		Yes
	Computer	nvarchar	255	Yes
	Description	nvarchar	-1	Yes
	DOMAIN_ID	int		No
	MaximumAllowed	int		Yes
	Name	nvarchar	-1	Yes
	Path	nvarchar	-1	Yes
	SYSTEM_ID	uniqueidentifier		No
	Type	bigint		Yes
STATUS	CollectionStatus	nvarchar	255	Yes
	CollectionType	nvarchar	255	Yes
	Domain	nvarchar	255	No
	EndTime	datetime		Yes
	id	int		No
	StartTime	datetime		Yes
sysdiagrams	definition	varbinary	-1	Yes
	diagram_id	int		No
	name	nvarchar	128	No
	principal_id	int		No
	version	int		Yes
TGA	ASSISTANT_ADMIN	nvarchar	255	Yes
	CREATION_TIME	datetime		Yes
	DESCRIPTION	ntext	1073741823	Yes
	ENABLED	int		Yes
	END_TIME	datetime		Yes
	NAME	nvarchar	255	Yes
	START_TIME	datetime		Yes
	STATE	int		Yes
	STATUS_MESSAGE	ntext	1073741823	Yes
	TARGET_GROUP	nvarchar	-1	Yes
	TGA_ID	int		No
TGA_GROUP_MEMBERSHIP	TGA_ID	int		No
	USER_PATH	nvarchar	-1	Yes
TRIGGER_SCOPES	McsNameValue	nvarchar	255	Yes
	OperationScope	nvarchar	255	Yes
	TRIGGER_ID	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	TriggerType	nvarchar	255	Yes
TRIGGERS	Action	nvarchar	255	Yes
	CmdLineArgs	nvarchar	255	Yes
	Description	ntext	1073741823	Yes
	Enabled	int		Yes
	ErrorMsg_General	ntext	1073741823	Yes
	ErrorMsg_Undo	ntext	1073741823	Yes
	McsClass	nvarchar	255	Yes
	McsName	nvarchar	255	Yes
	McsNameValue	nvarchar	255	Yes
	McsParent	nvarchar	255	Yes
	McsPath	ntext	1073741823	Yes
	McsSchema	ntext	1073741823	Yes
	Path	nvarchar	255	Yes
	TRIGGER_ID	int		No
	Type	int		Yes
	UndoCmdLineArgs	nvarchar	255	Yes
	UndoPath	nvarchar	255	Yes
TRUSTED_DOMAINS	DOMAIN_NAME	nvarchar	255	Yes
	TRUSTED_DOMAIN_DNS_NAME	nvarchar	255	Yes
	TRUSTED_DOMAIN_NAME	nvarchar	255	Yes
TRUSTING_DOMAINS	DOMAIN_NAME	nvarchar	255	Yes
	TRUSTING_DOMAIN_DNS_NAME	nvarchar	255	Yes
	TRUSTING_DOMAIN_NAME	nvarchar	255	Yes
USER_INTERFACE_EXTENTIONS	McsName	nvarchar	100	No
	McsPath	nvarchar	-1	Yes
	Status	nvarchar	50	Yes
USER_MAILBOXES	Domain	nvarchar	255	Yes
	IMPORT_TIME	real		Yes
	McsPath	ntext	1073741823	Yes
	MiniMB_Alias	nvarchar	68	Yes
	MiniMB_DeletedItemRetention	bit		No
	MiniMB_DeliveryMechanism	nvarchar	50	Yes
	MiniMB_DisplayName	nvarchar	255	Yes
	MiniMB_DistinguishedName	nvarchar	255	Yes
	MiniMB_FirstName	nvarchar	68	Yes
	MiniMB_HomeServer	nvarchar	50	Yes
	MiniMB_HomeSite	nvarchar	50	Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	MiniMB_Initials	nvarchar	8	Yes
	MiniMB_LastName	nvarchar	68	Yes
	MiniMB_MsgIncomingLimit	int		Yes
	MiniMB_MsgOutgoingLimit	int		Yes
	MiniMB_ProhibitSendReceive	int		Yes
	MiniMB_RID	int		Yes
	MiniMB_StoreLimitProhibit	int		Yes
	MiniMB_StoreLimitWarn	int		Yes
	MiniMB_UseISDefaults	bit		No
USERS	AccountDisabled	int		Yes
	accountExpires	datetime		Yes
	AccountLockedOut	int		Yes
	AccountNotDelegated	int		Yes
	canonicalName	nvarchar	-1	Yes
	cn	nvarchar	128	Yes
	description	nvarchar	2048	Yes
	displayName	nvarchar	512	Yes
	Domain_Id	int		Yes
	DontRequirePreauth	int		Yes
	EncryptedTextPasswordAllowed	int		Yes
	FpnwEnabled	int		Yes
	givenName	nvarchar	128	Yes
	HasMailbox	int		Yes
	homeDirectory	nvarchar	-1	Yes
	HomeDirectoryRequired	int		Yes
	homeDrive	nvarchar	-1	Yes
	homeMDB	nvarchar	-1	Yes
	InterDomainTrustAccount	int		Yes
	lastLogonTimestamp	datetime		Yes
	mail	nvarchar	512	Yes
	MailBoxType	int		Yes
	MailboxVersion	int		Yes
	mailNickname	nvarchar	-1	Yes
	managedObjects	nvarchar	-1	Yes
	manager	nvarchar	-1	Yes
	memberOf	nvarchar	-1	Yes
	name	nvarchar	255	Yes
	NormalAccount	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	objectCategory	nvarchar	-1	Yes
	objectClass	nvarchar	-1	Yes
	objectGuid	uniqueidentifier		No
	ou	nvarchar	128	Yes
	PasswordDoesNotExpire	int		Yes
	PasswordExpired	int		Yes
	PasswordNotRequired	int		Yes
	RasPermission	int		Yes
	RasPhonenumber	nvarchar	-1	Yes
	sAMAccountName	nvarchar	255	Yes
	sAMAccountType	int		Yes
	Script	int		Yes
	ServerTrustAccount	int		Yes
	SmartCardRequired	int		Yes
	TempDuplicateAccount	int		Yes
	TrustedForDelegation	int		Yes
	TrustedToAuthenticateForDelegation	int		Yes
	UseDesKeyOnly	int		Yes
	UserAccountControl	int		Yes
	userPrincipalName	nvarchar	-1	Yes
	usnChanged	bigint		Yes
	usnCreated	bigint		Yes
	whenChanged	datetime		Yes
	whenCreated	datetime		Yes
	WorkstationTrustAccount	int		Yes
	WtsAllowLogon	int		Yes
	WtsBrokenTimeoutSettings	int		Yes
	WtsDeviceClientDefaultPrinter	int		Yes
	WtsDeviceClientDrives	int		Yes
	WtsDeviceClientPrinters	int		Yes
	WtsHomeDir	nvarchar	-1	Yes
	WtsHomeDirDrive	nvarchar	-1	Yes
	WtsInheritInitialProgram	int		Yes
	WtsInitialProgram	nvarchar	-1	Yes
	WtsModemCallbackPhoneNumber	nvarchar	-1	Yes
	WtsModemCallbackSettings	int		Yes
	WtsProfilePath	nvarchar	-1	Yes
	WtsReconnectSettings	int		Yes

Table Name	Column Name	DATA_TYPE	Max Character Length	Is Nullable
	WtsRemoteHomeDir	int		Yes
	WtsShadowingSettings	int		Yes
	WtsTimeoutSettingsConnections	int		Yes
	WtsTimeoutSettingsDisconnections	int		Yes
	WtsTimeoutSettingsIdle	int		Yes
	WtsWorkingDirectory	nvarchar	-1	Yes
VA_CLASS	CLASS_ID	int		No
	VIRTUAL_ATTRIBUTE_ID	int		No
VIRTUAL_ATTRIBUTE	Description	ntext	1073741823	Yes
	DisplayName	nvarchar	50	Yes
	Enabled	nchar	10	Yes
	IsMultiValued	nvarchar	20	Yes
	McsClass	nvarchar	-1	Yes
	McsNameValue	nvarchar	50	Yes
	VarType	nchar	10	Yes
	VIRTUAL_ATTRIBUTE_ID	int		No

Stored Procedures

Stored Procedure name	Parameter name	Parameter Data Type	Parameter Max Bytes	Is Output Parameter	Is Nullable
CONSTRUCTOUTREE	*@OUOBJECTGUID*	nvarchar	-1	No	Yes
	@START	int		No	Yes
	@UDLEVEL	int		No	Yes
	@VDOMAINID	int		No	Yes
CONSTRUCTOUTREEINCR	*@DomainID*	int		No	Yes
DRA_Accounts_HasGuid	*@vObjectGUID*	uniqueidentifier		No	Yes
DRA_AccountsAndOUs_MergeDomain	*@vClassTypeId*	int		No	Yes
	@vDomainDN	nvarchar	-1	No	Yes
	@vDomainGUID	uniqueidentifier		No	Yes
	@vDomainId	int		No	Yes
DRA_ADD_DomainToAccountsAndOUs	*@vClassType*	int		No	Yes
	@vDomainDN	nvarchar	-1	No	Yes
	@vDomainGUID	uniqueidentifier		No	Yes
	@vDomainId	int		No	Yes
DRA_ADDJOB	*@vCollector_Info*	nvarchar	800	No	Yes
	@vDRA_Server_Name	nvarchar	800	No	Yes
	@vJob_Id	int		No	Yes
	@vLast_Update	datetime		No	Yes
	@vStart_Time	datetime		No	Yes
	@vStatus	nvarchar	40	No	Yes
DRA_ADDMovedorRenamedContainer	*@vcontainerDN*	nvarchar	-1	No	Yes
	@vcontainerGUID	uniqueidentifier		No	Yes
	@vDomainID	int		No	Yes
DRA_AddToRecycleBin	*@vClassType*	int		No	Yes
	@vdescription	nvarchar	510	No	Yes
	@vDomainId	int		No	Yes
	@vName	nvarchar	510	No	Yes
	@vObjectGuid	uniqueidentifier		No	Yes
	@vsamAccountName	nvarchar	510	No	Yes
	@vUSNChanged	bigint		No	Yes
DRA_CLEARALLADTABLES	*@vDomainId*	int		No	Yes
DRA_ClearAllResourceCollectorTables	*@vDomainId*	int		No	Yes
DRA_ClearGroupMembershipForAGroup	*@vGroupGUID*	uniqueidentifier		No	Yes

Stored Procedure name	Parameter name	Parameter Data Type	Parameter Max Bytes	Is Output Parameter	Is Nullable
DRA_ClearRunningJobs	*@DRAServerName*	char		No	Yes
	@JobId	int		No	Yes
DRA_ContactGetGUID	*@vContactDN*	nvarchar	-1	No	Yes
	@vContactName	nvarchar	256	No	Yes
	@vDomainID	int		No	Yes
	@vObjectGUID	uniqueidentifier		Yes	Yes
DRA_DELETE_LAST_COLLECTION_VA_ATTRIBUTES	*@vClassId*	int		No	Yes
	@vDomainId	int		No	Yes
DRA_DeleteContainersFromInternalTable	*@vdomainID*	int		No	Yes
DRA_DeleteDynamicGroup	*@vGroupGUID*	uniqueidentifier		No	Yes
DRA_DeleteDynamicGroupMember	*@vGroupGUID*	uniqueidentifier		No	Yes
	@vMemberGUID	uniqueidentifier		No	Yes
DRA_DeleteFromGroupMembership	*@vmemberGUID*	uniqueidentifier		No	Yes
DRA_DeleteFromRecycleBin	*@vObjectGuid*	uniqueidentifier		No	Yes
DRA_DeleteLastCollectedAttributes	*@vClassId*	int		No	Yes
	@vDomainId	int		No	Yes
DRA_DeleteManagedContainers	*@vDomainId*	int		No	Yes
DRA_DOMAINS_HasDomainId	*@vDomainId*	int		No	Yes
DRA_GetandUpdateParentGUID	*@vObjectGUID*	uniqueidentifier		No	Yes
DRA_GetClassInfo	*@vId*	int		Yes	Yes
	@vName	nvarchar	-1	No	Yes
DRA_GetContainerChildren	*@vParentGUID*	uniqueidentifier		No	Yes
DRA_GetContainersToProcess	*@vDomainId*	int		No	Yes
DRA_GetDomainId	*@vDomainId*	int		Yes	Yes
	@vDomainName	nvarchar	-1	No	Yes
DRA_GetDomainIdFromDomains	*@vDomainId*	int		Yes	Yes
	@vDomainName	nvarchar	-1	No	Yes
DRA_GetDomainInfo	*@vId*	int		Yes	Yes
	@vName	nvarchar	-1	No	Yes
DRA_GetDuplicateAVRuleInfo	*@RuleAccountBindId*	int		Yes	Yes
	@RuleId	int		No	Yes
	@RuleSpecification	varchar		No	Yes

Stored Procedure name	Parameter name	Parameter Data Type	Parameter Max Bytes	Is Output Parameter	Is Nullable
DRA_GetGroups	*@vClassType*	int		No	Yes
	@vDomainID	int		No	Yes
	@vLastADUSN	bigint		No	Yes
DRA_GetINCRObjects	*@vDomainID*	int		No	Yes
	@vLastUSN	bigint		No	Yes
DRA_GetInvocationIdDCName	*@vDomainID*	int		No	Yes
	@vprevDCName	nvarchar	2048	Yes	Yes
	@vprevInvocationId	binary		Yes	Yes
DRA_GetJobExecutionWindowSize	*@vExecutionWindowSize*	int		Yes	Yes
	@vJob_Id	int		No	Yes
DRA_GetJobID	*@vJob_Id*	int		Yes	Yes
	@vJob_Name	nvarchar	100	No	Yes
DRA_GetLastUSN	*@ADUSN*	bigint		Yes	Yes
	@DeletedUSN	bigint		Yes	Yes
	@vAUSN	bigint		Yes	Yes
	@vDomainName	nvarchar	-1	No	Yes
DRA_GetManagedContainersInfo	*@vDomainId*	int		No	Yes
DRA_GetObjectsOldDN	*@vContainerDN*	nvarchar	-1	Yes	Yes
	@vObjectGUID	uniqueidentifier		No	Yes
DRA_GetObjectsToProcessForVA	*@vClassTypes*	nvarchar	800	No	Yes
	@vDomainID	int		No	Yes
DRA_GetOptionValue	*@vDomainId*	int		No	Yes
	@vOptionName	nvarchar	-1	No	Yes
	@vValue	nvarchar	-1	Yes	Yes
DRA_GetPreviousINCRGroups	*@vDomainID*	int		No	Yes
DRA_GetRequiredContextFullCollectionInfo	*@vDomainId*	int		No	Yes
	@vIsRequiredContextTbFullCollection	bit		Yes	Yes
DRA_GetRunningJobsDetails	*@inJobName*	nvarchar	100	No	Yes
DRA_GetStartTimeOfJob	*@inCollectorInfo*	nvarchar	800	No	Yes
	@inJob_Id	int		No	Yes
	@inServerName	nvarchar	800	No	Yes
	@outStartTime	datetime		Yes	Yes
DRA_InsertDynamicGroup	*@vGroupGUID*	uniqueidentifier		No	Yes

Stored Procedure name	Parameter name	Parameter Data Type	Parameter Max Bytes	Is Output Parameter	Is Nullable
	@vIncludeChildContainers	bit		No	Yes
	@vLdapFilter	nvarchar	-1	No	Yes
	@vMemberFilterGUID	uniqueidentifier		No	Yes
	@vRootMemberGUID	uniqueidentifier		No	Yes
DRA_InsertDynamicGroupMember	*@vGroupGUID*	uniqueidentifier		No	Yes
	@vIsWhiteList	bit		No	Yes
	@vMemberGUID	uniqueidentifier		No	Yes
DRA_InsertInInternalOUStructure	*@vDomainId*	int		No	Yes
	@vObjectGUID	uniqueidentifier		No	Yes
DRA_InsertMemberByDN	*@vGroupDomainID*	int		No	Yes
	@vGroupGUID	uniqueidentifier		No	Yes
	@vMemberDN	nvarchar	-1	No	Yes
	@vMemberDomainId	int		No	Yes
DRA_InsertMembers	*@vDomainID*	int		No	Yes
	@vGroupGUID	uniqueidentifier		No	Yes
	@vMemberGUIDS	nvarchar	-1	No	Yes
DRA_InserttoDomainContextList	*@DomainName*	nvarchar	500	No	Yes
DRA_INTERNAL_ProcessMovedOrRenamedContainers_Merge	*@vContainerDN*	nvarchar	-1	No	Yes
	@vContainerGuid	uniqueidentifier		No	Yes
	@vDomainId	int		No	Yes
DRA_InternalOUStructure_Merge	*@vDomainId*	int		No	Yes
	@vObjectGUID	uniqueidentifier		No	Yes
DRA_IsMemberPresent	*@vObjectGUID*	uniqueidentifier		No	Yes
	@vOUTGUID	uniqueidentifier		Yes	Yes
DRA_LastCollectedAttributesInfo	*@vClassType*	int		No	Yes
	@vDomainId	int		No	Yes
DRA_MarkGroupforNextINCR	*@vGroupGUID*	uniqueidentifier		No	Yes
DRA_MarkGroupProcessed	*@vGroupGUID*	uniqueidentifier		No	Yes
DRA_MoveToJobHistory	*@vCollector_Info*	nvarchar	800	No	Yes
	@vDomain_Name	nvarchar	800	No	Yes
	@vEnd_Time	datetime		No	Yes
	@vJob_Id	int		No	Yes
	@vMessage	ntext		No	Yes

Stored Procedure name	Parameter name	Parameter Data Type	Parameter Max Bytes	Is Output Parameter	Is Nullable
	@vResult_Id	int		No	Yes
DRA_PopulateDomainSummaryInformation	*@vDomainId*	int		No	Yes
DRA_PopulateTrustDomainSummaryInformation	*@vDomainId*	int		No	Yes
DRA_ReadRecycleBinObjects	*@vDomainId*	int		No	Yes
	@vuSNChanged	bigint		No	Yes
DRA_RecycleBin_Merge	*@vClassTypeId*	int		No	Yes
	@vdescription	nvarchar	-1	No	Yes
	@vDomainId	int		No	Yes
	@vName	nvarchar	-1	No	Yes
	@vObjectGuid	uniqueidentifier		No	Yes
	@vsamAccountName	nvarchar	-1	No	Yes
	@vUSNChanged	bigint		No	Yes
DRA_Set_Internal_VA_Process	*@vObjectGUID*	uniqueidentifier		No	Yes
	@vProcess	bit		No	Yes
DRA_SetInvocationIdDCName	*@vDCName*	nvarchar	2048	No	Yes
	@vDomainID	int		No	Yes
	@vInvocationId	binary		No	Yes
DRA_SetLastUSN	*@ADUSN*	bigint		No	Yes
	@DELETEDUSN	bigint		No	Yes
	@VAUSN	bigint		No	Yes
	@vDomainName	nvarchar	-1	No	Yes
DRA_SetOptionValue	*@vDomainId*	int		No	Yes
	@vOptionName	nvarchar	-1	No	Yes
	@vValue	nvarchar	-1	No	Yes
DRA_Table_HasDomainId	*@vDomainId*	int		No	Yes
	@vTableName	nvarchar	100	No	Yes
DRA_Table_UpdateTypeAndStoredProcedure	*@vCreateSP*	nvarchar	-1	No	Yes
	@vCreateType	nvarchar	-1	No	Yes
	@vTableName	nvarchar	100	No	Yes
DRA_Update_IsRequiredContextTbFullCollectionValue	*@vDomainId*	int		No	Yes
	@vIsRequiredContextTbFullCollection	bit		No	Yes
DRA_UpdateContainerAsProcessed	*@vcontainerGUID*	uniqueidentifier		No	Yes

Stored Procedure name	Parameter name	Parameter Data Type	Parameter Max Bytes	Is Output Parameter	Is Nullable
DRA_UpdateContainerChildrenForNewDN	*@vobjectDN*	nvarchar	-1	No	Yes
	@vobjectGUID	uniqueidentifier		No	Yes
	@vparentDN	nvarchar	-1	No	Yes
DRA_UpdateContainerDN	*@vobjectDN*	nvarchar	-1	No	Yes
	@vobjectGUID	uniqueidentifier		No	Yes
DRA_UpdateIsDynamicGroupFlag	*@vGroupGUID*	uniqueidentifier		No	Yes
	@vIsDynamicGroup	bit		No	Yes
DRA_UpdateJob	*@vCollector_Info*	nvarchar	100	No	Yes
	@vJob_Id	int		No	Yes
	@vLast_Update	datetime		No	Yes
	@vStatus	nvarchar	40	No	Yes
DRA_UpdateRecycleBin	*@vObjectGuid*	uniqueidentifier		No	Yes
	@vorigDN	nvarchar	-1	No	Yes
	@vorigName	nvarchar	510	No	Yes
	@vorigOUDN	nvarchar	-1	No	Yes
	@vorigOUGUID	uniqueidentifier		No	Yes
	@vwhenDeleted	datetime		No	Yes
DRA_UpdateToRecycleBin	*@vClassType*	int		No	Yes
	@vdescription	nvarchar	510	No	Yes
	@vDomainId	int		No	Yes
	@vName	nvarchar	510	No	Yes
	@vObjectGuid	uniqueidentifier		No	Yes
	@vsamAccountName	nvarchar	510	No	Yes
	@vUSNChanged	bigint		No	Yes
SetChildNodes	*@OUOBJECTGUID*	nvarchar	-1	No	Yes
sp_InsertIntoInternalDomainInfo	*@DomainName*	nvarchar	-1	No	Yes
	@highestADUSN	bigint		No	Yes
	@highestDeleted	bigint		No	Yes
	@highestVAUSN	bigint		No	Yes
SPLIT_CONTEXT	*@COLUMNNAME*	nvarchar	-1	No	Yes
	@CONTEXT	nvarchar	-1	No	Yes
	@RESULTSTRING	nvarchar	-1	Yes	Yes
SPLIT_CONTEXT_CHANGES	*@CONTEXT1*	nvarchar	-1	No	Yes
	@RESULTDRACHANGE	int		Yes	Yes
	@RESULTSTRING	nvarchar	-1	Yes	Yes

Functions

Function Name	Parameter Name	Parameter Data Type	Parameter Max Bytes	Returns Parameter
BIGINTTODATETIME		datetime		True
	@INPUT	bigint		False
fn_diagramobjects		int		True
FN_PARSETEXT2TABLE	@P_SOURCETEXT	nvarchar	-1	False
	@P_DELIMETER	nvarchar	200	False
GET_GUID_TABLE	@CONTEXT	nvarchar	-1	False

Custom Triggers

This section contains examples for custom triggers.

Examples:

Use Case	Context
Collect Additional Virtual Attributes and Extend Object Property Page	• Virtual Attribute • PowerShell Trigger • Post Task Trigger • Exchange Online • Custom Web Client • Property Page
Enable or disable an Exchange Online user's Outlook web access when they are enabled or disabled in Active Directory	• PowerShell Trigger • Post Task Trigger • Exchange Online
Move a user to a new OU when their Office property is changed and change their 'City' attribute to match their new office location	• PowerShell Trigger • PreTask Trigger • Post Task Trigger
Launch Workflow from Trigger	• PreTask Trigger • Workflow

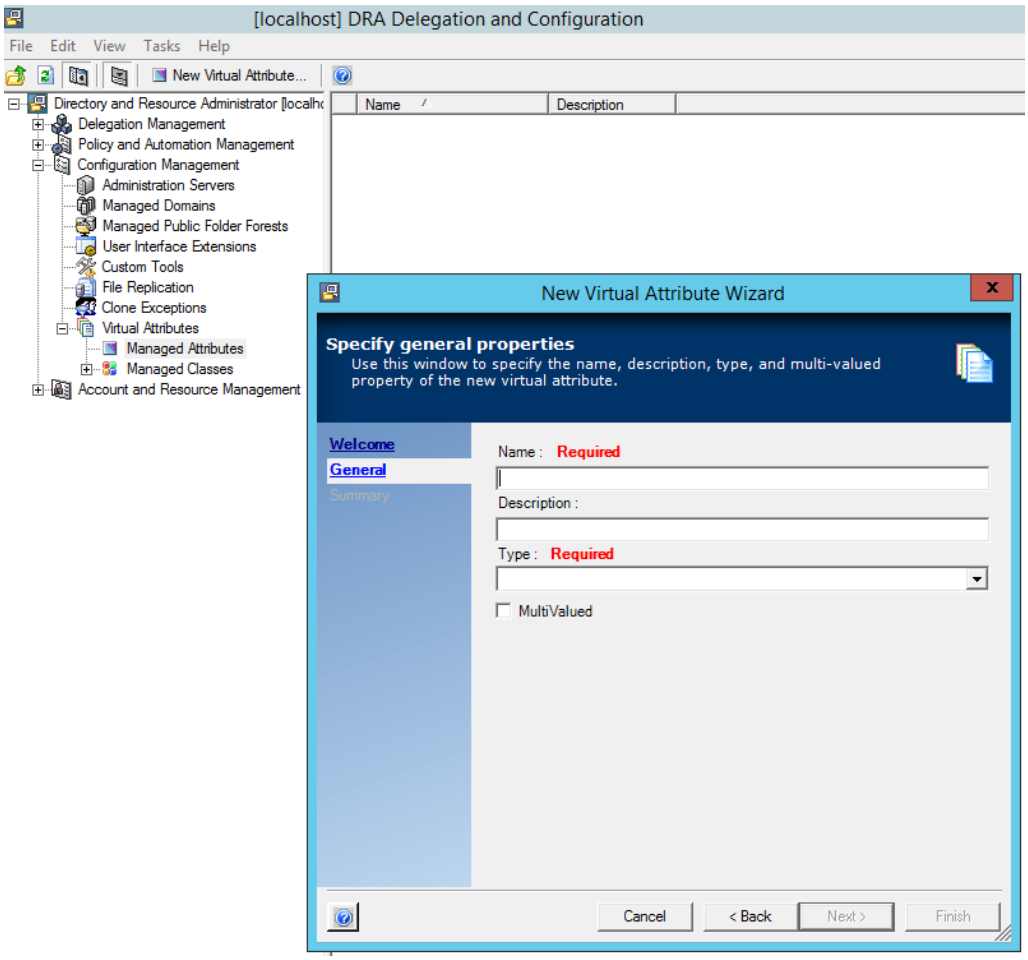
Collect Additional Virtual Attributes and Extend Object Property Page

Scope

This example demonstrates how to define virtual attributes in DRA, collect the virtual attribute values through a post task trigger and add extend an objects property page.

Step-by-step Guide

1. Start by creating a virtual attribute in the Delegation and Configuration Console:
    - On the "Configuration Management" node, navigate to the "Virtual Attributes" section
    - Select the option "New Virtual Attribute" from the "Managed Attributes" subheading

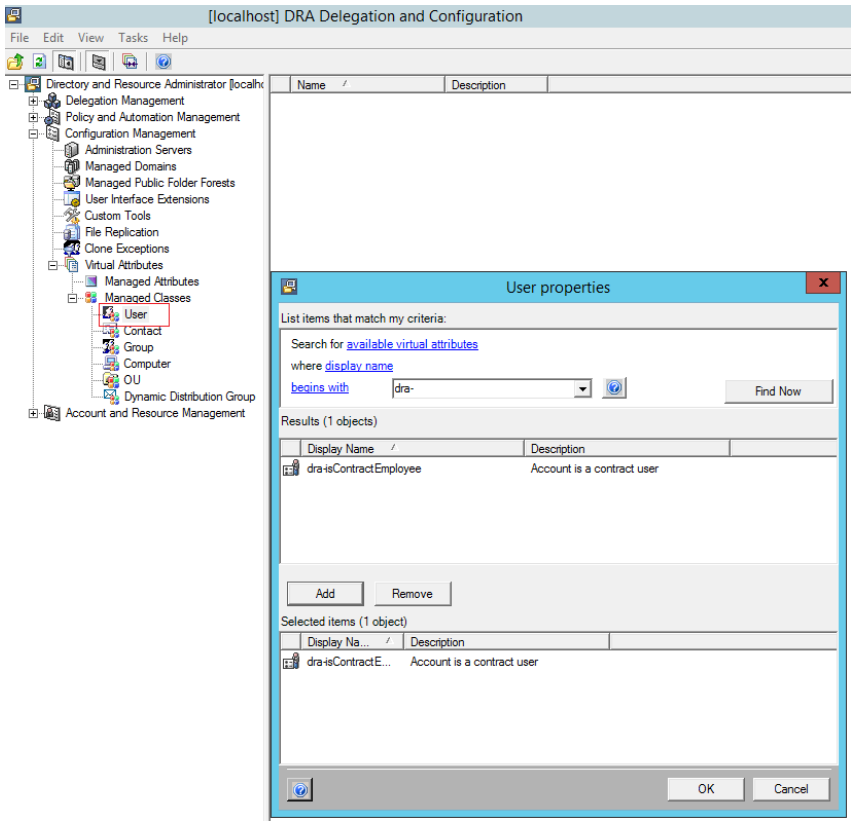


Define Attributes

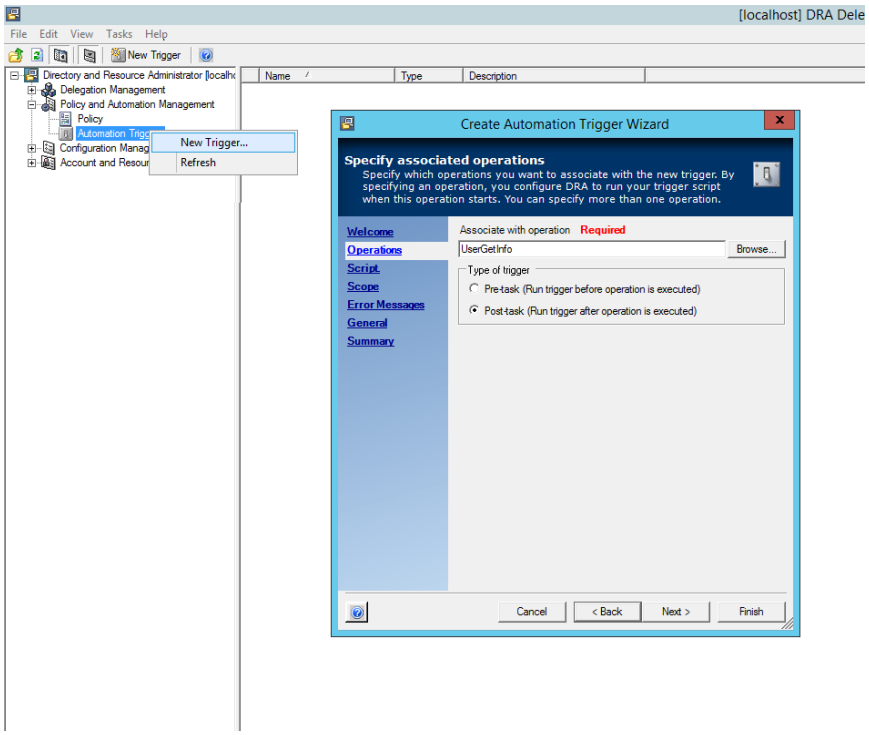
Create the following four attributes with the wizard:

- 'Name' = "va-ActiveSyncEnabled", 'Type' = Boolean
- 'Name' = "va-OWAEnabled", 'Type' = Boolean
- 'Name' = "va-MAPIEnabled", 'Type' = Boolean
- 'Name' = "va-EwsEnabled", 'Type' = Boolean

2. Associate the four new Virtual Attributes with the User object class.



3. Add a new post task trigger to the UserGetInfo() task that will execute a PowerShell command to collect the values of the new virtual attributes.



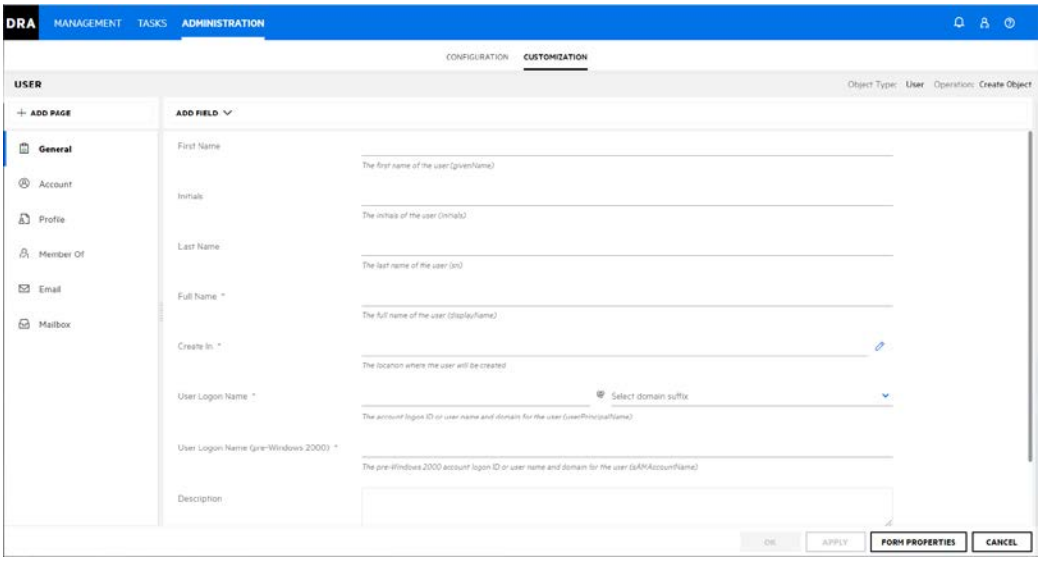
Post Task Trigger

```
################################################################################
#
# This is a post-task trigger that will collect additional Exchange Online Mailbox settings
and expose them as additionalAttributes
#
################################################################################

################################################################################
#
# Function to convert DN (CN=Fred Smith,OU=North America,DC=ks,DC=com) to domain FQDN
(keystone.com)
#
################################################################################
function Convert-DN-To-FQDN([string] $dn)
{
   [array]$ADObjectDNArray = $dn -Split(",DC=")
   [int]$DomainNameFECount = 0
   ForEach ($ADObjectDNArrayItem in $ADObjectDNArray)
   {
      if ($DomainNameFECount -gt 0)
      {
     [string]$ADObjectDNArrayItemDomainName += $ADObjectDNArrayItem + "."
      }

      $DomainNameFECount++
   }
   return $ADObjectDNArrayItemDomainName.Substring(0,$ADObjectDNArrayItemDomainName.Length-
1)
}


################################################################################
#
# Verify the operation name is UserGetInfo, in other cases return $true
#
################################################################################

$operation = $InVarSet.get("In.OperationName")

if ($operation -ne "UserGetInfo")
{
   return $true
}


################################################################################
#
# Execute the script only if varset contains any of the keys ("In.ActiveSyncEnabled" ,
# "In.OWAEnabled" , "In.MAPIEnabled" , "In.EwsEnabled"
#
################################################################################

$ActiveSyncEnabled = $InVarSet.get("In.Properties.va-ActiveSyncEnabled")
$OWAEnabled = $InVarSet.get("In.Properties.va-OWAEnabled")
$MAPIEnabled = $InVarSet.get("In.Properties.va-MAPIEnabled")
$EwsEnabled = $InVarSet.get("In.Properties.va-EwsEnabled")


if (!($ActiveSyncEnabled-eq "") -and !($OWAEnabled-eq "") -and !($MAPIEnabled-eq "") `
        -and !($EwsEnabled-eq ""))
{
   return $true
}
```

```
$userDN = $InVarSet.get("In.User").Replace("OnePoint://", "")
$domainFQDN = Convert-DN-To-FQDN($userDN)

Import-Module -Name NetIQ.DRA.PowershellExtensions
$user = Get-DRAUser -DRARestServer localhost -DRAHostServer localhost `
                                -Domain $domainFQDN -Identifier $userDN `
                                -Attribute "displayName","mailboxType" `
                                -IgnoreCertificateErrors `
                                -Force

if ($error.Count -gt 0)
{
   $errorMsg = "Failed to get $userDN displayname, error: $error[0]"
   $InVarset.Put("Out.ErrorMsg.Script", $errorMsg)
   return $false
}

if (!($user.MailboxType -band 64))
{
   # User doesn't have an online mailbox
   return $true
}

$userDisplayName = $user.DisplayName

#################################################################################
#
# For this example we are using a plain text username and password
#
#################################################################################
$securePassword = ConvertTo-SecureString <Password> -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential(<O365-Account>,
$securePassword)

#################################################################################
#
# Create the Exchange Online session
#
#################################################################################
$session = New-PSSession -ConfigurationName Microsoft.Exchange `
                         -ConnectionUri https://outlook.office365.com/powershell-liveid/ `
             -Credential $credentials -Authentication Basic -AllowRedirection
Import-PSSession $Session -DisableNameChecking

#################################################################################
#
# Assume it will succeed
#
#################################################################################
$succeeded = $true

#################################################################################
#
#  Execute command-let related O365 Mailbox
#
#################################################################################

$data = Get-CasMailbox -Identity $userDisplayName

#################################################################################
#
#  Populate the out varset based on requested attribute
#
#################################################################################
```

```
if ($ActiveSyncEnabled -eq "")
{
    $InVarSet.Put("Out.Properties.va-ActiveSyncEnabled", $data.ActiveSyncEnabled)
}

if ($OWAEnabled -eq "")
{
    $InVarSet.Put("Out.Properties.va-OWAEnabled", $data.OWAEnabled)
}
if ($MAPIEnabled -eq "")
{
    $InVarSet.Put("Out.Properties.va-MAPIEnabled", $data.MAPIEnabled)
}

if ($EwsEnabled -eq "")
{
    $InVarSet.Put("Out.Properties.va-EwsEnabled", $data.EwsEnabled)
}

###############################################################################
#
# Cleanup
#
###############################################################################
Remove-PSSession -Session (Get-PSSession)

###############################################################################
#
# If the trigger failed send back an error message
#
###############################################################################
if ($error.Count -gt 0)
{
   $errorMsg = "Failed to get additional mailbox values for user: $userDN error: $error[0]"
   $InVarset.Put("Out.ErrorMsg.Script", $errorMsg)
   $succeeded = $false
}

return $succeeded
```

4. To add the properties to the User Property Page, start by customizing the User Create Page and add a new 'Checkbox' field for each of the four properties.

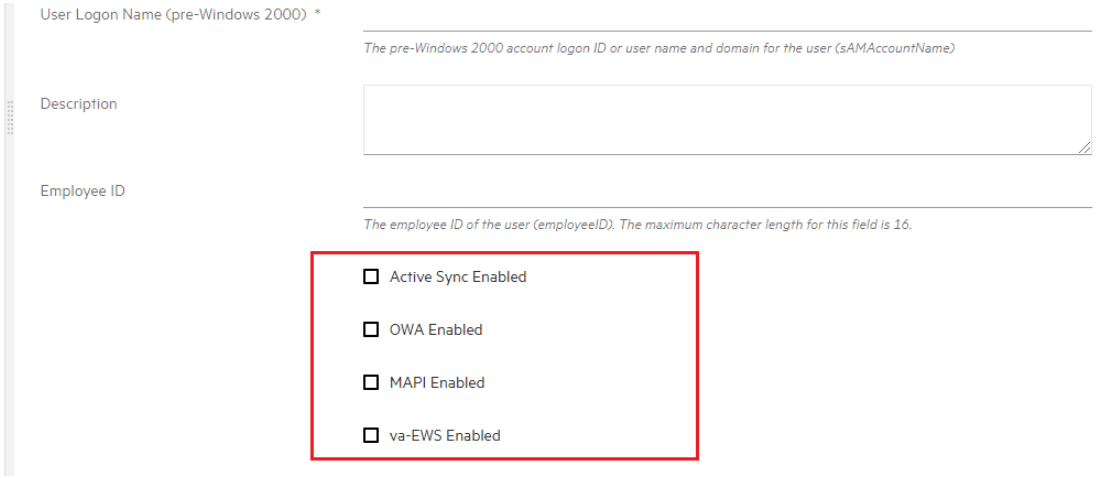


5. Configure each of the new fields for the new Virtual Attributes that we extended on the User object class.

Configure Form Fields

Configure the fields that were added to the form in the previous step as follows:

- Checkbox Field, Label: "Active Sync Enabled", 'Attribute' = "additionalAttributes.va-ActiveSyncEnabled"
- Checkbox Field, Label: "OWA Enabled", 'Attribute' = "additionalAttributes.va-OWAEnabled"
- Checkbox Field, Label: "MAPI Enabled", 'Attribute' = "additionalAttributes.va-MAPIEnabled"
- Checkbox Field, Label: "va-EWS Enabled", 'Attribute' = "additionalAttributes.va-EwsEnabled"



Enable or disable an Exchange Online user's Outlook web access when they are enabled or disabled in Active Directory

Scope

This example demonstrates how to define add a custom post task trigger to Enable or disable an Exchange Online user's Outlook web access when they are enabled or disabled in Active Directory.

Step-by-step Guide

Add a new post task trigger to the UserSetInfo() task that will execute a PowerShell command to update the users Outlook web access when they are enabled or disabled in Active Directory.

Post Task Trigger

```
################################################################################
#
# This is a post-task trigger for the UserEnable operation. The UserEnable
# operation is used to enable and disable users.
#
# We will enable or disable the user's Outlook web access when they are
# enabled or disabled.
#
################################################################################

################################################################################
#
# Function to convert DN (CN=Fred Smith,OU=North America,DC=ks,DC=com) to domain FQDN (keystone.com)
#
################################################################################
function Convert-DN-To-FQDN([string] $dn)
{
 [array]$ADObjectDNArray = $dn -Split(",DC=")

 [int]$DomainNameFECount = 0

 ForEach ($ADObjectDNArrayItem in $ADObjectDNArray)
 {
 if ($DomainNameFECount -gt 0)
 {
 [string]$ADObjectDNArrayItemDomainName += $ADObjectDNArrayItem + "."
 }

 $DomainNameFECount++
 }

 return $ADObjectDNArrayItemDomainName.Substring(0,$ADObjectDNArrayItemDomainName.Length-1)
}

################################################################################
#
# This is a quirk of DRA. To get a pre/post task trigger to fire on the
# UserEnable operation you actually have to specify the UserSetInfo operation
# when you configure your trigger. That means we need to make sure the operation
# is actually UserEnable
#
################################################################################
$operation = $InVarSet.get("In.OperationName")
```

```
if ($operation -ne "UserEnable")
{
 return $true
}

#################################################################################
#
# Get the user's mailboxType and displayName. If they don't have an online
# mailbox just return.
#
# We need to the user's display name to use as the -Identity value when we
# call Exchange Online.
#
#################################################################################
$userDN = $InVarSet.get("In.User").Replace("OnePoint://", "")
$domainFQDN = Convert-DN-To-FQDN($userDN)

Import-Module -Name NetIQ.DRA.PowershellExtensions

$user = Get-DRAUser -DRARestServer localhost -DRAHostServer localhost `
 -Domain $domainFQDN -Identifier $userDN `
 -Attribute "displayName","mailboxType" `
 -IgnoreCertificateErrors `
 -Force

if ($error.Count -gt 0)
{
 $errorMsg = "Failed to move $userDN to OU ${ouToMoveTo}: $error[0]"
 $InVarset.Put("Out.ErrorMsg.Script", $errorMsg)
 return $false
}

if (!($user.MailboxType -band 64))
{
 # User doesn't have an online mailbox
 return $true
}

$userDisplayName = $user.DisplayName

#################################################################################
#
# See if we are enabling or disabling the user
#
#################################################################################
$enableOWA = $InVarSet.get("In.Enable")

#################################################################################
#
# For this example we are using a plain text username and password
#
#################################################################################
$securePassword = ConvertTo-SecureString <Password> -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential(<user@domain>, $securePassword)

#################################################################################
#
# Create the Exchange Online session
#
#################################################################################
$session = New-PSSession -ConfigurationName Microsoft.Exchange `
 -ConnectionUri https://outlook.office365.com/powershell-liveid/ `
 -Credential $credentials -Authentication Basic -AllowRedirection
Import-PSSession $Session -DisableNameChecking

#################################################################################
#
```

```
# Assume it will succeed
#
################################################################################
$succeeded = $true

################################################################################
#
# See if OWA is enabled.
#
################################################################################
$enabled = Get-CasMailbox -Identity $userDisplayName | Select-Object -ExpandProperty OWAEnabled

################################################################################
#
# Only enable or disable it if we need to
#
################################################################################
if ($enabled -ne $enableOWA)
{
 ################################################################################
 #
 # Enable or disable the user's Outlook web access
 #
 ################################################################################
 Set-CasMailbox -Identity $userDisplayName -OWAEnabled $enableOWA

 ################################################################################
 #
 # Validate it was changed
 #
 ################################################################################
 $enabled = Get-CasMailbox -Identity $userDisplayName | Select-Object -ExpandProperty OWAEnabled

 if ($enabled -ne $enableOWA)
 {
 $succeeded = $false
 }
}

################################################################################
#
# Cleanup
#
################################################################################
Remove-PSSession -Session (Get-PSSession)

################################################################################
#
# If the trigger failed send back an error message
#
################################################################################
if ($succeeded -eq $false)
{
 $enableOrDisable = if ($enableOWA) { "enable" } else { "disable" }

 if ($error.Count -gt 0)
 {
 $errorMsg = "Failed to $enableOrDisable Outlook web access for ${userDisplayName}: $error[0]"
 }
 else
 {
 $errorMsg = "Failed to $enableOrDisable Outlook web access for $userDisplayName"
 }

 $InVarset.Put("Out.ErrorMsg.Script", $errorMsg)
}

return $succeeded
```

Launch Workflow from Trigger

Scope

This example demonstrates how to define add a custom pre task trigger to launch a workflow.

Step-by-step Guide

1. Define a workflow that will update the manager when object is moved from one OU to another OU.
2. Add a new pre task trigger to launch the custom work.

Pre-Task Trigger

```
$operation = $InVarSet.get("In.OperationName")

if ($operation -ne "OUMoveHere")
{
   return $true
}

################################################################################
#
# Find the Target Container
#
################################################################################
$targetOU = $InVarSet.get("In.Container")

################################################################################
#
# Find the object which is moving
#
################################################################################

$movingObject = $InVarSet.get("In.Object")




################################################################################
#
# Create server and varset Object
#
################################################################################
$ea1 = New-Object -comobject EaServer.EaServe.1
$NewVarSet = New-Object -comobject NetIQDraVarSet.VarSet.1
```

```
#
# Populate the Varset based on workItem attribute defined in Aegis
# here UserDN is the workitem attribute to represent User which is moving to different
container
#
################################################################################
$NewVarSet.put("Properties.UserDN", $movingObject)


################################################################################
#
# Populate the Varset based on workItem attribute defined in Aegis
# here managerDN is the workitem attribute to represent manager the value has
# to be DN format
#
################################################################################
$NewVarSet.put("Properties.managerDN", "cn=admin400_vino,ou=vino_400,dc=drdom400,dc=lab")


################################################################################
#
# Populate the Varset for RequestID which is unique ID generated by randamonly
#
################################################################################
$NewVarSet.put("RequestID", "upot66f5wfaxktvga4vn43kq")

################################################################################
#
# Populate the Varset for WorkflowID , it is unique path of the Aegis workflow
#
################################################################################
$NewVarSet.put("WorkflowID", "/PG_TopLevelContainer=PG/PG_Process=7d6fb8d9-b2c1-4478-b263-
61468e121d79")


$succeeded = $true

#Submit the varset
$vsOut1 = $ea1.ScriptSubmit($NewVarSet)
```

```
$error = $vsOut1.Get("Errors.NumErrors")

If ($error -gt 0){
  $succeeded = $false
}
Else{
    $succeeded  = $true
}

return $succeeded
```

Move a user to a new OU when their Office property is changed

Scope

This example demonstrates how to define add a custom pre & post task trigger to Move a user to a new OU when their Office property is changed and change their 'City' attribute to match their new office location.

Step-by-step Guide

1. Add a new pre task trigger to validate there is an OU matching the 'Office' attribute and update the 'City' attribute in the input VARSET.

Pre Task Trigger

```
################################################################################
#
# This is a pre-task trigger that will make sure there is a matching OU when a user's Office
property is changed.
# It will also make sure the user's City property is changed to match the Office property.
#
# There is a corresponding post-task trigger that will move the user to the new OU.
#
# 1. Make sure we have an OU with the same name as the Office
(In.Properties.physicalDeliveryOfficeName).
#    -- If we don't find a matching OU return $false.
# 2. Change the City property ("l") to match the Office property
#
################################################################################

################################################################################
#
# See if the office value was changed
#
################################################################################
$office = $InVarSet.get("In.Properties.physicalDeliveryOfficeName")

if (!$office)
{
   return $true
}

################################################################################
#
# Get the user's domain
```

```
#############################################################################
$userDN = $InVarSet.get("In.User").Replace("OnePoint://", "")
$domain = $userDN.Substring($userDN.indexOf("DC="))

#############################################################################
#
# Make a call to DRA to see if we can find an OU matching the office
#
#############################################################################
Import-Module -Name NetIQ.DRA.PowershellExtensions

$ous = Find-DRAObjects -DRARestServer localhost -DRAHostServer localhost `
                       -ContainerDN "OnePoint://$domain" `
               -OUAndFilter @{FriendlyName="$office"} `
               -OUOrFilter @{ShowInAdvancedViewOnly=$false} `
               -Attributes "Path" `
               -IncludeChildContainers `
               -IgnoreCertificateErrors `
               -Force

if ($ous.TotalObjectCount -ne 1)
{
   $InVarset.Put("Out.ErrorMsg.Script", "Could not find an OU named $office")
   return $false
}

#############################################################################
#
# Store the DN of the OU so we can use it in the post-task trigger
#
#############################################################################
$InVarSet.put("WorkArea.OUToMoveTo", $ous.Items[0].Path.Replace("OnePoint://", ""))

#############################################################################
#
# Update the City property
#
#############################################################################
$InVarSet.put("In.Properties.l", $office)

return $true
```

2. Add a new post task trigger to move the user to the new OU if their 'Office' attribute changed

Post Task Trigger

```
################################################################################
#
# This is a post-task trigger that will move a user to the OU specified in the Office
property
#
# There is a corresponding pre-task trigger that will set WorkArea.OUToMoveTo if the user
needs to be moved.
#
################################################################################

################################################################################
#
# Function to convert DN (CN=Fred Smith,OU=North America,DC=ks,DC=com) to domain FQDN
(keystone.com)
#
################################################################################
function Convert-DN-To-FQDN([string] $dn)
{
   [array]$ADObjectDNArray = $dn -Split(",DC=")

   [int]$DomainNameFECount = 0

   ForEach ($ADObjectDNArrayItem in $ADObjectDNArray)
   {
      if ($DomainNameFECount -gt 0)
      {
     [string]$ADObjectDNArrayItemDomainName += $ADObjectDNArrayItem + "."
      }

      $DomainNameFECount++
   }

   return $ADObjectDNArrayItemDomainName.Substring(0,$ADObjectDNArrayItemDomainName.Length-
1)
}

################################################################################
#
# See if the pre-task trigger set an OU for us to move the user to
```

```
#
################################################################################
$ouToMoveTo = $InVarSet.get("WorkArea.OUToMoveTo")

if (!$ouToMoveTo)
{
   return $true
}

################################################################################
#
# Get the domain FQDN to use in the Move-DRAUser cmdlet
#
################################################################################
$userDN = $InVarSet.get("In.User").Replace("OnePoint://", "")
$domainFQDN = Convert-DN-To-FQDN($userDN)

################################################################################
#
# Make a call to DRA to move the user to the office OU
#
################################################################################
Import-Module -Name NetIQ.DRA.PowershellExtensions

Move-DRAUser -DRARestServer localhost -DRAHostServer localhost `
             -Domain $domainFQDN -Identifier $userDN -TargetContainer $ouToMoveTo `
             -IgnoreCertificateErrors `
             -Force

if ($error.Count -gt 0)
{
   $errorMsg = "Failed to move $userDN to OU ${ouToMoveTo}: $error[0]"
   $InVarset.Put("Out.ErrorMsg.Script", $errorMsg)
   return $false
}

return $true
```

Web Client Customization

This section contains examples for customizing object property pages in the Web Console

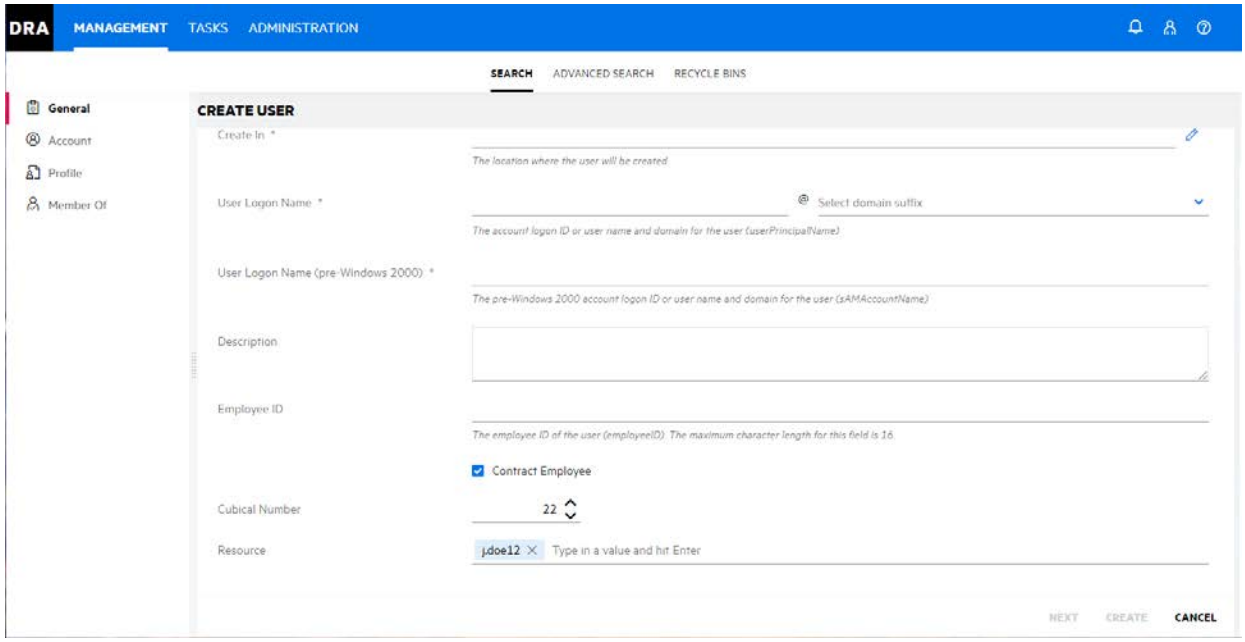
Custom Property Page Examples;

Use Case	Context
Pre-populate property values in form: Pre-populate Value (A) Based on Value (B) Using Built-in Attribute Setting Pre-populate value automatically based on custom handler	• On Attribute Change • On Load • Script Custom Handler • Built-in attribute function
Performing custom validation on form submit: On Form Submit, Validate Field (A) has a Value When Field (B) has a Value Validate Name Uniqueness for a Specified Field Value When a Form is Submitted	• On Submit • LDAP Query Custom Handler
Performing custom validation on property value change: Indicate Field (A) is Required When Field (B) has a Value at Runtime Validate Name Uniqueness for a Specified Field Value at Run-time	• On Attribute • Change Messagebox
Additional form customization scenarios: Populate selection values for a field based on previous field selection Add Virtual Attributes to Custom Forms	• On Attribute Change • LDAP Query custom handler • Custom Script Handler • Virtual attributes
Working with regular expressions in form properties Validate input using a regular expression	• Built-in attribute function

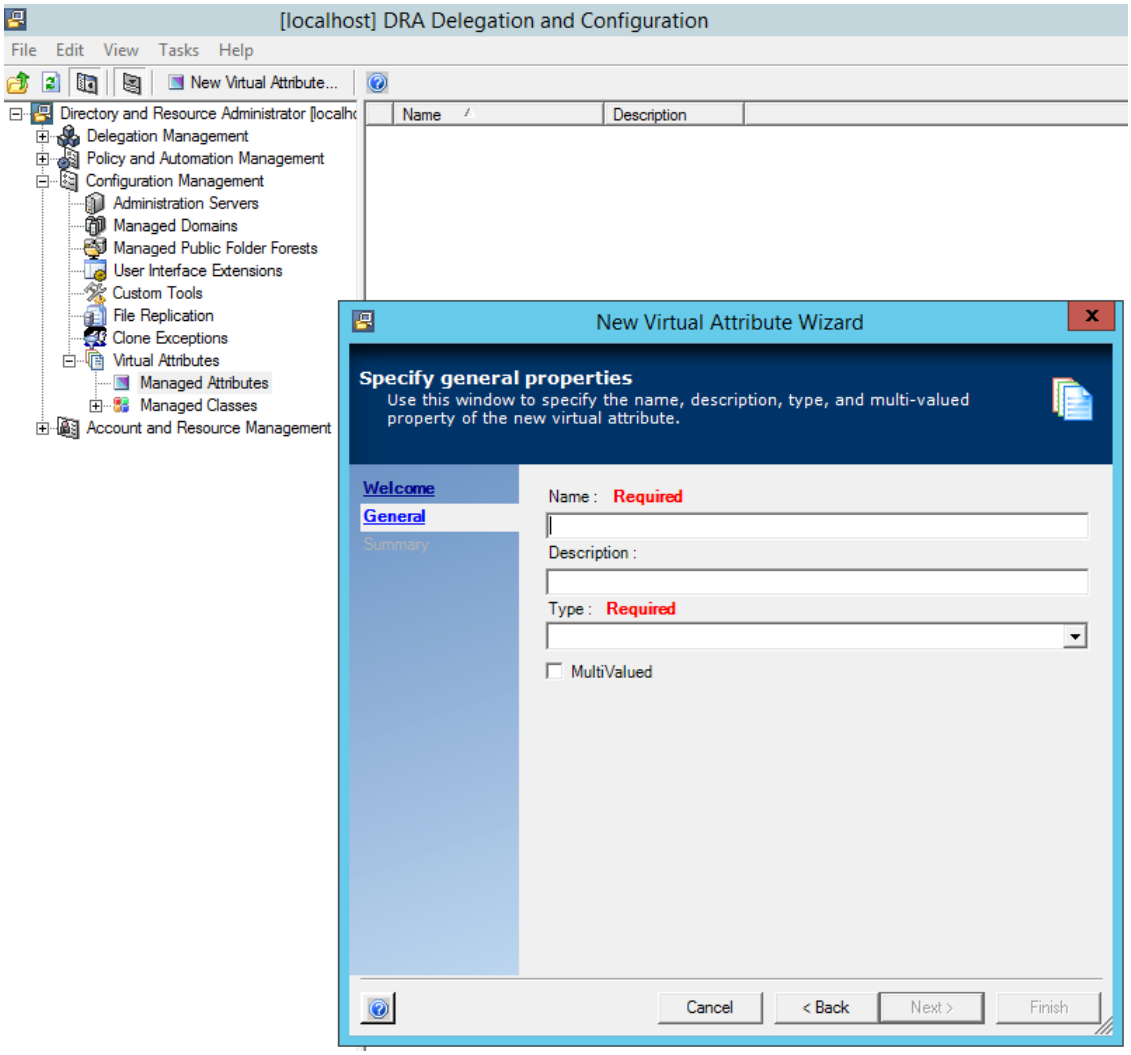
Add Virtual Attributes to Custom Forms

This example demonstrates how to define virtual attributes in DRA and add them to the user create page. We will define three new virtual attributes of different type ("dra-isContractEmployee", "dra-cubicleNumber" and "dra-orgResourceIDList") and associate them with a user property page.

Step-by-step Guide



1. Start by creating a virtual attribute in the Delegation and Configuration Console:
    - On the "Configuration Management" node, navigate to the "Virtual Attributes" section
    - Select the option "New Virtual Attribute" from the "Managed Attributes" subheading

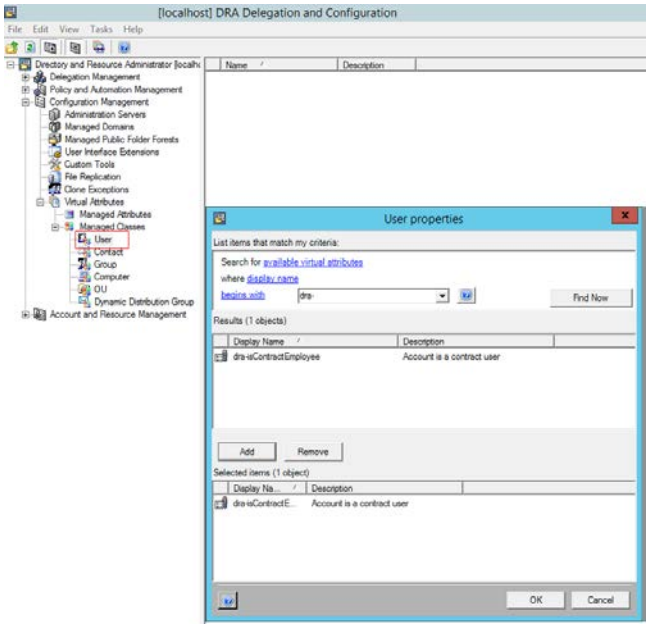


Define Attributes

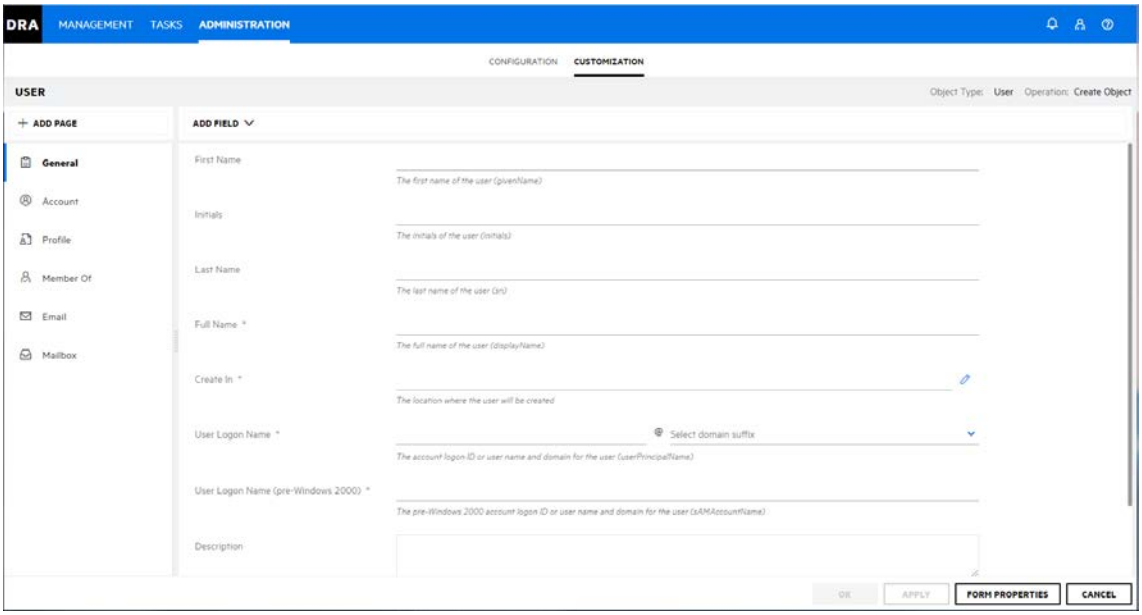
Create the following three attributes with the wizard:

- 'Name' = "dra-isContractEmployee", 'Type' = Boolean
- 'Name' = "dra-cubicleNumber", 'Type' = Integer
- 'Name' = "dra-orgResourceIDList", 'Type' = String, Multi Value = True

2. Associate the three new Virtual Attributes with the User object class.



3. To add the properties to the User Create page, start by customizing the User Create page in the Web Console and add new fields for each property by navigating to Adminstration > Customization > Property Pages and edit the User > Create Object.

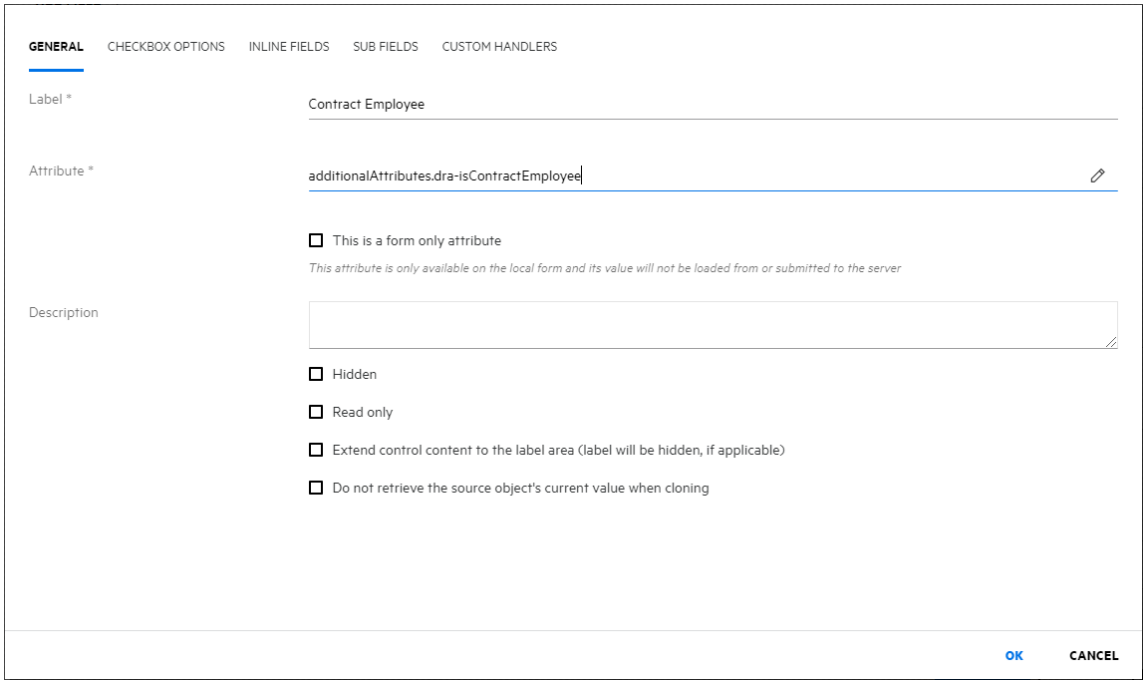


Add Property Fields

Add the following three fields to the form on the 'General Tab':

- Field Type = 'Checkbox'
- Field Type = 'Number'
- Field Type = 'Multi Valued Text'

4. Configure each of the new fields for the new Virtual Attributes that we extended on the User object class.



Configure Form Fields

Configure the fields that were added to the form in the previous step as follows:

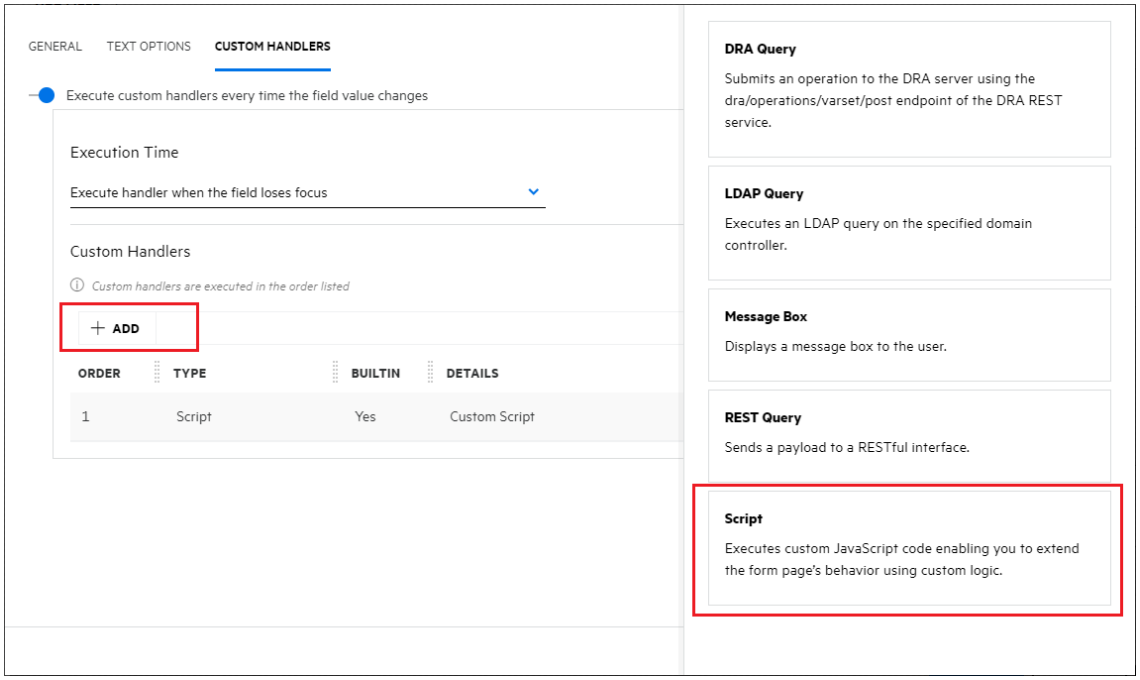
- Checkbox Field: "Contract Employee", 'Attribute' = "additionalAttributes.dra-isContractEmployee"
- Number Field: "Cubical Number", 'Attribute' = "additionalAttributes.dra-cubicleNumber"
- Multi Valued Field: 'Label' = "Resource", 'Attribute' = "additionalAttributes.dra-orgResourceIDList

Indicate Field (A) is Required When Field (B) has a Value at Runtime

This example demonstrates how to make a field required at runtime as soon as a second field on the form a a value entered. We'll customize the User Create pages to make Last Name required whenever the user enters a value for First Name. Now when the user enters a value for First Name the Last Name field is marked as required and the form cannot be submitted until either a Last Name is entered or First Name is cleared.

Step-by-step Guide

1. Start by customizing the User Create pages; edit the properties of the First Name field, and add a Script handler on the Custom Handlers tab. Click **Add** > **Script** to configure the script.



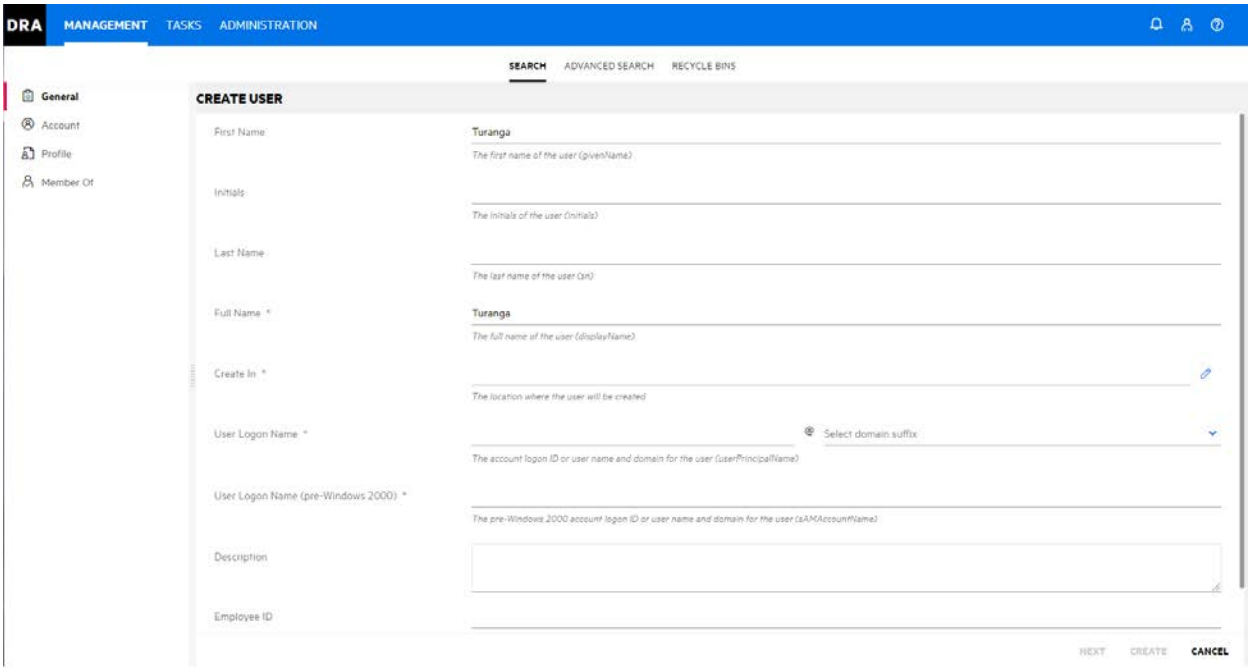
NOTE:
To allow customizations to include custom JavaScript code add allowCustomJavaScript="true"to the <c onsoleConfiguration>element found in %ProgramD ata%\NetIQ\DRARESTProxy\restProxy.config on the web server.

2. This script will set the required state of the lastName field to equal the truthiness of the firstName field.

```
draApi.fieldRequiredStates.lastName = Boolean(draApi.fieldValues.firstName);
```

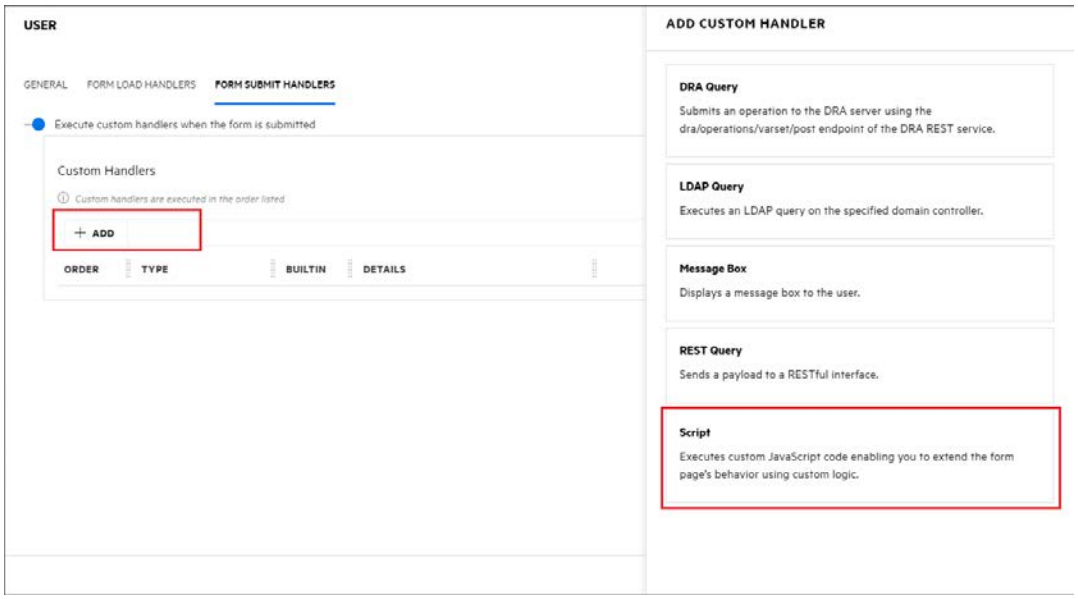
On Form Submit, Validate Field (A) has a Value When Field (B) has a Value

This example demonstrates how to validate a form 'on submit' to verify the user has entered a value for a field whenever a second field was filled in. In this example we'll customize the User Create pages to make sure that if the user fills in the First Name field that they also fill in the Last Name field. When the user attempts to create a user with a first name but not a last name they are shown a warning message indicating that the last name field needs to be entered before the form can be submitted.



Step-by-step Guide

1. Start by customizing the User Create page; open the Form Properties dialog, and add a Script custom handler in the Form Submit Handlers tab. Click **Add** > **Script** to create the script.



NOTE:
To allow customizations to include custom JavaScript code add allowCustomJavaScript="true"to the <consoleConfiguration> element found in %ProgramD ata%\NetIQ\DRARESTProxy\restProxy.config on the web server.

You will need to log out of the console and log back in to see this dialog go away

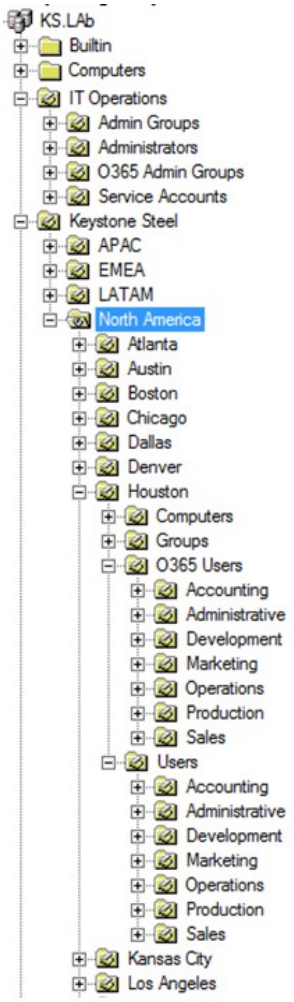
2. This script will check if the value of the firstName field is truthy but lastName field is not. If the condition returns true, we will cancel the form submission and inform the user they need to enter a value for Last Name.

Script

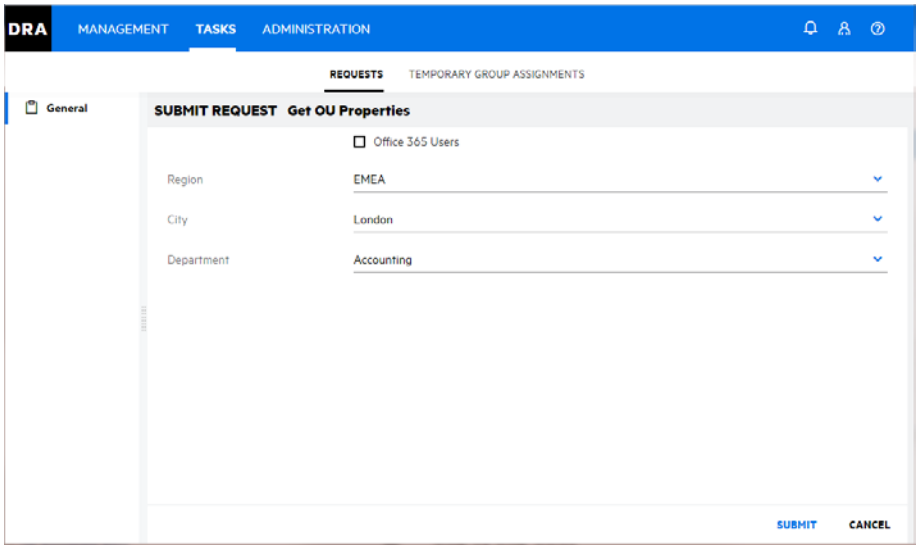
```
if (draApi.fieldValues.firstName && !draApi.fieldValues.lastName) {
    flowControl.cancel('Last Name is required when First Name is specified. Please enter a
value for Last Name');
}
```

Populate selection values for a field based on previous field selection

This example shows how to use custom handlers in the DRA web client to populate selection objects based on a previous selection and checkbox. The OU structure that this is based on can be seen in the image to the right. This custom page starts at the Keystone Steel level within the tree and provides the values of the Region to the first selection object, the second selection gets the cities based on the first selection, and the third selection provides a list of the departments based on both the first and second selection, and the checkbox. The checkbox is used to determine if the selection for department should be in either the O365 Users or Users OU. Only the First and Second selection objects require any custom handlers, and the first selection is the only one that requires an LDAP query on the options tab.

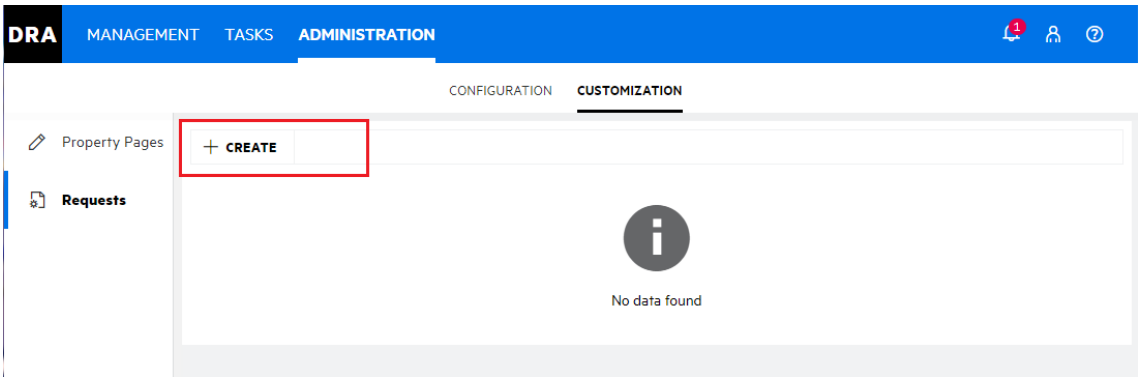


The following pages will contain screen captures of each setting for each of the selection objects and the checkbox in a Workflow Automation Request form.

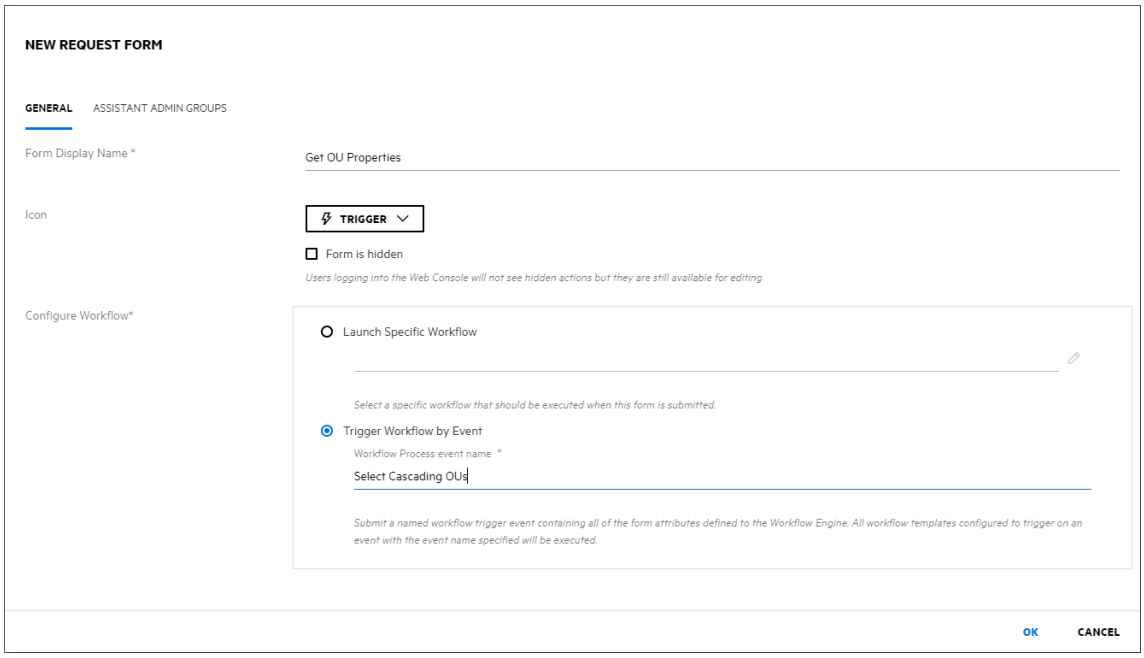


Step-by-step Guide

1. Navigate to Administration > Customization > Requests, and click **Create**.

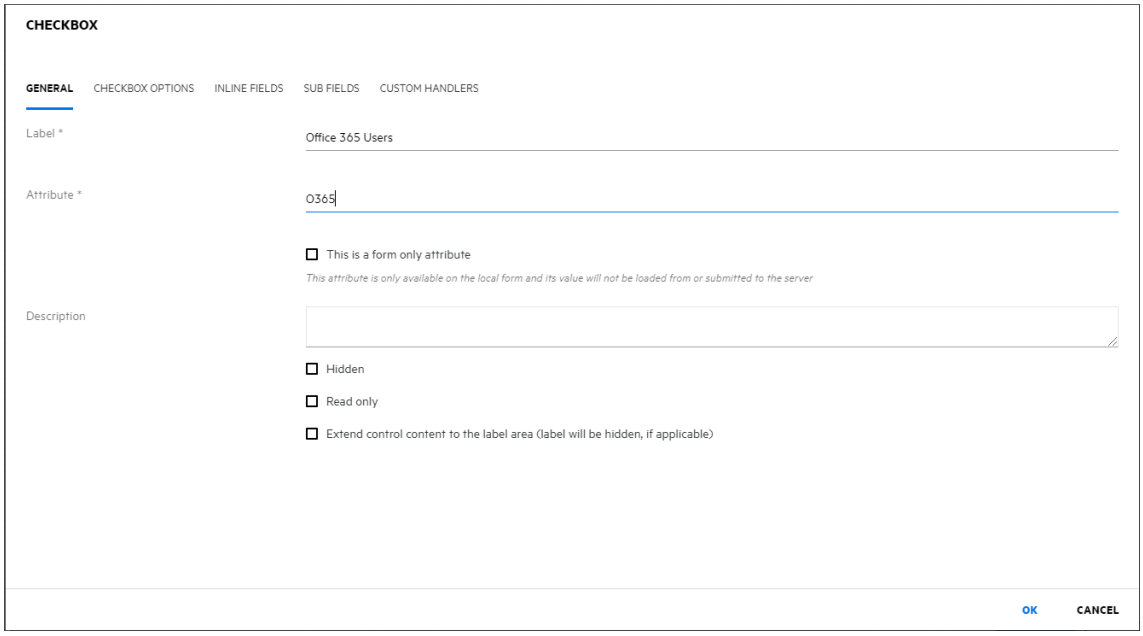


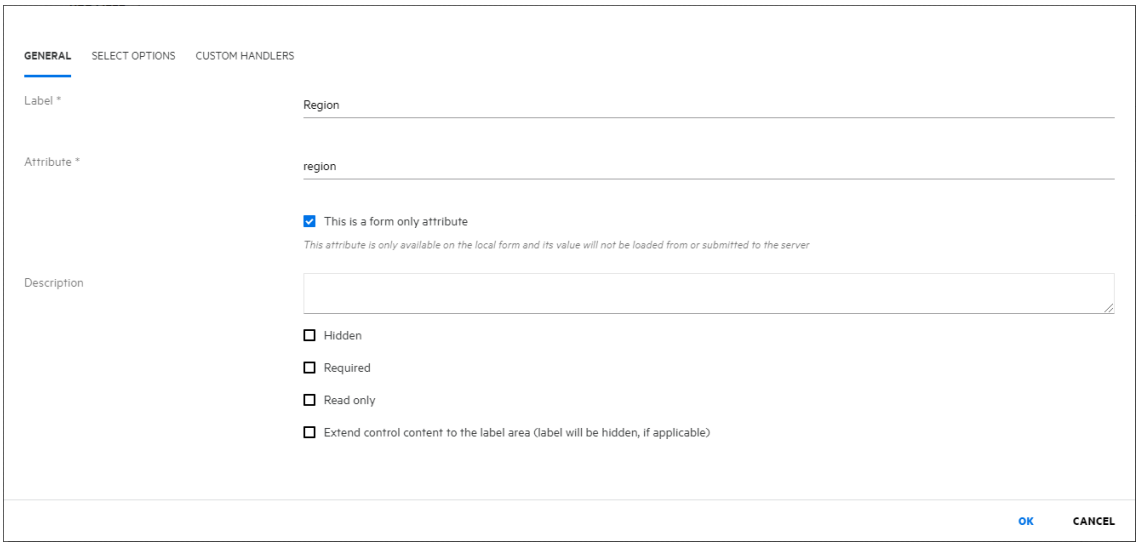
2. In the General tab, name the form, select the icon type and **Trigger Workflow by Event** option, enter an event name for the trigger, and click **OK** to save the form. The new form is added with a blank page titled, “New Tab”.



3. Open **Properties** for the page from the ellipsis icon to rename the page and select an icon for the page.

4. From the Add Field drop-down menu, add the checkbox ("Office 365 User") and the three list selection (*Select* field) ("Region", "City", "Department") controls to the custom form.

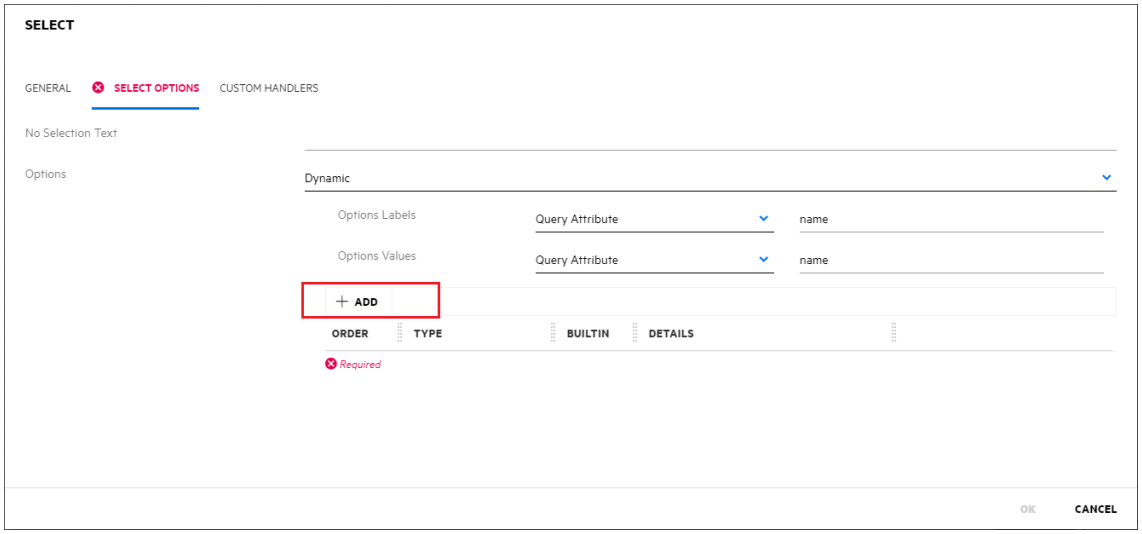




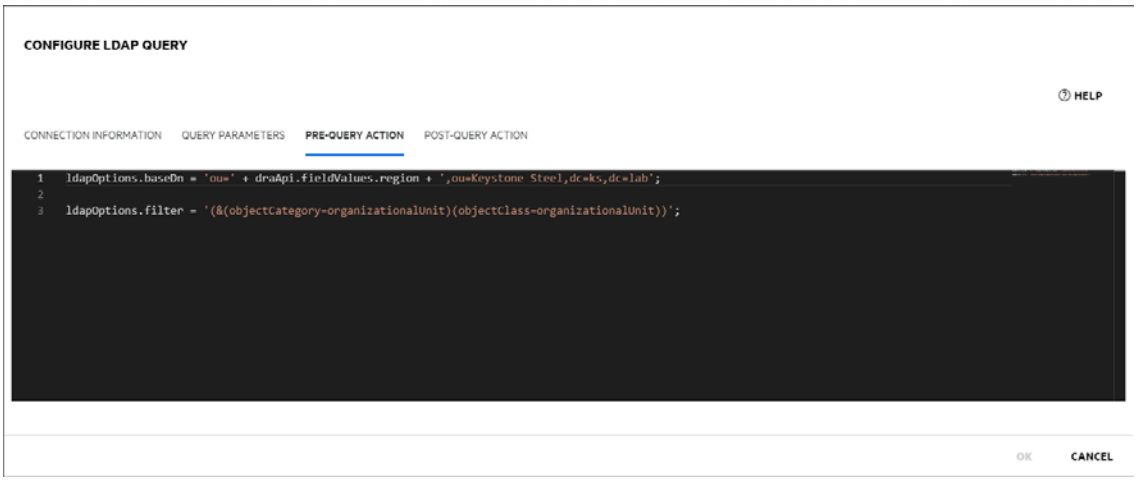
5. Configure the "Region" selection list field to populate with base selection values by defining a "Dynamic" LDAP query on the Select Options tab. When configuring the Query Parameters, enter the base distinguished name for the Region OU, choose One Level for the Scope, enter name for the Attributes, and add the string below for the Filter.

Region Options tab LDAP query

```
(&(objectCategory=organizationalUnit)(objectClass=organizationalUnit))
```



6. Add a Custom "LDAP Query" to the "Region" selection list field from the "Custom Handlers" tab and configure the Pre-Query and Post-Query logic, using the same settings as the Select Options in Query Parameters.



Region Custom Handler Pre-query LDAP script

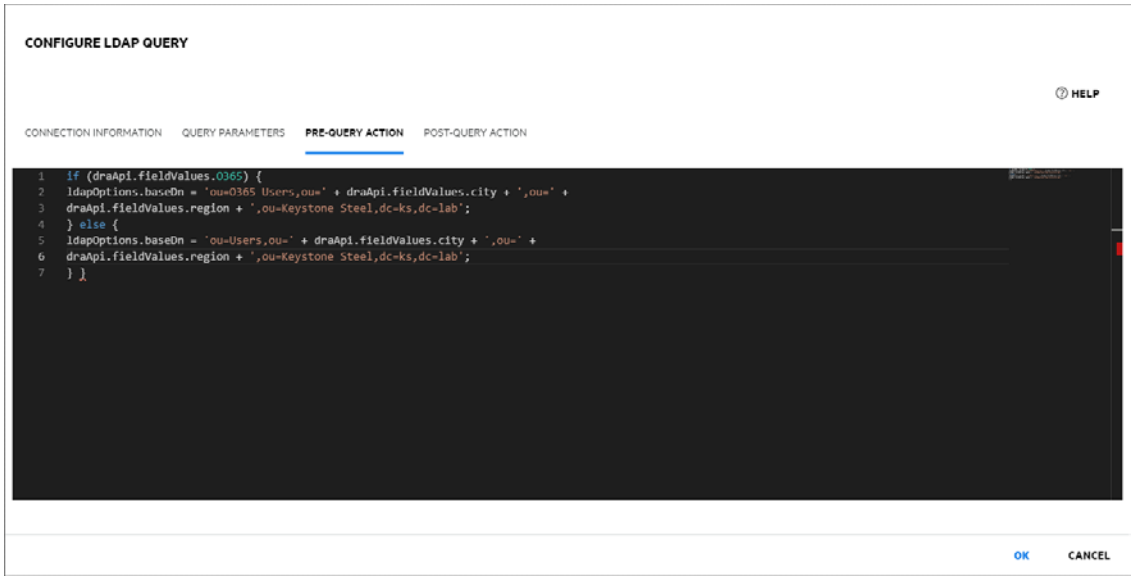
```
ldapOptions.baseDn = 'ou=' + draApi.fieldValues.region + ',ou=Keystone Steel,dc=ks,dc=lab';

ldapOptions.filter =
'(&(objectCategory=organizationalUnit)(objectClass=organizationalUnit))';
```

Region Custom Handler Post-query LDAP script

```
var labels = [];
var values = [];
var attrName;
var attrValue;

for (var i = 0; i < results.length; i++) {
    labels.push(results[i].attributes[0].values[0]);
    values.push(results[i].attributes[0].values[0]);
}

draApi.fieldOptionLabels.city = labels;
draApi.fieldOptionValues.city = values;
```

7. When configuring the new Select field for City, leave the Select Options tab at Static and use a placeholder for the Add Option.

8. Add a Custom "LDAP Query" to the "City" selection list field from the Properties field dialog on the "Custom Handlers" tab and configure the Pre-Query and Post-Query logic. Use the same configuration in Query Parameters as before, but with the addition of distinguishedName in the Attributes field.



City Custom Handler Pre-query LDAP script

```
if (draApi.fieldValues.O365) {
     ldapOptions.baseDn = 'ou=O365 Users,ou=' + draApi.fieldValues.city + ',ou=' +
draApi.fieldValues.region + ',ou=Keystone Steel,dc=ks,dc=lab';
} else {
     ldapOptions.baseDn = 'ou=Users,ou=' + draApi.fieldValues.city + ',ou=' +
draApi.fieldValues.region + ',ou=Keystone Steel,dc=ks,dc=lab';
} }
```

City Custom Handler Post-query LDAP script

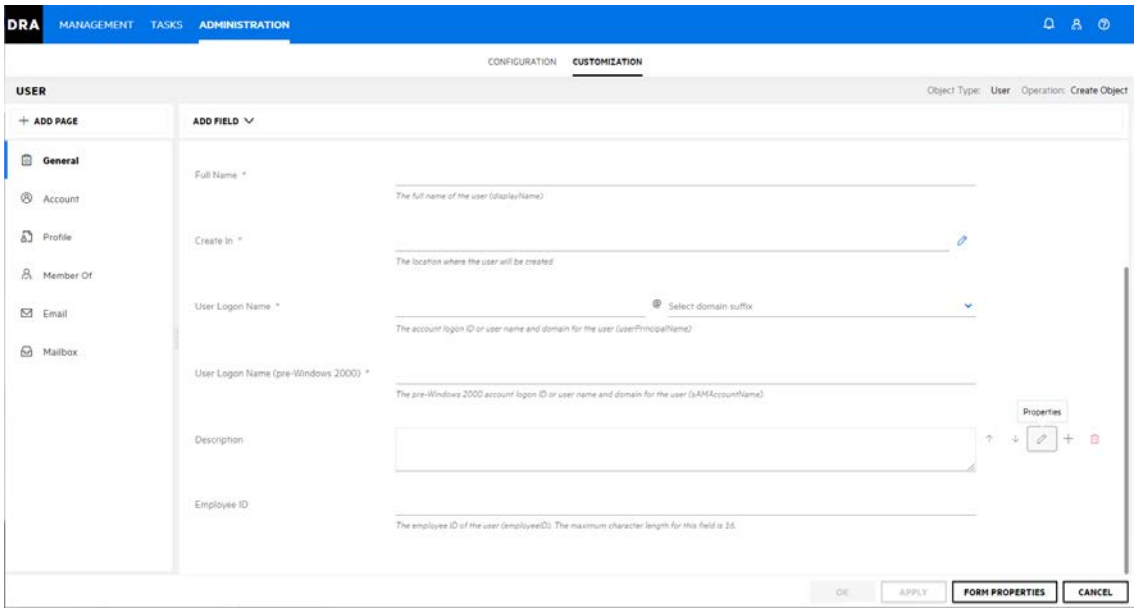
```
var labels = [];
var values = [];
var attrName;
var attrValue;

for (var i = 0; i < results.length; i++) {
     for(var x = 0; x < results[i].attributes.length; x++) {
          attrName = results[i].attributes[x].attrName;
          attrValue = results[i].attributes[x].values[0];
          if (attrName.toLowerCase() === 'name') {
               labels.push(attrValue);
          } else if (attrName.toLowerCase() === 'distinguishedname') {
               values.push(attrValue);
          }
     }
}

draApi.fieldOptionLabels.department = labels;
draApi.fieldOptionValues.department = values;
```

Pre-populate Value (A) Based on Value (B) Using Built-in Attribute Setting

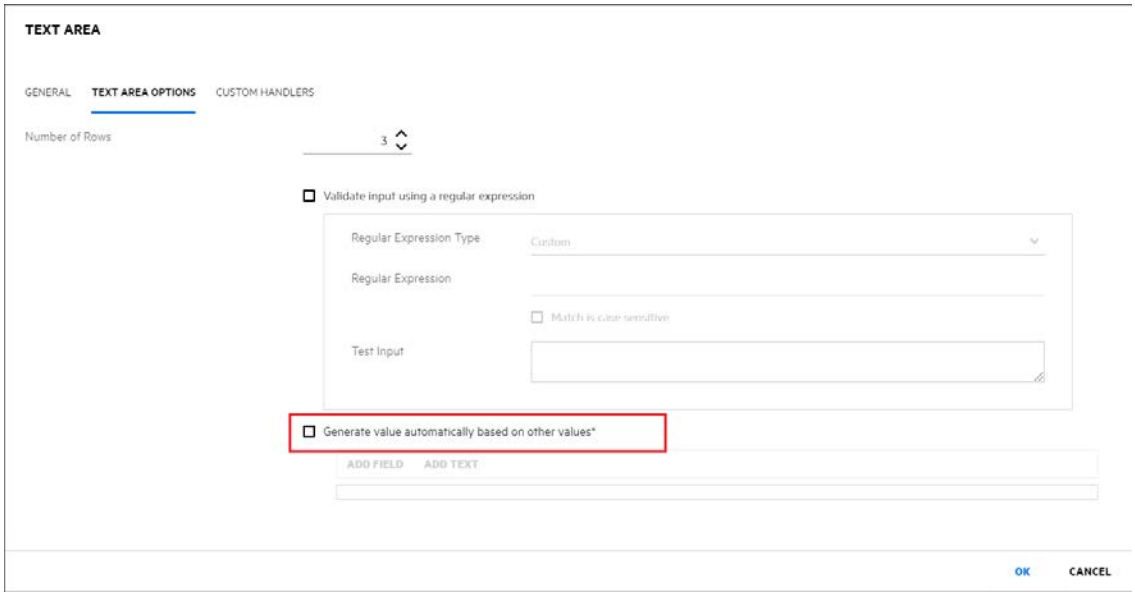
Example of how to pre-populate a field value based on another property field value using the built-in attribute setting customization "Generate value automatically based on other values". In this example we will pre-populate the 'Description' of a User with his 'Department' name in the User Properties page as "Department-<Department Name>".

Step-by-step Guide

1. Start by customizing the User Create page and edit the 'Description' property.

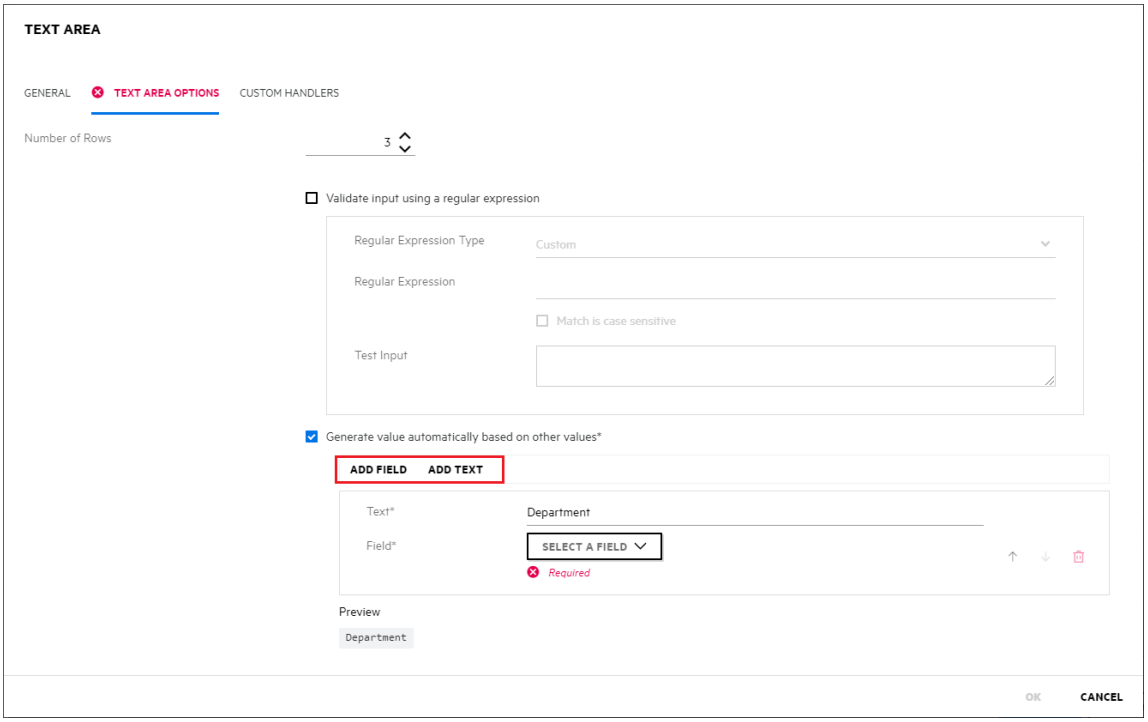


2. Select the “Generate value automatically based on other values” option in the Text Area Options tab.



3. Specify the value(s) that the field should be defaulted to. For this example we will add a static text string "Department " and a reference to the value of another property "Department" in the form. In this case the Department property was a customization previously added to the form.

> **NOTE:** Adding a space ' ' at the end of the static text string adds a break between concatenated parts of the default value. If you want to add a break between two property values, you can add an additional text element configured with a ' '.

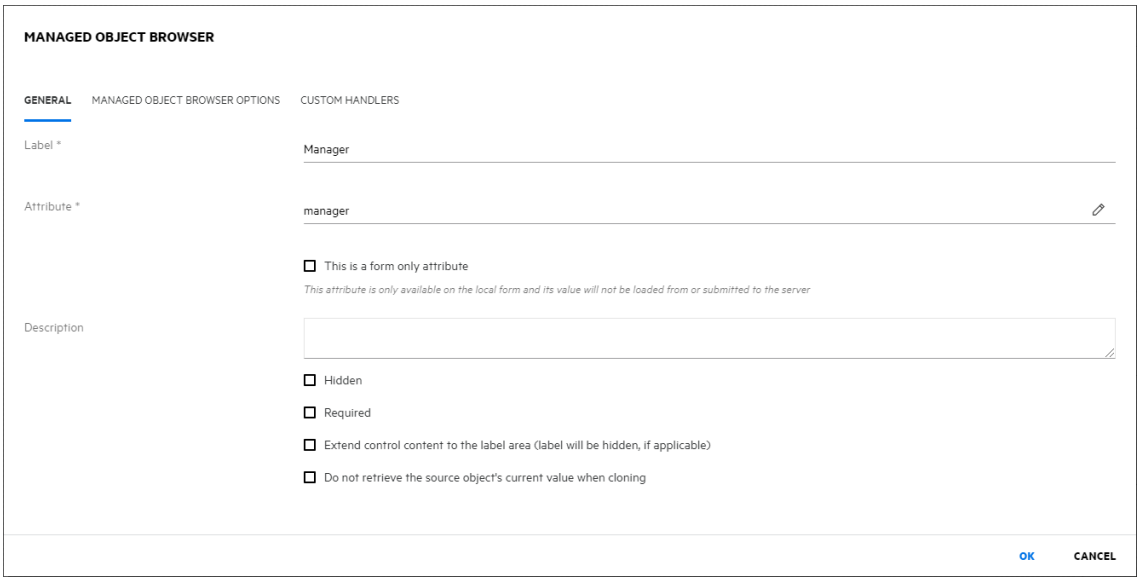


Pre-populate value automatically based on custom handler

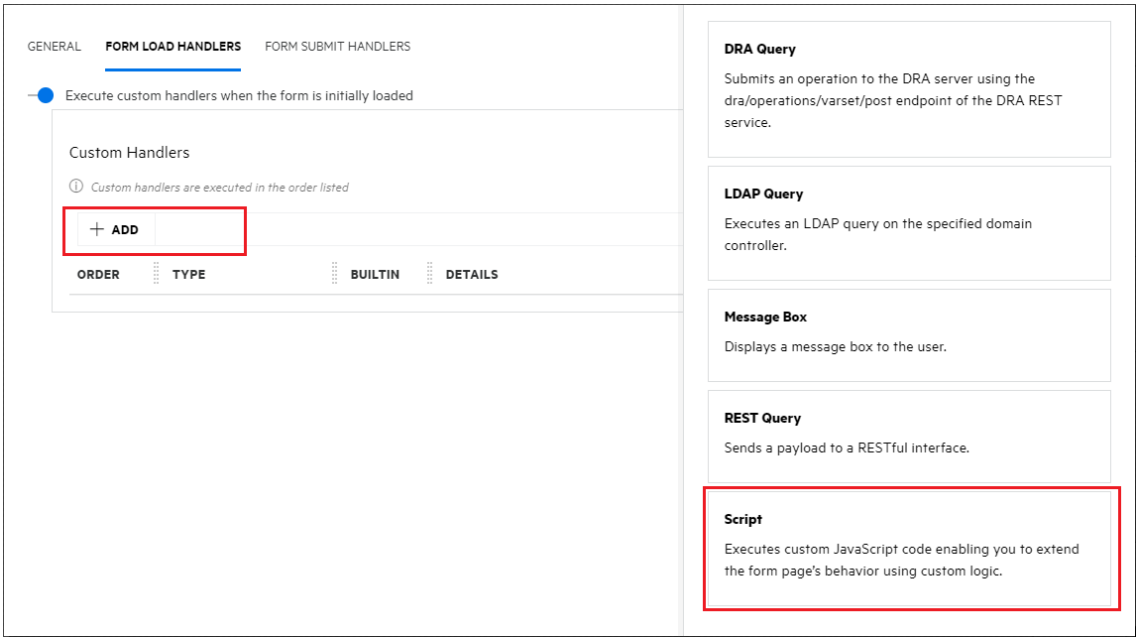
This example demonstrates how to pre-populate the manager field of a user with the assistant adminstrator who is creating the user.

Step-by-step Guide

1. Start by customizing the User Create page and add a new Managed Object Browser Field for manager.

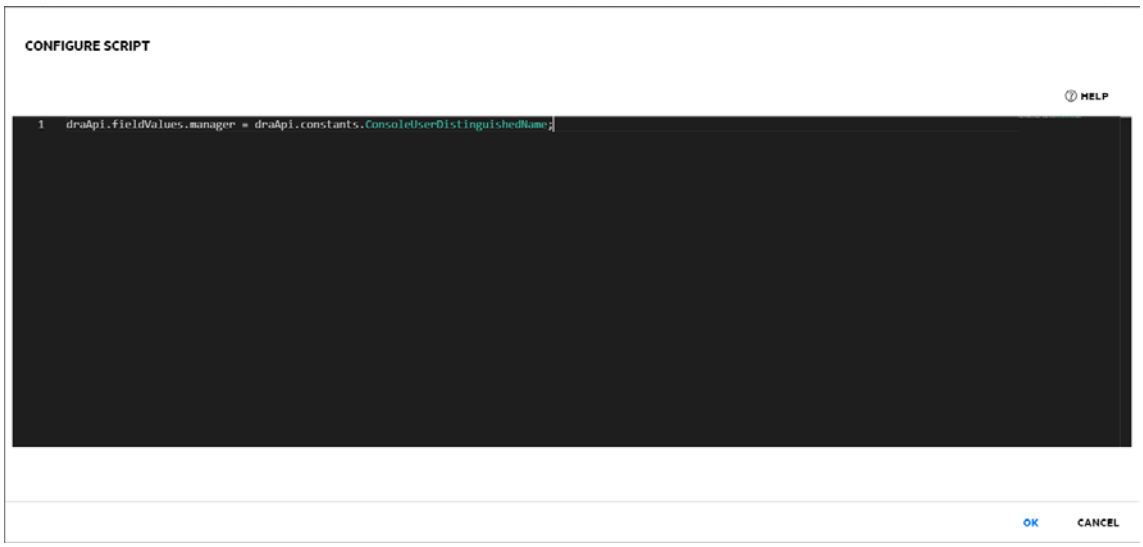


2. After adding the manager field, open the Form Properties and navigate to Form Load Handlers. Add a script Handler. Click **Add** > **Script** to configure the script.



NOTE: To allow customizations to include custom JavaScript code add allowCustomJavaScript="true"to the <c onsoleConfiguration>element found in %ProgramD ata%\NetIQ\DRARESTProxy\restProxy.configon the web server.

3. In Configure Script editor, assign the value of the current assistant administrator's distinguished name to the manager field. We use draApi.fieldValues and draApi.constants.ConsoleUserDistinguishedName APIs.



Configure Script

```
draApi.fieldValues.manager = draApi.constants.ConsoleUserDistinguishedName;
```

Validate input using a regular expression

The web client supports regular expressions based on JavaScript syntax, here are some reference documents:

- https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide/Regular_Expressions
- http://www.regular-expressions.info/javascript.html

NOTE:
JavaScript doesn't support the \p Unicode category expression, Unicode support in JavaScript's regular expressions is limited to single character matches. The following expression gets close to the behavior of \p: [\w.\-]*

NOTE:
you will not need the anchor tags since the whole expression is a single class of characters repeated any number of times. Any matching string will have to start and end with a character in that class.

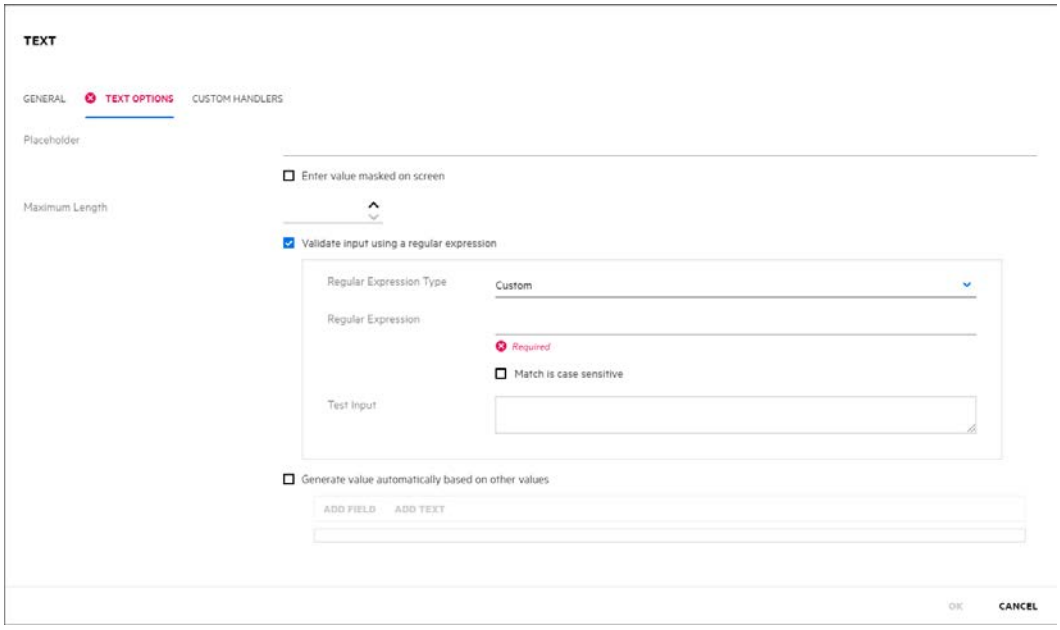
Built-in example regular expressions:

Use Case	Regular Expression
All Major Credit Cards	^(?:4[0-9]{12}(?:[0-9]{3})?|5[1-5][0-9]{14}|6011[0-9]{12}|3(?:0[0-5]|[68][0-9])[0-9]{11}|3[47][0-9]{13})$
Alpha-Numeric String	^[a-zA-Z0-9]*$
Alpha-Numeric String With Spaces	^[a-zA-Z0-9\s]*$
One Or More Digits	^[0-9]+$
Email Address	^[a-z0-9!#$%&'*+/=?^_`{\|}~.-]+@[a-z0-9]([a-z0-9-]*[a-z0-9])?(\.[a-z0-9]([a-z0-9-]*[a-z0-9])?)*$
Mail Alias	^[a-zA-Z0-9!#$%&'*.+\-/=?^_`{}\|~¡-ÿ]*$
URL	^[a-z][a-z\d.+-]*:/*(?:[^:@]+(?::[^@]+)?@)?(?:[^\s:/?#]+|\[[a-f\d:]+\])(?::\d+)?(?:/[^?#]*)?(?:\?[^#]*)?(?:#.*)?$
Number	^\s*(\-|\+)?(\d+|(\d*(\.\d*)))([eE][+-]?\d+)?\s*$
ISO Date	^\d{4}-[01]\d-[0-3]\dT[0-2]\d:[0-5]\d:[0-5]\d\.\d+([+-][0-2]\d:[0-5]\d|Z)$
IP Address (version 4)	^(?:(?:25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.){3}(?:25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)$
IP Address (version 6)	^((([0-9A-Fa-f]{1,4}:){7}([0-9A-Fa-f]{1,4}|:))|(([0-9A-Fa-f]{1,4}:){6}(:[0-9A-Fa-f]{1,4}|((25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)(\.(25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)){3})|:))|(([0-9A-Fa-f]{1,4}:){5}(((:[0-9A-Fa-f]{1,4}){1,2})|:((25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)(\.(25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)){3})|:))|(([0-9A-Fa-f]{1,4}:){4}(((:[0-9A-Fa-f]{1,4}){1,3})|((:[0-9A-Fa-f]{1,4})?:((25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)(\.(25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)){3}))|:))|(([0-9A-Fa-f]{1,4}:){3}(((:[0-9A-Fa-f]{1,4}){1,4})|((:[0-9A-Fa-f]{1,4}){0,2}:((25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)(\.(25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)){3}))|:))|(([0-9A-Fa-f]{1,4}:){2}(((:[0-9A-Fa-f]{1,4}){1,5})|((:[0-9A-Fa-f]{1,4}){0,3}:((25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)(\.(25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)){3}))|:))|(([0-9A-Fa-f]{1,4}:){1}(((:[0-9A-Fa-f]{1,4}){1,6})|((:[0-9A-Fa-f]{1,4}){0,4}:((25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)(\.(25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)){3}))|:))|(:(((:[0-9A-Fa-f]{1,4}){1,7})|((:[0-9A-Fa-f]{1,4}){0,5}:((25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)(\.(25[0-5]|2[0-4]\d|1\d\d|[1-9]?\d)){3}))|:)))(%.+)?$

This example demonstrates how to validate that a group name entered by a user begins with only specific characters, say it should begin with "GRP". When a group name is entered and if the given name doesn't begin with "GRP", then the name field will outlined with red that indicates input is invalid and the form cannot be submitted.

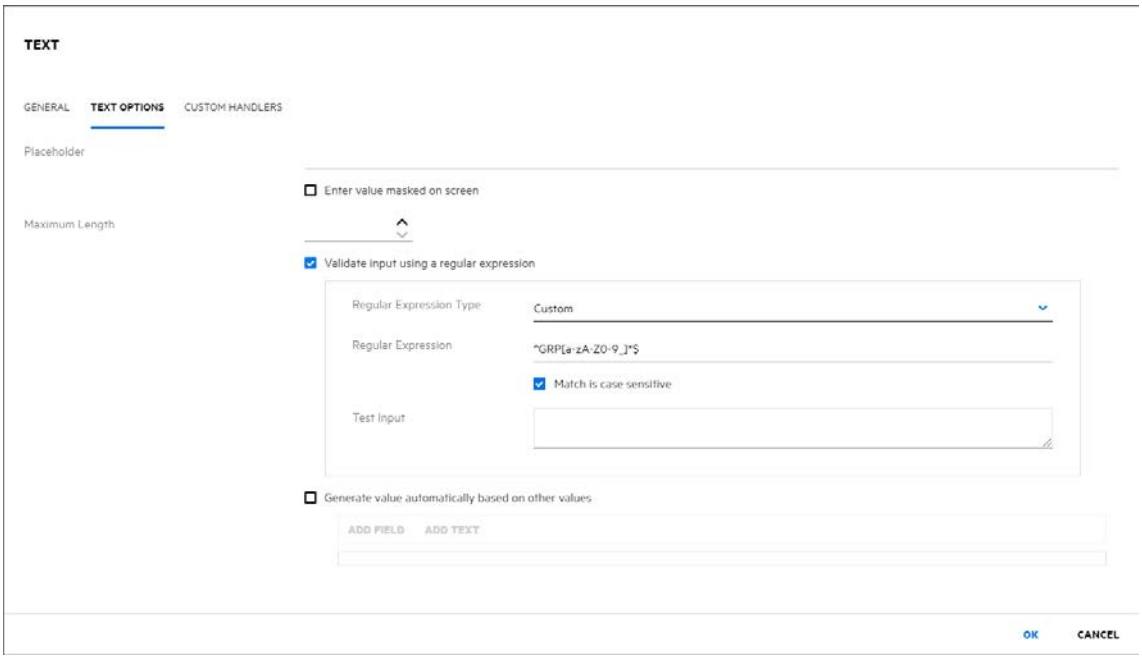
Step-by-step Guide

1. Start by customizing the Group Create page. Open the properties of the Name field, and select the "Validate input using a regularexpression" check box.

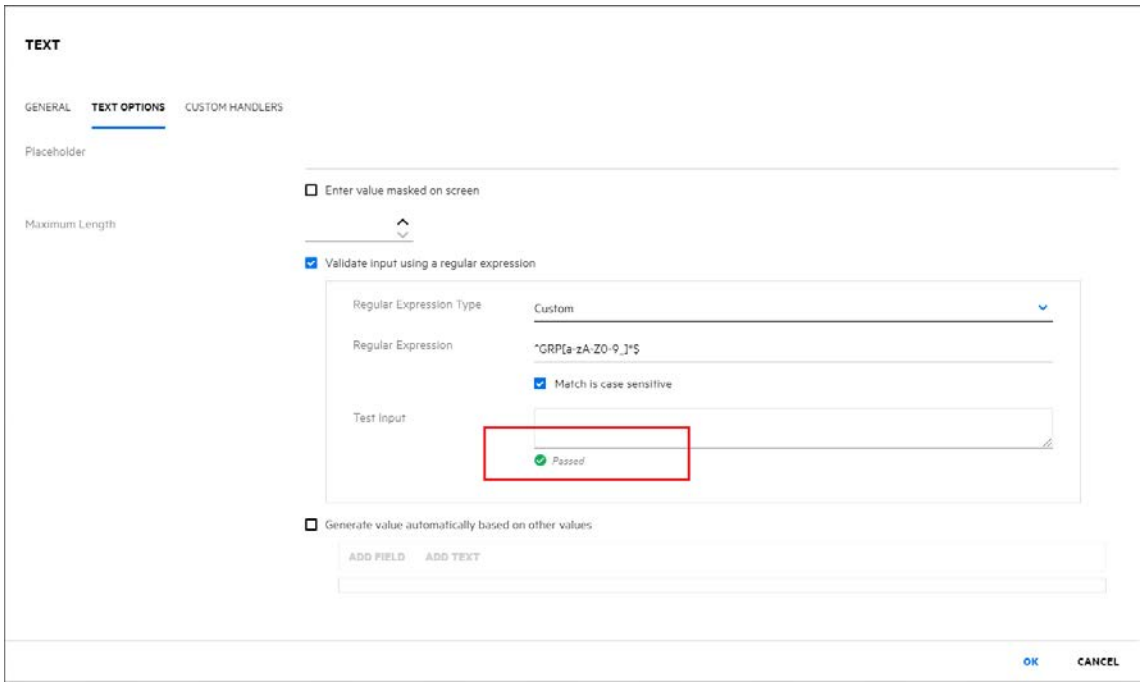


2. For this example we will be implementing a custom regular expression that will require the property value to begin with "GRP":
    - Set the 'Regular Expression Type' to 'Custom'
    - Enter the regular expression value "^GRP[a-zA-Z0-9_]*$"
    - Set the option regular expression option 'Match is case sensitive' (for strict capitalization checking)

> **NOTE:** You can select one of the default regular expressions as a starting point or select custom to create your own.

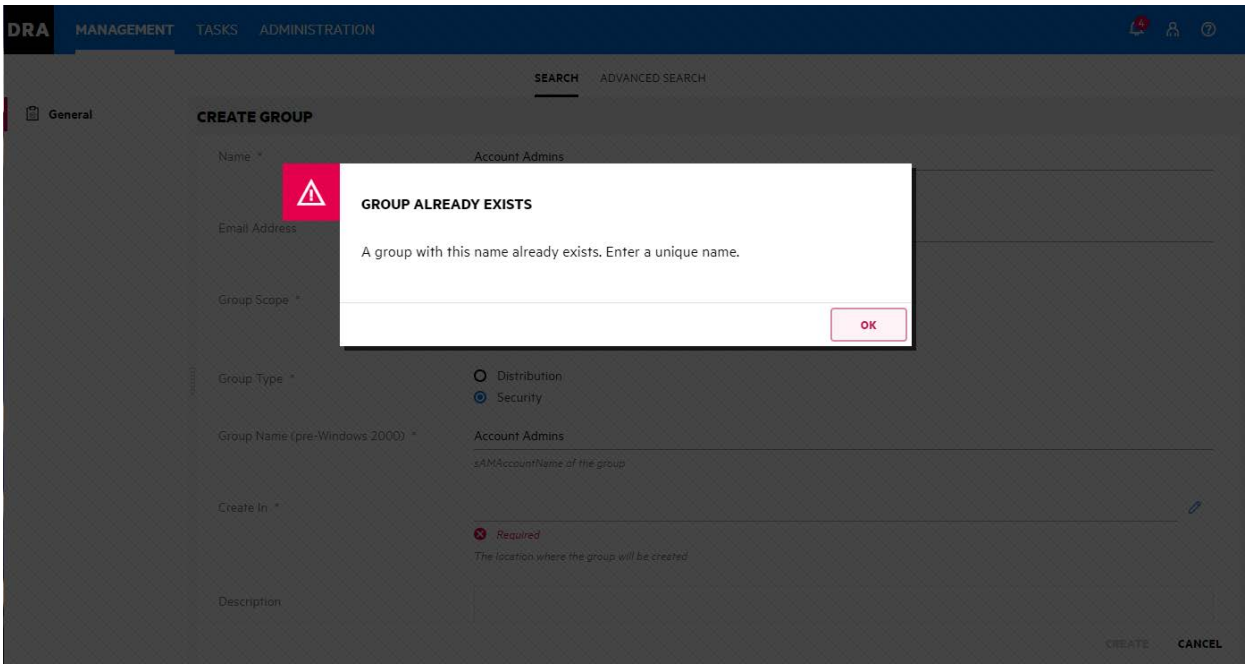


3. The regular expression can be tested by entering a test value to verify it is working as intended.



Validate Name Uniqueness for a Specified Field Value at Run-time

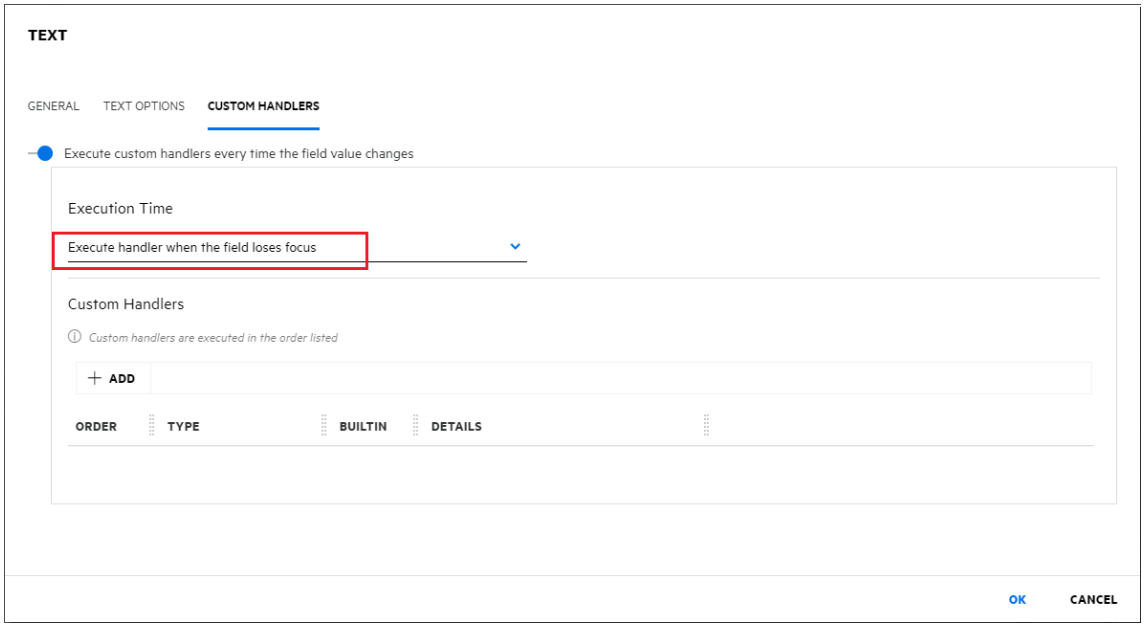
This example demonstrates how to validate that a group name entered by a user does not already exist in Active Directory at run-time. It will also demonstrate using multiple handlers in sequence and controlling the execution flow of those handlers. When a group with the given name does exist, an alert is shown to the user informing them of the issue. Note that the alert is only informational and the form can still be submitted after the message is cleared by the user.



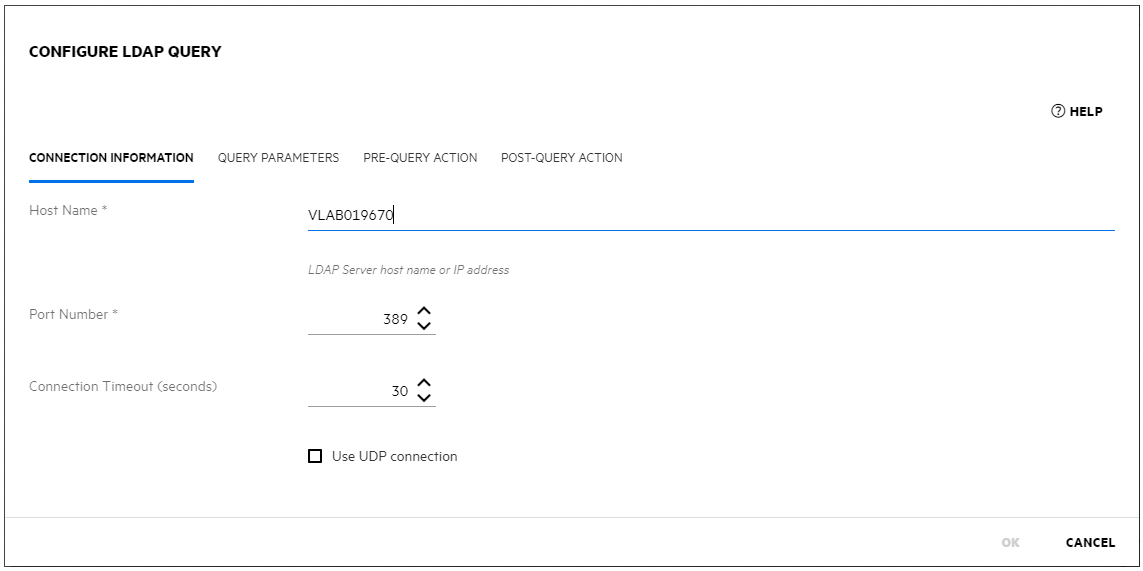
Step-by-step Guide

1. Start by customizing the Group Create page and open the properties of the Name field. Add an LDAP Query handler on the Custom Handlers tab and set the Execution Time to execute the handler when the field loses focus (otherwise it will be executed after every key stroke). Finally, click **Add** > **LDAP Query** to configure the LDAP query.

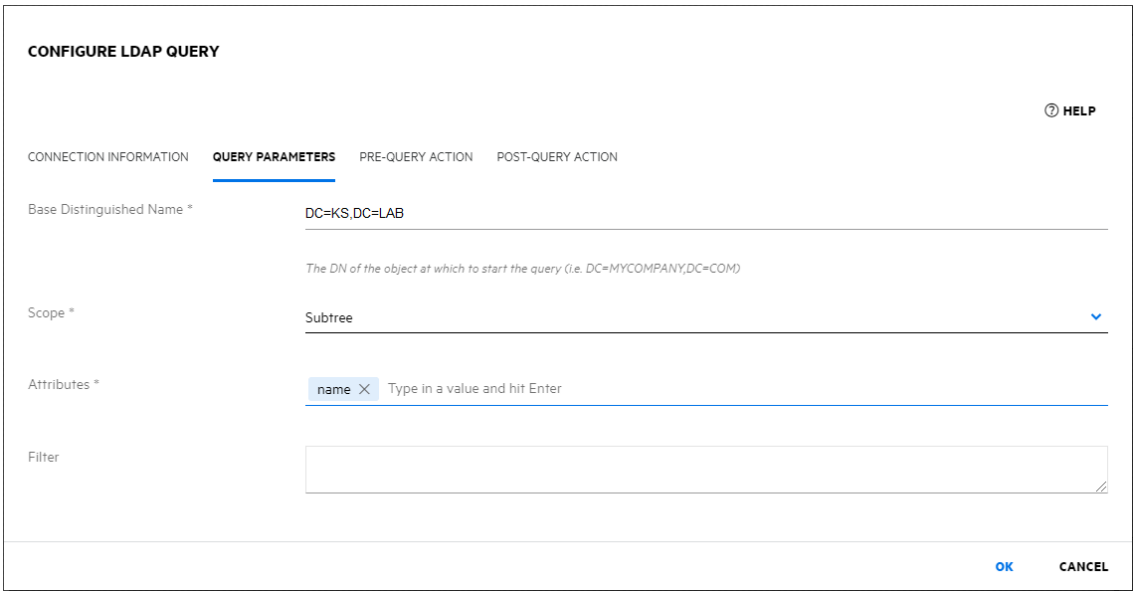
> **WARNING:** Running LDAP, REST, or DRA queries in a change handler for validation like this is generally not recommended and as a best practice should be done in the form's On Submit handler if possible.



2. Specify the name of the domain controller where you want the LDAP Query to execute in the Connection Information section.



3. Specify the Query Parameter configuration:
    - Set 'Base Distinguished Name' to the distinguished name of the domain to be searched
    - Set 'Scope' to Subtree so our search will be recursive and include all child OUs and containers in the domain
    - Set 'Attributes' to return the name value of the group
    - Leave the 'Filter' empty (we need to generate it dynamically based on the users input in the form)



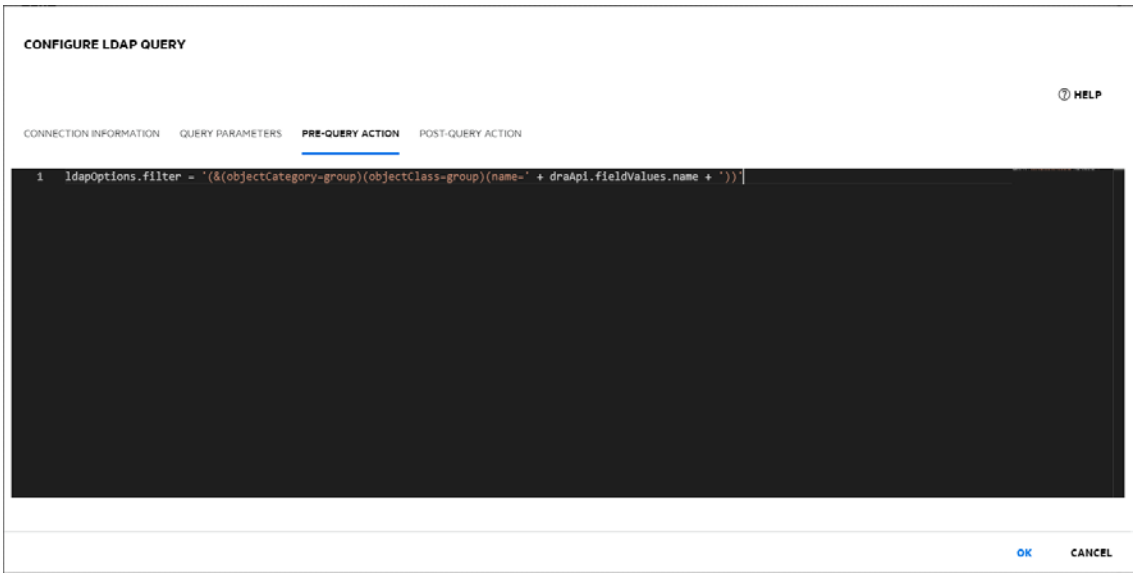
4. In the Pre-Query Action we need to create the LDAP query using the name entered by the user. We use the draApi.fieldValues API to access the value of the name field and build the query string which we then set as the query filter using the ldapOptions.filter API.

> **NOTE:** To verify uniqueness, we're only interested if the query returns 1 or more results, so we'll just have the query return the name attribute of any matching group.

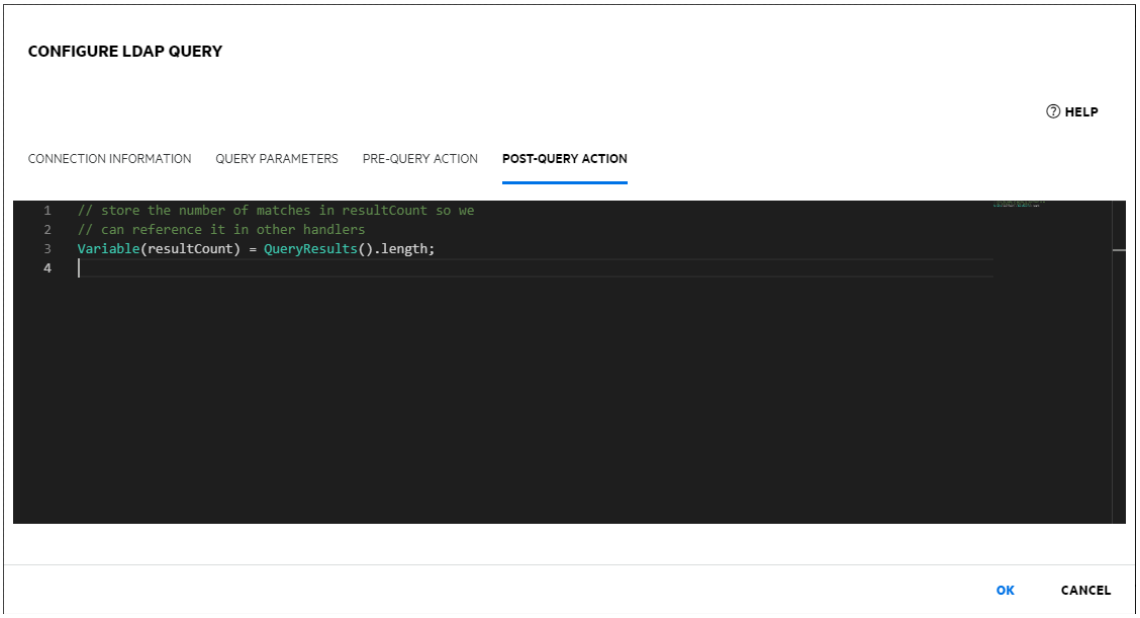
> **NOTE:** There are 3 possible options for Scope:
>
> - Base - The search is limited to the object specified by the Base Distinguished Name. This is useful if you want to see if that object exists.
> - One Level - The search is limited to the Base Distinguished Name.
> - Subtree - The search is recursive and will include all children of the object specified by the Base Distinguished Name. More details can be found here:https://docs.microsoft.com/en-us/windows/desktop/ad/search-scope

Pre-Query Action

```
ldapOptions.filter = '(&(objectCategory=group)(objectClass=group)(name=' +
draApi.fieldValues.name + '))'
```



5. In the Post-Query Action we'll store the number of matching objects so we can use it in a later handler. The results are returned as an array of objects that matched the query so we'll store the length of that array in a variable we can reference later using the variables API. The value passed to this API is just an arbitrary name that we decide to use that describes that information it holds.

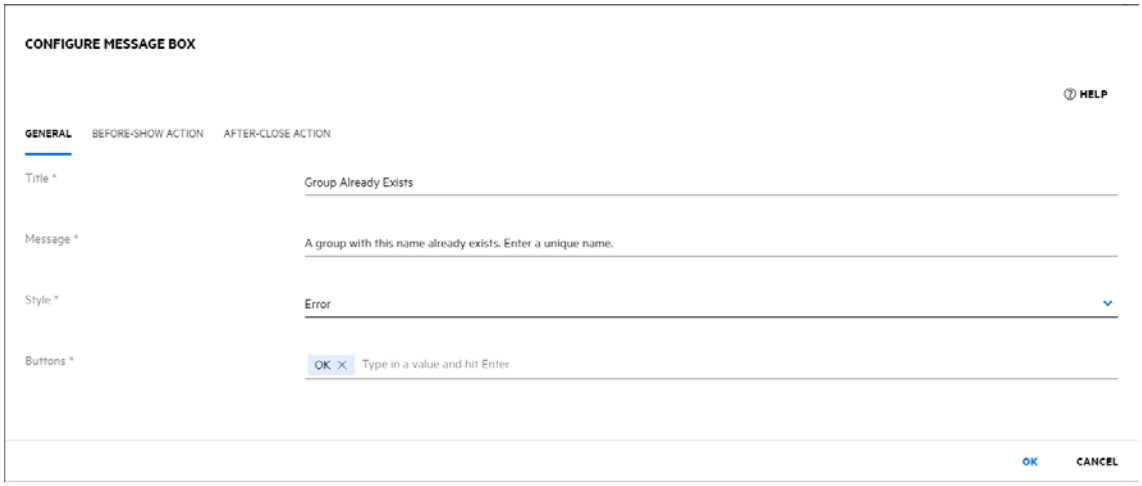


Post-Query Action

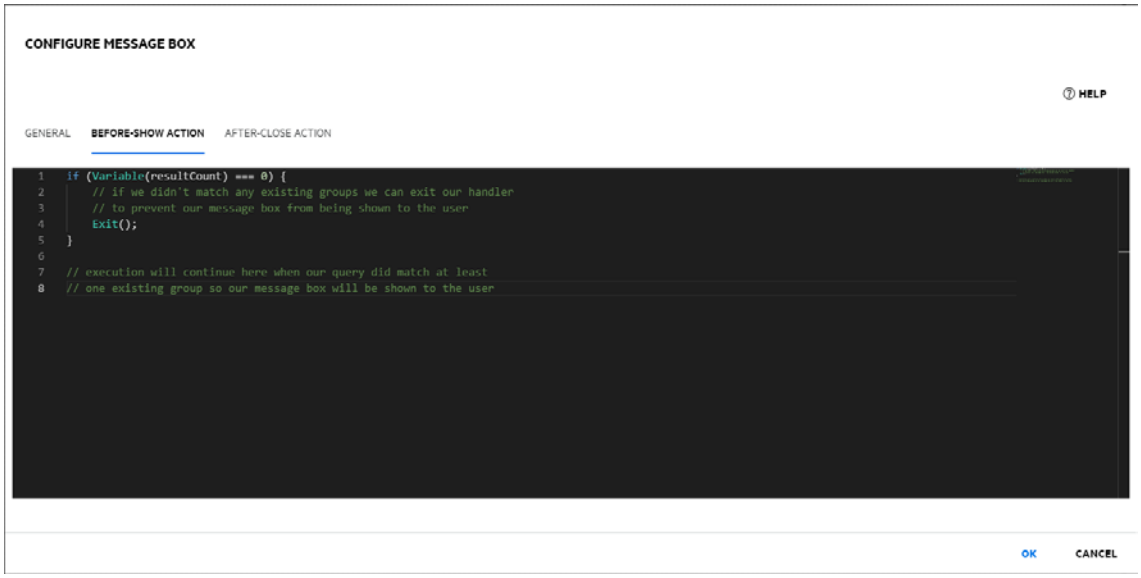
```
// store the number of matches in resultCount so we
// can reference it in other handlers
variables.resultCount = results.length;
```

6. After clicking OK to save the LDAP query, we'll now add a Message Box handler.

7. Click **Add** > **Message Box** to configure the handler. We'll configure the message box to have a descriptive title, an informative message, and set its style to Error.



8. The Before-Show Action is where we can execute some custom code before the message box is shown to the user. We'll use this to check the value of our resultCount variable and then only display the message box if the resultCount is greater than 0. In order to prevent the message box from being shown when the resultCount is 0 we'll call the flowControl.exit()API which will tell the Web Console to stop processing this handler and to not process any remaining handlers if there were any.

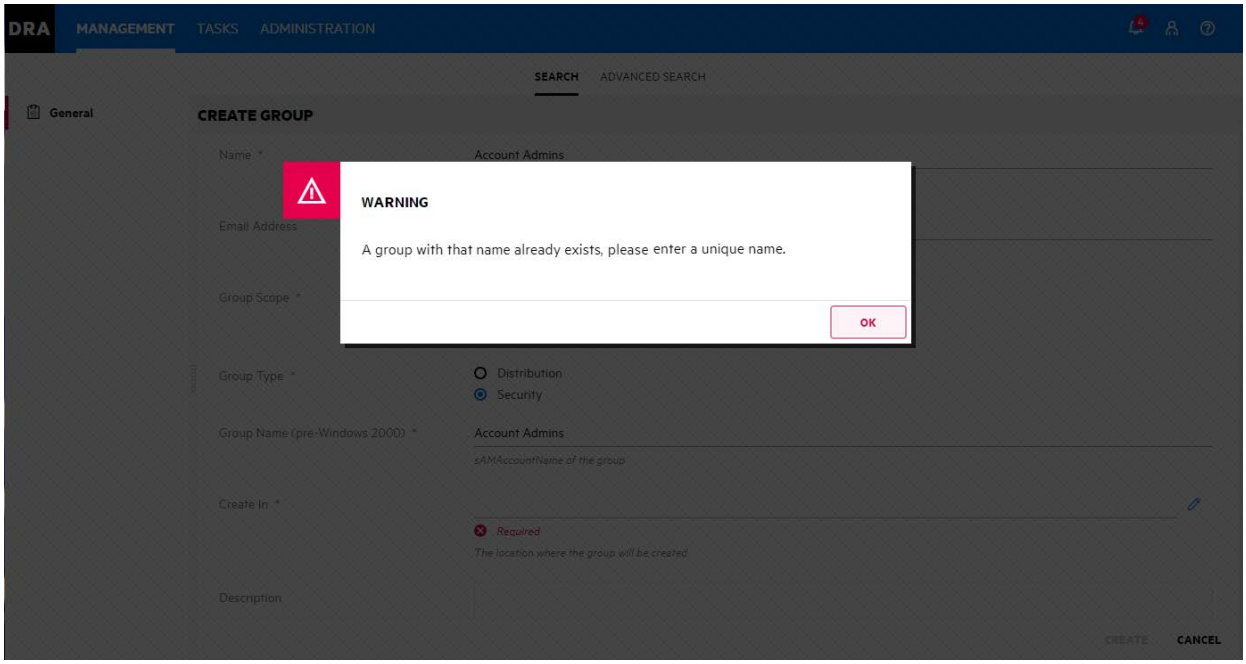


Before-Show Action

```
if (variables.resultCount === 0) {
    // if we didn't match any existing groups we can exit our handler
    // to prevent our message box from being shown to the user
    flowControl.exit();
}

// execution will continue here when our query did match at least
// one existing group so our message box will be shown to the user
```

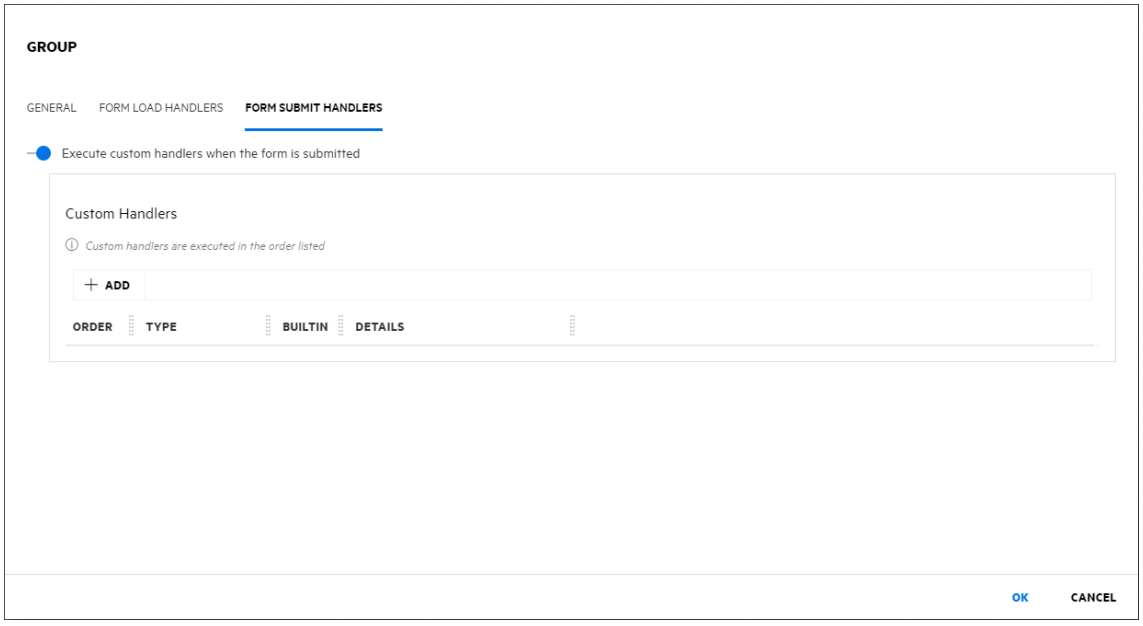
Validate Name Uniqueness for a Specified Field Value When a Form is Submitted

This example demonstrates how to validate that a group name entered by a user does not already exist in Active Directory when the form is submitted. When a group with the given name does exist a notification is presented to the user informing them of the issue and the form is not submitted to the server.

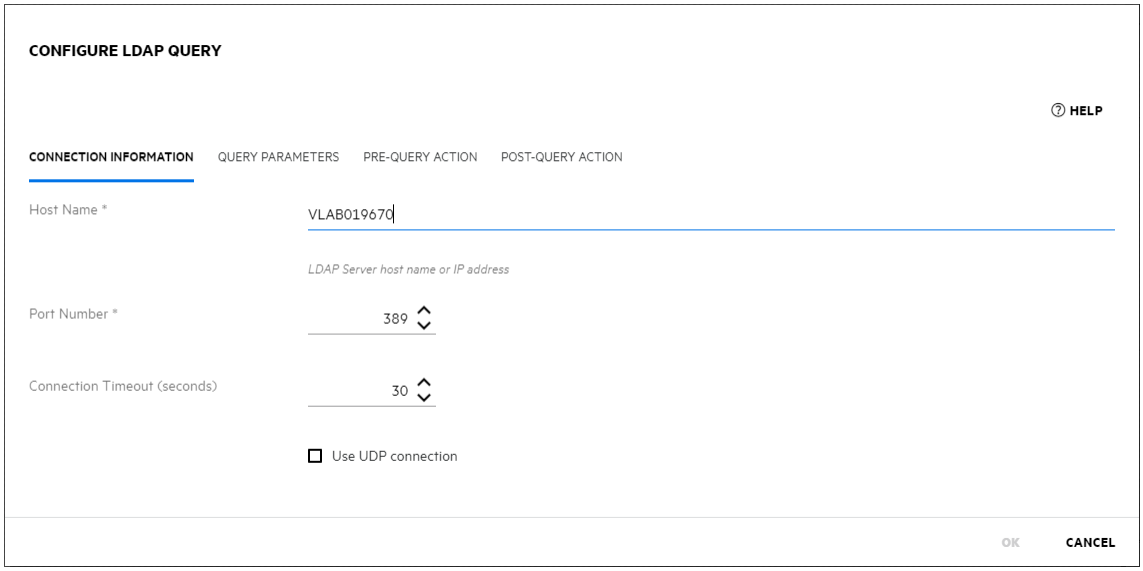


Step-by-step Guide

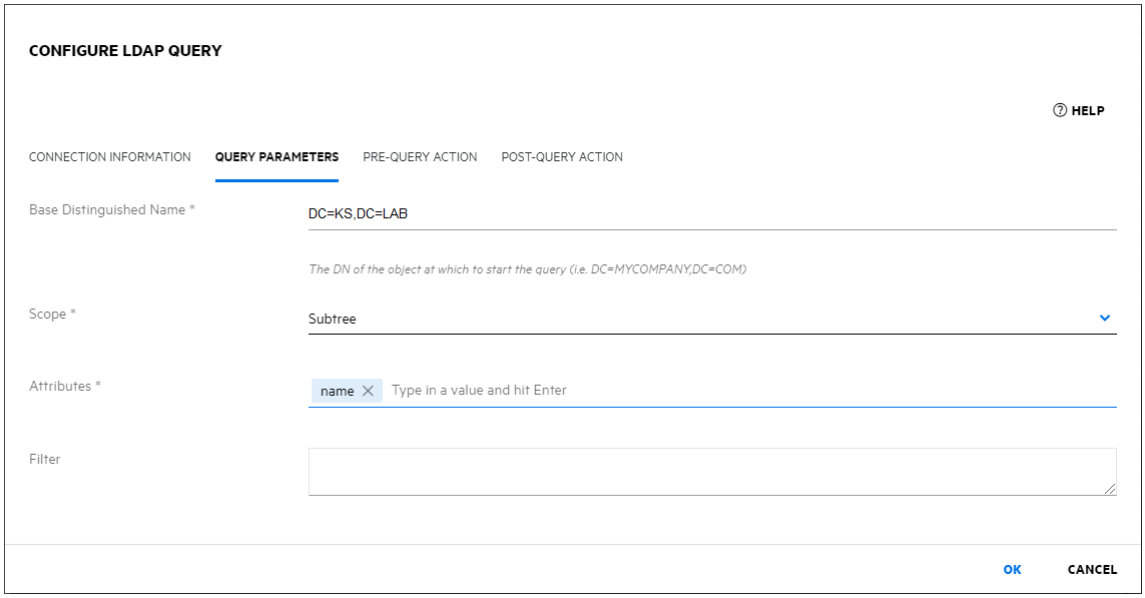
1. Start by customizing the Group Create page and open the Form Submit Handlers tab on the Form Properties dialog. Click **Add** > **LDAP Query** to configure the LDAP query.



2. Specify the name of the domain controller where you want the LDAP Query to execute in the Connection Information section.



3. Specify the Query Parameter configuration:
    - Set 'Base Distinguished Name' to the distinguished name of the domain to be searched
    - Set 'Scope' to Subtree so our search will be recursive and include all child OUs and containers in the domain
    - Set 'Attributes' to return the name value of the group
    - Leave the 'Filter' empty (we need to generate it dynamically based on the users input in the form)



NOTE: To verify uniqueness, we're only interested if the query returns 1 or more results, so we'll just have the query return the name attribute of any matching group.

NOTE: There are 3 possible options for Scope:

- Base - The search is limited to the object specified by the Base Distinguished Name. This is useful if you want to see if that object exists. One Level –
- The search is limited to the immediate children of the object specified by the Base Distinguished Name.
- Subtree - The search is recursive and will include all children of the object specified by the Base Distinguished Name.

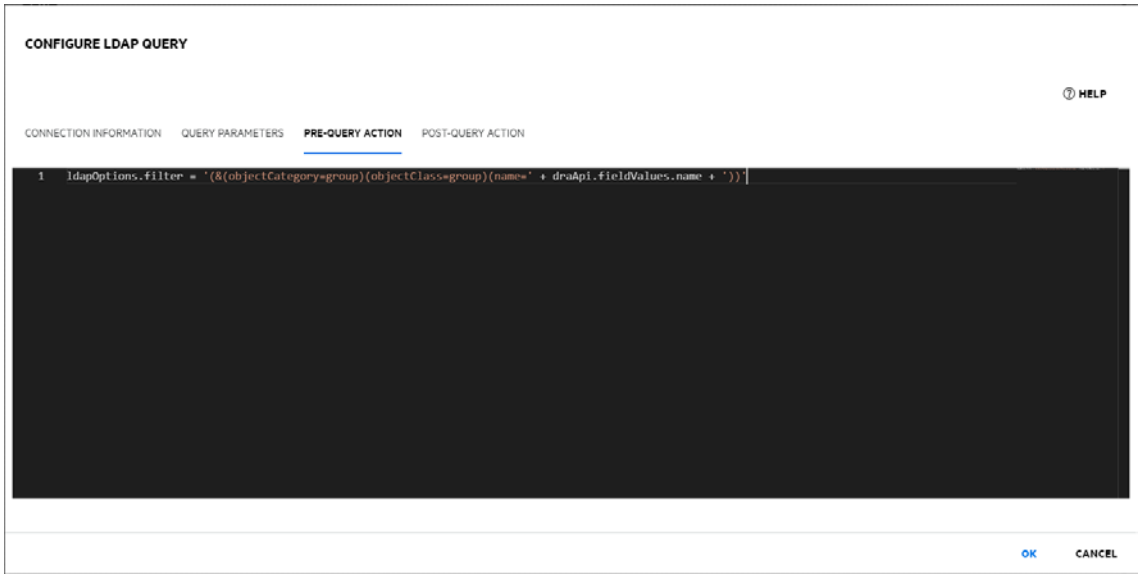
More details can be found here:

https://docs.microsoft.com/en-us/windows/desktop/ad/search-scope

4. In the Pre-Query Action we need to create the LDAP query using the name entered by the user. We use the draApi.fieldValues API to access the value of the Name field and build the query string which we then set as the query filter using the ldapOptions.filter API.

Pre-Query Action

```
ldapOptions.filter = '(&(objectCategory=group)(objectClass=group)(name=' +
draApi.fieldValues.name + '))';
```



5. In the Post-Query Action we'll check the results returned by the query. The results are returned as an array of objects that matched the query so we just need to check if the length of the array is greater than 0. When a matching group is found we use the flowControl.cancel() API to cancel the form submission passing the API an optional message to display to the user.

Post-Query Action

```
if (results.length > 0) {
    flowControl.cancel('A group with that name already exists, please enter a unique name.');
}
```

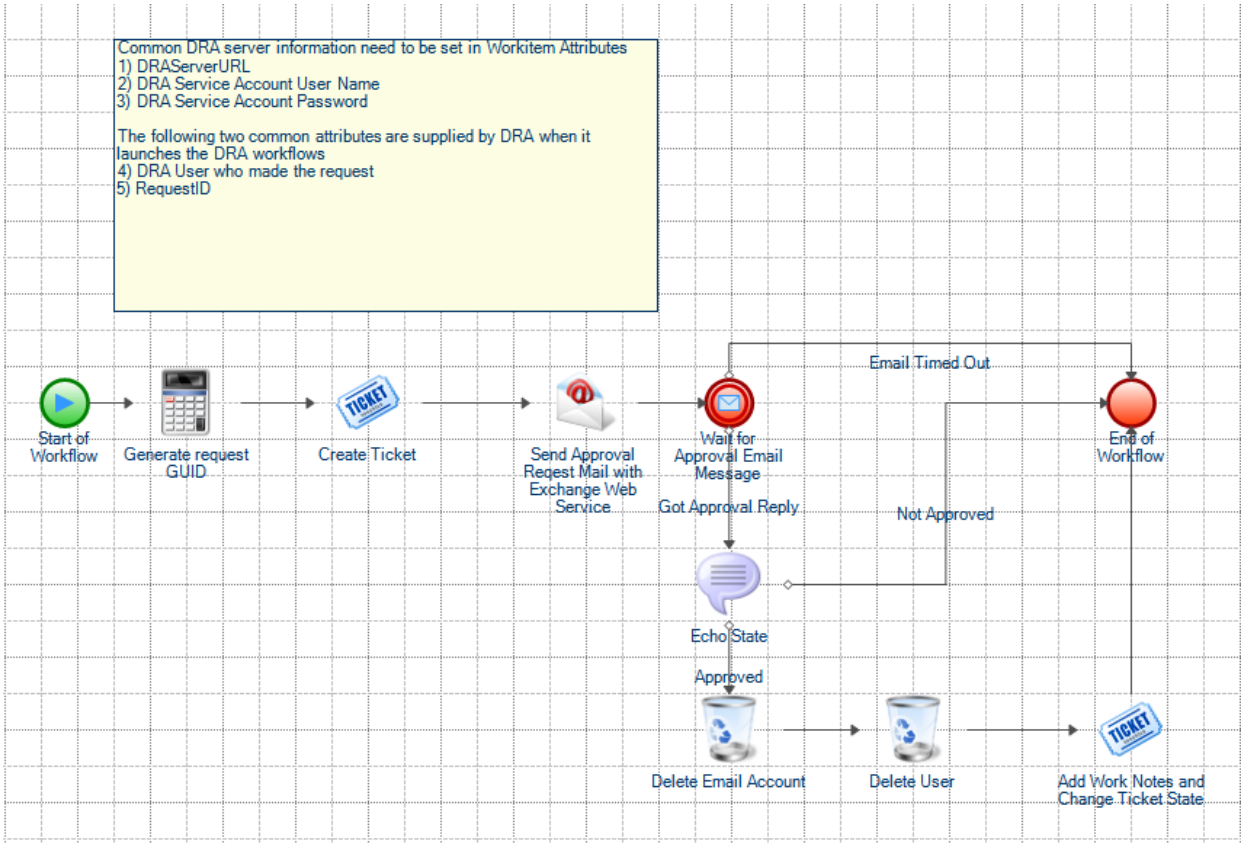
Workflow Customization

This section contains examples for customizing automated workflow forms in in the Web Console.

Custom Workflow Examples:

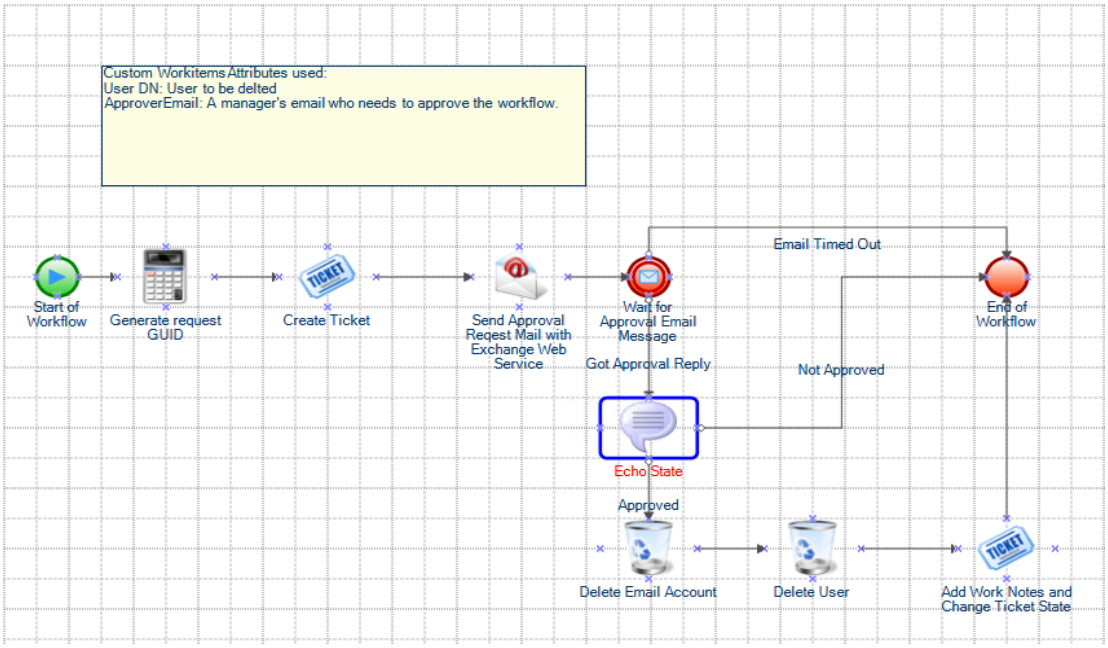
Solution	Use Case	Components for Example	Notes
This solution will be broken into 3 sub-workflows	Create and modify a user account	Legacy DRA activity Builtin DRA REST Activity Custom DRA REST (Include parsing JSON response)	Core Business logic, we may add additional use cases in the future. This workflow will have a corresponding Workflow form in the DRA web client so that it can be launched manually.
	Service Now Integration	Trigger workflow based on ServiceNow ticket Call Sub-workflow Update SericeNow with details from processing ticket	Create ServiceNow Change Request, add the request information. When approved, update ticket information and state
	Approval Workflow	Lookup group owner/manager IQMail EWS approval email request/response	Send EWS email to a user and wait for email reply.
Load users information from Human Resources database to DRA	Bulk Load User Accounts	Load HR DB to DRA	

Delete User Workflow

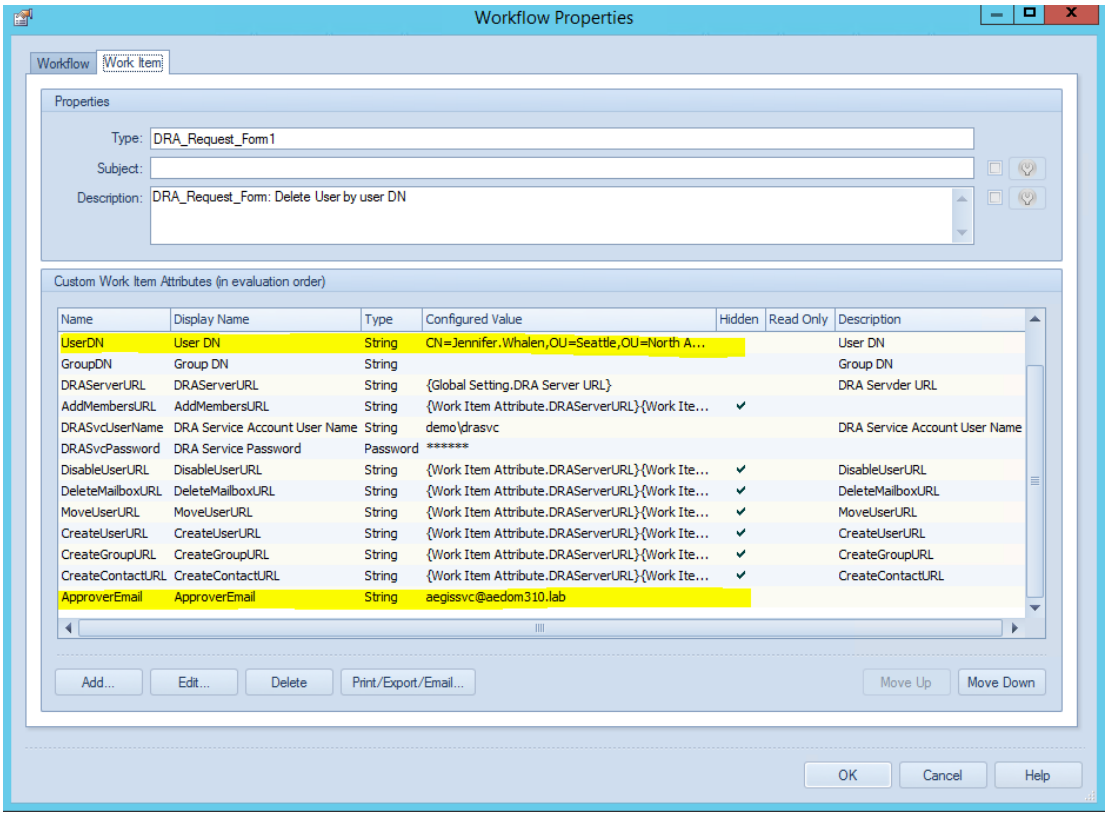


Custom Form Workflow to delete a user

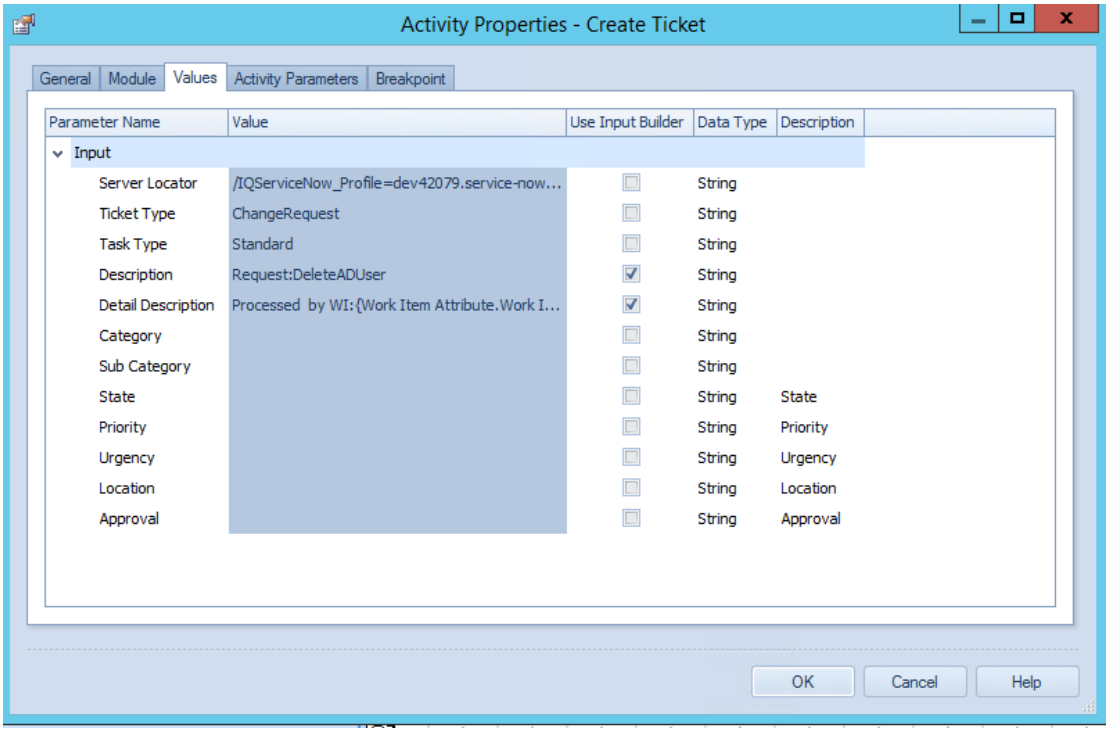
A DRA Custom Form launch the workflow "Delete User by DN" to delete a user. The user DN is supplied by setting workflow customer workitem attribute User DN. Approver's email is also read from the work



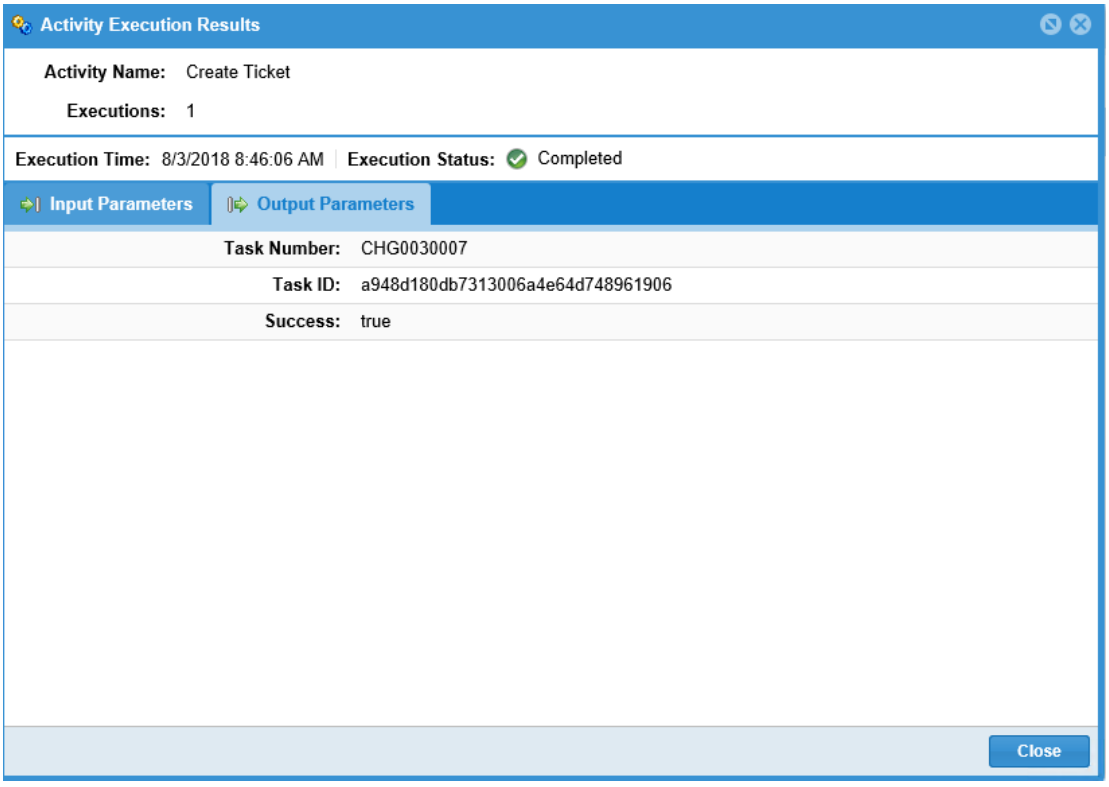
Workitem Attributes used:

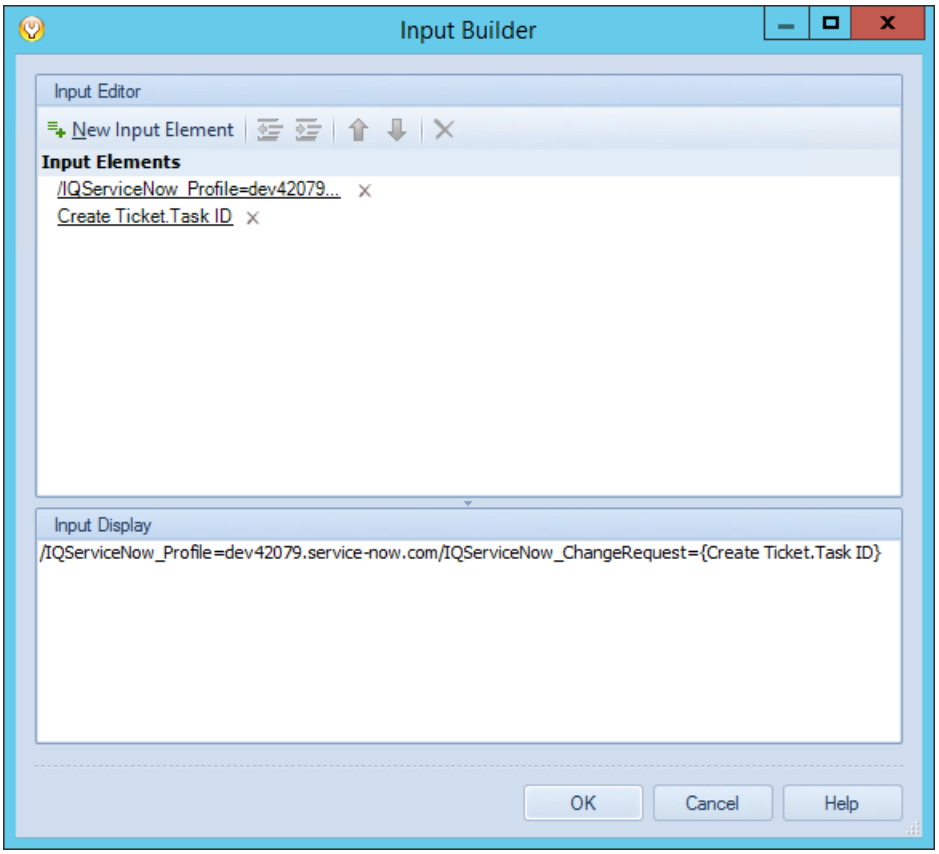


Create a new ServiceNow ChangeRequest ticket:



When the workflow finishes, the Task ID is returned and can be used to update ticket activity.




Input Builder
Input Editor
New Input Element
Input Elements
/IQServiceNow_Profile=dev42079...
Create Ticket.Task ID
Input Display
/IQServiceNow_Profile=dev42079.service-now.com/IQServiceNow_ChangeRequest={Create Ticket.Task ID}
OK
Cancel
Help

Lab Data Setup

User information is stored in HumanResources database. The database can be populated by the attached SQL script.

- CreateDB.sql
- CreateTables.sql
- LoadData.sql
- CreateSprocs.sql

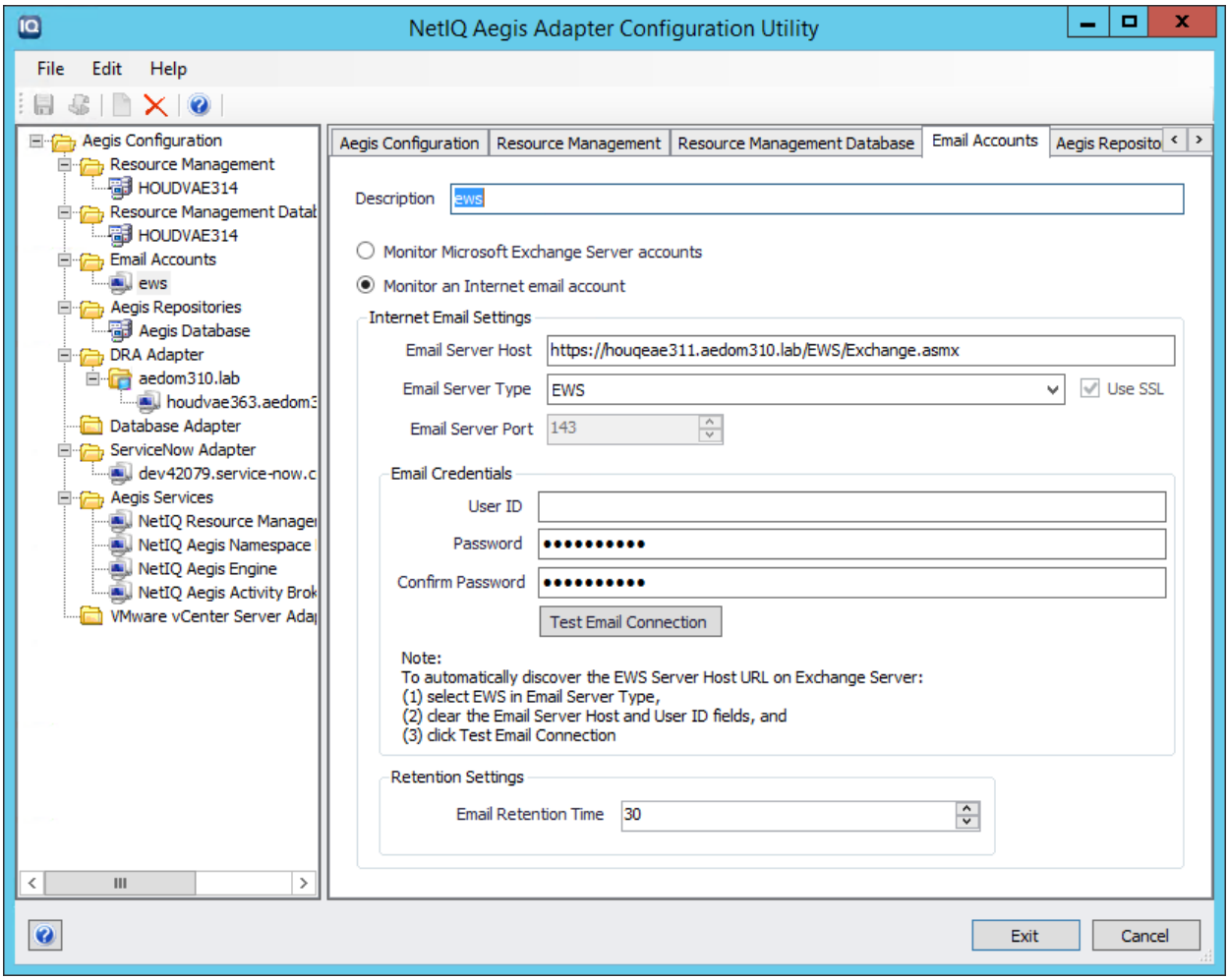
HumanResources Database

dbo.GetAllEmployeesAsJson() return all the employees as User JSON payload which can be used to call DRA Rest create user API.

{"user":{"container":"OU=Seattle,OU=North America,OU=Keystone Steel,DC=ks,DC=lab","name":"Jennifer.Whalen","firstName":"Jennifer","lastName":"Whalen","createEmail":true,"emailAddress":"jennifer.whalen@aedom310.lab","department":"Administration","streetAddress":"2004 Charade Rd","city":"Seattle","state":"Washington","country":"US","postalCode":"98199","telephoneNumber":"515.123.4444"}}
{"user":{"container":"OU=Toronto,OU=North America,OU=Keystone Steel,DC=ks,DC=lab","name":"Michael.Hartstein","firstName":"Michael","lastName":"Hartstein","createEmail":true,"emailAddress":" michael.hartstein@aedom310.lab","department":"Marketing","streetAddress":"147 Spadina Ave","city":"Toronto","state":"Ontario","country":"CA","postalCode":"M5V 2L7","telephoneNumber":"515.123.5555"}}
{"user":{"container":"OU=Toronto,OU=North America,OU=Keystone Steel,DC=ks,DC=lab","name":"Pat.Fay","firstName":"Pat","lastName":"Fay","createEmail":true,"emailAddress":"pat.fay@aedom310.lab","department":"Marketing","streetAddress":"147 Spadina Ave","city":"Toronto","state":"Ontario","country":"CA","postalCode":"M5V 2L7","telephoneNumber":"603.123.6666"}}
{"user":{"container":"OU=Seattle,OU=North America,OU=Keystone Steel,DC=ks,DC=lab","name":"Den.Raphaely","firstName":"Den","lastName":"Raphaely","createEmail":true,"emailAddress":"den.ra phaely@aedom310.lab","department":"Purchasing","streetAddress":"2004 Charade Rd","city":"Seattle","state":"Washington","country":"US","postalCode":"98199","telephoneNumber":"515.127.4561"}}

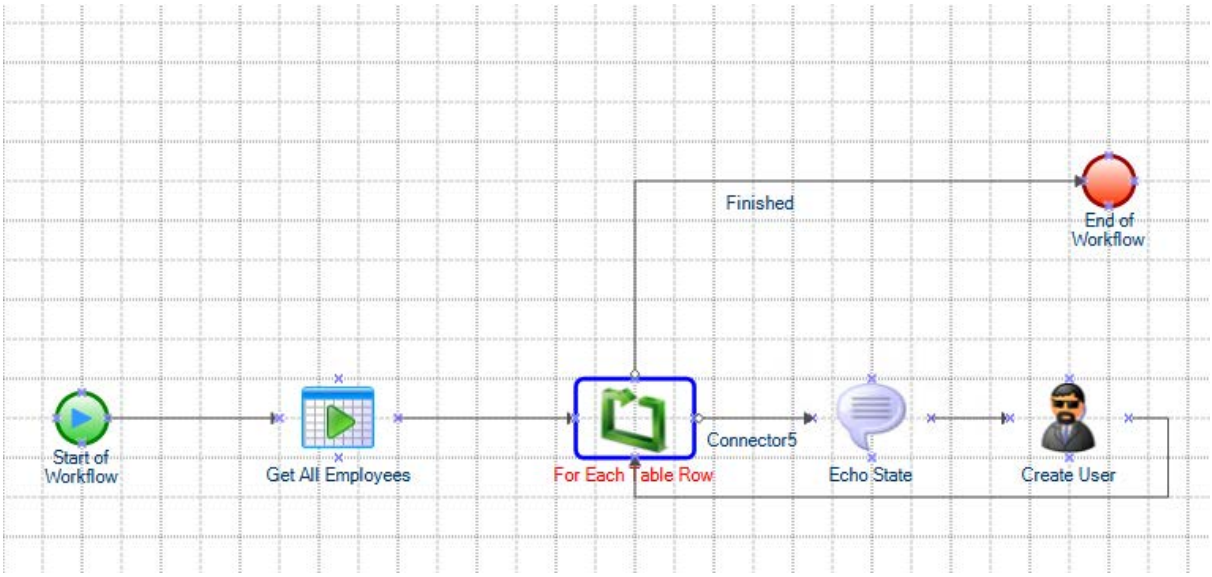
IQMail setup

If Email Server Host is blank, Select Email Server Type to EWS, Test Email Connection will autodiscover the exchange server URL. If user ID and password word is left blank, Aegis server account is gong to be used to connect to the exchange server.

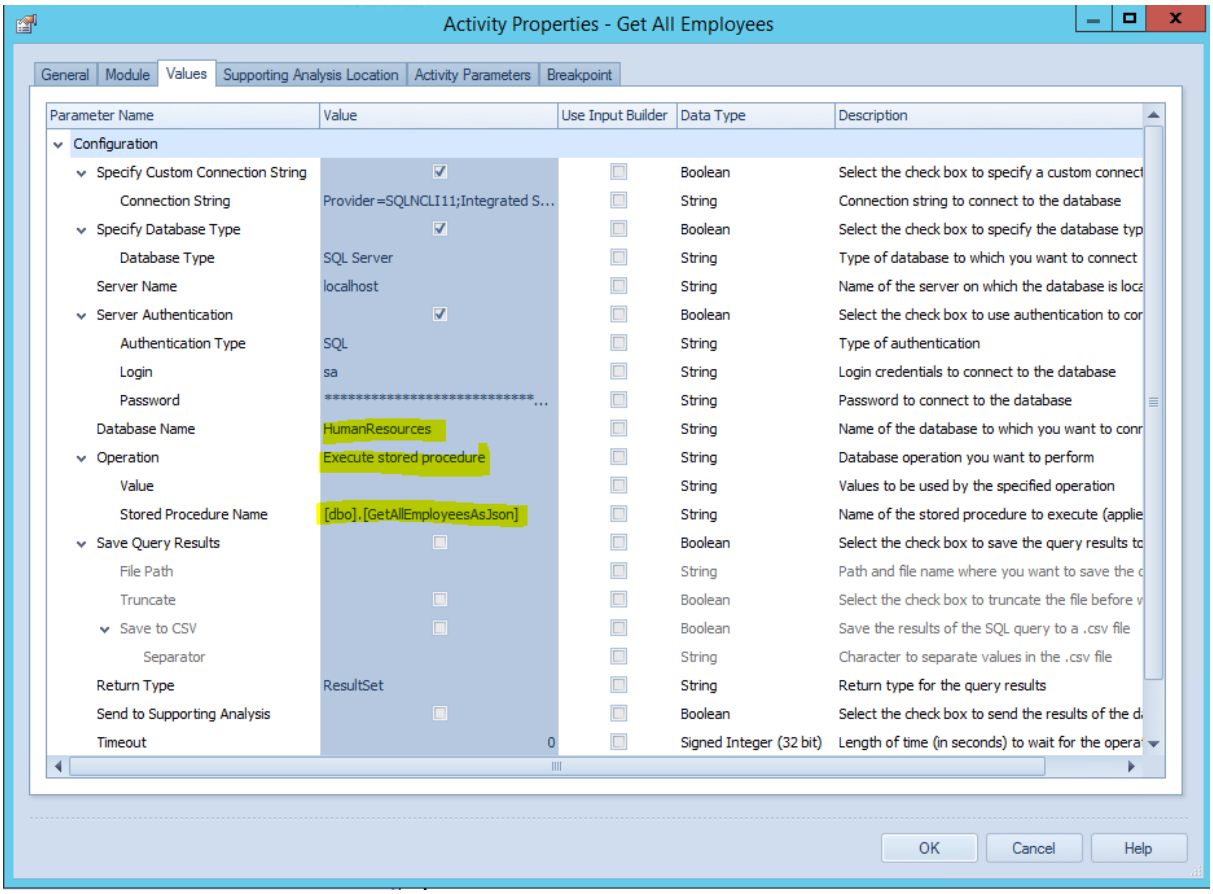

NetIQ Aegis Adapter Configuration Utility
File
Edit
Help
Aegis Configuration
Resource Management
HOUDVAE314
Resource Management Datal
HOUDVAE314
Email Accounts
ews
Aegis Repositories
Aegis Database
DRA Adapter
aedom310.lab
houdvae363.aedom3
Database Adapter
ServiceNow Adapter
dev42079.service-now.c
Aegis Services
NetIQ Resource Manage
NetIQ Aegis Namespace
NetIQ Aegis Engine
NetIQ Aegis Activity Brok
VMware vCenter Server Ada
Aegis Configuration
Resource Management
Resource Management Database
Email Accounts
Aegis Reposito
Description
ews
Monitor Microsoft Exchange Server accounts
Monitor an Internet email account
Internet Email Settings
Email Server Host
https://houqeae311.aedom310.lab/EWS/Exchange.asmx
Email Server Type
EWS
Use SSL
Email Server Port
143
Email Credentials
User ID
Password
Confirm Password
Test Email Connection
Note:
To automatically discover the EWS Server Host URL on Exchange Server:
(1) select EWS in Email Server Type,
(2) clear the Email Server Host and User ID fields, and
(3) click Test Email Connection
Retention Settings
Email Retention Time
30
Exit
Cancel

Load HR DB to DRA

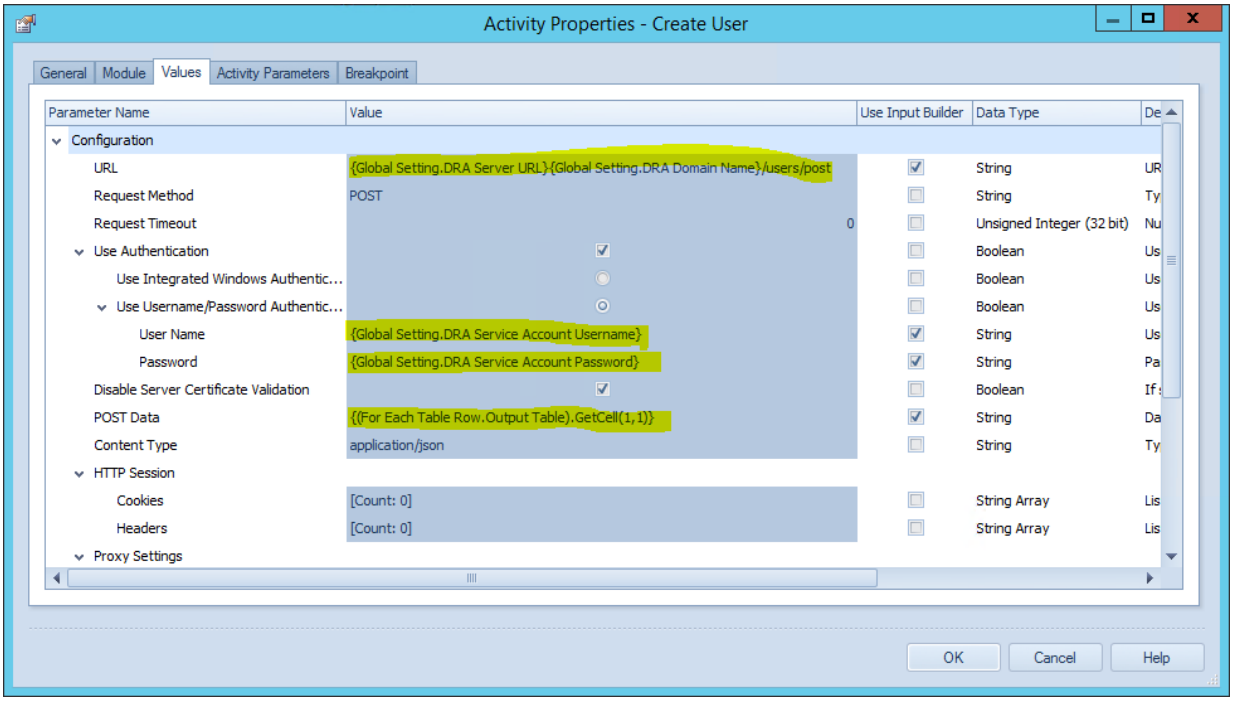
The workflow calls HumandResources sproc dbo.GetAllEmployeesAsJson to query all users information and returns json format.



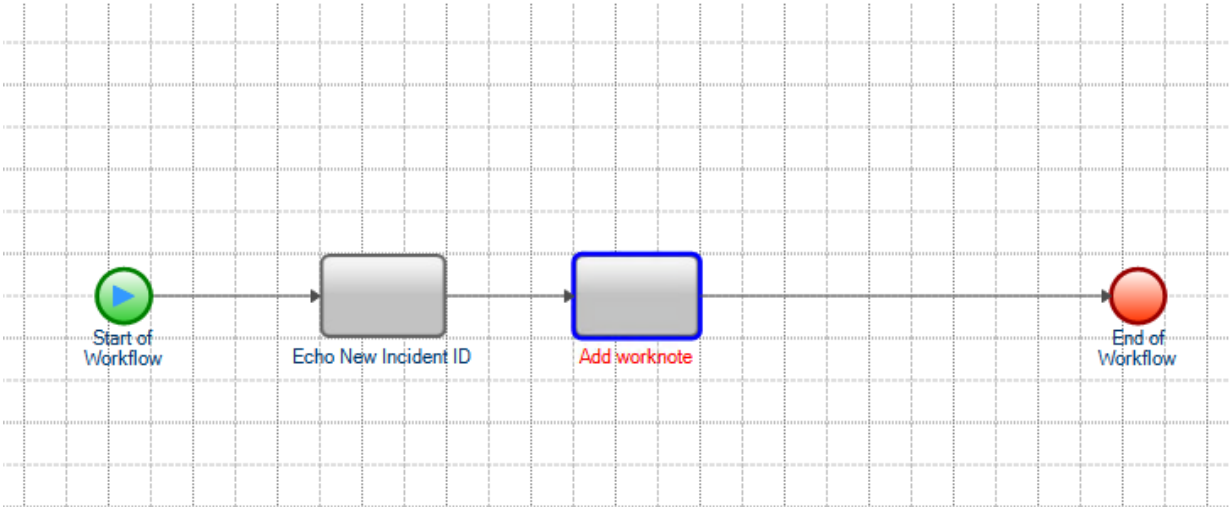
Get All Employees:



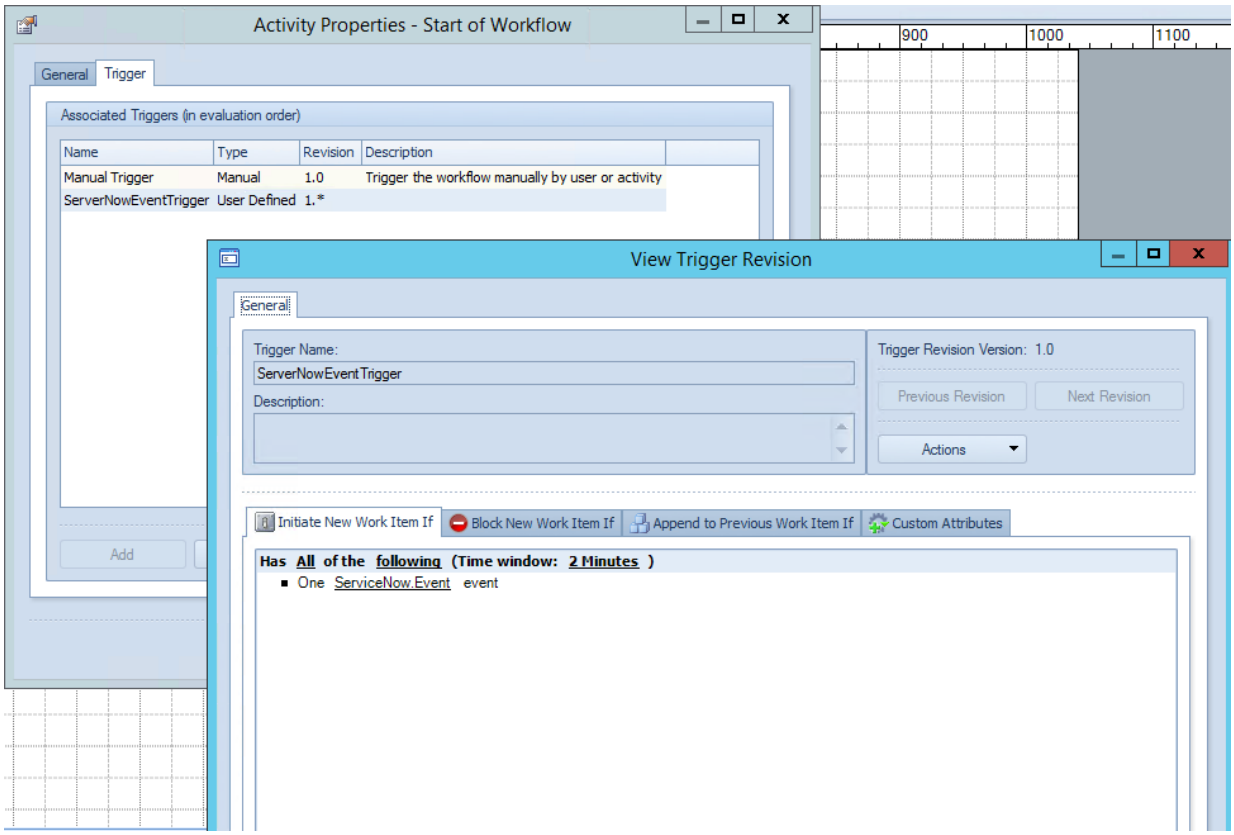
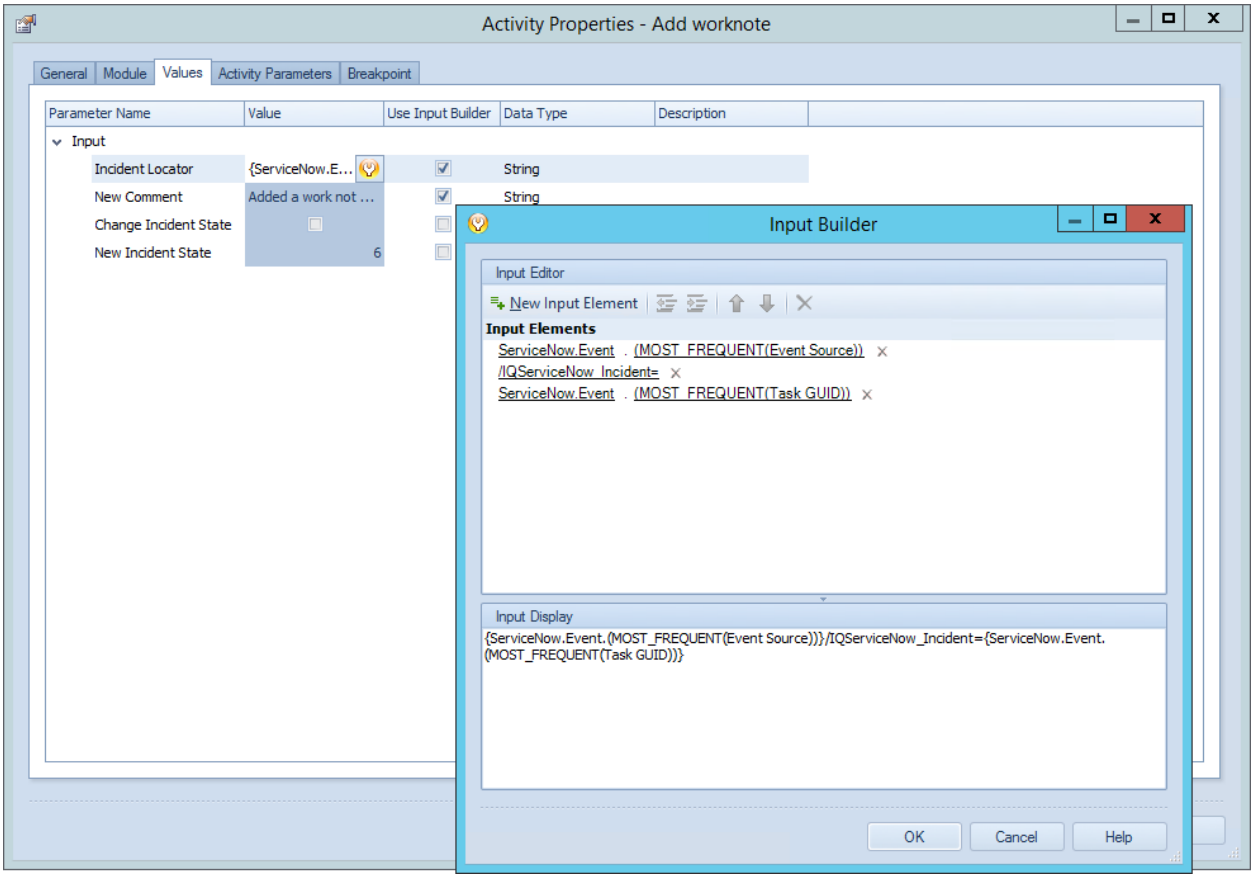
Create User:


Activity Properties - Create User
General
Module
Values
Activity Parameters
Breakpoint
Parameter Name
Value
Use Input Builder
Data Type
Configuration
URL
{Global Setting.DRA Server URL}:{Global Setting.DRA Domain Name}/users/post
String
Request Method
POST
String
Request Timeout
0
Unsigned Integer (32 bit)
Use Authentication
Boolean
Use Integrated Windows Authentic...
Boolean
Use Username/Password Authentic...
Boolean
User Name
{Global Setting.DRA Service Account Username}
String
Password
{Global Setting.DRA Service Account Password}
String
Disable Server Certificate Validation
Boolean
POST Data
{(For Each Table Row.Output Table).GetCell(1,1)}
String
Content Type
application/json
String
HTTP Session
Cookies
[Count: 0]
String Array
Headers
[Count: 0]
String Array
Proxy Settings
OK
Cancel
Help

ServiceNow Event Trigger



Trigger:



How to get event locator: