Oracle® Fusion Middleware

Administering Oracle Identity Role Intelligence

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Preface

Administering Oracle Identity Role Intelligence describes how to install Oracle Identity Role Intelligence, configure.and run data load, create and run role mining tasks, review candidate role analytics, and publish the roles to the target system.

Audience

This guide is intended for the following personas:

- IT administrators responsible for installing and configuring Oracle Identity Role Intelligence.
- Application administrators or application owners who define schemas, operations, and processes, and are responsible for loading entity data from Oracle Identity Governance to Oracle Identity Role Intelligence database.
- Role engineers who perform role mining in Oracle Identity Role Intelligence.

In addition, a user with any role can refer to this guide for an introduction and conceptual information about Oracle Identity Role Intelligence.

Documentation Accessibility

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Related Documents

For more information, refer to the following documents:

- *Help Topics for Oracle Identity Role Intelligence*
- *REST API Reference for Oracle Identity Role Intelligence*
- *Performing Self Service Tasks with Oracle Identity Governance*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Overview of Oracle Identity Role Intelligence

Oracle Identity Role Intelligence is an intelligent, automated, and flexible way to optimize role-based access control (RBAC).

This chapter describes the capabilities of Oracle Identity Role Intelligence (OIRI) in the following topics:

1.1 About Oracle Identity Role Intelligence

Role-Based Access Control (RBAC) faces the following challenges:

- Building roles as a manual process is time-consuming. Entitlement data is difficult and complex for humans to analyze and interpret.
- Entitlements accumulate over time. Users and applications data change constantly.
- Roles are difficult to maintain and change to align with business activities, such as reorganization, merge, acquisition, and so on.
- Lack of tooling to provide what if analysis before organizations adopt roles for various business units.

These challenges are addressed by the new Oracle Identity Role Intelligence (OIRI) microservice. This is a containerized microservice and is an extension to Oracle Identity Governance (OIG). You can deploy the microservice on-premises or on the Cloud. It can be deployed on Kubernetes containers for your on-premises landscape.

> **Note:**
>
> This document refers to Oracle Identity Role Intelligence as OIRI and Oracle Identity Governance as OIG.

The solution components of OIRI are:

- **Data ingress:** Supports data import to OIRI from OIG database or flat files in full and incremental modes
- **Data modelling:** The data model allows you to define role mining tasks based on a combination of user, application, and entitlement attributes.
- **Predictive analytics:** OIRI uses Oracle Database's KMean clustering and unsupervised Machine Learning (ML) algorithms. The regression model groups the user data based on the common entitlement attributes, and predicts the relevant and matching candidate roles.

- **Assistant:** Compares candidate roles with the existing roles in the system. You can publish the candidate roles to your system to avoid duplication or explosion of roles.
- **Data egress:** Provides automation to publish the candidate roles to Oracle Identity Governance and triggers the workflow approval.

OIRI Capabilities

The key capabilities of OIRI include:

- Discovery of entitlements patterns across peer groups
- Support for top-down approach for role mining based on user attributes, or for bottom-up approach that filters data based on applications and entitlements, or a hybrid approach
- Compare candidate roles with existing role to avoid role explosion
- Ability to fine tune the candidate roles based on user affinity and role affinity
- Automated publishing of roles to OIG to trigger workflow for role adoption
- Ability to merge data from different sources, such as OIG database and flat files, and provide what if analysis before moving candidate roles to production

Business Benefits

The business benefits of using OIRI are:

- OIRI automates role discovery and provisioning to eliminate the error-prone and manual process of creating roles.
- It optimizes existing RBAC.
- It provides what if analysis that is useful for merge, acquisitions, or new application onboarding.

1.2 About Role Mining

The role mining process discovers relationships between users based on similar access permissions that can logically be grouped to form a role. Role engineers can specify the applications and attributes that will return the best mining results. Role mining is also called *role discovery*.

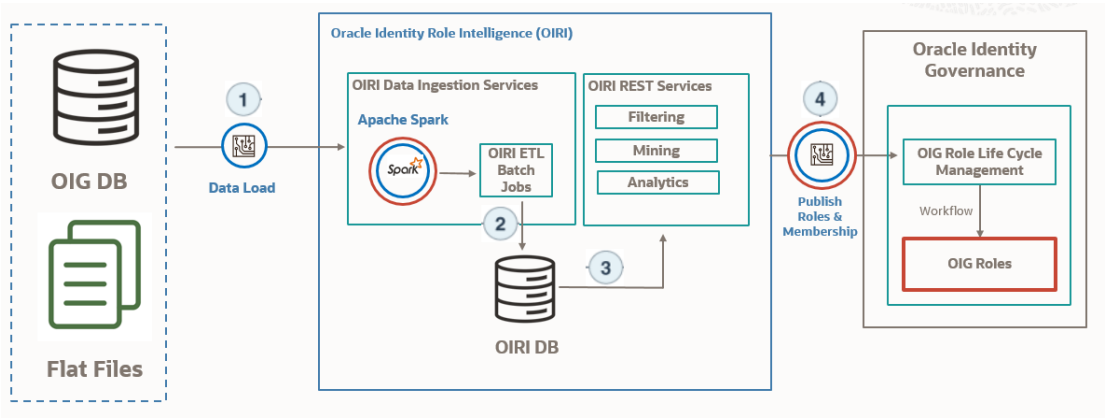
Role mining with OIG allows creation of role mining tasks by using data extracted from OIG with OIRI data import (or data ingestion) service. OIG data contains user, role, application, and entitlement information. A role mining task discovers the relationship between users and entitlements in OIG data filtered by user and application attribute values. These entitlements are then clustered into candidate roles. The role engineer can refine candidate roles by adjusting user-role affinity and role-entitlement affinity, and perform in-depth analysis based on OIRI role mining analytics. When satisfied, candidate roles can be published to OIG, approved, and adopted with RBAC.

Role mining with flat files allow creation of a role mining task by using flat files as the data source. This enables offline identity role mining and provides flexibility for user to discover roles outside of OIG without connecting to a live system. A role mining task discovers roles based on users, applications, and entitlements loaded with flat file. Candidate roles can then be refined and published to OIG.

1.3 Optimizing RBAC Using Role Mining

Figure 1-1 depicts a scenario for optimizing RBAC from multiple systems by using the role mining capability of OIRI.

Figure 1-1 RBAC Optimization from Multiple Systems



Here, the steps in the role mining process are:

1. Entity data is imported to OIRI database from OIG database or flat files. The process of importing data to OIRI is referred to as data import or data ingestion.
2. The role mining system filters the data based on user, application, and entitlement attributes, runs the role mining tasks to discover candidate roles.
3. OIRI provides the analytics of the candidate roles, and enables you to review and adjust the candidate roles by providing role similarity data and comparing with existing roles.
4. The candidate roles and role memberships are published to OIG, and workflow for approval is triggered.

2

Installing and Configuring Oracle Identity Role Intelligence

Installing and configuring Oracle Identity Role Intelligence involves setting up the configuration files, creating the wallet, installing the Helm chart, and starting the data load process.

This section contains the following topics:

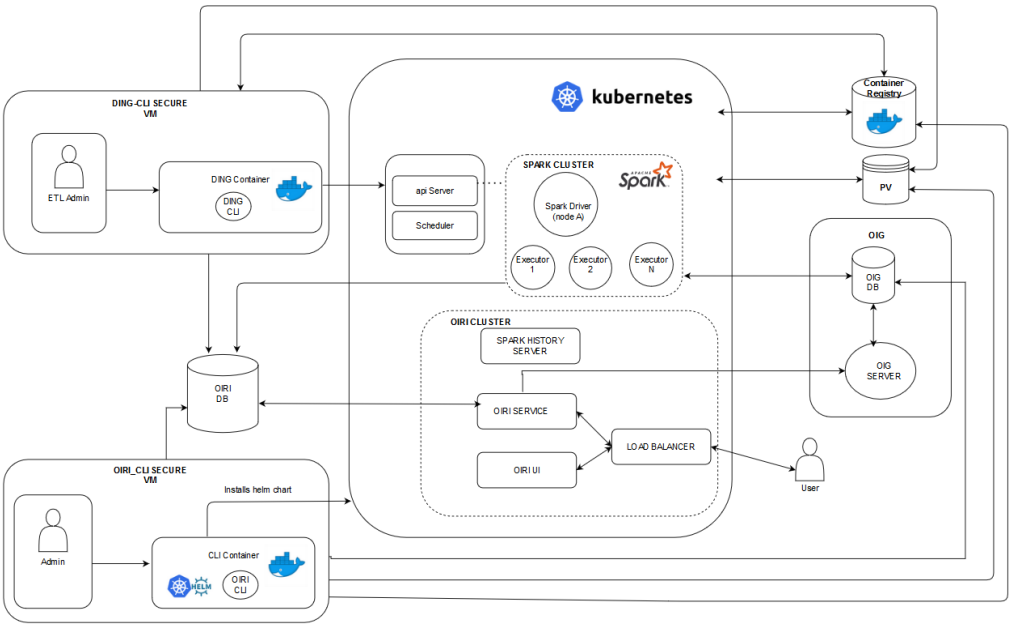
2.1 About OIRI on Kubernetes

OIRI uses Kubernetes as the Container Orchestration System.

OIRI uses Helm as the package manager for Kubernetes, which is used to install and upgrade OIRI on Kubernetes.

Figure 2-1 shows the deployment architecture of OIRI.

Figure 2-1 Deployment Architecture



OIRI deployment includes the following components:

- **Oracle Identity Governance (OIG):** This represents an already existing OIG setup. OIG is a prerequisite for setting up OIRI, and acts as an Identity Provider (IDP) for OIRI. As a result, any user logging in to OIRI is authenticated against OIG, which can also be used to load or import data for role mining into OIRI. Access to OIG database is required to import data into OIRI. Data is imported into OIRI through the Data Ingestion Command Line Interface (`ding-cli`) component.
- **OIRI Command Line Interface (`oiri-cli`):** This component is used to configure and install OIRI. This CLI is run as a pod inside the Kubernetes cluster. All the configuration scripts and Helm chart exists inside this pod. Command-line utilities, such as kubectl and helm is also available from inside the container. This CLI is also used to create the wallet and keystore. The wallet is used to securely store the credentials of the OIRI databse, OIG database, KeyStore, and OIG service account. KeyStore contains the Secure Sockets Layer (SSL) and token signing certificates. This VM should also have connectivity to the OIRI and OIG databases.
- **OIRI Cluster:** The OIRI Service, OIRI UI, Spark History Server, and front-end loadbalancer are installed as part of the Helm chart installation from the `oiri-cli` container. Spark History Server is not exposed outside the Kubernetes cluster and can be accessed by using kubectl port-formward. See Installing the OIRI Helm Chart. OIRI Service has connectivity with OIG to authenticate the user logging in to OIRI UI. This is also used to publish the mined roles back to OIG.
- **Data Ingestion Command Line Interface (`ding-cli`):** This is a secure VM to be used by the ETL Admin to carry out the data import process. This VM should have the connectivity and access to the Kubernetes cluster to trigger the data import jobs. The data import jobs are run inside a Spark cluster. This VM should have the connectivity with the OIRI and OIG databases.

- **Spark Cluster:** This is an ephemeral Spark cluster. When a request for data import job is triggered from the `ding-cli`, the Kubernetes scheduler spins a driver and executor pod(s). When the data import job is completed, the executor pods are terminated, and the driver pod state is changed from `Running` to `Completed`. This Spark cluster should have the connectivity with the OIRI and OIG databases.
- **Persistent Volume (PV):** This is a persistent volume mounted on the Network File System (NFS) server. This is used to store all the configuration files and data that needs to be persisted, such as logs. All the components should have access to the PV.
- **Container Registry:** This is the Docker registry, from which the required Docker images are pulled. Optionally, you can also use the .tar files for the images and load the images manually on all the VMs and Kubernetes nodes.

2.2 Prerequisites for Installing OIRI

The prerequisites for installing OIRI on Kubernetes are:

- Oracle Database version starting from 12c Release 2 (12.2.0.1), on-premises or container-based, is installed and running. Oracle Database versions 18.3 and 19.3 are also supported.

  > **Note:**
  >
  > if you have upgraded the OIRI database from 12.1.x to 12.2.x, 18c, or 19c, you should update the database parameter `compatible` to a value of '12.2' or higher. If this is not done, you will see `ORA-00972: identifier is too long` errors when creating some OIRI database objects.

- Oracle Identity Governance 12c (12.2.1.4.0) is installed and Oracle Identity Governance Bundle Patch 12.2.1.4.210428 is applied.
- Docker version 19.03.11+ and Kubernetes Cluster (v1.17+) with `kubectl` is installed. See Kubernetes documentation for information about installing Kubernetes cluster.
- Network File System (NFS) is available. NFS is used to create persistent volumes for using across nodes.
- Create a user in Oracle Identity Governance (OIG) to log in to OIRI. See Creating a User in *Performing Self Service Tasks with Oracle Identity Governance*.
- Authentication configuration is completed to authenticate users from OIG. See Configuring Authentication With Oracle Identity Governance for information about configuring authentication with OIG.
- The Identity Audit feature is enabled in OIG. See Enabling Identity Audit in *Performing Self Service Tasks with Oracle Identity Governance* for information about enabling Identity Audit in OIG.

2.3 System Requirements and Certification

Ensure that your environment meets the system requirements such as hardware and software, minimum disk space, memory, required system libraries, packages, or patches before performing any installation.

The minimum system requirements for installing OIRI is:

- For installing OIRI on a standalone host:
  - 16 GB of RAM
  - Disk space of 50 GB
  - 2 CPU
- For installing OIRI on a kubernetes cluster:
  - Number of nodes : 3
  - 16 GB of RAM per node
  - 2 CPU per node (with virtualization support, for example Intel VT)
  - Disk space of 150 GB

The certification document covers supported installation types, platforms, operating systems, databases, JDKs, and third-party products:

http://www.oracle.com/technetwork/middleware/ias/downloads/fusion-certification-100350.html

2.4 Configuring Authentication With Oracle Identity Governance

Oracle Identity Governance (OIG) manages the OIRI user and user access to the OIRI application.

To configure authentication to OIRI with OIG:

1. Create the user, for example `janedoe`, to login to OIRI.
2. Create the OIRI role engineer role in OIG. To do so, create a role `OrclOIRIRoleEngineer`, and assign it to the application user, such as `janedoe`. Only the user with role `OrclOIRIRoleEngineer` can login to the OIRI application. See Creating Roles in *Performing Self Service Tasks with Oracle Identity Governance*.
3. Create a user, for example `OIRIServiceAccountUser`, in OIG to use as service principal in OIRI for the purpose of back channel authentication and role publishing task. This is to serve the following purposes:
   - On startup, OIRI service authenticates with OIG by using the service account user, such as `OIRIServiceAccountUser`.
   - OIRI application uses the service account to authenticate the application user with OIG during the application user login. For authenticating the application user, such as `janedoe`, with OIG, the Service account user, such as `OIRIServiceAccountUser`, must have an admin role with User - View/Search capabilities. This is required as the service account user has to search the application user in OIG for authenticating the user.
   - OIRI uses the service account user to publish roles to OIG. For publishing roles to OIG, the service account user, such as `OIRIServiceAccountUser`, must have an admin role with the following capabilities:
     - User - View / Search

- Role - Create
- Access Policy - Create

See Creating an Admin Role in *Performing Self Service Tasks with Oracle Identity Governance* for information about creating an admin role in OIG.

> **Note:**
>
> - The role with the above capabilities must have Scope of Control and Organization as Top. It is required for creating access policies as the provisioned applications might belong to different organizations.
> - The OIRI service account password in OIG expires per the password policy. To update the service account password in OIRI wallet when the OIRI service account password is updated in OIG, perform step 2 of Verifying and Updating the Wallet by using OIGSA mode. After the service account password is updated in the OIRI wallet, restart the OIRI service before publishing roles to OIG.

2.5 Loading the Container Images

The OIRI service comprises of four container images as follows:

- `oiri`: OIRI service
- `oiri-cli`: OIRI command line interface
- `oiri-ding`: For data import
- `oiri-ui`: Identity Role Intelligence user interface

You can load the images by referring to the following:

- Using the Container Images from the Container Registry

2.5.1 Using the Container Images from the Container Registry

You can download the container images from the OIRI repository, which is available inside `middleware/` at `container-registry.oracle.com`.

To pull the image:

1. From your container environment, log in to the Oracle Container Registry, and enter your Oracle SSO username and password when prompted:

   ```
   $ docker|podman login container-registry.oracle.com
   ```

   Prompt:

   ```
   Username: <USERNAME>
       Password: <PASSWORD>
   ```

2. Pull the `oiri-cli` image by running the following command:

   ```
   $ docker|podman pull container-registry.oracle.com/middleware/oiri-cli:latest
   ```

> **Note:**
>
> to download that latest patchset you should pull the latest CPU by running the following command:
>
> ```
> $ docker|podman pull container-registry.oracle.com/middleware/oiri-cli_cpu:<TAG>
> $ docker|podman pull container-registry.oracle.com/middleware/oiri-ding_cpu:<TAG>
> $ docker|podman pull container-registry.oracle.com/middleware/oiri-ui_cpu:<TAG>
> $ docker|podman pull container-registry.oracle.com/middleware/oiri_cpu:<TAG>
> ```
>
> For example:
>
> ```
> $ docker|podman pull container-registry.oracle.com/middleware/oiri-cli_cpu:12.2.1.4.230310
> $ docker|podman pull container-registry.oracle.com/middleware/oiri-ding_cpu:12.2.1.4.230310
> $ docker|podman pull container-registry.oracle.com/middleware/oiri-ui_cpu:12.2.1.4.230310
> $ docker|podman pull container-registry.oracle.com/middleware/oiri_cpu:12.2.1.4.230310
> ```

Continue with the steps to install and configure OIRI, as described in Setting Up the Configuration Files.

2.6 Setting Up the Configuration Files

To set up the files required for configuring data import (or data ingestion) and Helm chart:

1. Create the following directories on NFS:

   The Kubernetes Cluster Administrator performs the following steps:

   ```
   $ mkdir <OIRI_SHARE>
   $ mkdir <OIRI_DING_SHARE>
   $ mkdir <OIRI_WORK_SHARE>
   ```

   For example:

   ```
   $ mkdir /nfs/oiri
   $ mkdir /nfs/ding
   $ mkdir /nfs/k8s
   ```

> **Note:**
>
> Create the directories as your OIRI user rather than `root`. If you create as `root` you will experience permissions errors when running `setupConfFiles.sh`.

2. Ensure write permissions on the directories created on step 1 by running the following commands:

   The Kubernetes Cluster Administrator performs the following steps:

   ```
   $ chmod -R 777 /nfs/ding /nfs/oiri /nfs/k8s
   ```

3. Setup Kube config. To do so:

   The Kubernetes Cluster Administrator performs the following steps:

   a. Create namespaces for OIRI and DING.

      ```
      $ kubectl create namespace oirins
      namespace/oirins created
      $ kubectl create namespace dingns
      namespace/dingns created
      ```

   b. Create `oiri-service-account.yaml` with the following content. Replace <OIRINS> with the OIRI namespace, and <DINGNS> with the DING namespace.

      ```
      apiVersion: v1
      kind: ServiceAccount
      metadata:
        name: oiri-service-account
      namespace: <OIRINS>
      ---apiVersion: v1
      kind: Secret
      type: kubernetes.io/service-account-token
      metadata:
        name: oiri-service-account-secret
        namespace: oiri
        annotations:
          kubernetes.io/service-account.name: "oiri-service-account"
      ---apiVersion: rbac.authorization.k8s.io/v1
      kind: Role
      metadata:
        name: oiri-ns-role
        namespace: <OIRINS>
      rules:
      - apiGroups: ["*"]
        resources: ["*"]
        verbs: ["*"]
      ---apiVersion: rbac.authorization.k8s.io/v1
      kind: Role
      metadata:
        name: ding-ns-role
        namespace: <DINGNS>
      rules:
      - apiGroups: ["*"]
        resources: ["*"]
        verbs: ["*"]
      ---kind: ClusterRole
      apiVersion: rbac.authorization.k8s.io/v1
      metadata:
        name: oiri-ingress-nginx-clusterrole
      rules:
      - apiGroups: [""]
        resources: ["configmaps", "endpoints", "nodes", "pods", "secrets"]
        verbs: ["watch", "list"]
      - apiGroups: [""]
        resourceNames: ["<OIRINS>"]
        resources: ["namespaces"]
      ```

```
  verbs: ["get"]
- apiGroups: [""]
  resources: ["nodes"]
  verbs: ["get"]
- apiGroups: [""]
  resources: ["services"]
  verbs: ["get", "list", "watch"]
- apiGroups: [""]
  resources: ["events"]
  verbs: ["create", "patch"]
- apiGroups: ["extensions"]
  resources: ["ingresses"]
  verbs: ["get", "list", "watch"]
- apiGroups: ["extensions"]
  resources: ["ingresses/status"]
  verbs: ["update"]
- apiGroups: ["networking.k8s.io"]
  resources: ["ingresses/status"]
  verbs: ["update"]
- apiGroups: ["networking.k8s.io"]
  resources: ["ingresses", "ingressclasses"]
  verbs: ["create", "delete", get", "list", "watch"]
---apiVersion: rbac.authorization.k8s.io/v1
kind: ClusterRoleBinding
metadata:
  name: oiri-ingress-nginx-clusterrolebinding-<OIRINS>
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: ClusterRole
  name: oiri-ingress-nginx-clusterrole
subjects:
- namespace: <OIRINS>
  kind: ServiceAccount
  name: oiri-service-account
---apiVersion: rbac.authorization.k8s.io/v1
kind: ClusterRoleBinding
metadata:
  name: oiri-clusterrolebinding-<OIRINS>
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: ClusterRole
  name: system:persistent-volume-provisioner
subjects:
- namespace: <OIRINS>
  kind: ServiceAccount
  name: oiri-service-account
---apiVersion: rbac.authorization.k8s.io/v1
kind: RoleBinding
metadata:
  name: oiri-rolebinding
  namespace: <OIRINS>
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: Role
  name: oiri-ns-role
subjects:
- namespace: <OIRINS>
  kind: ServiceAccount
  name: oiri-service-account
---apiVersion: rbac.authorization.k8s.io/v1
kind: RoleBinding
```

```
metadata:
  name: ding-rolebinding
  namespace: <DINGNS>
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: Role
  name: ding-ns-role
subjects:
- namespace: <OIRINS>
  kind: ServiceAccount
  name: oiri-service-account
```

c. Run the following `kubectl` commands. Replace <OIRINS> with the OIRI namespace where appropriate.

```
$ kubectl apply -f oiri-service-account.yaml
$ TOKEN=`kubectl -n oiri get secret oiri-service-account-secret -o
jsonpath='{.data.token}'| base64 --decode`
$ kubectl -n oiri get secret oiri-service-account-secret -o
jsonpath='{.data.ca\.crt}'| base64 --decode > ca.crt
$ K8SURL=`grep server: $KUBECONFIG | sed 's/server://;s/ //g'`
```

> **Note:**
>
> The command to get K8SURL works only if you have a single cluster configured. Please make sure that the URL returned is the one where you want to install OIRI.

d. Share the `ca.crt` and `TOKEN` to the OIRI Installation Administrator by copying the `ca.crt` to the Kubernetes directory, and listing the `TOKEN` created in step 5.c

```
$ cp ca.crt /nfs/k8s
```

4. Configure and start the OIRI CLI

   The OIRI Installation Administrator performs the following steps:

   a. The OIRI Installation Administrator sets up environment variables for the OIRI namespace, and a working directory.

```
OIRINS=oiri
WORKDIR=/work/oiri/
TOKEN=<Token Shared by the Kubernetes Cluster Admin>
K8SURL=<Kubernetes API Server URL shared by the Kubernetes Cluster Admin>
$ kubectl config --kubeconfig=$WORKDIR/oiri_config set-cluster oiri-cluster --
server=$K8SURL --certificate-authority=$WORKDIR/ca.crt --embed-certs=true
$ kubectl config --kubeconfig=$WORKDIR/oiri_config set-credentials oiri-
service-account --token=$TOKEN
$ kubectl config --kubeconfig=$WORKDIR/oiri_config set-context oiri --
user=oiri-service-account --cluster=oiri-cluster
$ kubectl config --kubeconfig=$WORKDIR/oiri_config use-context oiri
```

   These commands generate a file called `oiri_config` in the `<WORKDIR>` location. This file contains the Kubernetes cluster details.

   b. The OIRI Installation Administrator creates a container-registry secret.
   If you are using a container registry and want to pull the container images on demand, you must create a secret that contains the login details of the container registry. This step is not required if you have staged the container images locally.

   To create a container registry secret, use the following command.

```
$ kubectl create secret -n <NAMESPACE> docker-registry regcred --docker-
server=<REGISTRY_ADDRESS> --docker-username=<USERNAME> --docker-
password=<PASSWORD>
```

where:

- `NAMESPACE` is OIRI/DING namespace.
- `REGISTRY_ADDRESS` is the location of the registry. For example: `container-registry.oracle.com`.
- `USERNAME` is the name of the user using which you log in to the registry.
- `PASSWORD` is the registry user password.

For example:

```
$ kubectl create secret \
-n oiri docker-registry regcred \
--docker-server=container-registry.oracle.com \
--docker-username=myemail@email.com \
--docker-password=<password>

$ kubectl create secret \
-n ding docker-registry regcred \
--docker-server=container-registry.oracle.com \
--docker-username=myemail@email.com \
--docker-password=<password>
```

c. Create a file called `oiri-cli.yaml` with the following content:

```
apiVersion: v1
kind: Pod
metadata:
  name: oiri-cli
  namespace: <OIRINS>
  labels:
    app: oiricli
spec:
  restartPolicy: OnFailure
  volumes:
    - name: oiripv
      nfs:
        server: <PVSERVER>
        path: <OIRI_SHARE>
    - name: dingpv
      nfs:
        server: <PVSERVER>
        path: <OIRI_DING_SHARE>
    - name: workpv
      nfs:
        server: <PVSERVER>
        path: <OIRI_WORK_SHARE>
  containers:
  - name: oiricli
    image: <OIRI_CLI_IMAGE>:<OIRICLI_VER>
    volumeMounts:
      - name: oiripv
        mountPath: /app/oiri
      - name: dingpv
        mountPath: /app
      - name: workpv
        mountPath: /app/k8s
```

```
    command: ["/bin/bash", "-ec", "tail -f /dev/null"]
  imagePullSecrets:
    - name: regcred
```

where:

- `OIRINS` is the name of the namespace you are using to hold the OIRI objects.
- `PVSERVER` is the IP address of the NFS server hosting the persistent volumes.
- `OIRI_SHARE` is the NFS mount location for the OIRI persistent volume.
- `OIRI_DING_SHARE` is the NFS mount location for the OIRI Ding persistent volume.
- `OIRI_WORK_SHARE` is the NFS mount of the OIRI Work persistent volume.
- `OIRI_CLI_IMAGE` is the name of the OIRI CLI image file. If you are using a container registry, the name will be prefixed with the container registry name. For example:

  `container-registry.oracle.com/idm/oiri-cli`

  .
- `OIRICLI_VER` is the version of the image you want to use. For example:

  `12.2.1.4.latest`

  .
- `ImagePullSecrets`

  is required only if you are using a container registry and

  `regcred`

  is the name of the Kubernetes secret you created with the registry credentials stored.

For example:

```
apiVersion: v1
kind: Pod
metadata:
  name: oiri-cli
  namespace: oiri
  labels:
    app: oiricli
spec:
  restartPolicy: OnFailure
  volumes:
    - name: oiripv
    nfs:
      server: 100.69.233.106
      path: /nfs/oiri
    - name: dingpv
    nfs:
      server: 100.69.233.106
      path: /nfs/ding
```

```
    - name: workpv
    nfs:
      server: 100.69.233.106
      path: /nfs/k8s
  containers:
  - name: oiricli
  image: container-registry.oracle.com/idm/oiri-cli:12.2.1.4.02106
  volumeMounts:
    - name: oiripv
      mountPath: /app/oiri
    - name: dingpv
      mountPath: /app
    - name: workpv
      mountPath: /app/k8s
  command: ["/bin/bash", "-ec", "tail -f /dev/null"]
  imagePullSecrets:
    - name: regcred
```

d. Start the Administration CLI pod using the following command.

```
$ kubectl apply -f oiri-cli.yaml
```

> **Note:**
>
> When examples ask you to run a command from within the OIRI-CLI, you should connect to the running pod as described below, and then run the commands as specified.
>
> ```
> $ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
> ```

e. Copy files to the CLI pod.
Copy the `ca.crt` and `oiri_config` files to the OIRI-CLI pod, using the following commands.

```
$ OIRINS=oiri
$ WORKDIR=/work/oiri
$ cp $WORKDIR/ca.crt $OIRINS/oiri-cli:/app/k8s
$ cp $WORKDIR/oiri_config $OIRINS/oiri-cli:/app/k8s/config
```

Connect to the oiri-cli pod and set the file permissions.

```
 $ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
$ chmod 400 /app/k8s/config
```

5. Set up configuration files by running the following command:

a. Connect to the `oiri-cli` pod.

```
$ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
```

b. Setup the configuration files using the following command:

```
[oiri@1234 scripts]$ ./setupConfFiles.sh -m prod \
  --oigdbhost {OIG_DB_HOST} \
  --oigdbport {OIG_DB_PORT} \
  --oigdbsname {OIG_DB_SERVICE_NAME} \
  --oiridbhost {OIRI_DB_HOST} \
  --oiridbport {OIRI_DB_PORT} \
  --oiridbsname {OIRI_DB_SERVICE} \
  --sparkmode {SPARK_MODE} \
```

```
  --dingnamespace {DING_NAMESPACE} \
  --dingimage {DING_IMAGE} \
  --imagepullsecret {IMAGE_PULL_SECRET} \
  --k8scertificatefilename {KUBERNETES_CERTIFICATE_FILE_NAME} \
  --sparkk8smasterurl {KUBERNETES_MASTER_URL} \
  --oigserverurl {OIG_SERVER_URL} \
```

For example:

```
[oiri@1234 scripts]$ ./setupConfFiles.sh -m prod \
  --oigdbhost oigdbhost1.example.com \
  --oigdbport 1234 \
  --oigdbsname oimdb.example.com \
  --oiridbhost OIRI_DB_HOST_IP_ADDRESS \
  --oiridbport 1521 \
  --oiridbsname oiripdb \
  --sparkmode k8s \
  --dingnamespace dingns \
  --dingimage oiri-ding-12.2.1.4:latest \
  --imagepullsecret regcred \
  --k8scertificatefilename ca.crt \
  --sparkk8smasterurl k8s://https://IP_ADDRESS:PORT \
  --oigserverurl http://oigdbhost1.example.com:14000 \
```

> **Note:**
>
> The example of the `./setupConfFiles.sh` command provided in this step is a sample command. For information about more parameters that you can pass with this command, see the following topics:
>
> - Parameters Required for Source Configuration
> - Additional Parameters Required for Data Import
> - Parameters Required for Authentication Configuration

The output is:

```
INFO: OIG DB as source for ETL is true
INFO: Setting up /app/data/conf/config.yaml
INFO: Setting up /app/data/conf/data-ingestion-config.yaml
INFO: Setting up /app/data/conf/custom-attributes.yaml
INFO: Setting up /app/oiri/data/conf/application.yaml
INFO: Setting up /app/oiri/data/conf/authenticationConf.yaml
INFO: Setting up /app/data/conf/dbconfig.yaml
```

> **Note:**
>
> When running the `./setupconfFiles.sh` command with OIRI DBCS setup, specify PDB service name instead of CDB service name for the `--oiridbsname` parameter.

6. Verify that the configuration files have been generated by running the following commands:

Command:

```
[oiri@1234 scripts]$ ls /app/data/conf/
```

Output:

```
config.yaml custom-attributes.yaml data-ingestion-config.yaml dbconfig.yaml
```

Command:

```
[oiri@1234 scripts]$ ls /app/oiri/data/conf
```

Output:

```
application.yaml authenticationConf.yaml
```

7. Optionally, you can run the following command to update the configuration files:

```
$ kubectl exec -n oiri -ti oiri-cli -- /bin/bash

[oiri@1234 scripts]$ ./updateConfig.sh --parameter_name_1
parameter_value_1 ..... --parameter_name_n parameter_value_n
```

For example, if you want to update the OIRI database host to `newhost`, then run the following command:

```
[oiri@1234 scripts]$ ./updateConfig.sh --oiridbhost newhost
```

> **Note:**
>
> - You can run the `./updateConfig -h` command to view all the attributes that you can modify by the `updateConfig` command.
> - See Parameters Required for Source Configuration for information about the parameters required for OIRI database, OIG database, OIG server, and data load source configurations.
> - See Additional Parameters Required for Data Import for information about the additional parameters required for configuring data load.
> - See Parameters Required for Authentication Configuration for information about the parameters required for authenticating a OIG user to OIRI.

8. Set up the `values.yaml` file to be used for Helm chart by running the following command:

> **Note:**
>
> See Helm Chart Configuration Values for information about the parameters required for setting up the `values.yaml` file.

```
$ kubectl exec -n oiri -ti oiri-cli -- /bin/bash

[oiri@1234 scripts]$ ./setupValuesYaml.sh \
   --oiriapiimage {OIRI_API_IMAGE} \
```

```
   --oirinfsserver {OIRI_NFS_SERVER} \
   --oirinfsstoragepath {OIRI_NFS_PATH} \
   --oirinfsstoragecapacity {OIRI_NFS_STORAGE_CAPACITY} \
   --oiriuiimage {OIRI_UI_IMAGE} \
   --dingimage {DING_IMAGE} \
   --oirinamespace [OIRI_NAMESPACE] \
   --dingnamespace {DING_NAMESPACE} \
   --dingnfsserver {OIRI_NFS_SERVER} \
   --dingnfsstoragepath {DING_NFS_STORAGE_PATH} \
   --dingnfsstoragecapacity {DING_NFS_STORAGE_CAPACITY} \
   --ingresshostname {INGRESS_HOSTNAME} \
   --sslsecretname (SSL_SECRET_NAME)
```

For example:

```
[oiri@1234 scripts]$ ./setupValuesYaml.sh \
   --oiriapiimage oiri/oiri:latest \
   --oirinfsserver oirihost.example.com \
   --oirinfsstoragepath /nfs/oiri \
   --oirinfsstoragecapacity 10Gi \
   --oiriuiimage oiri/oiri-ui:latest \
   --dingimage oiri/oiri-ding:latest \
   --oirinamespace oirins \
   --dingnamespace dingns \
   --dingnfsserver oirihost.example.com \
   --dingnfsstoragepath /nfs/ding \
   --dingnfsstoragecapacity 10Gi \
   --ingresshostname oirihost.example.com \
   --sslsecretname "oiri-tls-cert"
```

9. Verify that `values.yaml` has been generated by running the following command:

   ```
   $ ls /app/k8s/
   ```

   The output is:

   ```
   values.yaml
   ```

10. Optionally, run the following command to update values for Helm:

    ```
    $ kubectl exec -n oiri -ti oiri-cli -- /bin/bash

    $ ./updateValuesYaml.sh --parameter_name_1 parameter_value_1 ..... --
    parameter_name_n parameter_value_n
    ```

    For example, if you want to update `oiriapiimage`, then run the following command:

    ```
    $ ./updateValuesYaml.sh --oiriapiimage oiri-12.2.1.4:latest
    ```

2.7 Parameters Required for Source Configuration

Table 2-1 lists the parameters required for OIRI database, OIG database, OIG server, and ETL source configurations.

Table 2-1 Source Configuration Parameters

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
OIG DB Host	Host name of OIG database. This value is required for specifying OIG database as the source for ETL.	No	None	`--oigdbhost`	`-oigdbh`
OIG DB Port	Port number of the OIG database. This value is required for specifying OIG database as the source for ETL.	No	None	`--oigdbport`	`-oigdbp`
OIG DB Service Name	Service name of the OIG database. This value is required for specifying OIG database as the source for ETL.	No	None	`--oigdbsname`	`-oigdbs`
OIRI DB Host	Host name of the OIRI database.	Yes	None	`--oiridbhost`	`-oiridbh`
OIRI DB Port	Port number of the OIRI database.	Yes	None	`--oiridbport`	`-oiridbp`
OIRI DB Service	Service name of the OIRI database. If you are using OIRI DBCS setup, then specify the PDB service name.	Yes	None	`--oiridbsname`	`-oiridbs`
OIG DB as Source for ETL	Set this to true to enable OIG database as the source for ETL.	No	true	`--useoigdbforetl`	`-uoigdb`
Flat File as Source for ETL	Set this to true to enable flat file as the source for ETL .	No	false	`--useflatfileforetl`	`-uff`

Table 2-1 (Cont.) Source Configuration Parameters

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
OIG Server URL	The URL of OIG server. If the OIG service is in the same K8s cluster as that of OIRI, this parameter typically takes the format `http://<OIM Service Name>.<Namespace>.svc.cluster.local:14000`	Yes	None	`--oigserverurl`	`-oigsu`
OIG Connection Timeout	Connect timeout interval, in milliseconds.	No	10000	`--oigconnectiontimeout`	`-oigct`
OIG Read Timeout	Read timeout interval, in milliseconds.	No	10000	`--oigreadtimeout`	`-oigrt`
OIG KeepAlive Timeout	KeepAlive timeout is used in keep alive strategy. This strategy will first try to apply the host's Keep-Alive policy stated in the header. If that information is not present in the response header it will keep alive connections for the period of `--oigkeepalivetimeout` i.e. 10	No	10	`--oigkeepalivetimeout`	`-oigkat`
OIG Connection Pool Maximum number	The total number of connections in the OIRI database connection pool.	No	15	`--oigconnectionpoolmax`	`-oigcpmx`
OIG Connections per route	The maximum number of connections per (any) route.	No	15	`--oigconnectionpoolmaxroute`	`-oigcpmr`
OIG Proxy URI	OIG Proxy URI	No		`--oigproxyuri`	`-oigpuri`
OIG Proxy Username	OIG Proxy Username	No		`--oigproxyusername`	`-oigpu`

Table 2-1 (Cont.) Source Configuration Parameters

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
OIG Proxy Password	OIG Proxy Password	No		`--oigproxypassword`	`-oigpp`
Key Store Name	Key Store Name	No		`--keystorename`	`-ksn`

2.8 Additional Parameters Required for Data Import

Table 2-2 lists the additional parameters required for configuring data import.

Table 2-2 Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Spark Event Logs Enabled	This flag enables the event logs that are used by the Spark history server to show job history. The allowed values for this flag are true/false. If set to false, no event logs are generated and you will not be able to see the job history on Spark history server.	No	true	`--sparkeventlogsenabled`	`-sele`

Table 2-2 (Cont.) Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Spark Mode	The supported values are `local` and `k8s`. If the value of this parameter is `local`, then the data import is run inside the `ding-cli` container. Local mode is recommended when you do not want to run the data import in a distributed manner. This can be ideal for small data sets. This mode should not be used for large data sets and when you want to do horizontal scaling. Oracle recommends using `k8s` mode for large data sets.	No	local	`--sparkmode`	`-sm`

Table 2-2 (Cont.) Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Spark K8S Master URL	This must be a URL with the format k8s://<API_SERVER_HOST>:<k8s_API_SERVER_PORT>. You must always specify the port, even if it is the HTTPS port 443. You can find the values of <API_SERVER_HOST> and <k8s_API_SERVER_PORT> in Kube config.	Yes, if the value of the Spark Mode parameter is `k8s`. If the value is `local`, then it is not mandatory.	None	`--sparkk8smasterurl`	`-skmu`
Ding Namespace	This is the value of the namespace in which you want to start the Spark driver and executor pods for ETL	No	Ding	`--dingnamespace`	`-dns`
Ding Image	This is the name of the ding image to be used for spinning up the Spark driver and executor pods. This image contains the logic to run ETL.	Yes, if the value of the Spark Mode parameter is `k8s`. If the value is `local`, then it is not mandatory.	None	`--dingimage`	`-di`

Table 2-2 (Cont.) Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Number of Executors	This is the number of executor instances to be run in the Kubernetes cluster. These executors are terminated as soon as the ETL jobs are completed.	No	3	`--numberofexecutors`	`-noe`
Image Pull Secret	This is the Kubernetes secret name to pull the ding image from the registry. This is required only when using the Docker images from the container registry.	No	None	`--imagepullsecret`	`-ips`
Kubernetes Certificate File Name	This is the name of the Kubernetes Certificate Name to be used for securely communicating to the kubernetes API server.	Yes, if the value of the Spark Mode parameter is `k8s`. If the value is `local`, then it is not mandatory.	None	`--k8scertificatefilename`	`-kcfn`

Table 2-2 (Cont.) Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Driver Request Cores	This is to specify the CPU request for the driver pod. The values of this parameter conform to the Kubernetes convention. For information about the meaning of CPU, see Meaning of CPU in Kubernetes documentation. Example values can be 0.1, 500m, 1.5, or 5, with the definition of CPU units documented in CPU units of Kubernetes documentation. This takes precedence over `spark.driver.cores` for specifying the driver pod CPU request, if set.	No	0.5	`--driverrequestcores`	`-drc`
Driver Limit Cores	This is to specify a hard CPU limit for the driver pod. See Resource requests and limits of Pod and Container for information about CPU limit.	No	1	`--driverlimitcores`	`-dlc`

Table 2-2 (Cont.) Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Executor Request Cores	This is to specify the cpu request for each executor pod. Values conform to the Kubernetes convention. Example values can be 0.1, 500m, 1.5, and 5, with the definition of CPU units in Kubernetes documentation.	No	0.5	`--executorrequestcores`	`-erc`
Executor Limit Cores	This is to specify a hard CPU limit for each executor pod launched for the Spark application.	No	0.5	`--executorlimitcores`	`-elc`
Driver Memory	This is the amount of memory to use for the driver process where SparkContext is initialized, in the same format as JVM memory strings with a size unit suffix ("k", "m", "g" or "t"), for example, 512m, 2g.	No	1g	`--drivermemory`	`-dm`

Table 2-2 (Cont.) Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Executor Memory	This is the amount of memory to use per executor process, in the same format as JVM memory strings with a size unit suffix ("k", "m", "g" or "t"), for example 512m, 2g.	No	1g	`--executorymemory`	`-em`
Driver Memory Overhead	This is the amount of non-heap memory to be allocated per driver process in cluster mode, in MiB unless otherwise specified. This is memory that accounts for VM overheads, interned strings, other native overheads, and so on. This tends to grow with the container size (typically 6 to 10 percent).	No	256m	`--drivermemoryoverhead`	`-dmo`

Table 2-2 (Cont.) Additional Parameters for Data Import

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Executor Memory Overhead	This is the amount of additional memory to be allocated per executor process in cluster mode, in MiB unless otherwise specified. This is memory that accounts for VM overheads, interned strings, other native overheads, and so on. This tends to grow with the executor size (typically 6 to 10 percent).	No	256m	`--executorymemoryoverhead`	`-emo`

2.9 Parameters Required for Authentication Configuration

Table 2-3 lists the parameters required for authentication configuration.

Table 2-3 Authentication Configuration Parameters

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Authentication Provider	The authentication provider for authenticating to OIRI.	No	OIG	`--authprovider`	`-ap`
Access Token Issuer	The OIG access token issuer.	No	www.example.com	`--oigaccesstokenissuer`	`-oigati`

Table 2-3 (Cont.) Authentication Configuration Parameters

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Cookie Domain	The domain attribute specifies the hosts that are allowed to receive the cookie. If unspecified, it defaults to the same host that set the cookie, excluding subdomains.	No	None	`--cookiedomain`	`-cd`
OIRI Access Token Issuer	The OIRI access token issuer.	No	www.example.com	`--accesstokenissuer`	`-ati`
Cookie Secure Flag	If you are using non-SSL setup, then set this parameter to false.	No	true	`--cookiesecureflag`	`-csf`
Cookie Same Site	Whether or not the cookie should be restricted to the same-site context.	No	Strict	`--cookiesamesite`	`-css`
OIRI Access Token Audience	The OIRI access token audience	No	www.example.com	`--accesstokenaudience`	`-ata`
OIRI Access Token Expiration Time in minutes	The OIRI access token expiration in minutes.	No	20	`--accesstokeneexpirationtime`	`-atet`
OIRI Access Token allowed clock skew	The OIRI access token allowed clock skew.	No	30	`--accesstokenallowedclockskew`	`-atacs`
Auth Roles	A user with the role specified as the value of this parameter can login to OIRI.	No	OrclOIRIRoleEngineer	`--authroles`	`-ar`

Table 2-3 (Cont.) Authentication Configuration Parameters

Parameter	Description	Mandatory	Default Value	Argument	Argument Shorthand
Idle Session Timeout	The session timeout in minutes if the OIRI application is idle.	No	15	`--idlesessiontimeout`	`-ist`
Session Timeout	OIRI session timeout in minutes	No	240	`--sessiontimeout`	`-st`

2.10 Entity Parameters for Data Import

Table 2-4 lists the user entity parameters that you can update by running the `updateDataIngestionConfig.sh` command.

> **Note:**
>
> To view all the supported parameters for the `updateDataIngestionConfig.sh` script, run the following command from the `ding-cli` pod:
>
> ```
> $ ./updateDataIngestionConfig.sh --help
> ```
>
> Or:
>
> ```
> $ ./updateDataIngestionConfig.sh -h
> ```

Table 2-4 User Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	`TRUE`	`--entityusersenabled`	`-eue`

Table 2-4 (Cont.) User Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityuserssyncmode`	`-eusm`
Lower Bound	The minimum value for the partitionColumn parameter that is used to determine partition stride.	`0`	`--entityuserslowerbound`	`-eulb`
Upper Bound	The maximum value for the partitionColumn parameter that is used to determine partition stride.	`10000`	`--entityusersupperbound`	`-euub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityusersnumberofpartitions`	`-eunop`

Table 2-5 lists the application entity parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-5 Application Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the application entity will be enabled or disabled during data import.	`TRUE`	`--entityapplicationsenabled`	`-eae`
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityapplicationssyncmode`	`-easm`
Lower Bound	The minimum value for the partitionColumn parameter that is used to determine partition stride.	`0`	`--entityapplicationslowerbound`	`-ealb`
Upper Bound	The maximum value for the partitionColumn that is used to determine partition stride.	`10000`	`--entityapplicationsupperbound`	`-eaub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityapplicationsnumberofpartitions`	`-eanop`

Table 2-6 lists the entitlement entity parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-6 Entitlement Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	`TRUE`	`--entityentitlementsenabled`	`-eee`
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityentitlementssyncmode`	`-eesm`
Lower Bound	The minimum value for the partitionColumn that is used to determine partition stride.	`0`	`--entityentitlementslowerbound`	`-eelb`
Upper Bound	The maximum value for the partitionColumn that is used to determine partition stride.	`10000`	`--entityentitlementsupperbound`	`-eeub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly. .	`3`	`--entityentitlementsnumberofpartitions`	`-eenop`

Table 2-7 lists the assigned entitlement parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-7 Assigned Entitlement Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	TRUE	`--entityassignedentitlementsenabled`	`-eaee`
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityassignedentitlementssyncmode`	`-eaesm`
Lower Bound	The minimum value for partitionColumn that is used to determine partition stride.	`0`	`--entityassignedentitlementslowerbound`	`-eaelb`
Upper Bound	The maximum value for partitionColumn that is used to determine partition stride.	`10000`	`--entityassignedentitlementsupperbound`	`-eaeub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityassignedentitlementsnumberofpartitions`	`-eaenop`

Table 2-8 lists the role entity parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-8 Role Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	`TRUE`	`--entityrolesenabled`	`-ere`
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityrolessyncmode`	`-ersm`
Lower Bound	The minimum value for partitionColumn that is used to determine partition stride.	`0`	`--entityroleslowerbound`	`-erlb`
Upper Bound	The maximum value for partitionColumn that is used to determine partition stride.	`10000`	`--entityrolesupperbound`	`-erub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityrolesnumberofpartitions`	`-ernop`

Table 2-9 lists the role hierarchy entity parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-9 Role Hierarchy Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	`TRUE`	`--entityrolehierarchyenabled`	`-erhe`
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityrolehierarchysyncmode`	`-erhsm`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityrolehierarchynumberofpartitions`	`-erhnop`

Table 2-10 lists the role user membership entity parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-10 Role User Membership Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	`TRUE`	`--entityroleusermembershipsenabled`	`-erume`

Table 2-10 (Cont.) Role User Membership Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityroleusermembershipssyncmode`	`-erumsm`
Lower Bound	The minimum value for partitionColumn that is used to determine partition stride.	`0`	`--entityroleusermembershipsowerbound`	`-erumlb`
Upper Bound	The maximum value for partitionColumn that is used to determine partition stride.	`10000`	`--entityroleusermembershipsupperbound`	`-erumub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityroleusermembershipsnumberofpartitions`	`-erumnop`

Table 2-11 lists the role entitlement composition entity parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-11 Role Entitlement Composition Entity Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	`TRUE`	`--entityroleentitlementcompositionsenabled`	`-erece`
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityroleentitlementcompositionssyncmode`	`-erecsm`
Lower Bound	The minimum value for partitionColumn that is used to determine partition stride.	`0`	`--entityroleentitlementcompositionslowerbound`	`-ereclb`
Upper Bound	The maximum value for partitionColumn that is used to determine partition stride.	`10000`	`--entityroleentitlementcompositionsupperbound`	`-erecub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityroleentitlementcompositionsnumberofpartitions`	`-erecnop`

Table 2-12 lists the account entity parameters for data import that you can update by running the `updateDataIngestionConfig.sh` command.

Table 2-12 Account Entity Parameters for Data Import

Parameters	Description	Default Value	Argument	Argument Shorthand
Enabled (true/ false)	Determines whether the entity is enabled or disabled during data import.	`TRUE`	`--entityaccountsenabled`	`-eace`
Sync Mode (full/ incremental)	For Day 0 data import, use full mode. For Day n data import, use incremental mode. In full mode, all the data is loaded in the OIRI database. In incremental mode, only updated data from the source is loaded in the OIRI database.	`full`	`--entityaccountssyncmode`	`-eacsm`
Lower Bound	The minimum value for partitionColumn that is used to determine partition stride.	`0`	`--entityaccountsslowerbound`	`-eaclb`
Upper Bound	The maximum value for partitionColumn that is used to determine partition stride.	`10000`	`--entityaccountsupperbound`	`-eacub`
Number of Partitions	The number of partitions. This, along with lowerBound (inclusive) and upperBound (exclusive) form the partition strides for the generated WHERE clause expressions that are used to split the partitionColumn evenly.	`3`	`--entityaccountsnumberofpartitions`	`-eacnop`

2.11 Flat File Parameters for Data Import

Table 2-13 lists the flat file parameters for data import.

> **Note:**
>
> To view all the parameters for the `updateDataIngestionConfig.sh` script that you can modify, run the following command from the `ding-cli` pod:
>
> ```
> $ ./updateDataIngestionConfig.sh --help
> ```
>
> Or:
>
> ```
> $ ./updateDataIngestionConfig.sh -h
> ```

Table 2-13 Flat File Parameters for Data Import

Parameter	Description	Default Value	Argument	Argument Shorthand
Flat File Enabled	Setting this parameter determines whether or not data import will be performed against flat files. The value can be `true` or `false`.	`false`	`--useflatfileforetl`	`-uff`
Flat File Format	The format of the flat file, which is CSV.	`csv`	`--flatfileformat`	`-fff`
Flat File Data Separator	The data separator in the rows of the flat files, which can be comma (,) colon (:) or vertical bar (|).	`,`	`--flatfileseparator`	`-ffs`
Flat File Time Stamp Format	The timestamp format in the flat files.	`yyyy-MM-dd`	`--flatfiletimestamp`	`-fftsf`

2.12 Helm Chart Configuration Values

Table 2-14 lists the parameters required for setting up the `Values.yaml` file to be used for Helm chart.

Table 2-14 Helm Chart Configuration Parameters

Parameter Name	Description	Mandatory	Default Value	Argument	Argument Shorthand
OIRI Namespace	The name of the Kubernetes namespace on which you want to install OIRI. This namespace contains the installation of OIRI API pods and OIRI UI pods.	No	oiri	`--oirinamespace`	`-ons`
OIRI Replicas	The number of OIRI API pods to be run in the OIRI namespace.	No	1	`--oirireplicas`	`-or`
OIRI API Image	Name of the OIRI API Image. For example: `oiri-12.2.1.4:<TAG>`	Yes	None	`--oiriapiimage`	`-oai`
OIRI NFS Server	NFS Server to be used for OIRI. This must be available across the Kubernetes nodes.	Yes	None	`--oirinfsserver`	`-onfs`
OIRI NFS Storage Path	The path on the NFS server that can be accessed by OIRI API and UI Pods, for example, `/nfs/oiri`.	Yes	None	`--oirinfsstoragepath`	`-onfsp`

Table 2-14 (Cont.) Helm Chart Configuration Parameters

Parameter Name	Description	Mandatory	Default Value	Argument	Argument Shorthand
OIRI NFS Storage Capacity	The capacity of the NFS Server. See the Kubernetes Resource Model for information about the units expected by capacity, for example, `10Gi`.	Yes	None	`--oirinfsstoragecapacity`	`-onfsc`
OIRI UI Image	Name of the OIRI UI Image. For example: `oiri-ui-12.2.1.4:<TAG>`	Yes	None	`--oiriuiimage`	`-oui`
OIRI UI Replicas	Number of OIRI UI pods to be run in the OIRI Namespace.	No	1	`--oiriuireplicas`	`-our`
DING Namespace	Name of the Kubernetes namespace on which you want to install the Spark Kubernetes history server. This namespace contains the installation of Spark history server and Spark cluster, including drivers and executors, for ETL.	No	ding	`--dingnamespace`	`-dns`
Spark History Server Replicas	Number of Spark history server pods to be run in the DING namespace.	No	1	`--sparkhistoryserverreplicas`	`-shsr`

Table 2-14 (Cont.) Helm Chart Configuration Parameters

Parameter Name	Description	Mandatory	Default Value	Argument	Argument Shorthand
DING NFS Server	NFS server to be used for DING. This must be available across the Kubernetes nodes.	Yes	None	`--dingnfsserver`	`-dnfs`
DING NFS Storage Path	The path on the NFS server that can be accessed by the Spark history server, driver, and executors in the spark cluster. For example: `/nf/ding/`	Yes	None	`--dingnfsstoragepath`	`-dnfsp`
DING NFS Storage Capacity	The capacity of the NFS Server. See the Kubernetes Resource Model for information about the units expected by capacity, for example, `10Gi`.	Yes	None	`--dingnfsstoragecapacity`	`-dnfsc`
DING Image	Name of the data ingestion image to be used by the Spark history server, executor, and driver pods. For example: `oiri-ding-12.2.1.4:<TAG>`	Yes	None	`--dingimage`	`-di`

Table 2-14 (Cont.) Helm Chart Configuration Parameters

Parameter Name	Description	Mandatory	Default Value	Argument	Argument Shorthand
Image Pull Secret	Name of the Kubernetes secret to pull the image from the registry.	No	regcred	`--imagepullsecret`	`-ips`
Ingress Enabled	Whether ingress is enabled. Default value of this parameter is 'true' which creates an ingress resource and an ingress controller. Setting this value to false will prevent creation of an ingress controller.	No	true	`--ingressenabled`	`-ie`
Ingress Class Name	Set Ingress controller. Default value of the parameter is 'nginx'. If you want to use your existing ingress controller then set this class to the class name managed by the controller.	No	nginx	`--ingressclass`	`-ic`
Ingress Host Name	Ingress host name	Yes	None	`--ingresshostname`	`-ih`
Install Service Account Name	Service Account Name that is used to create the Kubernetes configuration when installing OIRI.	No	oiri-service-account	`--installserviceaccount`	`-isa`

Table 2-14 (Cont.) Helm Chart Configuration Parameters

Parameter Name	Description	Mandatory	Default Value	Argument	Argument Shorthand
Nginx-Ingress Type	The type of ingress you want to create to access the OIRI API and OIRI UI. This can be NodePort or LoadBalancer. This release of OIRI supports only the NodePort ingress type.	No	NodePort	`--ingresstype`	`-it`
Nginx-Ingress NodePort	The port number of the ingress. Make sure the port provided is available and can be used.	No	30305	`--ingressnodeport`	`-inp`
Nginx-Ingress SSL enabled	Set this parameter to configure SSL.	Yes	`true`	`--sslenabled`	`-ssle`
Nginx-Ingress TLS secret	This is the TLS secret in the default namespace. This is required when SSL is enabled. This should match with the name you provide while creating a TLS secret using `kubectl` in step 2b of Installing the OIRI Helm Chart.	No (required only if SSL is enabled)	None	`--sslsecretname`	`-sslsn`
Nginx-Ingress Replica Count	Replica count for nginx controller.	No	1	`--nginxreplicas`	`-nr`

2.13 Creating the Wallets

To create the OIRI and DING wallets:

1. Connect to the `oiri-cli` pod.

```
$ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
```

2. Generate a keystore by running the following command:

```
[oiri@1234 scripts]$ keytool -genkeypair \
  -alias <OIRI_JWT_KEY_ALIAS> \
  -keypass <OIRI_KEYSTORE_PASSWORD> \
  -keyalg RSA \
  -keystore /app/oiri/data/keystore/keystore.jks \
  -storetype pkcs12 \
  -storepass <OIRI_KEYSTORE_PASSWORD>
```

> **Note:**
>
> The keypass and storepass passwords are the same.

The following is a sample command:

```
$ keytool -genkeypair -alias oiri -keypass <PASSWORD> -keyalg RSA -keystore /app/
oiri/data/keystore/keystore.jks -storepass <PASSWORD> -storetype pkcs12
```

The output is:

```
What is your first and last name?
  [Unknown]:
What is the name of your organizational unit?
  [Unknown]:
What is the name of your organization?
  [Unknown]:
What is the name of your City or Locality?
  [Unknown]:
What is the name of your State or Province?
  [Unknown]:
What is the two-letter country code for this unit?
  [Unknown]:
Is CN=Unknown, OU=Unknown, O=Unknown, L=Unknown, ST=Unknown, C=Unknown correct?
  [no]:  yes
```

3. Exit the pod.
4. Import OIG certificate in the keystore. To do so:
   a. Export OIG certificate for signature verification by running the following command:

```
$ keytool -export -rfc -alias xell -file xell.pem -keystore default-
keystore.jks
```

   The `default-keystore.jks` is located at *`DOMAIN_HOME`*`/config/fmwconfig`. The certificate you are exporting here protects the OIG REST API. It is not the same as the OIG server certificate.

b. Copy the `xell.pem` file exported from the OIG keystore to the `/nfs/oiri/data/keystore/` directory.

c. Import the certificate into OIRI keystore by running the following command from the `oiri-cli` pod:

```
$ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
[oiri@1234 scripts]$ keytool -import \
  -alias xell \
  -file /app/oiri/data/keystore/xell.pem \
  -keystore /app/oiri/data/keystore/keystore.jks
```

5. To integrate OIRI with OIG in SSL mode, import OIG SSL certificate chain into OIRI. To do so:

a. Download the OIG SSL certificate chain from OIG server by running the following command:

```
$ echo -n | openssl s_client -connect ${host}:${port} | sed -ne '/-BEGIN
CERTIFICATE-/,/-END CERTIFICATE-/p' > oigsslcert.cer
```

For example:

```
$ echo -n | openssl s_client -connect oim.example.com:123 | sed -ne '/-
BEGIN CERTIFICATE-/,/-END CERTIFICATE-/p' > oigsslcert.cer
```

b. Copy the certificate file downloaded from the OIG keystore to the `/nfs/oiri/data/keystore/` directory.

c. Import the certificate chain into OIRI keystore by running the following command from the `oiri-cli` pod:

```
$ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
[oiri@1234 scripts]$ keytool -import -alias oigsslcert -file
oigsslcert.cer -keystore /app/oiri/data/keystore/keystore.jks
```

When prompted, enter the same keystore password that you provided in step 1.

6. To create the wallets, connect to the `oiri-cli` pod, and run the following command:

```
[oiri@1234 scripts]$ oiri-cli --config=/app/data/conf/config.yaml wallet
create
```

Enter the following information when prompted:

- OIRI database username prefix and password
- OIG database username and password
- OIG service account username and password
- OIRI keystore password
- OIRI JWT key alias and password

You can either provide all the parameter values on prompt or all of them in the command line. Therefore, instead of providing the values in the prompt, you can provide the values of the parameters in the command line, as follows:

```
[oiri@1234 scripts]$ oiri-cli --config=/app/data/conf/config.yaml wallet
create --oiridbuprefix OIRI_DB_PREFIX --oiridbp OIRI_DB_PASSWORD --oigdbu
OIG_DB_USERNAME --oigdbp OIG_DB_PASSWORD -oigsau
OIG_SERVICE_ACCOUNT_USERNAME --oigsap OIG_SERVICE_ACCOUNT_PASSWORD --oiriksp
```

```
OIRI_KEYSTORE_PASSWORD --oirijka OIRI_JWT_KEY_ALIAS -oirijkp OIRI_JWT_KEY_PASSWORD
```

The output is as shown:

```
Setting up wallet in [/app/data/wallet]
DING Wallet created.
Setting up wallet in [/app/oiri/data/wallet]
OIRI Wallet created.
```

7. Verify that the OIRI and Ding wallets have been created by running the following commands:

   Command:

   ```
   [oiri@1234 scripts]$ ls /app/data/wallet
   ```

   Output:

   ```
   cwallet.sso cwallet.sso.lck
   ```

   Command:

   ```
   $ ls /app/oiri/data/wallet
   ```

   Output:

   ```
   cwallet.sso cwallet.sso.lck
   ```

2.14 Creating and Seeding the OIRI Database Schema

To create and seed the OIRI database schema:

1. Connect to the `oiri-cli` container.

   ```
   $ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
   ```

2. Create the database user schema by running the following command:

   ```
   [oiri@1234 scripts]$ oiri-cli --config=/app/data/conf/config.yaml schema
   create /app/data/conf/dbconfig.yaml
   ```

   After you provide the `SYS` password when prompted, the output is:

   ```
   Creating the schema ci_oiri
   CREATING OIRI SCHEMA ............
   ================================================
   DB USER ci_oiri has been successfully created
   ```

3. Seed the schema by running the following command:

   ```
   $ oiri-cli --config=/app/data/conf/config.yaml schema migrate /app/data/conf/
   dbconfig.yaml
   ```

   The output is:

   ```
   Migrating the OIRI schema
   Migrating OIRI SCHEMA ............
   ================================================
   ............
   OIRI Schema has been successfully migrated
   ```

> **Note:**
>
> The Schema Create command creates the permanent tablespace and temporary tablespace by using the `tablespaceConfiguration` parameter in the `dbconfig.yaml` file. By default, only one DATAFILE for permanent database and one TEMPFILE for temporary database are created. Because there is a limit on the file size, perform regular checks in the database tablespaces, and add the additional datafiles when required.

2.15 Verifying and Updating the Wallet

To verify the wallet and update the credentials in the wallet:

1. Verify the wallets by running the following command:

   > **Note:**
   >
   > This command verifies the wallet locations, OIRI database connection, OIG database connection, keystore entries, and OIG server connection by using the service account.

   ```
   $ ./verifyWallet.sh
   ```

   The output is:

   ```
   Verifying Wallets. Wallet locations and entries will be validated
   DING Wallet is Valid.
   OIRI Wallet is Valid.
   OIRI DB Connection is Valid.
   OIG DB Connection is Valid.
   KeyStore location and entries are Valid.
   OIG Server Connection is Valid.
   SUCCESS: Wallet locations and entries are valid.
   ```

2. Optionally, run the following command to update credentials in the wallet:

   ```
   $ oiri-cli --config=/app/data/conf/config.yaml wallet update
   ```

   The output is as shown with sample values:

   ```
   Please enter the DB name, credentials of which need to be updated. Supported
   values are OIGSA/OIGDB/OIRIDB/OIRIKS/OIRIJWT: OIRIDB
   Please enter OIRI DB UserName: oiri_core
   Please enter OIRI DB password: <OIRI_DB_PASSWORD>
   Updating OIRI DB Credentials in OIRI wallet
   Updating DB wallet in [/app/oiri/data/dbwallet]
   OIRI Wallet updated.
   Updating OIRI DB Credentials in DING wallet
   Updating DB wallet in [/app/data/dbwallet]
   DING Wallet updated.
   ```

   The supported modes prompted in the output are:

- OIGSA: Use this mode to update the OIG service account username and password.
- OIGDB: Use this mode to update the OIG database username and password.
- OIRIDB: Use this mode to update the OIRI database schema prefix and password.
- OIRIKS: Use this mode to update the OIRI keystore password.
- OIRIJWT: Use this mode to update the OIRI JWT key alias and password.

2.16 Installing the OIRI Helm Chart

To create the OIRI Helm chart:

1. Create Image Pull Secrets for the `oiri` and `ding` namespaces created in Step 1.

   Command:

   ```
   $ kubectl create secret docker-registry regcred --docker-
   server=<registry_server_url> --docker-username=<registry_user> --docker-
   password=<registry_password> -n <oirins>

   $ kubectl create secret docker-registry regcred --docker-
   server=<registry_server_url> --docker-username=<registry_user> --docker-
   password=<registry_password> -n <dingns>
   ```

2. Optionally, perform the following steps (2a and 2b) if you want to enable SSL from a Docker container host machine that is outside the `oiri-cli` container:

   > **Note:**
   >
   > Skip this step if you have specified `false` as the value of `--sslenabled` while running the `setupValuesYaml.sh` script.

   a. Create a certificate if you do not have an existing certificate. You can skip this if you already have a key and a certificate.

      ```
      $ openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout tls.key -out
      tls.crt -subj "/CN=<HOSTNAME>"
      ```

      For example:

      ```
      $ openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout tls.key -out
      tls.crt -subj "/CN=oiri.example.com"
      ```

      The output is:

      ```
      Generating a 2048 bit RSA private key
      ..+++
      ............................+++
      writing new private key to 'tls.key'
      -----
      ```

   b. Create the TLS secret by running the following command:

      ```
      $ kubectl create secret tls oiri-tls-cert --key="tls.key" --cert="tls.crt"
      ```

The output is:

```
secret/oiri-tls-cert created
```

3. Install the chart by running the following command:

```
$ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
[oiri@1234 scripts] helm install oiri /helm/oiri -f /app/k8s/values.yaml -n
<oirinamespace>
```

The output is:

```
NAME: oiri
LAST DEPLOYED: Mon Jan 11 15:14:22 2021
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
Please be patient while the chart installs. Pod may not be in running status.

To check the status of the pod, run following command.
Pods READY state must be 1/1 and status RUNNING

    kubectl get pods --namespace oiri

    kubectl get pods --namespace ding

Access OIRI Service by using following URL in your browser.

    https://IP_ADDRESS:PORT/

Access OIRI UI by using following URL in your browser.

    https://IP_ADDRESS:PORT/oiri/ui/v1/console

Admins can access DING History Server by port forwarding the ding-history
pod through kubectl.

  kubectl port-forward <pod_name> <desired_port>:18080 -n ding

Inside the DING-CLI, use following commands to start data ingestion

    ding-cli --config=/app/data/conf/config.yaml data-ingestion start /app/
data/conf/data-ingestion-config.yaml
```

> **Note:**
>
> The log files for installation and configuration are found in the following locations:
>
> - For `oiri-cli`: The following log files are in the `/nfs/oiri/data/logs/` directory:
>   - `oiri-service-audit.log`: This file contains the audit information of the OIRI API Server.
>   - `oiri-service.log`: This file contains the OIRI API Server logs. The logs are enabled in WARN mode.
> - For `oiri-ding`: The following log files are in the `/nfs/ding/data/logs/` directory:
>   - `oiri-ding-access-xxx.log`: This file contains the access information of the data ingestion container.
>   - `oiri-ding-cli-xxx.log`: This file contains the logs of the data ingestion CLI.

If you want to upgrade the Helm chart after you have updated the values in the `values.yaml` file, then run the `updateValuesYaml.sh` script from the `oiri-cli` container, as described in Upgrade the OIRI Image in *Deploy Oracle Identity Role Intelligence on Kubernetes*.

If you want to change the data load configuration before running the data load process, then see Importing Entity Data to OIRI Database.

2.17 Uninstalling the OIRI Helm Chart (Optional)

While installing the OIRI Helm chart, if you encounter any issue, then fix the issue, unistall OIRI Helm chart, and then reinstall it again. If you do not unistall OIRI Helm chart, then the install process will fail with errors.

To uninstall the OIRI Helm chart, run the following command:

```
$ helm uninstall oiri -n <oirinamespace>
```

The output is:

```
release "oiri" uninstalled
```

2.18 Starting the Data Load Process

To start the data load process:

1. Create the `ding-cli.yaml` file with the following content.

```
apiVersion: v1
kind: Pod
metadata:
  name: oiri-ding-cli
  namespace: <DINGNS>
  labels:
```

```
    app: dingcli
spec:
serviceAccount: ding-sa
restartPolicy: OnFailure
  volumes:
    - name: oiripv
      nfs:
        server: <PVSERVER>
        path: <OIRI_SHARE>
    - name: dingpv
      nfs:
        server: <PVSERVER>
        path: <OIRI_DING_SHARE>
    - name: workpv
      nfs:
        server: <PVSERVER>
        path: <OIRI_WORK_SHARE>
  containers:
  - name: oiricli
    image: <OIRI_DING_IMAGE>:<OIRIDING_VER>
    volumeMounts:
      - name: oiripv
        mountPath: /app/oiri
      - name: dingpv
        mountPath: /app
      - name: workpv
        mountPath: /app/k8s
    command: ["/bin/bash","-ec", "tail -f /dev/null"]
  imagePullSecrets:
    - name: regcred
```

where:

- `DINGNS` is the name of the namespace you are using to hold the DING objects.
- `PVSERVER` is the IP address of the NFS server hosting the persistent volumes.
- `OIRI_SHARE` is the NFS mount location for the OIRI persistent volume.
- `OIRI_DING_SHARE` is the NFS mount location for the OIRI DING persistent volume.
- `OIRI_WORK_SHARE` is the nfs mount of the OIRI work persistent volume.
- `OIRI_CLI_IMAGE` is the name of the OIRI CLI image file. If you are using a container registry, the name will be prefixed with the container registry name. For example: `iad.ocir.io/mytenancy/idm/oiri-cli`.
- `OIRICLI_VER` is the version of the image you want to use. For example: 12.2.1.4.02106.
- `ImagePullSecrets` are required only if you are using a container registry and `regcred` is the name of the Kubernetes secret you created with the registry credentials stored.

For example.

```
apiVersion: v1
kind: Pod
metadata:
  name: oiri-ding-cli
  namespace: ding
  labels:
```

```
    app: dingcli
spec:
  restartPolicy:
        OnFailure
  volumes:
    - name: oiripv
      nfs:
        server: 100.69.233.106
        path: /nfs/oiri
    - name: dingpv
      nfs:
        server: 100.69.233.106
        path: /nfs/ding
    - name: workpv
      nfs:
        server: 100.69.233.106
        path: /nfs/k8s
  containers:
  - name: oiricli
    image: iad.ocir.io/mytenancy/idm/oiri-ding:12.2.1.4.02106
    volumeMounts:
      - name: oiripv
        mountPath: /app/oiri
      - name: dingpv
        mountPath: /app
      - name: workpv
        mountPath: /app/k8s
    command: ["/bin/bash", "-ec", "tail -f /dev/null"]
  imagePullSecrets:
    - name: regcred
```

2. Start the DING Administration CLI using the following command.

```
$ kubectl apply -f ding-cli.yaml
```

3. Connect to the DING pod.

```
$ kubectl exec -n ding -ti ding-cli -- /bin/bash
```

4. Copy the certificate to the DING pod using the command:

```
$ kubectl cp <WORKDIR>/ca.crt <DINGNS>/oiri-ding-cli:/app/ca.crt
```

   For example:

```
$ kubectl cp $WORKDIR/ca.crt ding/oiri-ding-cli:/app/ca.crt
```

5. Verify the data load configuration by running the following command:

```
$ ding-cli --config=/app/data/conf/config.yaml data-ingestion verify /app/data/
conf/data-ingestion-config.yaml
```

> **Note:**
>
> The `data-ingestion verify` command works with Service URL specified in the `data-ingestion-config.yaml` file but throws the following error if SID is specified:
>
> ```
> oracle.net.ns.NetException: Listener refused the connection with
> the following error:
> ORA-12514, TNS:listener does not currently know of service
> requested in connect descriptor
>
> at
> oracle.net.ns.NSProtocolNIO.negotiateConnection(NSProtocolNIO.java:2
> 84)
> at oracle.net.ns.NSProtocol.connect(NSProtocol.java:340)
> at oracle.jdbc.driver.T4CConnection.connect(T4CConnection.java:1596)
> at oracle.jdbc.driver.T4CConnection.logon(T4CConnection.java:588)
> ```
>
> This is because OIRI supports service name for connecting to the database instead of SID. If you want to use SID in your environment, then edit the `data-ingestion-config.yaml` file, and change the URL in the following format:
>
> ```
> url: jdbc:oracle:thin:@_DBHOSTNAME:DBHOSTPORT:DBSID_
> ```

6. If you want to load custom attributes as part of the Day 0 data load, then configure the schema definition for the custom attributes.

   See Importing Custom Attributes for information about configuring data import for custom attributes.

7. If you want to update the existing data load configuration, you can use the following command:

   ```
   $ kubectl exec -n ding -ti ding-cli -- /bin/bash

   $ ./updateDataIngestionConfig.sh --parameter_name_1 parameter_value_1 --
   parameter_name_2 parameter_value_2 ..... --parameter_name_n
   parameter_value_n
   ```

   For example, if you want to update `useflatfileforetl` to `true` and `useoigdbforetl` to `false`, then run the following command:

   ```
   $ ./updateDataIngestionConfig.sh --useoigdbforetl false --useflatfileforetl
   true
   ```

> **Note:**
>
> To view all the parameters for the `updateDataIngestionConfig.sh` script, run the following command:
>
> ```
> ./updateDataIngestionConfig.sh --help
> ```
>
> Or:
>
> ```
> ./updateDataIngestionConfig.sh -h
> ```
>
> See Entity Parameters for Data Import for information about the entity parameters that you can update by running the `updateDataIngestionConfig.sh` script.
>
> See Flat File Parameters for Data Import for information about the flat file parameters that you can update by running the `updateDataIngestionConfig.sh` script.

2.19 Upgrading the Container Image

To upgrade the OIRI image to a newer version, complete the steps detailed in this section:

1. Update the `oiri-cli.yaml` and `ding-cli.yaml` with the updated images.

   ```
   $ kubectl apply -f oiri-cli.yaml
   $ kubectl apply -f ding-cli.yaml
   ```

2. Connect to the `oiri-cli` pod.

   ```
   $ kubectl exec -n oiri -ti oiri-cli -- /bin/bash
   ```

3. Update the images.

   ```
   $ ./updateValuesYaml.sh \
   --oiriapiimage {OIRI_NEW_IMAGE} \
   --oiriuiimage {OIRI_UI_NEW_IMAGE} \
   --dingimage {DING_NEW_IMAGE}
   $ ./updateConfig.sh \
   --dingimage {DING_NEW_IMAGE}
   ```

4. Upgrade the Helm Chart.

   ```
   $ helm upgrade oiri /helm/oiri -f /app/k8s/values.yaml -n oiri
   ```

5. If the OIRI schema has been changed, seed the schema by running the following command:

   ```
   $ oiri-cli --config=/app/data/conf/config.yaml schema migrate /app/data/conf/
   dbconfig.yaml
   ```

6. If upgrading from the April 2021 Release, perform the one-time step below.

   ```
   $ kubectl create secret docker-registry regcred --docker-
   server=<registry_server_url> --docker-username=<registry_user> --docker-
   password=<registry_password> -n <oirins>
   $ kubectl create secret docker-registry regcred --docker-
   server=<registry_server_url> --docker-username=<registry_user> --docker-
   password=<registry_password> -n <dingns>
   ```

3

Importing Entity Data to OIRI Database

You can configure OIRI to load entity data, including custom attributes, from Oracle Identity Governance database or flat files, and then run the data import process.

This section contains the following topics:

3.1 About Data Import

Data import, also called data ingestion, is the process of importing entity data from a source to the Oracle Identity Role Intelligence (OIRI) database. OIRI uses a data ingestion command-line tool (`DING CLI`) to fetch and load entity data from third-party sources, namely Oracle Identity Governance (OIG) database or flat files.

As part of the data import process, data from the source, such as OIG database or flat files, is loaded into the following tables of the OIRI database:

USERS, APPLICATIONS, ACCOUNTS, ENTITLEMENTS, ASSIGNED_ENTS, ROLES, ROLE_USER_MSHIP, ROLE_ENT_COMPOSI, ROLE_HIERARCHY, ORGANIZATIONS

You can run the data import process in the following modes:

Full: You run data import in full mode when you first install OIRI and want to load all the data from the source to the OIRI database. This is called Day 0 data import. If you run data import in full mode after Day 0, which is referred to as Day N data import, when the OIRI database already contains entity data, the existing data is truncated and new data from the sources is loaded.

Incremental: You run data import in incremental mode on Day N, which matches the data in OIRI and the source, and loads only the data that has been added, updated, or deleted in the source after the last data import run.

When you install OIRI, the default configuration sets data import in full mode with OIG database as the source. You can provide the details of the source OIG database, such as database name, port, and service name. Otherwise, if you want flat files to be the source for the data import, then you can provide the details of the flat files. See the subsequent topics for more information on Day 0 and Day N data import configuration when the source is OIG database or flat files.

3.2 Importing Data from Oracle Identity Governance Database

You can import entity data from Oracle Identity Governance database on Day 0 and Day N scenarios.

This section contains the following topics:

- Configuring Day 0 Data Import from Oracle Identity Governance Database
- Configuring Day N Data Import from Oracle Identity Governance Database

3.2.1 Configuring Day 0 Data Import from Oracle Identity Governance Database

Day 0 data import is when you run data load for importing entity data into the OIRI database for the first time. Because you want to import all entity data from the Oracle Identity Governance (OIG) database to the OIRI database, you must run the data import in `full` mode. When you install OIRI, the default configuration sets data import in `full` mode with OIG database as the source. You can provide the details of the source OIG database, such as database name, port, and service name. See Setting Up the Configuration Files for information about data import configuration.

To configure Day 0 data import, make sure that the `ding-cli` container is running, and then perform the following steps:

1. If you want to change any default data import configuration, run the `updateDataIngestionConfig.sh` command in the following format:

   ```
   $ docker exec -it ding-cli bash

   $ ./updateDataIngestionConfig.sh --parameter_name_1 parameter_value_1 --
   parameter_name_2 parameter_value_2
         ...... --parameter_name_n parameter_value_n
   ```

   For example, if you want to update the OIG database host to `myoigdb` and port to `12345`, then run the following command:

   ```
   $ docker exec -it ding-cli bash

   $ ./updateDataIngestionConfig.sh --oigdbhost myoigdb --oigdbport 12345
   ```

> **Note:**
>
> By running the `updateDataIngestionConfig.sh` script, you can update the values of data import configuration parameters, such as for entity parameters. To view all the parameters of the `updateDataIngestionConfig.sh` script, run the following command:
>
> ```
> $ ./updateDataIngestionConfig.sh --help
> ```
>
> See Arguments of the updateDataIngestionConfig.sh Script for information about all the parameters that you can set by running the `updateDataIngestionConfig.sh` script.
>
> You can update some other parameter values for OIRI microservice by running the `updateConfig.sh`. To view all the parameters of the `updaConfig.sh script`, run the following command:
>
> ```
> $ ./updateConfig.sh --help
> ```
>
> See Arguments of the updateConfig.sh Script for information about all the parameters that you can set by running the `updateConfig.sh` script.

2. Verify the `data-ingestion-config.yaml` by running the following command:

```
$ docker exec -it oiri-cli bash

$ cat /app/data/conf/data-ingestion-config.yaml
```

> **Note:**
>
> - To update the values in the `data-ingestion-config.yaml` file, run the `updateDataIngestionConfig.sh` script.
> - See Tuning Performance for information about all entity configuration parameters and their meaning, such as how to configure lowerbound, upperbound, and numpartition values for optimal performance of the data import.

You can now run the data import process, as described in Running the Data Import Dry Run Process and Running the Data Import Process.

3.2.2 Configuring Day N Data Import from Oracle Identity Governance Database

On Day N, you want to sync the entity data in the OIRI database to bring in the modifications made to the source. Therefore, you can run the data import in incremental mode by specifying the value of the `syncMode` parameter to `incremental` for each entity by running the `updateDataIngestionConfig.sh` script. For example, if you want to specify that incremental data import takes place for the user, application, and entitlement entities, then run the following command:

```
$ ./updateDataIngestionConfig.sh --entityusersenabled true --entityuserssyncmode
incremental --entityapplicationsenabled true --entityapplicationssyncmode
incremental --entityentitlementsenabled true --entityentitlementssyncmode
incremental
```

See Entity Parameters for Data Import for information about the parameters for each entity that you can update by running the `updateDataIngestionConfig.sh` script.

In addition, if you want to specify any other changes to the data import configuration parameter values, then run the `updateDataIngestionConfig.sh` command. For example, if you want to change the source OIG database details, then run the following command:

```
$ ./updateDataIngestionConfig.sh --useoigdbforetl true --oigdbhost
host2.example.com --oigdbport 12345 --oigdbsname oigdb.example.com
```

See Parameters Required for Source Configuration for information about the source configuration parameters for data import.

> **Note:**
>
> if OIG contains roles/entitlements which are no longer associated with any users, then you should also run the delete ETL operation to ensure there are no inconsistencies in the data synchronized to OIRI.

You can now run the data import process, as described in Running the Data Import Dry Run Process and Running the Data Import Process.

3.3 Importing Data from Flat Files

You can import entity data from flat files on Day 0 and Day N scenarios.

This section contains the following topics:

- Configuring Day 0 Data Import from Flat Files
- Configuring Day N Data Import from Flat Files
- Sample CSV Files for All Entities

3.3.1 Configuring Day 0 Data Import from Flat Files

You can import entity data to OIRI database from flat files, which is data in CSV format. For each entity, such as user, account, or application, you must specify a separate flat file.

The first line of each flat file is a fixed header that specifies the attributes to be imported. For example, for a flat file for account data, the header can be:

```
"EXT_ACCOUNT_ID","ACCOUNT_NAME", "ACCOUNT_TYPE", "USER_NAME", "APPLICATION_NAME"
```

For applications, the header can be:

```
"EXT_APP_ID", "NAME", "DISPLAY_NAME", "TYPE", "DESCRIPTION", "RISK_SCORE"
```

After the header, specify the comma-separated attribute values that you want to load into the OIRI database. The data in the flat files is comma-separated by default. However, you can configure to use any other separator by setting the value of the `--flatfileseparator` parameter to `:` for colon or `|` for vertical bar when running the `./updateDataIngestionConfig.sh` command.

The following is the header and contents of a sample CSV file for the application entity:

```
"EXT_APP_ID","NAME","DISPLAY_NAME","TYPE","DESCRIPTION","RISK_SCORE"
47,"ebs1","ebs1","Disconnected","ebs1",3
48,"EBS2","EBS2","Disconnected","EBS2",3
1,"myapp","myapp","Disconnected:,"mytestapplication",1
41,"Laptop","Laptop","Disconnected","Laptop",3
44,"activeb","activeb","Disconnected","activeb",3
45,"ActiveD","ActiveD","Disconnected","ActiveD",3
46,"ActiveE","ActiveE","Disconnected","ActiveE",3
5,"myapp1","myapp1","Disconnected","",3
43,"mobile","mobile","Disconnected","mobile",3
49,"DB1","DB1","Disconnected","DB1",3
2,"VISDU1","VISDU1","DOBBased","VISDU1",7
3,"VISDU2","VISDU2",,"DOCBased","VISDU2",7
4,"VISDU3","VISDU3","DOBBased","VISDU3",7
23,"JIRAApp","JIRAApp","Disconnected","JIRAApp",3
42,"Badge","Badge","Disconnected","Badge",3
50,"DB2","DB2","Disconnected","DB2",3
```

Save the .CSV file in a directory. In the same way, create the .CSV files for all entities for which you want to import the data to OIRI database. See Sample CSV Files for All Entities for the headers and contents of sample CSV files for the user, application, account, entitlement, assigned entitlement, role, role hierarchy, role user membership, and role entitlement composition entities.

Save the files in a directory. Then, update the parameter for specifying flat files as the source for data load by running the `updateDataIngestionConfig.sh` script, as shown:

```
$ ./updateDataIngestionConfig.sh --useoigdbforetl false --useflatfileforetl true --
format csv
```

You can now run the data import process, as described in Running the Data Import Dry Run Process and Running the Data Import Process.

3.3.2 Configuring Day N Data Import from Flat Files

On Day N, you want to sync the entity data in the OIRI database to bring in the modifications made to the source. Therefore, you can run the data import in incremental mode by specifying the value of the `syncMode` parameter to `incremental` for each entity. In addition, if you want to specify any other changes to the data import configuration parameter values, then run the `updateDataIngestionConfig.sh` command. For example, if you want to change the attribute values in the source flat files and specify that incremental data load takes place for the user, application, and entitlement entities, then run the following commands:

For users:

```
$ ./updateDataIngestionConfig.sh --useoigdbforetl false --useflatfileforetl true --
flatfileformat csv --entityuserssyncmode incremental
```

For applications:

```
$ ./updateDataIngestionConfig.sh --useoigdbforetl false --useflatfileforetl true
--flatfileformat csv --entityapplicationssyncmode incremental
```

For entitlements:

```
$ ./updateDataIngestionConfig.sh --useflatfileforetl true --flatfileformat csv --
entityentitlementssyncmode incremental
```

You can now run the data load process, as described in Running the Data Import Dry Run Process and Running the Data Import Process.

3.3.3 Sample CSV Files for All Entities

This topic shows the headers and contents of sample CSV files for the user, application, account, entitlement, assigned entitlement, role, role hierarchy, role user membership, and role entitlement composition entities. It also lists the mandatory and optional attributes of these entities for importing data from flat files.

It contains the following topics:

- Sample users.csv File
- Sample applications.csv File
- Sample accounts.csv File
- Sample entitlements.csv File
- Sample assignedEntitlements.csv File
- Sample roles.csv File
- Sample roleHierarchy.csv File
- Sample roleUserMembership.csv File
- Sample roleEntitlementComposition.csv File

3.3.3.1 Sample users.csv File

The following table lists the mandatory and optional user attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_USER_ID	Optional
USER_NAME	Mandatory
LAST_NAME	Optional
FIRST_NAME	Optional
MIDDLE_NAME	Optional
DISPLAY_NAME	Mandatory
TITLE	Optional
LOCALE	Optional
PREFERRED_LANGUAGE	Optional
STATUS	Optional
WORK_EMAIL	Optional
HOME_EMAIL	Optional

OIRI Attribute	Mandatory/Optional
PRIMARY_EMAIL_TYPE	Optional
WORK_STATE	Optional
WORK_POSTAL_CODE	Optional
WORK_COUNTRY	Optional
EMPLOYEE_NUMBER	Optional
EMPLOYEE_TYPE	Mandatory
JOB_CODE	Optional
COST_CENTER	Optional
ORGANIZATION	Mandatory
PARENT_ORG_NAME	Optional
DIVISION	Optional
DEPARTMENT	Optional
MANAGER_NAME	Optional
MANAGER_DISPLAY_NAME	Optional
DEPROVISIONED_DATE	Optional
DEPROVISIONING_DATE	Optional
DESCRIPTION	Optional
FULL_NAME	Optional
OFFICE_NAME	Optional
TERRITORY	Optional
RISK_SCORE	Optional

The following is a sample users.csv file:

```
EXT_USER_ID,USER_NAME,LAST_NAME,FIRST_NAME,MIDDLE_NAME,DISPLAY_NAME,TITLE,LOCALE,PREFER
RED_LANGUAGE,STATUS,WORK_EMAIL,HOME_EMAIL,PRIMARY_EMAIL_TYPE,WORK_STATE,WORK_POSTAL_COD
E,WORK_COUNTRY,EMPLOYEE_NUMBER,EMPLOYEE_TYPE,JOB_CODE,COST_CENTER,ORGANIZATION,PARENT_O
RG_NAME,DIVISION,DEPARTMENT,MANAGER_NAME,MANAGER_DISPLAY_NAME,DEPROVISIONED_DATE,DEPROV
ISIONING_DATE,DESCRIPTION,FULL_NAME,OFFICE_NAME,TERRITORY,RISK_SCORE
70,AuditAdmin,Admin,Audit,,Identity Audit Admin Without
Hier,,,,Active,audit.admin.without.hier@example.com,,Work,,,,,CONTRACTOR,,,Xellerate
Users,,,,,,,,,,,,0
71,IDENTITY_AUDIT_VIEWER_WITH_HIER,Viewer,Audit,,Identity Audit Viewer With
Hier,,,,Active,audit.viewer.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
72,IDENTITY_AUDIT_VIEWER_WITHOUT_HIER,Viewer,Audit,,Identity Audit Viewer Without
Hier,,,,Active,audit.viewer.without.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
73,HOME_ORG_USER,Org,Home,,UserMgmt Home Org
User,,,,Active,usermgmt.home.org.user@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org,,,,,,,,,,,,0
74,MGMT_CHAIN_MGR_LVL_1,Level1,UserMgmt,Manager,UserMgmt Manager User Level
1,,,,Active,usermgmt.manager.level.1@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org,,,,,,,,,,,,0
75,MGMT_CHAIN_MGR_LVL_2,Level2,UserMgmt,Manager,UserMgmt Manager User Level
2,,,,Active,usermgmt.manager.level.2@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org_child,user_mgmt_org,,,MGMT_CHAIN_MGR_LVL_1,UserMgmt Manager User
Level 1,,,,,,,0
76,MGMT_CHAIN_DIR_REP_1_LVL_1,Level1,UserMgmt,DirectReport1,UserMgmt Direct Report 1
Level 1,,,,Active,usermgmt.direct.report.1.level.1@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org,,,,MGMT_CHAIN_MGR_LVL_1,UserMgmt Manager User Level 1,,,,,,,0
77,MGMT_CHAIN_DIR_REP_2_LVL_1,Level1,UserMgmt,DirectReport2,UserMgmt Direct Report 2
```

```
Level 1,,,,Active,usermgmt.direct.report.2.level.1@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org,,,,MGMT_CHAIN_MGR_LVL_1,UserMgmt Manager User Level
1,,,,,,,0
78,MGMT_CHAIN_DIR_REP_1_LVL_2,Level2,UserMgmt,DirectReport1,UserMgmt Direct
Report 1 Level
2,,,,Active,usermgmt.direct.report.1.level.2@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org_child,user_mgmt_org,,,MGMT_CHAIN_MGR_LVL_1,UserMgmt Manager
User Level 1,,,,,,,0
79,MGMT_CHAIN_DIR_REP_2_LVL_2,Level2,UserMgmt,DirectReport2,UserMgmt Direct
Report 2 Level
2,,,,Active,usermgmt.direct.report.2.level.2@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org_child,user_mgmt_org,,,MGMT_CHAIN_MGR_LVL_1,UserMgmt Manager
User Level 1,,,,,,,0
80,MGMT_CHAIN_DIR_REP_3_LVL_2,Level2,UserMgmt,DirectReport3,UserMgmt Direct
Report 3 Level
2,,,,Active,usermgmt.direct.report.3.level.2@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org_child,user_mgmt_org,,,MGMT_CHAIN_MGR_LVL_2,UserMgmt Manager
User Level 2,,,,,,,0
81,MGMT_CHAIN_DIR_REP_4_LVL_2,Level2,UserMgmt,DirectReport4,UserMgmt Direct
Report 4 Level
2,,,,Active,usermgmt.direct.report.4.level.2@example.com,,Work,,,,,Full-
Time,,,user_mgmt_org_child,user_mgmt_org,,,MGMT_CHAIN_MGR_LVL_2,UserMgmt Manager
User Level 2,,,,,,,0
82,CERTIFICATIONADMINISTRATOR,ln_certificationAdministrator,fn_certificationAdmin
istrator,,fn_certificationAdministrator
ln_certificationAdministrator,,,,Active,certificationAdministrator@example.com,,W
ork,,,,,Full-Time,,,Xellerate Users,,,,,,,,,,,0
83,CERTIFICATIONVIEWER,ln_certificationViewer,fn_certificationViewer,,fn_certific
ationViewer
ln_certificationViewer,,,,Active,certificationViewer@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,0
84,CERTIFIEREXORG,ln_certifierExOrg,fn_certifierExOrg,,fn_certifierExOrg
ln_certifierExOrg,,,,Active,certifierExOrg@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,0
85,CERTIFICATIONCONFIGURATIONADMINISTRATOR,ln_certificationConfigurationAdministr
ator,fn_certificationConfigurationAdministrator,,fn_certificationConfigurationAdm
inistrator
ln_certificationConfigurationAdministrator,,,,Active,certificationConfigurationAd
ministrator@example.com,,Work,,,,,Full-Time,,,Xellerate Users,,,,,,,,,,,0
86,ACERTUSER1,ln_ACERTUSER1,fn_ACERTUSER1,,fn_ACERTUSER1
ln_ACERTUSER1,,,,Active,fn_acertuser1.ln_acertuser1@avicertorg.com,,Work,,,,,Full
-Time,,,AviCertOrg,,,,,,,,,,,0
87,ACERTUSER2,ln_ACERTUSER2,fn_ACERTUSER2,,fn_ACERTUSER2
ln_ACERTUSER2,,,,Active,fn_acertuser2.ln_acertuser2@avicertorg.com,,Work,,,,,Full
-Time,,,AviCertOrg,,,,ACERTUSER1,fn_ACERTUSER1 ln_ACERTUSER1,,,,,,,0
88,ACERTUSER3,ln_ACERTUSER3,fn_ACERTUSER3,,fn_ACERTUSER3
ln_ACERTUSER3,,,,Active,fn_acertuser3.ln_acertuser3@avicertorg.com,,Work,,,,,Full
-Time,,,AviCertOrg,,,,ACERTUSER1,fn_ACERTUSER1 ln_ACERTUSER1,,,,,,,0
89,ACERTUSER4,ln_ACERTUSER4,fn_ACERTUSER4,,fn_ACERTUSER4
ln_ACERTUSER4,,,,Active,fn_acertuser4.ln_acertuser4@avicertorg.com,,Work,,,,,Full
-Time,,,AviCertOrg,,,,ACERTUSER1,fn_ACERTUSER1 ln_ACERTUSER1,,,,,,,0
6,SPALMENTIERI,Palmentieri,Sonny,,Sonny
Palmentieri,,,,Active,sonny.palmentieri@avitek.com,,Work,,,,,Full-
Time,,,Avitek,,,,,,,,,,,0
90,VCERTUSER1,ln_VCERTUSER1,fn_VCERTUSER1,,fn_VCERTUSER1
ln_VCERTUSER1,,,,Active,fn_vcertuser1.ln_vcertuser1@viscertorg.com,,Work,,,,,Full
-Time,,,VisCertOrg,,,,,,,,,,,0
91,VCERTUSER2,ln_VCERTUSER2,fn_VCERTUSER2,,fn_VCERTUSER2
ln_VCERTUSER2,,,,Active,fn_vcertuser2.ln_vcertuser2@viscertorg.com,,Work,,,,,Full
-Time,,,VisCertOrg,,,,VCERTUSER1,fn_VCERTUSER1 ln_VCERTUSER1,,,,,,,0
92,VCERTUSER3,ln_VCERTUSER3,fn_VCERTUSER3,,fn_VCERTUSER3
```

```
ln_VCERTUSER3,,,,Active,fn_vcertuser3.ln_vcertuser3@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER1,fn_VCERTUSER1 ln_VCERTUSER1,,,,,,,0
93,VCERTUSER4,ln_VCERTUSER4,fn_VCERTUSER4,,fn_VCERTUSER4
ln_VCERTUSER4,,,,Active,fn_vcertuser4.ln_vcertuser4@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER2,fn_VCERTUSER2 ln_VCERTUSER2,,,,,,,0
94,VCERTUSER5,ln_VCERTUSER5,fn_VCERTUSER5,,fn_VCERTUSER5
ln_VCERTUSER5,,,,Active,fn_vcertuser5.ln_vcertuser5@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER2,fn_VCERTUSER2 ln_VCERTUSER2,,,,,,,0
95,VCERTUSER6,ln_VCERTUSER6,fn_VCERTUSER6,,fn_VCERTUSER6
ln_VCERTUSER6,,,,Active,fn_vcertuser6.ln_vcertuser6@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER2,fn_VCERTUSER2 ln_VCERTUSER2,,,,,,,0
96,VCERTUSER7,ln_VCERTUSER7,fn_VCERTUSER7,,fn_VCERTUSER7
ln_VCERTUSER7,,,,Active,fn_vcertuser7.ln_vcertuser7@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER2,fn_VCERTUSER2 ln_VCERTUSER2,,,,,,,0
97,VCERTUSER8,ln_VCERTUSER8,fn_VCERTUSER8,,fn_VCERTUSER8
ln_VCERTUSER8,,,,Active,fn_vcertuser8.ln_vcertuser8@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER3,fn_VCERTUSER3 ln_VCERTUSER3,,,,,,,0
98,VCERTUSER9,ln_VCERTUSER9,fn_VCERTUSER9,,fn_VCERTUSER9
ln_VCERTUSER9,,,,Active,fn_vcertuser9.ln_vcertuser9@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER3,fn_VCERTUSER3 ln_VCERTUSER3,,,,,,,0
99,VCERTUSER10,ln_VCERTUSER10,fn_VCERTUSER10,,fn_VCERTUSER10
ln_VCERTUSER10,,,,Active,fn_vcertuser10.ln_vcertuser10@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER3,fn_VCERTUSER3 ln_VCERTUSER3,,,,,,,0
100,VCERTUSER11,ln_VCERTUSER11,fn_VCERTUSER11,,fn_VCERTUSER11
ln_VCERTUSER11,,,,Active,fn_vcertuser11.ln_vcertuser11@viscertorg.com,,Work,,,,,Full-
Time,,,VisCertOrg,,,,VCERTUSER3,fn_VCERTUSER3 ln_VCERTUSER3,,,,,,,0
1001,BOB.MILLER@example.com,Miller,Bob,,Bob Miller,,,,Active,,,,,,,,Full-
Time,,,Demoorg,,,,,,,,,,,0
1002,TIM.COOK@example.com,Cook,Tim,,Tim Cook,,,,Active,,,,,,,,Full-
Time,,,Demoorg,,,,,,,,,,,0
1003,ALISTER.COOK@example.com,Cook,Alister,,Alister Cook,,,,Active,,,,,,,,Full-
Time,,,Demoorg,,,,,,,,,,,0
1004,MARK.WILCOX@example.com,Wilcox,Mark,,Mark Wilcox,,,,Active,,,,,,,,Full-
Time,,,Demoorg,,,,,,,,,,,0
1005,ALAN.BORDER@example.com,Border,Alan,,Alan Border,,,,Active,,,,,,,,Full-
Time,,,Demoorg,,,,,,,,,,,0
1006,DONALD.TRUMP@example.com,Trump,Donald,,Donald Trump,,,,Active,,,,,,,,Full-
Time,,,Demoorg,,,,,,,,,,,0
2002,USR_5,Usr_5,Usr_5,,Usr_5 Usr_5,,,,Active,Usr_5@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,0
2004,KARNOLD,Arnold,Kari,,Kari Arnold,,,,Active,karnold@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2006,DLEWIS,Lewis,Donald,,Donald Lewis,,,,Active,Dlewis@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2007,MSANDOVAL,Sandoval,Molly,,Molly
Sandoval,,,,Active,msandoval@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2008,CDELGADO,Delgado,Carol,,Carol
Delgado,,,,Active,cdelgado@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
5,ELANGOVAN.SUBRAMANIAN@example.com,Subramanian,Elangovan,,Elangovan
Subramanian,,,,Active,,,,,,,,Full-Time,,,vision,,,,,,,,,,,0
7,HHANZO,Hanzo,Hattori,,Hattori
Hanzo,,,,Active,hattori.hanzo@avitek.com,,Work,,,,,Full-Time,,,Avitek,,,,,,,,,,,0
8,PQUITO,Quito,Paulo,,Paulo Quito,,,,Active,paulo.quito@avitek.com,,Work,,,,,Full-
Time,,,Avitek,,,,,,,,,,,0
9,DBAJAJ,Bajaj,Deepak,,Deepak Bajaj,,,,Active,deepak.bajaj@avitek.com,,Work,,,,,Full-
Time,,,Avitek,,,,,,,,,,,0
10,GKELLY,Kelly,Grace,,Grace Kelly,,,,Active,grace.kelly@avitek.com,,Work,,,,,Full-
Time,,,Avitek,,,,,,,,,,,0
11,STOLER,Toler,Sydney,,Sydney Toler,,,,Active,sydney.toler@avitek.com,,Work,,,,,Full-
Time,,,Avitek,,,,,,,,,,,0
12,MSTARR,Starr,Manny,,Manny Starr,,,,Active,manny.starr@vision.com,,Work,,,,,Full-
```

```
Time,,,vision,,,,,,,,,,,0
13,RKLEIN,Klein,Robert,,Robert
Klein,,,,Active,robert.klein@vision.com,,Work,,,,,Full-
Time,,,vision,,,,MSTARR,Manny Starr,,,,,,,0
14,MSMITH,Smith,Mark,,Mark Smith,,,,Active,mark.smith@vision.com,,Work,,,,,Full-
Time,,,vision,,,,,,,,,,,0
15,PDEVRIES,DeVries,Peter,,Peter
DeVries,,,,Active,peter.devries@vision.com,,Work,,,,,Full-
Time,,,vision,,,,,,,,,,,0
16,JLONG,Long,Junki,,Junki Long,,,,Active,junki.long@vision.com,,Work,,,,,Full-
Time,,,vision,,,,RKLEIN,Robert Klein,,,,,,,0
17,AARORA,Arora,Ajay,,Ajay Arora,,,,Active,ajay.arora@vision.com,,Work,,,,,Full-
Time,,,vision,,,,MSMITH,Mark Smith,,,,,,,0
18,HSMITH,Smith,Howard,,Howard
Smith,,,,Active,howard.smith@vision.com,,Work,,,,,Full-
Time,,,vision,,,,RKLEIN,Robert Klein,,,,,,,0
19,YTANAWA,Tanawa,Yuki,,Yuki
Tanawa,,,,Active,yuki.tanawa@vision.com,,Work,,,,,Full-
Time,,,vision,,,,RKLEIN,Robert Klein,,,,,,,0
20,PBENCHLEY,Benchley,Peter,,Peter
Benchley,,,,Active,peter.benchley@vision.com,,Work,,,,,Full-
Time,,,vision,,,,,,,,,,,0
21,THILL,Hill,Terence,,Terence
Hill,,,,Active,terence.hill@vision.com,,Work,,,,,Full-Time,,,vision,,,,,,,,,,,0
22,BSPENCER,Spencer,Bud,,Bud
Spencer,,,,Active,bud.spencer@vision.com,,Work,,,,,Full-
Time,,,vision,,,,AARORA,Ajay Arora,,,,,,,0
23,PMEI,Mei,Pai,,Pai Mei,,,,Active,pai.mei@vision.com,,Work,,,,,Full-
Time,,,vision,,,,,,,,,,,0
24,BKIDDO,Kiddo,Beatrix,,Beatrix
Kiddo,,,,Active,beatrix.kiddo@vision.com,,Work,,,,,Full-
Time,,,vision,,,,AARORA,Ajay Arora,,,,,,,0
25,GYUBARI,Yubari,Gogo,,Gogo
Yubari,,,,Active,gogo.yubari@vision.com,,Work,,,,,Full-Time,,,vision,,,,,,,,,,,0
26,KGHEEWALA,Gheewala,Kurush,,Kurush
Gheewala,,,,Active,kurush.gheewala@vision.com,,Work,,,,,Full-
Time,,,vision,,,,,,,,,,,0
27,JUDHAS,Udhas,Jagjit,,Jagjit
Udhas,,,,Active,jagjit.udhas@vision.com,,Work,,,,,Full-Time,,,vision,,,,,,,,,,,0
28,NGALIL,Galil,Noah,,Noah Galil,,,,Active,noah.galil@vision.com,,Work,,,,,Full-
Time,,,vision,,,,,,,,,,,0
29,UNAOT,Naot,Uzi,,Uzi Naot,,,,Active,uzi.naot@vision.com,,Work,,,,,Full-
Time,,,vision,,,,,,,,,,,0
30,USER_ADMIN_WITH_HIER,Admin,User,,User Admin With
Hier,,,,Active,user.admin.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,0
31,USER_ADMIN_WITHOUT_HIER,Admin,User,,User Admin Without
Hier,,,,Active,user.admin.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,0
32,USER_VIEWER_WITH_HIER,Viewer,User,,User Viewer With
Hier,,,,Active,user.viewer.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,0
33,USER_VIEWER_WITHOUT_HIER,Viewer,User,,User Viewer Without
Hier,,,,Active,user.viewer.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,0
34,HELP_DESK_ADMIN_WITH_HIER,Admin,Helpdesk,,Help Desk Admin With
Hier,,,,Active,helpdesk.admin.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,0
35,HELP_DESK_ADMIN_WITHOUT_HIER,Admin,Helpdesk,,Help Desk Admin Without
Hier,,,,Active,helpdesk.admin.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,0
```

```
36,ORG_ADMIN_WITH_HIER,Admin,Org,,Org Admin With
Hier,,,,Active,org.admin.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
37,ORG_ADMIN_WITHOUT_HIER,Admin,Org,,Org Admin Without
Hier,,,,Active,org.admin.without.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
38,ORG_ADMIN_USER_VIEWER_WITH_HIER,UserViewer,OrgAdmin,,Org Admin User Viewer With
Hier,,,,Active,org.admin.user.viewer.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
39,ORG_VIEWER_WITH_HIER,Viewer,Org,,Org Viewer With
Hier,,,,Active,org.viewer.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
40,ORG_VIEWER_WITHOUT_HIER,Viewer,Org,,Org Viewer Without
Hier,,,,Active,org.viewer.without.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
41,ROLE_ADMIN_WITH_HIER,Admin,Role,,Role Admin With
Hier,,,,Active,role.admin.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
42,ROLE_ADMIN_WITHOUT_HIER,Admin,Role,,Role Admin Without
Hier,,,,Active,role.admin.without.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
43,ROLE_VIEWER_WITH_HIER,Viewer,Role,,Role Viewer With
Hier,,,,Active,role.viewer.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
44,ROLE_VIEWER_WITHOUT_HIER,Viewer,Role,,Role Viewer Without
Hier,,,,Active,role.viewer.without.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
45,ROLE_AUTHORIZER_WITH_HIER,Authorizer,Role,,Role Authorizer With
Hier,,,,Active,role.authorizer.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
46,ROLE_AUTHORIZER_WITHOUT_HIER,Authorizer,Role,,Role Authorizer Without
Hier,,,,Active,role.authorizer.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
47,APP_INST_ADMIN_WITH_HIER,Admin,Appinst,,Appinst Admin With
Hier,,,,Active,appinst.admin.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
48,APP_INST_ADMIN_WITHOUT_HIER,Admin,Appinst,,Appinst Admin Without
Hier,,,,Active,appinst.admin.without.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
49,APP_INST_VIEWER_WITH_HIER,Viewer,Appinst,,Appinst Viewer With
Hier,,,,Active,appinst.viewer.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
50,APP_INST_VIEWER_WITHOUT_HIER,Viewer,Appinst,,Appinst Viewer Without
Hier,,,,Active,appinst.viewer.without.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
51,APP_INST_AUTHORIZER_WITH_HIER,Authorizer,Appinst,,Appinst Authorizer With
Hier,,,,Active,appinst.authorizer.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
52,APP_INST_AUTHORIZER_WITHOUT_HIER,Authorizer,Appinst,,Appinst Authorizer Without
Hier,,,,Active,appinst.authorizer.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
1,XELSYSADM,Administrator,System,,System
Administrator,,,,Active,donotreply@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
2,XELOPERATOR,Group,Operator,,System Operator,,,,Deleted,,,,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
3,WEBLOGIC,WEBLOGIC,WEBLOGIC,,Weblogic User,,,,Active,,,,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
4,OIMINTERNAL,OIMINTERNAL,OIMINTERNAL,,Internal User,,,,Active,,,,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
53,ENTITLEMENT_ADMIN_WITH_HIER,Admin,Entitlement,,Entitlement Admin With
```

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Hier,,,,Active,entitlement.admin.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
54,ENTITLEMENT_ADMIN_WITHOUT_HIER,Admin,Entitlement,,Entitlement Admin Without
Hier,,,,Active,entitlement.admin.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
55,ENTITLEMENT_VIEWER_WITH_HIER,Viewer,Entitlement,,Entitlement Viewer With
Hier,,,,Active,entitlement.viewer.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
56,ENTITLEMENT_VIEWER_WITHOUT_HIER,Viewer,Entitlement,,Entitlement Viewer
Without
Hier,,,,Active,entitlement.viewer.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
57,ENTITLEMENT_AUTHORIZER_WITH_HIER,Authorizer,Entitlement,,Entitlement
Authorizer With
Hier,,,,Active,entitlement.authorizer.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
58,ENTITLEMENT_AUTHORIZER_WITHOUT_HIER,Authorizer,Entitlement,,Entitlement
Authorizer Without
Hier,,,,Active,entitlement.authorizer.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
59,SYSTEM_ADMIN_WITH_HIER,Admin,System,,System Admin With
Hier,,,,Active,system.admin.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
60,SYSTEM_ADMIN_WITHOUT_HIER,Admin,System,,System Admin Without
Hier,,,,Active,system.admin.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
61,SYSTEM_CONFIGURATOR_WITH_HIER,Configurator,System,,System Configurator With
Hier,,,,Active,system.configurator.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
62,SYSTEM_CONFIGURATOR_WITHOUT_HIER,Configurator,System,,System Configurator
Without
Hier,,,,Active,system.configurator.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
63,CATALOG_ADMIN_WITH_HIER,Admin,Catalog,,Catalog Admin With
Hier,,,,Active,catalog.admin.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
64,CATALOG_ADMIN_WITHOUT_HIER,Admin,Catalog,,Catalog Admin Without
Hier,,,,Active,catalog.admin.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
65,CERTIFICATION_ADMIN_WITH_HIER,Admin,Certification,,Certification Admin With
Hier,,,,Active,certification.admin.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
66,CERTIFICATION_ADMIN_WITHOUT_HIER,Admin,Certification,,Certification Admin
Without
Hier,,,,Active,certification.admin.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
67,CERTIFICATION_VIEWER_WITH_HIER,Reviewer,Certification,,Certification Reviewer
With Hier,,,,Active,certification.reviewer.with.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
68,CERTIFICATION_VIEWER_WITHOUT_HIER,Reviewer,Certification,,Certification
Reviewer Without
Hier,,,,Active,certification.reviewer.without.hier@example.com,,Work,,,,,Full-
Time,,,Xellerate Users,,,,,,,,,,,,0
69,IDENTITY_AUDIT_ADMIN_WITH_HIER,Admin,Audit,,Identity Audit Admin With
Hier,,,,Active,audit.admin.with.hier@example.com,,Work,,,,,Full-Time,,,Xellerate
Users,,,,,,,,,,,,0
2009,KGILL,Gill,Katie,,Katie Gill,,,,Active,kgill@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,,0
2010,JNEWTON,Newton,Jose,,Jose
Newton,,,,Active,jnewton@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,,0
2011,AMEYER,Meyer,Amanda,,Amanda
```

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Meyer,,,,Active,ameyer@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2012,LBATES,Bates,Laurie,,Laurie Bates,,,,Active,lbates@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2013,VMORALES,Morales,Vera,,Vera Morales,,,,Active,vmorales@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2014,KPOOLE,Poole,Kristen,,Kristen Poole,,,,Active,kpoole@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2015,WOLIVER,Oliver,Winifred,,Winifred
Oliver,,,,Active,woliver@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2016,DSCHULTZ,Schultz,Deanna,,Deanna
Schultz,,,,Active,dSchultz@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2017,PGOODMAN,Goodman,Patricia,,Patricia
Goodman,,,,Active,pgoodman@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2018,JMULLINS,Mullins,Julio,,Julio
Mullins,,,,Active,jmullins@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2019,RWALTON,Walton,Rodney,,Rodney Walton,,,,Active,rwalton@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2020,ECROSS,Cross,Elijah,,Elijah Cross,,,,Active,ecross@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2021,SROBERTSON,Robertson,Sheldon,,Sheldon
Robertson,,,,Active,srobertson@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2022,MHALL,Hall,Maria,,Maria Hall,,,,Active,mhall@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2023,CMCKINNEY,Mckinney,Clark,,Clark
Mckinney,,,,Active,cmckinney@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2024,WWHEELER,Wheeler,Wendy,,Wendy
Wheeler,,,,Active,wwheeler@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2025,JRYAN,Ryan,Jerome,,Jerome Ryan,,,,Active,jryan@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2026,CMARSH,Marsh,Catherine,,Catherine
Marsh,,,,Active,cmarsh@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2027,ECOLEMAN,Coleman,Elvira,,Elvira
Coleman,,,,Active,ecoleman@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2028,SMORAN,Moran,Shawna,,Shawna Moran,,,,Active,smoran@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2029,VCARPENTER,Carpenter,Victor,,Victor
Carpenter,,,,Active,vcarpenter@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2030,TGOMEZ,Gomez,Teri,,Teri Gomez,,,,Active,tgomez@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2031,EMUNOZ,Munoz,Elizabeth,,Elizabeth
Munoz,,,,Active,emunoz@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2032,YWATKINS,Watkins,Yvonne,,Yvonne
Watkins,,,,Active,ywatkins@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2033,SKELLER,Keller,Steve,,Steve Keller,,,,Active,skeller@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2034,SKING,King,Saul,,Saul King,,,,Active,sking@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2036,DHOWELL,Howell,Dawn,,Dawn Howell,,,,Active,dHowell@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2038,HBROCK,Brock,Hazel,,Hazel Brock,,,,Active,hBrock@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,DHOWELL,Dawn Howell,,,,,,,0
2039,EPATTON,Patton,Erick,,Erick Patton,,,,Active,ePatton@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2040,VANDERSON,Anderson,Verna,,Verna
Anderson,,,,Active,vAnderson@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2041,AREYES,Reyes,Archie,,Archie Reyes,,,,Active,aReyes@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2042,ISAUNDERS,Saunders,van,,van
Saunders,,,,Active,ISaunders@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2043,SWEBER,Weber,Saul,,Saul Weber,,,,Active,sWeber@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
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2044,JWATERS,Waters,Jo,,Jo Waters,,,,Active,jWaters@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2045,WJOSEPH,Joseph,Wilbur,,Wilbur
Joseph,,,,Active,wJoseph@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2046,ACOOK,Cook,Aaron,,Aaron Cook,,,,Active,aCook@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2047,BBECKER,Becker,Beulah,,Beulah
Becker,,,,Active,bBecker@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2048,BNICHOLS,Nichols,Bethany,,Bethany
Nichols,,,,Active,bNichols@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2049,CCHAVEZ,Chavez,Cathy,,Cathy
Chavez,,,,Active,cChavez@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2050,GHANSON,Hanson,Gertrude,,Gertrude
Hanson,,,,Active,gHanson@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2051,MROY,Roy,May,,May Roy,,,,Active,mRoy@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2052,SWILLIS,Willis,Shelia,,Shelia
Willis,,,,Active,sWillis@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2053,TWILKINS,Wilkins,Toby,,Toby
Wilkins,,,,Active,tWilkins@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2054,CPAGE,Page,Connie,,Connie Page,,,,Active,cPage@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2055,TDANIELS,Daniels,Tommie,,Tommie
Daniels,,,,Active,tDaniels@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2056,TORTIZ,Ortiz,Theodore,,Theodore
Ortiz,,,,Active,tOrtiz@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2057,FLAMB,Lamb,Florence,,Florence
Lamb,,,,Active,fLamb@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2058,SABBOTT,Abbott,Sherry,,Sherry
Abbott,,,,Active,sAbbott@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2059,AQUINN,Quinn,Austin,,Austin
Quinn,,,,Active,aQuinn@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2060,FWHEELER,Wheeler,Freda,,Freda
Wheeler,,,,Active,fWheeler@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2061,ENEWTON,Newton,Evelyn,,Evelyn
Newton,,,,Active,eNewton@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2062,RROBERSON,Roberson,Rick,,Rick
Roberson,,,,Active,rRoberson@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2063,JNORMAN,Norman,Jerald,,Jerald
Norman,,,,Active,jNorman@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2064,AWILKINS,Wilkins,Alfred,,Alfred
Wilkins,,,,Active,aWilkins@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2065,AMUNOZ,Munoz,Alyssa,,Alyssa
Munoz,,,,Active,aMunoz@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2066,AWONG,Wong,April,,April Wong,,,,Active,aWong@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2067,NMYERS,Myers,Nelson,,Nelson
Myers,,,,Active,nMyers@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2068,PFRANCIS,Francis,Patti,,Patti
Francis,,,,Active,pFrancis@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2069,BBARBER,Barber,Bert,,Bert
Barber,,,,Active,bBarber@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2070,RCHAMBERS,Chambers,Randolph,,Randolph
Chambers,,,,Active,rChambers@example.com,,Work,,,,,Full-
```

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Time,,,Starlight,,,,,,,,,,,0
2071,VORTIZ,Ortiz,Vernon,,Vernon Ortiz,,,,Active,vOrtiz@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2072,ICALDWELL,Caldwell,Inez,,Inez
Caldwell,,,,Active,ICaldwell@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2073,KMYERS,Myers,Karla,,Karla Myers,,,,Active,kMyers@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2074,LMULLINS,Mullins,Lowell,,Lowell
Mullins,,,,Active,lMullins@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2075,CHOPKINS,Hopkins,Crystal,,Crystal
Hopkins,,,,Active,cHopkins@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2076,NRICE,Rice,Nichole,,Nichole Rice,,,,Active,nRice@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2077,LVEGA,Vega,Luke,,Luke Vega,,,,Active,lVega@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2078,MBAKER,Baker,Mable,,Mable Baker,,,,Active,mBaker@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2079,OGONZALES,Gonzales,Ollie,,Ollie
Gonzales,,,,Active,oGonzales@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2080,TARMSTRONG,Armstrong,Toby,,Toby
Armstrong,,,,Active,tArmstrong@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2081,GABBOTT,Abbott,Gerard,,Gerard Abbott,,,,Active,gAbbott@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2082,LDAWSON,Dawson,Leah,,Leah Dawson,,,,Active,lDawson@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2083,NROMERO,Romero,Noel,,Noel Romero,,,,Active,nRomero@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2084,ACANNON,Cannon,Austin,,Austin Cannon,,,,Active,aCannon@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2085,TMALDONADO,Maldonado,Terry,,Terry
Maldonado,,,,Active,tMaldonado@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2086,CGREGORY,Gregory,Cora,,Cora Gregory,,,,Active,cGregory@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2087,SCORTEZ,Cortez,Shannon,,Shannon
Cortez,,,,Active,sCortez@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2088,SMCDONALD,Mcdonald,Sharon,,Sharon
Mcdonald,,,,Active,sMcdonald@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2089,FGOODMAN,Goodman,Fredrick,,Fredrick
Goodman,,,,Active,fGoodman@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2090,SRICHARDSON,Richardson,Sherman,,Sherman
Richardson,,,,Active,sRichardson@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2091,RPETERSON,Peterson,Russell,,Russell
Peterson,,,,Active,rPeterson@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2092,LPITTMAN,Pittman,Lora,,Lora Pittman,,,,Active,lPittman@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2093,CORTEGA,Ortega,Chester,,Chester
Ortega,,,,Active,cOrtega@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2094,NTHOMPSON,Thompson,Nicole,,Nicole
Thompson,,,,Active,nThompson@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2095,JFREEMAN,Freeman,Jill,,Jill Freeman,,,,Active,jFreeman@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2096,DWASHINGTON,Washington,Danny,,Danny
Washington,,,,Active,dWashington@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2097,CALEXANDER,Alexander,Carmen,,Carmen
Alexander,,,,Active,cAlexander@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2098,PBARTON,Barton,Patsy,,Patsy Barton,,,,Active,pBarton@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2099,JMOODY,Moody,Jo,,Jo Moody,,,,Active,jMoody@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
```

```
2100,DELLIOTT,Elliott,Doyle,,Doyle
Elliott,,,,Active,dElliott@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2101,DFOWLER,Fowler,Dwayne,,Dwayne
Fowler,,,,Active,dFowler@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2102,VCALDWELL,Caldwell,Virginia,,Virginia
Caldwell,,,,Active,vCaldwell@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2103,LBLAKE,Blake,Lynn,,Lynn Blake,,,,Active,lBlake@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2104,JLARSON,Larson,Jermaine,,Jermaine
Larson,,,,Active,jLarson@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2105,GOSBORNE,Osborne,Gloria,,Gloria
Osborne,,,,Active,gOsborne@example.com,,Work,,,,,Full-
Time,,,Starlight,,,,,,,,,,,0
2106,TMORENO,Moreno,Tanya,,Tanya
Moreno,,,,Active,tMoreno@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
2107,KADAMS,Adams,Kristina,,Kristina
Adams,,,,Active,kAdams@example.com,,Work,,,,,Full-Time,,,Starlight,,,,,,,,,,,0
```

3.3.3.2 Sample applications.csv File

The following table lists the mandatory and optional application attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_APP_ID	Optional
NAME	Mandatory
DISPLAY_NAME	Optional
TYPE	Mandatory
DESCRIPTION	Optional
RISK_SCORE	Optional

The following is a sample applications.csv file:

```
"EXT_APP_ID","NAME","DISPLAY_NAME","TYPE","DESCRIPTION","RISK_SCORE"
47,"ebs1","ebs1","Disconnected","ebs1",3
48,"EBS2","EBS2","Disconnected","EBS2",3
1,"myapp","myapp","Disconnected","my test application",1
41,"LapTop","LapTop","Disconnected","Laptop",3
44,"activeb","activeb","Disconnected","activeb",3
45,"ActiveD","ActiveD","Disconnected","ActiveD",3
46,"ActiveE","ActiveE","Disconnected","ActiveE",3
5,"myapp1","myapp1","Disconnected","",3
43,"mobile","mobile","Disconnected","mobile",3
49,"DB1","DB1","Disconnected","DB1",3
2,"VISDU1","VISDU1","DOBBased","VISDU1",7
3,"VISDU2","VISDU2","DOBBased","VISDU2",7
4,"VISDU3","VISDU3","DOBBased","VISDU3",7
23,"JIRAApp","JIRAApp","Disconnected","JIRAApp",3
42,"Badge","Badge","Disconnected","Badge",3
50,"DB2","DB2","Disconnected","DB2",3
```

3.3.3.3 Sample accounts.csv File

The following table lists the mandatory and optional account attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_ACCOUNT_ID	Optional
ACCOUNT_NAME	Mandatory
ACCOUNT_TYPE	Mandatory
USER_NAME	Mandatory
APPLICATION_NAME	Mandatory

The following is a sample accounts.csv file:

```
"EXT_ACCOUNT_ID","ACCOUNT_NAME","ACCOUNT_TYPE","USER_NAME","APPLICATION_NAME"
238,"VCERTUSER1","primary","VCERTUSER1","VISDU1"
239,"VCERTUSER2","primary","VCERTUSER2","VISDU1"
240,"VCERTUSER3","primary","VCERTUSER3","VISDU1"
241,"VCERTUSER4","primary","VCERTUSER4","VISDU1"
242,"VCERTUSER5","primary","VCERTUSER5","VISDU1"
243,"VCERTUSER6","primary","VCERTUSER6","VISDU1"
244,"VCERTUSER7","primary","VCERTUSER7","VISDU1"
245,"VCERTUSER8","primary","VCERTUSER8","VISDU1"
246,"VCERTUSER9","primary","VCERTUSER9","VISDU1"
247,"VCERTUSER10","primary","VCERTUSER10","VISDU1"
248,"VCERTUSER11","primary","VCERTUSER11","VISDU1"
249,"VCERTUSER1","primary","VCERTUSER1","VISDU2"
250,"VCERTUSER2","primary","VCERTUSER2","VISDU2"
251,"VCERTUSER3","primary","VCERTUSER3","VISDU2"
252,"VCERTUSER4","primary","VCERTUSER4","VISDU2"
253,"VCERTUSER5","primary","VCERTUSER5","VISDU2"
254,"VCERTUSER6","primary","VCERTUSER6","VISDU2"
255,"VCERTUSER7","primary","VCERTUSER7","VISDU2"
256,"VCERTUSER8","primary","VCERTUSER8","VISDU2"
257,"VCERTUSER9","primary","VCERTUSER9","VISDU2"
258,"VCERTUSER10","primary","VCERTUSER10","VISDU2"
259,"VCERTUSER11","primary","VCERTUSER11","VISDU2"
260,"VCERTUSER1","primary","VCERTUSER1","VISDU3"
261,"VCERTUSER2","primary","VCERTUSER2","VISDU3"
262,"VCERTUSER3","primary","VCERTUSER3","VISDU3"
263,"VCERTUSER4","primary","VCERTUSER4","VISDU3"
264,"VCERTUSER5","primary","VCERTUSER5","VISDU3"
265,"VCERTUSER6","primary","VCERTUSER6","VISDU3"
266,"VCERTUSER7","primary","VCERTUSER7","VISDU3"
267,"VCERTUSER8","primary","VCERTUSER8","VISDU3"
268,"VCERTUSER9","primary","VCERTUSER9","VISDU3"
269,"VCERTUSER10","primary","VCERTUSER10","VISDU3"
270,"VCERTUSER11","primary","VCERTUSER11","VISDU3"
271,"test","primary","XELSYSADM","myapp1"
303,"303","other","USR_5","LapTop"
304,"304","primary","USR_5","LapTop"
561,"561","primary","JNORMAN","Badge"
562,"562","primary","AMUNOZ","Badge"
563,"563","primary","AWONG","Badge"
564,"564","primary","NMYERS","Badge"
565,"565","primary","BBARBER","Badge"
```

```
566,"566","primary","RCHAMBERS","Badge"
567,"567","primary","VORTIZ","Badge"
568,"568","primary","ICALDWELL","Badge"
569,"569","primary","KMYERS","Badge"
570,"570","primary","LMULLINS","Badge"
571,"571","primary","CHOPKINS","Badge"
572,"572","primary","NRICE","Badge"
573,"573","primary","LVEGA","Badge"
574,"574","primary","MBAKER","Badge"
575,"575","primary","OGONZALES","Badge"
576,"576","primary","TARMSTRONG","Badge"
577,"577","primary","GABBOTT","Badge"
578,"578","primary","LDAWSON","Badge"
579,"579","primary","NROMERO","Badge"
580,"580","primary","ACANNON","Badge"
581,"581","primary","TMALDONADO","Badge"
582,"582","primary","CGREGORY","Badge"
583,"583","primary","SCORTEZ","Badge"
584,"584","primary","SMCDONALD","Badge"
585,"585","primary","FGOODMAN","Badge"
586,"586","primary","SRICHARDSON","Badge"
587,"587","primary","RPETERSON","Badge"
588,"588","primary","LPITTMAN","Badge"
589,"589","primary","CORTEGA","Badge"
590,"590","primary","NTHOMPSON","Badge"
591,"591","primary","JFREEMAN","Badge"
592,"592","primary","DWASHINGTON","Badge"
593,"593","primary","CALEXANDER","Badge"
594,"594","primary","PBARTON","Badge"
595,"595","primary","JMOODY","Badge"
596,"596","primary","DELLIOTT","Badge"
597,"597","primary","DFOWLER","Badge"
598,"598","primary","VCALDWELL","Badge"
599,"599","primary","LBLAKE","Badge"
600,"600","primary","JLARSON","Badge"
601,"601","primary","GOSBORNE","Badge"
602,"602","primary","TMORENO","Badge"
603,"603","primary","KADAMS","Badge"
604,"604","primary","HBROCK","mobile"
605,"605","primary","EPATTON","mobile"
606,"606","primary","VANDERSON","mobile"
607,"607","primary","AREYES","mobile"
608,"608","primary","ISAUNDERS","mobile"
609,"609","primary","SWEBER","mobile"
610,"610","primary","JWATERS","mobile"
611,"611","primary","WJOSEPH","mobile"
612,"612","primary","ACOOK","mobile"
613,"613","primary","BBECKER","mobile"
614,"614","primary","BNICHOLS","mobile"
615,"615","primary","CCHAVEZ","mobile"
616,"616","primary","GHANSON","mobile"
617,"617","primary","MROY","mobile"
618,"618","primary","SWILLIS","mobile"
619,"619","primary","TWILKINS","mobile"
620,"620","primary","CPAGE","mobile"
621,"621","primary","TDANIELS","mobile"
622,"622","primary","TORTIZ","mobile"
623,"623","primary","FLAMB","mobile"
624,"624","primary","SABBOTT","mobile"
625,"625","primary","AQUINN","mobile"
626,"626","primary","FWHEELER","mobile"
```

```
627,"627","primary","RROBERSON","mobile"
713,"713","primary","NROMERO","activeb"
714,"714","primary","ACANNON","activeb"
715,"715","primary","TMALDONADO","activeb"
716,"716","primary","CGREGORY","activeb"
717,"717","primary","SCORTEZ","activeb"
718,"718","primary","SMCDONALD","activeb"
719,"719","primary","FGOODMAN","activeb"
720,"720","primary","SRICHARDSON","activeb"
721,"721","primary","RPETERSON","activeb"
722,"722","primary","LPITTMAN","activeb"
723,"723","primary","CORTEGA","activeb"
724,"724","primary","NTHOMPSON","activeb"
725,"725","primary","JFREEMAN","activeb"
726,"726","primary","DWASHINGTON","activeb"
727,"727","primary","CALEXANDER","activeb"
728,"728","primary","PBARTON","activeb"
729,"729","primary","JMOODY","activeb"
730,"730","primary","DELLIOTT","activeb"
731,"731","primary","DFOWLER","activeb"
732,"732","primary","VCALDWELL","activeb"
733,"733","primary","LBLAKE","activeb"
734,"734","primary","JLARSON","activeb"
735,"735","primary","GOSBORNE","activeb"
736,"736","primary","TMORENO","activeb"
737,"737","primary","KADAMS","activeb"
741,"second1","other","CALEXANDER","Badge"
628,"628","primary","JNORMAN","mobile"
629,"629","primary","AMUNOZ","mobile"
630,"630","primary","AWONG","mobile"
631,"631","primary","NMYERS","mobile"
632,"632","primary","BBARBER","mobile"
633,"633","primary","RCHAMBERS","mobile"
634,"634","primary","VORTIZ","mobile"
635,"635","primary","ICALDWELL","mobile"
636,"636","primary","KMYERS","mobile"
637,"637","primary","LMULLINS","mobile"
638,"638","primary","CHOPKINS","mobile"
639,"639","primary","NRICE","mobile"
640,"640","primary","LVEGA","mobile"
641,"641","primary","MBAKER","mobile"
642,"642","primary","OGONZALES","mobile"
643,"643","primary","TARMSTRONG","mobile"
644,"644","primary","GABBOTT","mobile"
645,"645","primary","LDAWSON","mobile"
646,"646","primary","NROMERO","mobile"
647,"647","primary","ACANNON","mobile"
648,"648","primary","TMALDONADO","mobile"
649,"649","primary","CGREGORY","mobile"
650,"650","primary","SCORTEZ","mobile"
651,"651","primary","SMCDONALD","mobile"
652,"652","primary","FGOODMAN","mobile"
653,"653","primary","SRICHARDSON","mobile"
654,"654","primary","RPETERSON","mobile"
655,"655","primary","LPITTMAN","mobile"
656,"656","primary","CORTEGA","mobile"
657,"657","primary","NTHOMPSON","mobile"
658,"658","primary","JFREEMAN","mobile"
659,"659","primary","DWASHINGTON","mobile"
660,"660","primary","CALEXANDER","mobile"
661,"661","primary","PBARTON","mobile"
```

```
662,"662","primary","JMOODY","mobile"
663,"663","primary","DELLIOTT","mobile"
664,"664","primary","DFOWLER","mobile"
665,"665","primary","VCALDWELL","mobile"
666,"666","primary","LBLAKE","mobile"
667,"667","primary","JLARSON","mobile"
668,"668","primary","GOSBORNE","mobile"
669,"669","primary","TMORENO","mobile"
670,"670","primary","KADAMS","mobile"
671,"671","primary","HBROCK","activeb"
672,"672","primary","EPATTON","activeb"
673,"673","primary","VANDERSON","activeb"
674,"674","primary","AREYES","activeb"
675,"675","primary","ISAUNDERS","activeb"
676,"676","primary","SWEBER","activeb"
677,"677","primary","JWATERS","activeb"
678,"678","primary","WJOSEPH","activeb"
679,"679","primary","ACOOK","activeb"
680,"680","primary","BBECKER","activeb"
681,"681","primary","BNICHOLS","activeb"
682,"682","primary","CCHAVEZ","activeb"
683,"683","primary","GHANSON","activeb"
684,"684","primary","MROY","activeb"
685,"685","primary","SWILLIS","activeb"
686,"686","primary","TWILKINS","activeb"
687,"687","primary","CPAGE","activeb"
688,"688","primary","TDANIELS","activeb"
689,"689","primary","TORTIZ","activeb"
690,"690","primary","FLAMB","activeb"
691,"691","primary","SABBOTT","activeb"
692,"692","primary","AQUINN","activeb"
693,"693","primary","FWHEELER","activeb"
694,"694","primary","RROBERSON","activeb"
695,"695","primary","JNORMAN","activeb"
696,"696","primary","AMUNOZ","activeb"
697,"697","primary","AWONG","activeb"
698,"698","primary","NMYERS","activeb"
699,"699","primary","BBARBER","activeb"
700,"700","primary","RCHAMBERS","activeb"
701,"701","primary","VORTIZ","activeb"
702,"702","primary","ICALDWELL","activeb"
703,"703","primary","KMYERS","activeb"
704,"704","primary","LMULLINS","activeb"
705,"705","primary","CHOPKINS","activeb"
706,"706","primary","NRICE","activeb"
707,"707","primary","LVEGA","activeb"
708,"708","primary","MBAKER","activeb"
709,"709","primary","OGONZALES","activeb"
710,"710","primary","TARMSTRONG","activeb"
711,"711","primary","GABBOTT","activeb"
712,"712","primary","LDAWSON","activeb"
366,"366","primary","DLEWIS","LapTop"
367,"367","primary","MSANDOVAL","LapTop"
368,"368","primary","CDELGADO","LapTop"
369,"369","primary","KGILL","LapTop"
370,"370","primary","JNEWTON","LapTop"
371,"371","primary","AMEYER","LapTop"
372,"372","primary","LBATES","LapTop"
373,"373","primary","VMORALES","LapTop"
374,"374","primary","KPOOLE","LapTop"
375,"375","primary","WOLIVER","LapTop"
```

```
376,"376","primary","DSCHULTZ","LapTop"
377,"377","primary","PGOODMAN","LapTop"
378,"378","primary","JMULLINS","LapTop"
379,"379","primary","RWALTON","LapTop"
380,"380","primary","ECROSS","LapTop"
381,"381","primary","SROBERTSON","LapTop"
382,"382","primary","MHALL","LapTop"
383,"383","primary","CMCKINNEY","LapTop"
384,"384","primary","WWHEELER","LapTop"
385,"385","primary","JRYAN","LapTop"
386,"386","primary","CMARSH","LapTop"
387,"387","primary","ECOLEMAN","LapTop"
388,"388","primary","SMORAN","LapTop"
389,"389","primary","VCARPENTER","LapTop"
390,"390","primary","TGOMEZ","LapTop"
391,"391","primary","EMUNOZ","LapTop"
392,"392","primary","YWATKINS","LapTop"
393,"393","primary","SKELLER","LapTop"
394,"394","primary","SKING","LapTop"
537,"537","primary","HBROCK","Badge"
538,"538","primary","EPATTON","Badge"
539,"539","primary","VANDERSON","Badge"
540,"540","primary","AREYES","Badge"
541,"541","primary","ISAUNDERS","Badge"
542,"542","primary","SWEBER","Badge"
543,"543","primary","JWATERS","Badge"
544,"544","primary","WJOSEPH","Badge"
545,"545","primary","ACOOK","Badge"
546,"546","primary","BBECKER","Badge"
547,"547","primary","BNICHOLS","Badge"
548,"548","primary","CCHAVEZ","Badge"
549,"549","primary","GHANSON","Badge"
550,"550","primary","MROY","Badge"
551,"551","primary","SWILLIS","Badge"
552,"552","primary","TWILKINS","Badge"
553,"553","primary","CPAGE","Badge"
554,"554","primary","TDANIELS","Badge"
555,"555","primary","TORTIZ","Badge"
556,"556","primary","FLAMB","Badge"
557,"557","primary","SABBOTT","Badge"
558,"558","primary","AQUINN","Badge"
559,"559","primary","FWHEELER","Badge"
560,"560","primary","RROBERSON","Badge"
```

3.3.3.4 Sample entitlements.csv File

The following table lists the mandatory and optional entitlement attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_ENT_ID	Optional
NAME	Mandatory
DISPLAY_NAME	Optional
APPLICATION_NAME	Mandatory
GRANTEE_TYPE	Optional
EXT_GRANTEE_ID	Optional

OIRI Attribute	Mandatory/Optional
GRANTEE_NAME	Optional
RISK_SCORE	Optional

The following is a sample entitlements.csv file:

```
"EXT_ENT_ID","NAME","DISPLAY_NAME","APPLICATION_NAME","GRANTEE_TYPE","EXT_GRANTEE
_ID","GRANTEE_NAME","RISK_SCORE"
9,"EntTestDB~CN=VISDU33,DC=abc,DC=com","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISD
U3","VISDU3 child form",7,"VISDU3 lookup",3
8,"EntTestDB~CN=VISDU32,DC=abc,DC=com","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISD
U3","VISDU3 child form",7,"VISDU3 lookup",3
7,"EntTestDB~CN=VISDU31,DC=abc,DC=com","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISD
U3","VISDU3 child form",7,"VISDU3 lookup",3
11,"Dell","Dell","myapp1","myapp1 child form",8,"ID",3
10,"Mac","Mac","myapp1","myapp1 child form",8,"ID",3
3,"EntTestDB~CN=VISDU13,DC=abc,DC=com","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISD
U1","VISDU1 child form",5,"VISDU1 lookup",3
2,"EntTestDB~CN=VISDU12,DC=abc,DC=com","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISD
U1","VISDU1 child form",5,"VISDU1 lookup",3
1,"EntTestDB~CN=VISDU11,DC=abc,DC=com","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISD
U1","VISDU1 child form",5,"VISDU1 lookup",3
6,"EntTestDB~CN=VISDU23,DC=abc,DC=com","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISD
U2","VISDU2 child form",6,"VISDU2 lookup",3
5,"EntTestDB~CN=VISDU22,DC=abc,DC=com","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISD
U2","VISDU2 child form",6,"VISDU2 lookup",3
4,"EntTestDB~CN=VISDU21,DC=abc,DC=com","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISD
U2","VISDU2 child form",6,"VISDU2 lookup",3
110,"EBS1_6","EBS1_6","ebs1","ebs1 child form",67,"entitlements",3
109,"EBS1_2","EBS1_2","ebs1","ebs1 child form",67,"entitlements",3
108,"EBS1_10","EBS1_10","ebs1","ebs1 child form",67,"entitlements",3
107,"EBS1_3","EBS1_3","ebs1","ebs1 child form",67,"entitlements",3
106,"EBS1_1","EBS1_1","ebs1","ebs1 child form",67,"entitlements",3
105,"EBS1_9","EBS1_9","ebs1","ebs1 child form",67,"entitlements",3
104,"EBS1_5","EBS1_5","ebs1","ebs1 child form",67,"entitlements",3
103,"EBS1_4","EBS1_4","ebs1","ebs1 child form",67,"entitlements",3
102,"EBS1_8","EBS1_8","ebs1","ebs1 child form",67,"entitlements",3
101,"EBS1_7","EBS1_7","ebs1","ebs1 child form",67,"entitlements",3
130,"DB1_2","DB1_2","DB1","DB1 child form",69,"entitlements",3
129,"DB1_6","DB1_6","DB1","DB1 child form",69,"entitlements",3
128,"DB1_10","DB1_10","DB1","DB1 child form",69,"entitlements",3
127,"DB1_5","DB1_5","DB1","DB1 child form",69,"entitlements",3
126,"DB1_4","DB1_4","DB1","DB1 child form",69,"entitlements",3
125,"DB1_1","DB1_1","DB1","DB1 child form",69,"entitlements",3
124,"DB1_7","DB1_7","DB1","DB1 child form",69,"entitlements",3
123,"DB1_9","DB1_9","DB1","DB1 child form",69,"entitlements",3
122,"DB1_8","DB1_8","DB1","DB1 child form",69,"entitlements",3
121,"DB1_3","DB1_3","DB1","DB1 child form",69,"entitlements",3
140,"DB2_8","DB2_8","DB2","DB2 child form",70,"entitlements",3
139,"DB2_7","DB2_7","DB2","DB2 child form",70,"entitlements",3
138,"DB2_6","DB2_6","DB2","DB2 child form",70,"entitlements",3
137,"DB2_10","DB2_10","DB2","DB2 child form",70,"entitlements",3
136,"DB2_2","DB2_2","DB2","DB2 child form",70,"entitlements",3
135,"DB2_4","DB2_4","DB2","DB2 child form",70,"entitlements",3
134,"DB2_3","DB2_3","DB2","DB2 child form",70,"entitlements",3
133,"DB2_9","DB2_9","DB2","DB2 child form",70,"entitlements",3
132,"DB2_1","DB2_1","DB2","DB2 child form",70,"entitlements",3
131,"DB2_5","DB2_5","DB2","DB2 child form",70,"entitlements",3
44,"Store","Store","Badge","Badge Types",62,"type",3
```

```
43,"Access","Access","Badge","Badge Types",62,"type",3
60,"reception","reception","Badge","Badge Types",62,"type",3
59,"warehouse","warehouse","Badge","Badge Types",62,"type",3
55,"Conference","Conference","Badge","Badge Types",62,"type",3
54,"Cafteria","Cafteria","Badge","Badge Types",62,"type",3
53,"Office","Office","Badge","Badge Types",62,"type",3
51,"Printer","Printer","Badge","Badge Types",62,"type",3
50,"ACRoom","ACRoom","Badge","Badge Types",62,"type",3
45,"generator","generator","Badge","Badge Types",62,"type",1
80,"ActiveB9","ActiveB9","activeb","activeb child form",64,"entitlements",3
79,"ActiveB8","ActiveB8","activeb","activeb child form",64,"entitlements",3
78,"ActiveB3","ActiveB3","activeb","activeb child form",64,"entitlements",3
77,"ActiveB2","ActiveB2","activeb","activeb child form",64,"entitlements",3
76,"ActiveB10","ActiveB10","activeb","activeb child form",64,"entitlements",3
75,"ActiveB7","ActiveB7","activeb","activeb child form",64,"entitlements",3
74,"ActiveB1","ActiveB1","activeb","activeb child form",64,"entitlements",3
73,"ActiveB6","ActiveB6","activeb","activeb child form",64,"entitlements",3
72,"ActiveB5","ActiveB5","activeb","activeb child form",64,"entitlements",3
71,"ActiveB4","ActiveB4","activeb","activeb child form",64,"entitlements",3
42,"DELL","DELL","LapTop","LapTop child form",61,"model",3
41,"HP","HP","LapTop","LapTop child form",61,"model",3
58,"Toshiba","Toshiba","LapTop","LapTop child form",61,"model",3
57,"Compaq","Compaq","LapTop","LapTop child form",61,"model",3
56,"Lenovo","Lenovo","LapTop","LapTop child form",61,"model",3
52,"Zenith","Zenith","LapTop","LapTop child form",61,"model",3
49,"MI","MI","LapTop","LapTop child form",61,"model",3
48,"Mac","Mac","LapTop","LapTop child form",61,"model",3
47,"HCL","HCL","LapTop","LapTop child form",61,"model",3
46,"Asus","Asus","LapTop","LapTop child form",61,"model",3
70,"realme","samsung","mobile","mobile child form",63,"company",3
69,"apple","apple","mobile","mobile child form",63,"company",3
68,"micromax","micromax","mobile","mobile child form",63,"company",3
67,"HTC","HTC","mobile","mobile child form",63,"company",3
66,"Nokia","Nokia","mobile","mobile child form",63,"company",3
65,"celeron","celeron","mobile","mobile child form",63,"company",3
64,"Lenovo","Lenovo","mobile","mobile child form",63,"company",3
63,"Oppo","Oppo","mobile","mobile child form",63,"company",3
62,"MI","MI","mobile","mobile child form",63,"company",3
61,"samsung","samsung","mobile","mobile child form",63,"company",3
90,"ActiveD8","ActiveD8","ActiveD","ActiveD child form",65,"entitlements",3
89,"ActiveD4","ActiveD4","ActiveD","ActiveD child form",65,"entitlements",3
88,"ActiveD1","ActiveD1","ActiveD","ActiveD child form",65,"entitlements",3
87,"ActiveD9","ActiveD9","ActiveD","ActiveD child form",65,"entitlements",3
86,"ActiveD10","ActiveD10","ActiveD","ActiveD child form",65,"entitlements",3
85,"ActiveD3","ActiveD3","ActiveD","ActiveD child form",65,"entitlements",3
84,"ActiveD5","ActiveD5","ActiveD","ActiveD child form",65,"entitlements",3
83,"ActiveD7","ActiveD7","ActiveD","ActiveD child form",65,"entitlements",3
82,"ActiveD6","ActiveD6","ActiveD","ActiveD child form",65,"entitlements",3
81,"ActiveD2","ActiveD2","ActiveD","ActiveD child form",65,"entitlements",3
100,"ActiveE7","ActiveE7","ActiveE","ActiveE child form",66,"entitlements",3
99,"ActiveE8","ActiveE8","ActiveE","ActiveE child form",66,"entitlements",3
98,"ActiveE6","ActiveE6","ActiveE","ActiveE child form",66,"entitlements",3
97,"ActiveE1","ActiveE1","ActiveE","ActiveE child form",66,"entitlements",3
96,"ActiveE4","ActiveE4","ActiveE","ActiveE child form",66,"entitlements",3
95,"ActiveE5","ActiveE5","ActiveE","ActiveE child form",66,"entitlements",3
94,"ActiveE3","ActiveE3","ActiveE","ActiveE child form",66,"entitlements",3
93,"ActiveE2","ActiveE2","ActiveE","ActiveE child form",66,"entitlements",3
92,"ActiveE10","ActiveE10","ActiveE","ActiveE child form",66,"entitlements",3
91,"ActiveE9","ActiveE9","ActiveE","ActiveE child form",66,"entitlements",3
120,"EBS2_9","EBS2_9","EBS2","EBS2 child form",68,"entitlements",3
119,"EBS2_1","EBS2_1","EBS2","EBS2 child form",68,"entitlements",3
```

```
118,"EBS2_4","EBS2_4","EBS2","EBS2 child form",68,"entitlements",3
117,"EBS2_7","EBS2_7","EBS2","EBS2 child form",68,"entitlements",3
116,"EBS2_8","EBS2_8","EBS2","EBS2 child form",68,"entitlements",3
115,"EBS2_5","EBS2_5","EBS2","EBS2 child form",68,"entitlements",3
114,"EBS2_2","EBS2_2","EBS2","EBS2 child form",68,"entitlements",3
113,"EBS2_6","EBS2_6","EBS2","EBS2 child form",68,"entitlements",3
112,"EBS2_10","EBS2_10","EBS2","EBS2 child form",68,"entitlements",3
111,"EBS2_3","EBS2_3","EBS2","EBS2 child form",68,"entitlements",3
```

3.3.3.5 Sample assignedEntitlements.csv File

The following table lists the mandatory and optional assignedEntitlements attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_USER_ID	Optional
USER_NAME	Mandatory
ENTITLEMENT_NAME	Mandatory
APPLICATION_NAME	Mandatory
GRANTEE_TYPE	Mandatory
GRANTEE_NAME	Mandatory

The following is a sample assignedEntitlements.csv file:

```
"EXT_USER_ID","USER_NAME","ENTITLEMENT_NAME","APPLICATION_NAME","GRANTEE_TYPE","G
RANTEE_NAME"
100,"VCERTUSER11","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
2006,"DLEWIS","Lenovo","LapTop","LapTop child form","model"
2007,"MSANDOVAL","Mac","LapTop","LapTop child form","model"
2008,"CDELGADO","HCL","LapTop","LapTop child form","model"
2009,"KGILL","Lenovo","LapTop","LapTop child form","model"
90,"VCERTUSER1","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
94,"VCERTUSER5","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
97,"VCERTUSER8","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
99,"VCERTUSER10","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
2026,"CMARSH","Mac","LapTop","LapTop child form","model"
2026,"CMARSH","Compaq","LapTop","LapTop child form","model"
2026,"CMARSH","MI","LapTop","LapTop child form","model"
2027,"ECOLEMAN","Compaq","LapTop","LapTop child form","model"
2028,"SMORAN","Zenith","LapTop","LapTop child form","model"
2011,"AMEYER","Toshiba","LapTop","LapTop child form","model"
2012,"LBATES","Mac","LapTop","LapTop child form","model"
2013,"VMORALES","Asus","LapTop","LapTop child form","model"
2014,"KPOOLE","HP","LapTop","LapTop child form","model"
2014,"KPOOLE","Toshiba","LapTop","LapTop child form","model"
2016,"DSCHULTZ","Mac","LapTop","LapTop child form","model"
2017,"PGOODMAN","HP","LapTop","LapTop child form","model"
2017,"PGOODMAN","Toshiba","LapTop","LapTop child form","model"
2017,"PGOODMAN","MI","LapTop","LapTop child form","model"
1,"XELSYSADM","Dell","myapp1","myapp1 child form","ID"
2018,"JMULLINS","HP","LapTop","LapTop child form","model"
2018,"JMULLINS","Lenovo","LapTop","LapTop child form","model"
```

```
2020,"ECROSS","MI","LapTop","LapTop child form","model"
2021,"SROBERTSON","Compaq","LapTop","LapTop child form","model"
2023,"CMCKINNEY","HP","LapTop","LapTop child form","model"
2025,"JRYAN","Zenith","LapTop","LapTop child form","model"
2025,"JRYAN","Lenovo","LapTop","LapTop child form","model"
2026,"CMARSH","DELL","LapTop","LapTop child form","model"
90,"VCERTUSER1","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
91,"VCERTUSER2","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
93,"VCERTUSER4","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
94,"VCERTUSER5","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
98,"VCERTUSER9","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
98,"VCERTUSER9","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
99,"VCERTUSER10","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
90,"VCERTUSER1","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
93,"VCERTUSER4","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
94,"VCERTUSER5","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
95,"VCERTUSER6","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
97,"VCERTUSER8","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
2057,"FLAMB","reception","Badge","Badge Types","type"
2059,"AQUINN","Store","Badge","Badge Types","type"
2060,"FWHEELER","Printer","Badge","Badge Types","type"
2060,"FWHEELER","warehouse","Badge","Badge Types","type"
2060,"FWHEELER","generator","Badge","Badge Types","type"
2062,"RROBERSON","warehouse","Badge","Badge Types","type"
2063,"JNORMAN","reception","Badge","Badge Types","type"
2065,"AMUNOZ","warehouse","Badge","Badge Types","type"
2065,"AMUNOZ","reception","Badge","Badge Types","type"
2066,"AWONG","Printer","Badge","Badge Types","type"
2078,"MBAKER","Store","Badge","Badge Types","type"
2078,"MBAKER","Office","Badge","Badge Types","type"
2079,"OGONZALES","generator","Badge","Badge Types","type"
2080,"TARMSTRONG","Store","Badge","Badge Types","type"
2080,"TARMSTRONG","Printer","Badge","Badge Types","type"
2080,"TARMSTRONG","Office","Badge","Badge Types","type"
2080,"TARMSTRONG","generator","Badge","Badge Types","type"
2081,"GABBOTT","Store","Badge","Badge Types","type"
2081,"GABBOTT","Cafteria","Badge","Badge Types","type"
2082,"LDAWSON","warehouse","Badge","Badge Types","type"
2084,"ACANNON","warehouse","Badge","Badge Types","type"
2084,"ACANNON","generator","Badge","Badge Types","type"
2086,"CGREGORY","ACRoom","Badge","Badge Types","type"
2086,"CGREGORY","Printer","Badge","Badge Types","type"
2086,"CGREGORY","Office","Badge","Badge Types","type"
2086,"CGREGORY","warehouse","Badge","Badge Types","type"
2087,"SCORTEZ","warehouse","Badge","Badge Types","type"
2089,"FGOODMAN","Store","Badge","Badge Types","type"
2089,"FGOODMAN","generator","Badge","Badge Types","type"
2091,"RPETERSON","Access","Badge","Badge Types","type"
2091,"RPETERSON","Conference","Badge","Badge Types","type"
```

```
2092,"LPITTMAN","reception","Badge","Badge Types","type"
2093,"CORTEGA","Conference","Badge","Badge Types","type"
2094,"NTHOMPSON","Conference","Badge","Badge Types","type"
2094,"NTHOMPSON","generator","Badge","Badge Types","type"
2095,"JFREEMAN","ACRoom","Badge","Badge Types","type"
2095,"JFREEMAN","Cafteria","Badge","Badge Types","type"
2096,"DWASHINGTON","Printer","Badge","Badge Types","type"
2096,"DWASHINGTON","Conference","Badge","Badge Types","type"
2097,"CALEXANDER","reception","Badge","Badge Types","type"
2099,"JMOODY","Cafteria","Badge","Badge Types","type"
2101,"DFOWLER","Conference","Badge","Badge Types","type"
2102,"VCALDWELL","Access","Badge","Badge Types","type"
2067,"NMYERS","Access","Badge","Badge Types","type"
2067,"NMYERS","reception","Badge","Badge Types","type"
2071,"VORTIZ","Access","Badge","Badge Types","type"
2072,"ICALDWELL","Office","Badge","Badge Types","type"
2072,"ICALDWELL","Conference","Badge","Badge Types","type"
2074,"LMULLINS","generator","Badge","Badge Types","type"
2075,"CHOPKINS","Printer","Badge","Badge Types","type"
2029,"VCARPENTER","DELL","LapTop","LapTop child form","model"
2029,"VCARPENTER","Zenith","LapTop","LapTop child form","model"
2030,"TGOMEZ","HP","LapTop","LapTop child form","model"
2033,"SKELLER","HP","LapTop","LapTop child form","model"
2033,"SKELLER","HCL","LapTop","LapTop child form","model"
2039,"EPATTON","Cafteria","Badge","Badge Types","type"
2039,"EPATTON","generator","Badge","Badge Types","type"
2040,"VANDERSON","Store","Badge","Badge Types","type"
2040,"VANDERSON","generator","Badge","Badge Types","type"
2042,"ISAUNDERS","Store","Badge","Badge Types","type"
2043,"SWEBER","Store","Badge","Badge Types","type"
2043,"SWEBER","Cafteria","Badge","Badge Types","type"
2049,"CCHAVEZ","Cafteria","Badge","Badge Types","type"
2051,"MROY","generator","Badge","Badge Types","type"
2055,"TDANIELS","Cafteria","Badge","Badge Types","type"
2077,"LVEGA","samsung","mobile","mobile child form","company"
2078,"MBAKER","Oppo","mobile","mobile child form","company"
2078,"MBAKER","celeron","mobile","mobile child form","company"
2079,"OGONZALES","micromax","mobile","mobile child form","company"
2081,"GABBOTT","samsung","mobile","mobile child form","company"
2082,"LDAWSON","MI","mobile","mobile child form","company"
2084,"ACANNON","Nokia","mobile","mobile child form","company"
2084,"ACANNON","Lenovo","mobile","mobile child form","company"
2084,"ACANNON","celeron","mobile","mobile child form","company"
2086,"CGREGORY","Nokia","mobile","mobile child form","company"
2088,"SMCDONALD","MI","mobile","mobile child form","company"
2090,"SRICHARDSON","micromax","mobile","mobile child form","company"
2092,"LPITTMAN","apple","mobile","mobile child form","company"
2092,"LPITTMAN","celeron","mobile","mobile child form","company"
2093,"CORTEGA","apple","mobile","mobile child form","company"
2093,"CORTEGA","Nokia","mobile","mobile child form","company"
2093,"CORTEGA","HTC","mobile","mobile child form","company"
2042,"ISAUNDERS","samsung","mobile","mobile child form","company"
2042,"ISAUNDERS","celeron","mobile","mobile child form","company"
2043,"SWEBER","HTC","mobile","mobile child form","company"
2045,"WJOSEPH","Oppo","mobile","mobile child form","company"
2046,"ACOOK","Nokia","mobile","mobile child form","company"
2102,"VCALDWELL","ACRoom","Badge","Badge Types","type"
2102,"VCALDWELL","warehouse","Badge","Badge Types","type"
2106,"TMORENO","Office","Badge","Badge Types","type"
2047,"BBECKER","Oppo","mobile","mobile child form","company"
2047,"BBECKER","samsung","mobile","mobile child form","company"
```

```
2048,"BNICHOLS","celeron","mobile","mobile child form","company"
2049,"CCHAVEZ","samsung","mobile","mobile child form","company"
2050,"GHANSON","micromax","mobile","mobile child form","company"
2052,"SWILLIS","celeron","mobile","mobile child form","company"
2054,"CPAGE","celeron","mobile","mobile child form","company"
2055,"TDANIELS","HTC","mobile","mobile child form","company"
2056,"TORTIZ","MI","mobile","mobile child form","company"
2059,"AQUINN","Lenovo","mobile","mobile child form","company"
2059,"AQUINN","micromax","mobile","mobile child form","company"
2062,"RROBERSON","apple","mobile","mobile child form","company"
2062,"RROBERSON","HTC","mobile","mobile child form","company"
2063,"JNORMAN","micromax","mobile","mobile child form","company"
2065,"AMUNOZ","apple","mobile","mobile child form","company"
2065,"AMUNOZ","HTC","mobile","mobile child form","company"
2069,"BBARBER","Lenovo","mobile","mobile child form","company"
2071,"VORTIZ","Nokia","mobile","mobile child form","company"
2073,"KMYERS","samsung","mobile","mobile child form","company"
2074,"LMULLINS","micromax","mobile","mobile child form","company"
2075,"CHOPKINS","Nokia","mobile","mobile child form","company"
2077,"LVEGA","Lenovo","mobile","mobile child form","company"
2051,"MROY","ActiveB9","activeb","activeb child form","entitlements"
2052,"SWILLIS","ActiveB9","activeb","activeb child form","entitlements"
2054,"CPAGE","ActiveB9","activeb","activeb child form","entitlements"
2056,"TORTIZ","ActiveB6","activeb","activeb child form","entitlements"
2058,"SABBOTT","ActiveB2","activeb","activeb child form","entitlements"
2058,"SABBOTT","ActiveB6","activeb","activeb child form","entitlements"
2059,"AQUINN","ActiveB2","activeb","activeb child form","entitlements"
2059,"AQUINN","ActiveB3","activeb","activeb child form","entitlements"
2079,"OGONZALES","ActiveB4","activeb","activeb child form","entitlements"
2080,"TARMSTRONG","ActiveB2","activeb","activeb child form","entitlements"
2082,"LDAWSON","ActiveB4","activeb","activeb child form","entitlements"
2083,"NROMERO","ActiveB5","activeb","activeb child form","entitlements"
2085,"TMALDONADO","ActiveB9","activeb","activeb child form","entitlements"
2086,"CGREGORY","ActiveB2","activeb","activeb child form","entitlements"
2087,"SCORTEZ","ActiveB10","activeb","activeb child form","entitlements"
2089,"FGOODMAN","ActiveB3","activeb","activeb child form","entitlements"
2091,"RPETERSON","ActiveB5","activeb","activeb child form","entitlements"
2093,"CORTEGA","ActiveB4","activeb","activeb child form","entitlements"
2094,"NTHOMPSON","ActiveB1","activeb","activeb child form","entitlements"
2060,"FWHEELER","ActiveB8","activeb","activeb child form","entitlements"
2063,"JNORMAN","ActiveB3","activeb","activeb child form","entitlements"
2063,"JNORMAN","ActiveB4","activeb","activeb child form","entitlements"
2063,"JNORMAN","ActiveB8","activeb","activeb child form","entitlements"
2065,"AMUNOZ","ActiveB1","activeb","activeb child form","entitlements"
2065,"AMUNOZ","ActiveB2","activeb","activeb child form","entitlements"
2066,"AWONG","ActiveB9","activeb","activeb child form","entitlements"
2071,"VORTIZ","ActiveB1","activeb","activeb child form","entitlements"
2071,"VORTIZ","ActiveB5","activeb","activeb child form","entitlements"
2072,"ICALDWELL","ActiveB9","activeb","activeb child form","entitlements"
2074,"LMULLINS","ActiveB10","activeb","activeb child form","entitlements"
2075,"CHOPKINS","ActiveB1","activeb","activeb child form","entitlements"
2075,"CHOPKINS","ActiveB5","activeb","activeb child form","entitlements"
2075,"CHOPKINS","ActiveB9","activeb","activeb child form","entitlements"
2075,"CHOPKINS","ActiveB10","activeb","activeb child form","entitlements"
2077,"LVEGA","ActiveB2","activeb","activeb child form","entitlements"
2095,"JFREEMAN","samsung","mobile","mobile child form","company"
2096,"DWASHINGTON","Oppo","mobile","mobile child form","company"
2096,"DWASHINGTON","Lenovo","mobile","mobile child form","company"
2097,"CALEXANDER","HTC","mobile","mobile child form","company"
2101,"DFOWLER","Nokia","mobile","mobile child form","company"
2101,"DFOWLER","HTC","mobile","mobile child form","company"
```

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2102,"VCALDWELL","Oppo","mobile","mobile child form","company"
2103,"LBLAKE","micromax","mobile","mobile child form","company"
2105,"GOSBORNE","Oppo","mobile","mobile child form","company"
2105,"GOSBORNE","Lenovo","mobile","mobile child form","company"
2105,"GOSBORNE","HTC","mobile","mobile child form","company"
2105,"GOSBORNE","samsung","mobile","mobile child form","company"
2038,"HBROCK","ActiveB6","activeb","activeb child form","entitlements"
2039,"EPATTON","ActiveB4","activeb","activeb child form","entitlements"
2040,"VANDERSON","ActiveB4","activeb","activeb child form","entitlements"
2041,"AREYES","ActiveB5","activeb","activeb child form","entitlements"
2041,"AREYES","ActiveB10","activeb","activeb child form","entitlements"
2043,"SWEBER","ActiveB10","activeb","activeb child form","entitlements"
2044,"JWATERS","ActiveB9","activeb","activeb child form","entitlements"
2045,"WJOSEPH","ActiveB2","activeb","activeb child form","entitlements"
2046,"ACOOK","ActiveB3","activeb","activeb child form","entitlements"
2046,"ACOOK","ActiveB7","activeb","activeb child form","entitlements"
2046,"ACOOK","ActiveB9","activeb","activeb child form","entitlements"
2050,"GHANSON","ActiveB8","activeb","activeb child form","entitlements"
2095,"JFREEMAN","ActiveB9","activeb","activeb child form","entitlements"
2097,"CALEXANDER","ActiveB2","activeb","activeb child form","entitlements"
2097,"CALEXANDER","ActiveB5","activeb","activeb child form","entitlements"
2100,"DELLIOTT","ActiveB2","activeb","activeb child form","entitlements"
2103,"LBLAKE","ActiveB7","activeb","activeb child form","entitlements"
2104,"JLARSON","ActiveB4","activeb","activeb child form","entitlements"
2104,"JLARSON","ActiveB7","activeb","activeb child form","entitlements"
2104,"JLARSON","ActiveB8","activeb","activeb child form","entitlements"
2106,"TMORENO","ActiveB2","activeb","activeb child form","entitlements"
2106,"TMORENO","ActiveB9","activeb","activeb child form","entitlements"
2006,"DLEWIS","Asus","LapTop","LapTop child form","model"
2008,"CDELGADO","Zenith","LapTop","LapTop child form","model"
2008,"CDELGADO","HP","LapTop","LapTop child form","model"
2008,"CDELGADO","Mac","LapTop","LapTop child form","model"
91,"VCERTUSER2","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
96,"VCERTUSER7","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
99,"VCERTUSER10","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
2026,"CMARSH","Zenith","LapTop","LapTop child form","model"
2011,"AMEYER","Compaq","LapTop","LapTop child form","model"
2011,"AMEYER","Lenovo","LapTop","LapTop child form","model"
2011,"AMEYER","HCL","LapTop","LapTop child form","model"
2013,"VMORALES","MI","LapTop","LapTop child form","model"
2015,"WOLIVER","MI","LapTop","LapTop child form","model"
2018,"JMULLINS","Zenith","LapTop","LapTop child form","model"
2018,"JMULLINS","Mac","LapTop","LapTop child form","model"
2018,"JMULLINS","HCL","LapTop","LapTop child form","model"
2018,"JMULLINS","Toshiba","LapTop","LapTop child form","model"
2019,"RWALTON","DELL","LapTop","LapTop child form","model"
2019,"RWALTON","Zenith","LapTop","LapTop child form","model"
2019,"RWALTON","MI","LapTop","LapTop child form","model"
2021,"SROBERTSON","Mac","LapTop","LapTop child form","model"
2023,"CMCKINNEY","Lenovo","LapTop","LapTop child form","model"
2025,"JRYAN","Asus","LapTop","LapTop child form","model"
91,"VCERTUSER2","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
94,"VCERTUSER5","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
96,"VCERTUSER7","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
2058,"SABBOTT","Office","Badge","Badge Types","type"
```

```
2059,"AQUINN","generator","Badge","Badge Types","type"
2063,"JNORMAN","Printer","Badge","Badge Types","type"
2063,"JNORMAN","generator","Badge","Badge Types","type"
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2078,"MBAKER","ACRoom","Badge","Badge Types","type"
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2089,"FGOODMAN","reception","Badge","Badge Types","type"
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2095,"JFREEMAN","warehouse","Badge","Badge Types","type"
2096,"DWASHINGTON","Access","Badge","Badge Types","type"
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2099,"JMOODY","generator","Badge","Badge Types","type"
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2103,"LBLAKE","reception","Badge","Badge Types","type"
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2051,"MROY","samsung","mobile","mobile child form","company"
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2096,"DWASHINGTON","HTC","mobile","mobile child form","company"
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form","VISDU2 lookup"
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2010,"JNEWTON","HP","LapTop","LapTop child form","model"
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form","VISDU3 lookup"
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form","VISDU3 lookup"
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form","VISDU3 lookup"
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2011,"AMEYER","HP","LapTop","LapTop child form","model"
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2012,"LBATES","Asus","LapTop","LapTop child form","model"
2012,"LBATES","Toshiba","LapTop","LapTop child form","model"
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2013,"VMORALES","Lenovo","LapTop","LapTop child form","model"
2019,"RWALTON","Mac","LapTop","LapTop child form","model"
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form","VISDU1 lookup"
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form","VISDU2 lookup"
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form","VISDU2 lookup"
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2045,"WJOSEPH","Cafteria","Badge","Badge Types","type"
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2053,"TWILKINS","Store","Badge","Badge Types","type"
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2080,"TARMSTRONG","Oppo","mobile","mobile child form","company"
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2092,"LPITTMAN","micromax","mobile","mobile child form","company"
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2043,"SWEBER","Nokia","mobile","mobile child form","company"
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form","VISDU2 lookup"
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form","VISDU3 lookup"
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form","VISDU3 lookup"
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2019,"RWALTON","HCL","LapTop","LapTop child form","model"
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form","VISDU1 lookup"
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form","VISDU1 lookup"
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form","VISDU1 lookup"
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form","VISDU2 lookup"
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form","VISDU2 lookup"
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form","VISDU2 lookup"
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form","VISDU2 lookup"
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2030,"TGOMEZ","MI","LapTop","LapTop child form","model"
2031,"EMUNOZ","Toshiba","LapTop","LapTop child form","model"
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2044,"JWATERS","ActiveB8","activeb","activeb child form","entitlements"
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form","VISDU2 lookup"
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2010,"JNEWTON","Mac","LapTop","LapTop child form","model"
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form","VISDU3 lookup"
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form","VISDU3 lookup"
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2016,"DSCHULTZ","Compaq","LapTop","LapTop child form","model"
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form","VISDU1 lookup"
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form","VISDU1 lookup"
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form","VISDU2 lookup"
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form","VISDU2 lookup"
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2010,"JNEWTON","HCL","LapTop","LapTop child form","model"
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form","VISDU3 lookup"
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2022,"MHALL","Asus","LapTop","LapTop child form","model"
2023,"CMCKINNEY","Asus","LapTop","LapTop child form","model"
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form","VISDU2 lookup"
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2081,"GABBOTT","Printer","Badge","Badge Types","type"
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2082,"LDAWSON","Oppo","mobile","mobile child form","company"
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2016,"DSCHULTZ","DELL","LapTop","LapTop child form","model"
2017,"PGOODMAN","DELL","LapTop","LapTop child form","model"
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2046,"ACOOK","samsung","mobile","mobile child form","company"
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2016,"DSCHULTZ","MI","LapTop","LapTop child form","model"
2017,"PGOODMAN","Mac","LapTop","LapTop child form","model"
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2018,"JMULLINS","DELL","LapTop","LapTop child form","model"
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form","VISDU1 lookup"
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80,"MGMT_CHAIN_DIR_REP_3_LVL_2","ActiveB8","activeb","activeb child
form","entitlements"
80,"MGMT_CHAIN_DIR_REP_3_LVL_2","ActiveB9","activeb","activeb child
form","entitlements"
80,"MGMT_CHAIN_DIR_REP_3_LVL_2","ActiveB3","activeb","activeb child
form","entitlements"
80,"MGMT_CHAIN_DIR_REP_3_LVL_2","ActiveB6","activeb","activeb child
form","entitlements"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","Access","Badge","Badge Types","type"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","Printer","Badge","Badge Types","type"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","Conference","Badge","Badge Types","type"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","ActiveB4","activeb","activeb child
form","entitlements"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","Store","Badge","Badge Types","type"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","Cafteria","Badge","Badge Types","type"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","ActiveB5","activeb","activeb child
form","entitlements"
79,"MGMT_CHAIN_DIR_REP_2_LVL_2","ActiveB8","activeb","activeb child
form","entitlements"
```

3.3.3.6 Sample roles.csv File

The following table lists the mandatory and optional role attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_ROLE_ID	Optional
NAME	Mandatory
DISPLAY_NAME	Optional
DESCRIPTION	Optional
RISK_SCORE	Optional

The following is a sample roles.csv file:

```
"EXT_ROLE_ID","NAME","DISPLAY_NAME","DESCRIPTION","RISK_SCORE"
8,"Fraud Analyst","Fraud Analyst","",5
10,"Fraud Supervisor","Fraud Supervisor","",7
11,"Chargeback Supervisor","Chargeback Supervisor","",7
13,"Bankcard Services Analyst","Bankcard Services Analyst","",5
14,"Customer Service Supervisor - Midwest","Customer Service Supervisor - Midwest","",5
15,"Customer Service Analyst - Midwest","Customer Service Analyst - Midwest","",3
16,"Customer Service Analyst - West Coast","Customer Service Analyst - West Coast","",3
18,"Item Analyst","Item Analyst","",3
20,"AP Expense Approver","AP Expense Approver","",5
17,"External Auditor","External Auditor","",7
19,"Retail Buyer","Retail Buyer","",3
21,"AP Merchandise Vendor Approver","AP Merchandise Vendor Approver","",5
9,"Customer Service Supervisor - West Coast","Customer Service Supervisor - West
Coast","",5
12,"Bankcard Services Lead","Bankcard Services Lead","",5
61,"Candidate Role 4","Candidate Role 4","Candidate Role 4",3
62,"test rule","test rule","",3
63,"Candidate Role 3","Candidate Role 3","Candidate Role 3",3
81,"Candidate Role 1","Candidate Role 1","Candidate Role 1",3
82,"Candidate Role 7","Candidate Role 7","Candidate Role 7",3
22,"aCertRole1","aCertRole1","Description for role aCertRole1",3
23,"aCertRole2","aCertRole2","Description for role aCertRole2",3
24,"aCertRole3","aCertRole3","Description for role aCertRole3",3
25,"aCertRole4","aCertRole4","Description for role aCertRole4",3
26,"aCertRole5","aCertRole5","Description for role aCertRole5",3
27,"aCertRole6","aCertRole6","Description for role aCertRole6",3
28,"vCertRole1","vCertRole1","Description for role vCertRole1",3
29,"vCertRole2","vCertRole2","Description for role vCertRole2",3
30,"vCertRole3","vCertRole3","Description for role vCertRole3",3
31,"vCertRole4","vCertRole4","Description for role vCertRole4",3
32,"vCertRole5","vCertRole5","Description for role vCertRole5",3
33,"vCertRole6","vCertRole6","Description for role vCertRole6",3
34,"vCertRole7","vCertRole7","Description for role vCertRole7",3
35,"vCertRole8","vCertRole8","Description for role vCertRole8",3
36,"vCertRole9","vCertRole9","Description for role vCertRole9",3
37,"vCertRole10","vCertRole10","Description for role vCertRole10",3
38,"vCertRole11","vCertRole11","Description for role vCertRole11",3
39,"vCertRole12","vCertRole12","Description for role vCertRole12",3
40,"vCertRole13","vCertRole13","Description for role vCertRole13",3
41,"vCertRole14","vCertRole14","Description for role vCertRole14",3
42,"vCertRole15","vCertRole15","Description for role vCertRole15",3
43,"vCertRole16","vCertRole16","Description for role vCertRole16",3
44,"vCertRole17","vCertRole17","Description for role vCertRole17",3
45,"vCertRole18","vCertRole18","Description for role vCertRole18",3
46,"vCertRole19","vCertRole19","Description for role vCertRole19",3
47,"vCertRole20","vCertRole20","Description for role vCertRole20",3
48,"vCertRole21","vCertRole21","Description for role vCertRole21",3
49,"vCertRole22","vCertRole22","Description for role vCertRole22",3
```

3.3.3.7 Sample roleHierarchy.csv File

The following table lists the mandatory and optional roleHierarchy attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
ROLE_NAME	Mandatory
NESTED_ROLE_NAME	Mandatory

The following is a sample roleHierarchy.csv file:

```
ROLE_NAME,NESTED_ROLE_NAME
aCertRole2,Fraud Analyst
aCertRole1,Fraud Analyst
aCertRole3,vCertRole16
aCertRole6,aCertRole3
aCertRole5,vCertRole16
aCertRole2,vCertRole10
Fraud Analyst,Item Analyst
Item Analyst,aCertRole6
vCertRole16,vCertRole10
vCertRole16,vCertRole17
```

3.3.3.8 Sample roleUserMembership.csv File

The following table lists the mandatory and optional roleUserMembership attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_ROLE_ID	Optional
ROLE_NAME	Mandatory
USER_NAME	Mandatory

The following is a sample roleUserMembership.csv file:

```
"EXT_ROLE_ID","ROLE_NAME","USER_NAME"
23,"aCertRole2","ACERTUSER1"
22,"aCertRole1","ACERTUSER1"
25,"aCertRole4","ACERTUSER2"
24,"aCertRole3","ACERTUSER2"
27,"aCertRole6","ACERTUSER3"
26,"aCertRole5","ACERTUSER3"
81,"Candidate Role 1","VCERTUSER1"
29,"vCertRole2","VCERTUSER1"
28,"vCertRole1","VCERTUSER1"
81,"Candidate Role 1","VCERTUSER2"
31,"vCertRole4","VCERTUSER2"
30,"vCertRole3","VCERTUSER2"
81,"Candidate Role 1","VCERTUSER3"
33,"vCertRole6","VCERTUSER3"
32,"vCertRole5","VCERTUSER3"
81,"Candidate Role 1","VCERTUSER4"
35,"vCertRole8","VCERTUSER4"
34,"vCertRole7","VCERTUSER4"
81,"Candidate Role 1","VCERTUSER5"
37,"vCertRole10","VCERTUSER5"
36,"vCertRole9","VCERTUSER5"
81,"Candidate Role 1","VCERTUSER6"
39,"vCertRole12","VCERTUSER6"
38,"vCertRole11","VCERTUSER6"
81,"Candidate Role 1","VCERTUSER7"
41,"vCertRole14","VCERTUSER7"
40,"vCertRole13","VCERTUSER7"
81,"Candidate Role 1","VCERTUSER8"
43,"vCertRole16","VCERTUSER8"
42,"vCertRole15","VCERTUSER8"
81,"Candidate Role 1","VCERTUSER9"
```

```
45,"vCertRole18","VCERTUSER9"
44,"vCertRole17","VCERTUSER9"
81,"Candidate Role 1","VCERTUSER10"
47,"vCertRole20","VCERTUSER10"
46,"vCertRole19","VCERTUSER10"
81,"Candidate Role 1","VCERTUSER11"
49,"vCertRole22","VCERTUSER11"
48,"vCertRole21","VCERTUSER11"
63,"Candidate Role 3","KPOOLE"
63,"Candidate Role 3","CMCKINNEY"
63,"Candidate Role 3","SKELLER"
61,"Candidate Role 4","HBROCK"
82,"Candidate Role 7","EPATTON"
82,"Candidate Role 7","AREYES"
82,"Candidate Role 7","SWEBER"
82,"Candidate Role 7","WJOSEPH"
82,"Candidate Role 7","BBECKER"
61,"Candidate Role 4","BNICHOLS"
82,"Candidate Role 7","CCHAVEZ"
82,"Candidate Role 7","MROY"
82,"Candidate Role 7","TWILKINS"
82,"Candidate Role 7","TDANIELS"
82,"Candidate Role 7","FLAMB"
61,"Candidate Role 4","SABBOTT"
82,"Candidate Role 7","AQUINN"
82,"Candidate Role 7","JNORMAN"
82,"Candidate Role 7","AMUNOZ"
82,"Candidate Role 7","NMYERS"
82,"Candidate Role 7","BBARBER"
82,"Candidate Role 7","VORTIZ"
82,"Candidate Role 7","KMYERS"
82,"Candidate Role 7","CHOPKINS"
82,"Candidate Role 7","LVEGA"
61,"Candidate Role 4","MBAKER"
82,"Candidate Role 7","OGONZALES"
82,"Candidate Role 7","GABBOTT"
82,"Candidate Role 7","NROMERO"
82,"Candidate Role 7","TMALDONADO"
82,"Candidate Role 7","SCORTEZ"
61,"Candidate Role 4","SMCDONALD"
82,"Candidate Role 7","FGOODMAN"
82,"Candidate Role 7","RPETERSON"
82,"Candidate Role 7","CORTEGA"
82,"Candidate Role 7","JFREEMAN"
82,"Candidate Role 7","CALEXANDER"
61,"Candidate Role 4","PBARTON"
82,"Candidate Role 7","JMOODY"
82,"Candidate Role 7","DFOWLER"
82,"Candidate Role 7","LBLAKE"
82,"Candidate Role 7","GOSBORNE"
82,"Candidate Role 7","KADAMS"
```

3.3.3.9 Sample roleEntitlementComposition.csv File

The following table lists the mandatory and optional roleEntitlementComposition attributes for data import from flat files.

OIRI Attribute	Mandatory/Optional
EXT_ROLE_ID	Optional
ROLE_NAME	Mandatory
ENTITLEMENT_NAME	Mandatory
APPLICATION_NAME	Mandatory
GRANTEE_TYPE	Mandatory
GRANTEE_NAME	Mandatory

The following is a sample roleEntitlementComposition.csv file:

```
"EXT_ROLE_ID","ROLE_NAME","ENTITLEMENT_NAME","APPLICATION_NAME","GRANTEE_TYPE","G
RANTEE_NAME"
46,"vCertRole19","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1
child form","VISDU1 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3
child form","VISDU3 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
```

```
40,"vCertRole13","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
```

```
form","VISDU3 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3
child form","VISDU3 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
38,"vCertRole11","EntTestDB~CN=VISDU31,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU33,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
46,"vCertRole19","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
```

```
44,"vCertRole17","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
42,"vCertRole15","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
40,"vCertRole13","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
41,"vCertRole14","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU32,DC=abc,DC=com","VISDU3","VISDU3 child
form","VISDU3 lookup"
45,"vCertRole18","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
44,"vCertRole17","EntTestDB~CN=VISDU12,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU13,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU11,DC=abc,DC=com","VISDU1","VISDU1 child
form","VISDU1 lookup"
43,"vCertRole16","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
39,"vCertRole12","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
37,"vCertRole10","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
28,"vCertRole1","EntTestDB~CN=VISDU23,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU22,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
81,"Candidate Role 1","EntTestDB~CN=VISDU21,DC=abc,DC=com","VISDU2","VISDU2 child
form","VISDU2 lookup"
```

3.4 Arguments of the updateDataIngestionConfig.sh Script

Arguments of the updateDataIngestionConfig.sh Script lists the parameters that you can update by running the `updateDataIngestionConfig.sh` script.

Table 3-1 Arguments of the updateDataIngestionConfig.sh Command

Short argument	Option	Description
-eacbs	--entityaccountsbatchsize	Entity accounts batch size.
-eace	--entityaccountsenabled	Determines whether the entity will be enabled/disabled during data import. Default value is `true`.
-eaclb	--entityaccountsslowerbound	The minimum value of `partitionColumn` used to decide partition stride. Default value is `0`.
-eacnop	--entityaccountsnumberofpartitions	The number of partitions, This, along with `lowerBound` (inclusive), `upperBound` (exclusive), form partition strides for generated WHERE clause expressions used to split the column `partitionColumn` evenly. Default value is `3`.
-eacsm	--entityaccountssyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is loaded in OIRI database, but for incremental mode, the delta data is fetched from the source and updated/ inserted accordingly. Default value is full.
-eacub	--entityaccountsupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-eabs	--entityapplicationsbatchsize	Entity applications batch size
-eae	--entityapplicationsenabled	Determines whether the entity will be enabled/disabled during data import. Default value is true.
-eaebs	--entityassignedentitlementsbatchsize	Entity assigned entitlements batch size
-eaee	--entityassignedentitlementsenabled	Determines whether the entity will be enabled/disabled during data import. Default value is true.
-eaelb	--entityassignedentitlementslowerbound	The minimum value of partitionColumn used to decide partition stride. Default value is 0.

Table 3-1 (Cont.) Arguments of the updateDataIngestionConfig.sh Command

Short argument	Option	Description
-eaenop	--entityassignedentitlementsnumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.
-eaesm	--entityassignedentitlementssyncmode	Incremental is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/ inserted accordingly.
-eaeub	--entityassignedentitlementssupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-ealb	--entityapplicationslowerbound	The minimum value of partitionColumn used to decide partition stride. Default value is 0.
-eanop	--entityapplicationsnumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.
-easm	--entityapplicationssyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/inserted accordingly.
-eaub	--entityapplicationsupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-eebs	--entityentitlementsbatchsize	Entity entitlements batch size
-eee	--entityentitlementsenabled	Determines whether the entity will be enabled/disabled during data import. Default value is true.

Table 3-1 (Cont.) Arguments of the updateDataIngestionConfig.sh Command

Short argument	Option	Description
-eelb	--entityentitlementslowerbound	The minimum value of partitionColumn used to decide partition stride. Default value is 0.
-eenop	--entityentitlementsnumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.
-eesm	--entityentitlementssyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/inserted accordingly. Default value is full.
-eeub	--entityentitlementsupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-erbs	--entityrolesbatchsize	Entity roles batch size
-ere	--entityrolessenabled	Determines whether the entity will be enabled/disabled during ETL. Default value is true.
-erecbs	--entityroleentitlementcompositionsbatchsize	Entity role entitlement compositions batch size
-erece	--entityroleentitlementcompositionsenabled	Determines whether the entity will be enabled/disabled during ETL. Default value is true.
-ereclb	--entityroleentitlementcompositionslowerbound	The minimum value of partitionColumn used to decide partition stride. Default value is 0.
-erecnop	--entityroleentitlementcompositionsnumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.

Table 3-1 (Cont.) Arguments of the updateDataIngestionConfig.sh Command

Short argument	Option	Description
-erecsm	--entityroleentitlementcompositionssyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/inserted accordingly. Default value is full.
-erecub	--entityroleentitlementcompositionsupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-erhbs	--entityrolehierarchybatchsize	Entity role hierarchy batch size.
-erhe	--entityrolehierarchyenabled	Determines whether the entity will be enabled/disabled during ETL. Default value is true.
-erhnop	--entityrolehierarchynumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.
-erhsm	--entityrolehierarchysyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/inserted accordingly.
-erlb	--entityroleslowerbound	The minimum value of partitionColumn used to decide partition stride. Default value is 0.
-ernop	--entityrolesnumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.

Table 3-1 (Cont.) Arguments of the updateDataIngestionConfig.sh Command

Short argument	Option	Description
-ersm	--entityrolessyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/inserted accordingly.
-erub	--entityrolesupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-erumbs	--entityroleusermembershipsbatchsize	Entity role user memberships batch size
-erume	--entityroleusermembershipsenabled	Determines whether the entity will be enabled/disabled during ETL. Default value is true.
-erumlb	--entityroleusermembershipsowerbound	The minimum value of partitionColumn used to decide partition stride. Default value is 0.
-erumnop	--entityroleusermembershipsnumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.
-erumsm	--entityroleusermembershipssyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/inserted accordingly. Default value is full.
-erumub	--entityroleusermembershipsupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-eubs	--entityusersbatchsize	Entity user batch size
-eue	--entityusersenabled	Determines whether the entity will be enabled/disabled during ETL. Default value is true.

Table 3-1 (Cont.) Arguments of the updateDataIngestionConfig.sh Command

Short argument	Option	Description
-eulb	--entityuserslowerbound	The minimum value of partitionColumn used to decide partition stride. Default value is 0.
-eunop	--entityusersnumberofpartitions	The number of partitions, This, along with lowerBound (inclusive) and upperBound (exclusive), form partition strides for the generated WHERE clause expressions used to split the column partitionColumn evenly. Default value is 3.
-eusm	--entityuserssyncmode	For Day 0, full mode is used. For Day N, incremental mode is used. In full mode, all the data is fetched and loaded in OIRI database. For incremental mode, only the delta data is fetched from the source and updated/inserted accordingly. Default value is full.
-euub	--entityusersupperbound	The maximum value of partitionColumn used to decide partition stride. Default value is 10000.
-fff	--flatfileformat	Format of the flat file. Default value is csv.
-ffs	--flatfileseparator	Data Separator in the rows of the flat files. It can be , : or |. Default value is ,.
-fftsf	--flatfiletimestampformat	TimeStamp format. Default value is yyyy-MM-dd.
-kcfn	--k8scertificatefilename	Name of the Kubernetes Certificate to be used for securely communicating with the K8S API Server.
-oigdbh	--oigdbhost	Host name of OIG database.
-oigdbp	--oigdbport	Port of OIG database.
-oigdbs	--oigdbsname	Service name of OIG Database.
d-uff	--useflatfileforetl	Use flat file as the data import source. Value is true or false.
-uoigdb	--useoigdbforetl	Use OIG database as the data import source. Value is true or false.

3.5 Arguments of the updateConfig.sh Script

Arguments of the updateConfig.sh Script lists the parameters that you can update by running the `updateConfig.sh` script.

Table 3-2 Arguments of the updateConfig.sh Script

Short Argument	Argument	Description
ap	--authprovider	Authentication provider. Supported value is OIG.
ar	--authroles	Comma-separated roles required for authentication with OIG.
ata	--accesstokenaudience	OIRI access token audience
atacs	--accesstokenallowedclockskew	OIRI access token allowed clock skew in seconds
atet	--accesstokenexpirationtime	OIRI access token expiration time in minutes
ati	--accesstokenissuer	OIRI access token issuer
cd	--cookiedomain	OIRI cookie domain
csf	--cookiesecureflag	OIRI cookie secure flag
css	--cookiesamesite	OIRI cookie same site
di	--dingimage	Data Ingestion Image name:tag
dlc	--driverlimitcores	Hard CPU limit for the driver pod
dm	--drivermemory	Amount of memory to use for the driver process where SparkContext is initialized in the same format as JVM memory strings with a size unit suffix (k, m, g or t). For example, 512m,2g.
dmo	--drivermemoryoverhead	Amount of non-heap memory to be allocated per driver process in cluster mode in MiB unless otherwise specified. It accounts for VM overheads, interned strings, and so on. This tends to grow with the container size (typically 6-10%).
dns	--dingnamespace	Namespace for the spark driver and executor pods for data import jobs.
drc	--driverrequestcores	Specify the CPU request for each driver pod. Values conform to the K8S convention. Sample values are 0.1, 500m, 1.5, and 5.

Table 3-2 (Cont.) Arguments of the updateConfig.sh Script

Short Argument	Argument	Description
elc	--executorlimitcores	Hard CPU limit for each executor pod launched for the Spark application.
em	--executormemory	Amount of memory to use per executor process in the same format as JVM memory strings with a size unit suffix (k, m, g or t). For example, 512m,2g.
emo	--executormemoryoverhead	Amount of additional memory to be allocated per executor process in cluster mode, in MiB unless otherwise specified. It accounts for VM overheads, interned strings, and so on. This tends to grow with the executor size (typically 6-10%).
erc	--executorrequestcores	Specify the CPU request for each executor pod. Values conform to the K8S convention. Sample values are 0.1, 500m, 1.5, and 5.
ips	--imagepullsecret	Kubernetes secret name to pull the ding image from the registry.
ist	--idlesessiontimeout	OIRI Idle Session Timeout in minutes.
ksn	--keystorename	File name of the keystore containing the OIRI keys.
noe	--numberofexecutors	Number of executor instances to be run in the Kubernetes cluster to complete a data import job.
oigati	--oigaccesstokenissuer	OIG access token issuer.
oigcpmx	--oigconnectionpoolmax	OIG maximum number of connections in the pool.
oigcpmr	--oigconnectionpoolmaxroute	OIG maximum number of connections per route.
oigct	--oigconnectiontimeout	OIG connection timeout interval in milliseconds.
oigkat	--oigkeepalivetimeout	OIG keep alive timeout (in seconds) is used in keep alive strategy. This strategy will first try to apply the host's Keep-Alive Policy stated in the header. If that information is not present in the response header, it will keep alive connections for the period of keepAliveTimeout.
oigpp	--oigproxypassword	OIG proxy password.
oigpuri	--oigproxyuri	OIG proxy URI.

Table 3-2 (Cont.) Arguments of the updateConfig.sh Script

Short Argument	Argument	Description
oigpu	--oigproxyusername	OIG proxy username
oigrt	--oigreadtimeout	OIG Read timeout interval in milliseconds.
oigsu	--oigserverurl	OIG server URL
oiridbh	--oiridbhost	Host name of OIRI database
oiridbp	--oiridbport	Port of OIRI database
oiridbs	--oiridbsname	Service name of OIRI database
sele	--sparkeventlogsenabled	true/false to enable/disable Spark event logs
st	--sessiontimeout	OIRI session timeout in minutes
skmu	--sparkk8smasterurl	URL of Kubernetes API server in the format: k8s://https://{K8S_API_SERVER_URL}

3.6 Importing Data from OIG Database and Flat Files

You can import entity data from OIG database and flat files at the same time. This topic describes the Day 0 and Day N configurations for importing data from both the sources.

Day 0 Configuration

For Day 0 configuration, you can specify the data import to be in full mode for both the sources. For example, to configure importing user and application data in full mode from both OIG database and flat files, run the `updateDataIngestionConfig.sh` command with the following arguments:

```
$ ./updateDataIngestionConfig.sh --useoigdbforetl true --entityusersenabled true
--entityuserssyncmode full --entityapplicationsenabled true --
entityapplicationssyncmode full --useflatfileforetl true
```

When you run the data import process, OIRI first imports the data from OIG database in full mode by truncating the existing data in the OIRI database. Then, the data is imported from flat files without truncating the data that has been loaded from OIG database. If there is the same user or application record in the flat files, then those records from the flat files do not replace the records in the OIRI database, but updates them.

Day N Configuration

For Day N configuration, you can specify the data import to be in incremental mode for both the sources. For example, to configure importing user and application data in incremental mode from both OIG database and flat files, run the `updateDataIngestionConfig.sh` command with the following arguments:

```
$ ./updateDataIngestionConfig.sh --useoigdbforetl true --entityusersenabled true
--entityuserssyncmode incremental --entityapplicationsenabled true --
entityapplicationssyncmode incremental --useflatfileforetl true
```

When you run the data import process, OIRI first updates the existing data in the OIRI database from the OIG database, and then updates the data from the flat files.

3.7 Importing Custom Attributes to OIRI Database

OIRI supports managing custom attributes for the user entity along with the default attributes. You can populate the custom attribute values by using OIRI data ingestion service (data import) for using them in role mining operations.

> **Note:**
>
> See Attribute Mapping of Entities for information about the default attributes of the user entity, which are fetched from a specified data source and saved in OIRI database table during data import, and their mapping with OIG user attributes.

In addition to the default attributes, you can add a maximum of 40 custom attributes to OIRI, out of which, 20 can be of `string` data type, 10 can be of `number` data type, and 10 can be of `date` data type.

This section contains the following topics:

- Importing Custom Attributes
- Custom Attributes Definition
- Parameters of the custom-attributes.yaml File

3.7.1 Importing Custom Attributes

To import custom attributes to OIRI database:

1. Copy the sample `custom-attributes-metadata.yaml` file from `/ding-cli/samples/custom-attributes/` to `/nfs/ding/data/metadata/customattributes/`.

   The sample `custom-attributes-metadata.yaml` file contains the custom attributes definition, as shown:

```
customAttributes:
  - entityType: user
    attributeName: USER_STATUS
    displayName: User Status
    dataType: string
    searchable: true
    displayable: true
    required: false
    uniqueness: false
    caseExact: false
    supportAnalytics: false
    userMembershipRule: false
    oigAttributeName: Status
    oigTableColumnName: usr.USR_STATUS
    csvHeaderColumnOrder: 1
    oiriTableColumnName: CUST_ATTR_VC_1
  - entityType: user
    attributeName: PROVISIONED_DATE
```

```
  displayName: Provisioned Date
  dataType: date
  searchable: true
  displayable: true
  required: false
  uniqueness: false
  caseExact: false
  supportAnalytics: false
  userMembershipRule: false
  oigAttributeName: Provisioned_Date
  oigTableColumnName: usr.USR_PROVISIONED_DATE
  csvHeaderColumnOrder: 2
  oiriTableColumnName: CUST_ATTR_DT_1
- entityType: user
  attributeName: LOCKOUT_DURATION
  displayName: Lockout Duration
  dataType: number
  searchable: false
  displayable: true
  required: false
  uniqueness: false
  caseExact: false
  supportAnalytics: false
  userMembershipRule: false
  oigAttributeName: Lockout_Duration
  oigTableColumnName: usr.USR_LOCKOUT_DURATION
  csvHeaderColumnOrder: 3
  oiriTableColumnName: CUST_ATTR_NB_1
```

See Custom Attributes Definition for information about the parameters of the `custom-attributes-metadata.yaml` file.

Alternatively, you can create your own `custom-attributes-metadata.yaml` file.

2. Edit the `custom-attributes-metadata.yaml` file to specify the custom attributes of the user entity that you want to import.
3. If you want to import custom attributes when the source for the data import is flat files:
   a. Edit the `custom-attributes-metadata.yaml` file to change the value of the `oigTableColumnName` parameter to blank.
   b. Add the custom attributes in the flat file for the user entity, which is `Users.csv`. For example, to add the custom attributes User Status, Provisioned Date, and Lockout Duration for the user entity, add `"USER_STATUS", "PROVISIONED_DATE", "LOCKOUT_DURATION"` to the header. A sample header for the `Users.csv` file is as shown:

      ```
      “EXT_USER_ID”, “USER_NAME”, “LAST_NAME”, “FIRST_NAME”, “MIDDLE_NAME”,
      “DISPLAY_NAME”, “TITLE”, “USER_TYPE”, “LOCALE”, “PREFERRED_LANDUAGE”,
      “TIMEZONE”, “STATUS”, “WORK_EMAIL”, “HOME_EMAIL”, “PRIMARY_EMAIL_TYPE”,
      “WORK_PHONE”, “MOBILE_NO”, “WORK_STREET”, “WORK_CITY”, “WORK_STATE”,
      “WORK_POSTAL_CODE”, “WORK_COUNTRY”, “EMPLOYEE_NUMBER”, “EMPLOYEE_TYPE”,
      “JOB_CODE”, “COST_CENTER”, “ORGANIZATION”, PARENT_ORG_NAME”, “DIVISION”,
      “DEPARTMENT”, “MANAGER_NAME”, “RISK_SCORE”, "USER_STATUS",
      "PROVISIONED_DATE", "LOCKOUT_DURATION"
      ```

   c. Add the values of the custom attributes, and save the `Users.csv` file.

> **Note:**
>
> You can also copy the sample `/ding-cli/samples/etl/users_with_ca.csv` file, add or modify the custom attributes, and use the file for data import.

4. List the custom attribute definitions from OIRI schema definition by running the following command:

```
ding-cli --config=/app/data/conf/config.yaml custom-attributes list /app/data/conf/
custom-attributes.yaml
```

Here, `config.yaml` and `custom-attributes.yaml` are the files you generated in step 5 of Setting Up the Configuration Files.

In the `custom-attributes.yaml` file that contains the details of the OIRI database, the `customAttributesMetadataFilePath` parameter points to the path to the custom attributes schema definition file, which is `/nfs/ding/data/metadata/customattributes/custom-attributes-metadata.yaml`. See Parameters of the custom-attributes.yaml File for information about the parameters of the `custom-attributes.yaml` file.

5. Insert or update the given custom attribute definition to the OIRI schema definition by running the following command:

```
$ ding-cli --config=/app/data/conf/config.yaml custom-attributes manage /app/data/
conf/custom-attributes.yaml
```

The output is:

```
The given User entity custom attributes {user,PROVISIONED_DATE={entity_type=user,
attribute_name=PROVISIONED_DATE, display_name=Provisioned Date, data_type=date,
searchable=true, displayable=true, is_required=false, uniqueness=false,
case_exact=false, support_analytics=false, custom=true,
target_column_name=CUST_ATTR_DT_1, oig_table_column_name=USR.USR_PROVISIONED_DATE,
csv_header_column_order=2, expr_attr_name=provisionedDate,
user_membership_rule=false, oig_attribute_name=Provisioned_Date},
user,LOCKOUT_DURATION={entity_type=user, attribute_name=LOCKOUT_DURATION,
display_name=Lockout Duration, data_type=number, searchable=false,
displayable=true, is_required=false, uniqueness=false, case_exact=false,
support_analytics=false, custom=true, target_column_name=CUST_ATTR_NB_1,
oig_table_column_name=USR.USR_LOCKOUT_DURATION, csv_header_column_order=3,
expr_attr_name=lockoutDuration, user_membership_rule=false,
oig_attribute_name=Lockout_Duration}, user,USER_STATUS={entity_type=user,
attribute_name=USER_STATUS, display_name=User Status, data_type=string,
searchable=true, displayable=true, is_required=false, uniqueness=false,
case_exact=false, support_analytics=false, custom=true,
target_column_name=CUST_ATTR_VC_1, oig_table_column_name=USR.USR_STATUS,
csv_header_column_order=1, expr_attr_name=userStatus, user_membership_rule=false,
oig_attribute_name=Status}} has been successfully created/updated in the OIRI
schema definition
SUCCESS: manage custom attributes.
```

The definition for the sample custom attributes User Status, Provisioned Date, and Lockout Duration have been updated in the OIRI database.

> **Note:**
>
> If you need to remove a certain custom attribute from the user assignment rule, then you need to set the `userMembershipRule` attribute value to *false* and execute the `custom-attributes manage` command.
>
> Removing one or more attributes from the custom attributes definition by running the `custom-attributes manage` CLI has the following impact:
>
> - The removed custom attributes are no longer displayed in the Selected Criteria tile of the role mining task creation/modification page.
> - Attempt to mine roles with the task containing deleted custom attributes fails with the following error:
>
>   `Invalid <DELETED_CUSTOM_ATTRIBUTE_NAME>`
>
>   Therefore, create a new task by copying the current task that has the deleted custom attributes. The copy operation copies the available attributes only. This allows the mine role operation on the copied task.

6. If you list the custom attribute definitions from OIRI schema definition by running the `custom-attributes list` command, as shown in step 3, the output is:

```
List the custom attribute definitions from OIRI schema definition
OIRI User Custom Attributes list ............
============================================
[{entity_type=user, attribute_name=PROVISIONED_DATE,
display_name=Provisioned Date, data_type=date, searchable=true,
displayable=true, is_required=false, is_indexed=false, uniqueness=false,
case_exact=false, support_analytics=false, custom=true,
target_column_name=CUST_ATTR_DT_1,
oig_table_column_name=USR.USR_PROVISIONED_DATE, csv_header_column_order=2,
expr_attr_name=provisionedDate}, {entity_type=user,
attribute_name=LOCKOUT_DURATION, display_name=Lockout Duration,
data_type=number, searchable=false, displayable=true, is_required=false,
is_indexed=false, uniqueness=false, case_exact=false,
support_analytics=false, custom=true, target_column_name=CUST_ATTR_NB_1,
oig_table_column_name=USR.USR_LOCKOUT_DURATION, csv_header_column_order=3,
expr_attr_name=lockoutDuration}, {entity_type=user,
attribute_name=USER_STATUS, display_name=User Status, data_type=string,
searchable=true, displayable=true, is_required=false, is_indexed=false,
uniqueness=false, case_exact=false, support_analytics=false, custom=true,
target_column_name=CUST_ATTR_VC_1, oig_table_column_name=USR.USR_STATUS,
csv_header_column_order=1, expr_attr_name=userStatus}]
SUCCESS: custom attributes listing.
```

7. Run the data import as shown:

```
$ ding-cli --config=/app/data/conf/config.yaml data-ingestion start /app/
data/conf/data-ingestion-config.yaml
```

After seeding custom attributes metadata in the SCHEMA_DEF table, if you run the `data-ingestion start` command, then the custom attributes data is seeded in the Users table.

The custom attributes data is populated in the SCHEMA_DEF table of the OIRI database after running the `custom-attributes manage` command.

8. Refresh the user entity metadata cache in the OIRI server by logging into the OIRI console and calling the following browser API.

```
http://<host>:<port>/oiri/api/v1/entity/refresh-user-entity-metadata-cache
```

3.7.2 Custom Attributes Definition

Table 3-3 lists the parameters for the custom attributes definition.

Table 3-3 Parameters for Custom Attributes Definition

Parameter	Mandatory	Sample Value	Description
entityType	Yes	user	The entity type of the custom attribute. OIRI supports importing custom attributes only of the user entity type.
attributeName	Yes	USER_STATUS	The name of the custom attribute. OIRI supports a maximum length of 20 characters. All characters must be in upper case. The value must be alpha numeric and must start with a letter. The only allowed special character is under score (_).
displayName	Yes	User Status	The display name of the custom attribute. OIRI supports a maximum length of 100 characters.
dataType	Yes	String	The data type of the custom attribute. OIRI supports string, number, and date data types. The value must match the literals `string`, `number`, or `date`.
searchable	Yes	true	Whether or not the attribute is shown in the user filter operation.
displayable	Yes	true	Whether or not the attribute is returned by user search operation.
required	Yes	false	Whether or not null value is allowed. OIRI supports only false as the value of this parameter, which means that null value cannot be specified.
indexed	Yes	false	Whether or not the attribute can be indexed. OIRI supports only false as the value of this parameter, which means that the attribute cannot be indexed.

Table 3-3 (Cont.) Parameters for Custom Attributes Definition

Parameter	Mandatory	Sample Value	Description
uniqueness	Yes	false	Whether or not duplicate value is allowed. OIRI supports only false as the value of this parameter, which means that duplicate values of the attribute is allowed.
caseExact	Yes	false	Whether or not case is ignored for user filter operation.
supportAnalytics	No	false	Whether or not the attribute is allowed for analytics.
userMembershipRule	Yes	true|false	Whether or not the attribute is allowed for userMembershipRule generation.
oigAttributeName	Yes	Status	OIG attribute name that will be used in the user membership rule.
oigTableColumnName	Yes for OIG as the data source	usr.USER_STATUS	For OIG database as the data source, this is the SQL select clause used for this column. OIRI supports only the USER table with table alias value as `usr`.
csvHeaderColumnOrder	Yes for flat files as the data source	1	For flat files in CSV format as the data source, this is the position of the attribute in the CSV custom attributes column list. Custom attribute columns must be added to the end of default attributes. For example, when the header is: `"EXT_USER_ID", "USER_NAME", ... , "MANAGER_NAME", "RISK_SCORE", "USER_STATUS", "PROVISIONED_DATE", "LOCKOUT_DURATION"` The value 1 for this parameter indicates the USER_STATUS custom attribute.
oiriTableColumnName	Yes	CUST_ATTR_VC_1	The fixed column name of the target OIRI database table where the custom attribute will be populated. You must use the following columns for the supported data types: • For string: `CUST_ATTR_VC*` • For number: `CUST_ATTR_NB*` • For date: `CUST_ATTR_DT*`

3.7.3 Parameters of the custom-attributes.yaml File

The following is the contents of a sample `custom-attributes.yaml` file.

```
## Oracle Identity Intelligence - Data Ingestion Service - Custom Attributes
version: 1.0
walletDirectory: __DING__WALLET__DIRECTORY__

databaseConfiguration:
  url: jdbc:oracle:thin:@__OIRI__DB__HOSTNAME__:__OIRI__DB__HOSTPORT__/
__OIRI__DB__SERVICENAME__
  driver: oracle.jdbc.driver.OracleDriver
  queryTimeout: 300
  fetchSize: 50

customAttributesMetadataFilePath: /app/data/metadata/customattributes/custom-
attributes-metadata.yaml
```

Table 3-4 lists the parameters of the `custom-attributes.yaml` file.

Table 3-4 Parameters of the custom-attributes.yaml File

Parameter	Description
walletDirectory	The name of the wallet directory.
url	The OIRI database URL.
driver	The JDBC driver.
queryTimeout	The query timeout value in seconds.
fetchSize	The number of records to be fetched.
customAttributesMetadataFilePath	The path to the `custom-attributes-metadata.yaml` file, which is the custom attributes schema definition file.

3.8 Running the Data Import Dry Run Process

Before data import (or data ingestion), perform a dry run to validate if the data fits into the OIRI database. This will fetch data from the source, such as Oracle Identity Governance database or flat files, and validate it against the metadata of the OIRI database. For example, in OIRI database, the user name cannot be more than 50 characters, or duplicate data will not be populated in OIRI.

To run the data import dry run process:

1. From the CLI command line, run the following command for a dry run of the data import:

   ```
   $ docker exec -it ding-cli bash
   $ ding-cli --config=/app/data/conf/config.yaml data-ingestion dry-run /app/data/
   conf/data-ingestion-config.yaml
   ```

   This command picks each entity one by one and fetches the data from the OIG database instance or the flat files, and validates it with the metadata defined in the OIRI database.

2. Review the summary of the dry run, as described in Reviewing Data Import Task Result, and correct any errors.

3.9 Reviewing Data Import Task Result

To review the results of a data load task:

1. Sign in to Identity Role Intelligence user interface as described in Signing In to Identity Role Intelligence.
2. On the Home page, perform any one of the following steps:
   - Click the Application Navigation menu icon on the top left of the page, and click **Data Import** to open the Manage Data Import page with a list of all the data import tasks.
   - In the Review last 24 hour activity tile, click **Data Import** to open the Manage Data Import page with a list of the data import tasks that have been run in the past 24 hours.
   - In the Explore Tasks and Roles tile, click **Data Import** to open the Manage Data Import page with a list of all the data import tasks.

   In the Manage Data Import page, the following information is displayed for each data import task:
   - Dry run or not
   - Start date and time
   - Completion date and time
3. Filter the data import tasks to locate the task that you want to review. To do so:
   a. In the Search field, enter the complete or partial name of the data import task, and press Enter.

      > **Note:**
      >
      > OIRI uses SCIM Filter to search for the data. By default, a `contains` search is performed. Therefore, you do not need to specify any wildcard characters, such as `%` or `*`. Although it is not necessary to mention `%` in the search box, OIRI returns the data with `%` search. For example, to search for an organization VisCertOrg, type `vis` or `cert`, and press Enter.
      >
      > OIRI does not return any data for the `*` search. Also, OIRI does not support search with the underscore (_) special character. For example, to search for an organization `dev_org`, the filter value can be `dev` or `org`. Search with the _ character returns `dev_org` as well as other organizations that do not contain the _ character because the underlying Oracle database treats the underscore character _ as a pattern matching character.
      >
      > This search capability is applicable to all text box searches in the Identity Role Intelligence user interface.

   b. From the Last Updated list, select any one of the **All**, **1 Day**, **7 Days**, **1 Month**, or **6 Months** options to specify the duration within which the data import task was run.

c. In the Status field, enter or remove any one or more of the task statuses, such as **Running**, **Successful**, and **Failed**.

4. For the data import task you want to review, click **View Results**. Alternatively, you can click the data import task name. The View Results window is displayed with the result for data import from Oracle Identity Governance database and from flat files.

   The dry run operation captures the following data-related issues:

   - Whether data is valid
   - Expected schema
   - Actual schema
   - Invalid data count
   - Invalid data error details
   - Missing mandatory data count
   - Missing mandatory data error details
   - Invalid data type count
   - Invalid data type error details
   - Invalid data length countInvalid data length error details
   - Duplicate data count
   - Duplicate data error detailsInvalid user data count
   - Invalid user data error details
   - Invalid entitlement data count
   - Invalid entitlement error details
   - Invalid application data count
   - Invalid applications error details

5. If you are importing data from Oracle Identity Governance database, then expand **Imports from OIG** if it is not already expanded. The data import result for each entity imported from the OIG database is listed.

6. Expand each entity to review the details of the data import of that entity, such as duplicate data count, whether or not dataset is valid, and the count of invalid data type.

> **Note:**
>
> If you are reviewing the results of a data import dry run, then correct the mismatches displayed in the View Results page, and run the data import dry run again.

7. If you are importing data from flat files, then expand **Imports from File** if it is not already expanded. The data import result for each entity imported from flat files is listed.

8. Expand each entity to review the details of the data import of that entity, such as duplicate data count, whether or not dataset is valid, and the count of invalid data type.

> **Note:**
>
> If you are reviewing the results of a data import dry run, then correct the mismatches displayed in the View Results page, and run the data import dry run again.

9. Click **Cancel** to close the View Results window.

3.10 Running the Data Import Process

After reviewing the dry run summary and fixing all errors, perform the following steps to run the data import process:

1. Run the command for data import, as follows:
   a. Copy `ca.crt` from K8S Master (`/etc/kubernetes/pki/`) to `/nfs/ding/` by running the following command:

      ```
      $ cp/etc/kubernetes/pki/ca.crt /nfs/ding/
      ```

   b. Start the data import by running the following command:

      ```
      $ docker exec -it ding-cli bash
      $ ding-cli --config=/app/data/conf/config.yaml data-ingestion start /app/data/conf/data-ingestion-config.yaml
      ```

> **Note:**
>
> - If there are some issues in data import dry run that have not been fixed and you run the `data-ingestion-start` command, then the import process will fail. You must fix all issues reported by dry run before running the actual data import.
> - The data import process might terminate because of some unusual condition, such as network issues or source DB service being stopped or not responding, and the data in OIRI database tables might be in inconsistent state. In this situation, rerun the data import process.
> - OIRI marks any long running data import job, such as jobs stuck because of lost connectivity, as failed. The maximum time after which data import job is marked as failed is 6 hours. This is set by the default value of 360 in minutes for the `maxEtlJobRunningTimeInMinute` parameter in the `/app/data/conf/application.yaml` file.

   This command extracts the entity data from the OIG database or flat file and loads it to the OIRI database tables.

2. Review the data import summary, as described in Reviewing Data Import Task Result, to verify that there are no errors.
3. Verify that the data has been loaded in OIRI database tables.

In the USERS table of the OIRI database, the values of the USER_ID field has been prefixed with G to indicate that the user record has been imported from OIG. For example, if the user ID in OIG is 2103, which is populated in the EXT_USER_ID field in the OIRI USERS table, then the USER_ID field will have the value G2103. Similarly, if the user entity has been imported from flat files, then the USER_ID field will have the value F2103.

3.11 Deleting Imported Entity Data

To delete data from the OIRI database:

1. List the data to be deleted in a file by running the following command:

   ```
   ding-cli --config=/app/data/conf/config.yaml data-ingestion list-data-to-be-deleted /app/data/conf/data-ingestion-config.yaml
   ```

   When the source of the data is OIG database, running this command identifies the data deleted form OIG but is still present in OIRI database. This is done by comparing both the databases. Then, this command lists the data to be deleted for each entity in a generated `oig_list_data_to_be_deleted.properties` file. Click here to see a sample file.

   The `list-data-to-be-deleted` utility lists the data to be deleted for the following OIG source entities in the `oig_list_data_to_be_deleted.properties` file:

   - **Users:** Fetches all the users having `usr_status` as `Deleted` from OIG, checks the OIRI database, and lists the users to be deleted from OIRI users table.
   - **Applications:** Fetches all the applications data from OIG having `app_instance_is_soft_delete = 1`, checks the OIRI database, and lists the applications to be deleted from OIRI applications table.
   - **Accounts:** Fetches all the accounts data from OIG and OIRI, and lists the accounts data to be deleted from the OIRI accounts table.
   - **Entitlements:** Fetches all the entitlements data from OIG and OIRI, and lists the entitlements data to be deleted from the OIRI entitlements table.
   - **Roles:** Fetches all the roles data from OIG and OIRI, and lists the roles data to be deleted from the OIRI roles table.
   - **RoleHierarchy:** Fetches all the role hierarchy data from OIG and OIRI, and lists the role hierarchy data to be deleted.
   - **AssignedEntitlements:** Fetches all the assignedEntitlements data from OIG and OIRI, and lists the entitlements that have not been assigned to any user in OIG.
   - **RoleUserMembership:** Fetches all the roleUserMembership data from OIG and OIRI, and lists the roles data that have not been assigned to any user in OIG.
   - **RoleEntitlementComposition:** Fetches all the roleEntitlementComposition data from OIG and OIRI,and lists the roles data that have not been linked with any entitlement.

   When the source of the data is flat files, the `list-data-to-be-deleted` utility cannot be used because there is no consolidated list of records. Manually specify the records for each entity that are to be deleted in the `file_list_data_to_be_deleted.properties` file. Click here to see a sample file.

> **Note:**
>
> The location of the properties files is determined by the following parameters in the `data-ingestion-config.yaml` file:
>
> - For data from OIG:
>
>   `toBeDeletedOigDataDirectory: <DIRECTORY_PATH>`
>
> - For data from flat files:
>
>   `toBeDeletedFileDataDirectory: <DIRECTORY_PATH>`
>
> Here, *<DIRECOTRY_PATH>* is the location of the properties file.

2. Validate the data to be deleted from OIRI database (specified in the properties files) by specifying the source parameter as an argument, as shown:

   - For data from OIG:

     ```
     ding-cli --config=/app/data/conf/config.yaml data-ingestion delete-dry-
     run -s OIG /app/data/conf/data-ingestion-config.yaml
     ```

   - For data from flat files:

     ```
     ding-cli --config=/app/data/conf/config.yaml data-ingestion delete-dry-
     run -s File /app/data/conf/data-ingestion-config.yaml
     ```

   > **Note:**
   >
   > The View Results window for the data import dry run task in the Identity Role Intelligence user interface displays the invalid data count and invalid error details for each entity. See Reviewing Data Import Task Result for information about how to review the delete dry run task result.
   >
   > After resolving all issues reported by delete dry run, you can run the delete operation.

3. Delete data from OIRI database by specifying the source parameter as an argument in the following command:

   For OIG database as the source:

   ```
   ding-cli --config=/app/data/conf/config.yaml data-ingestion delete -s
   OIG /app/data/conf/data-ingestion-config.yaml
   ```

   For flat files as the source:

   ```
   ding-cli --config=/app/data/conf/config.yaml data-ingestion delete -s
   File /app/data/conf/data-ingestion-config.yaml
   ```

   This command reads the data for each entity in the properties file and deletes the records for those entities from the OIRI database.

> **Note:**
>
> If the delete process fails, then the data will be in inconsistent state, and you must rerun the delete process.

3.12 Data Import Scenarios

This topic describes the following data import scenarios.

Data Import of Indirect Role-User Membership

Based on the role hierarchy imported into OIRI from OIG database or flat files, the indirect role user memberships is determined and populated in the OIRI database tables. Because a nested role inherits permissions from its parent roles, a user being a member of a nested role is made indirect member of all its parent roles in OIRI. Both the direct and indirect role user memberships are taken into consideration for role mining.

Data Import of Organization Hierarchy

OIRI does not support separate data import for organizations. After the user data in loaded in OIRI, based on the user's association with an organization, the organization hierarchy is dynamically generated in OIRI. The organizations details are populated in the OIRI organizations table, and the organization hierarchy path is generated and populated in the organizations and users tables.

Partial Data Deleted by Data Import

You perform data import from both OIG database and flat files in full mode, create role mining task with file data, mine roles, and publish the candidate roles. If you again perform data import only from OIG database in full mode, then the new data is loaded by truncating all the existing data in the OIRI database. In the Identity Role Intelligence user interface, the users, applications, and entitlements count is displayed correctly in the candidate role and published candidate role. However, the actual data is not displayed because the users, applications, and entitlements data has been deleted from the respective database tables.

Data Import by Retaining EXT_IDs

You perform data import from flat files, create role mining task, mine roles, and publish the candidate roles. Then you modify the users, applications, and entitlements data by retaining the same EXT_ID in the flat files, and again perform data import in full mode. Here, the master data for users, applications, and entitlements have changed, but their EXT_IDs have not changed. Therefore, the users, applications, and entitlements count is displayed correctly in the candidate role and published candidate role, but the changed user, application, and entitlement names are displayed on the Identity Role Intelligence user interface for the existing candidate role and published candidate role.

4
Managing Role Mining Tasks

Use the Identity Role Intelligence user interface to create, modify, search, copy, and run role mining tasks.

This section contains the following topics:

4.1 Signing In to Identity Role Intelligence

To sign in to the Identity Role Intelligence user interface:

1. Navigate to the following URL:

   `http://HOST_NAME:PORT/oiri/ui/v1/console`

   The OIRI account sign in page appears.
2. Enter the user name and password.
3. Click **Sign In**.

   The Identity Role Intelligence home page appears.

You have successfully authenticated to the Identity Role Intelligence user interface.

4.2 Creating Role Mining Tasks

As the role engineer, you use role mining to discover relationships between users based on similar entitlements across various data sources that can logically be grouped to form candidate roles and publish to Oracle Identity Governance.

To create a role mining task:

1. On the Identity Role Intelligence home page, in the Start something new tile, click **Create a new Task**.

   Alternatively, you can click the Application Navigation menu icon, and click **All Tasks**, and then click **New Task** on the top right of the page.

   The New Task page to select the data for creating a new role mining task appears.
2. In the Users tab, filter and select a group of users that you want to include in the role mining task. To do so:

> **Note:**
>
> The Users tab lists the users that have entitlements assigned to them. This tab does not list all the users in the OIRI database.

a. Click a filter criteria on the left column, such as Organization. The organizations are shown in a hierarchical manner on the right column.
The left column lists the filter criteria based on which you can select the users. For example, you can select the users based on organizations, managers, roles, job code, or country.

b. Select one or more organizations or suborganizations that are listed on the right column. Alternatively, you can enter the organization name in the search field and press Enter, and then select the organization.
Organization search is supported only on the organizations that contain users with at least one entitlement membership. But the organization hierarchy might contain parent organizations with no users having entitlement membership. Such parent organizations are not searchable.

> **Note:**
>
> If you select multiple rows and then click any other row, the earlier selection is deselected. You can press the Ctrl key and then select multiple organizations. This is also applicable to user and entitlement selections.

The organizations are included in the Selected Criteria tile on the right side of the page. In other words, users belonging to the selected organizations have been included in the role mining task.

c. Expand **Search for Users from the selected data**. All the users that belong to the selected organizations are listed. You can enter a user name or a search criteria, such as the first letter of the user name, in the search field and press Enter to verify if one or more users you wanted to include in the task have been selected.

d. Click the next filter criteria in the left column, and select the users based on that criteria. For example, select all users reporting to managers Gloria Osborne and Russell Peterson.
The managers you selected have been included in the Selected criteria tile.

e. If you want to specify advanced filter criteria for selecting the users, click **Advanced** on the left column. Then, expand one or more user attributes, and specify the criteria for selecting the users.
The Advanced section shows Department Number, Employee Number, Employee Type, Territory, Email, and State default user attributes. In addition, if custom user attributes have been imported to OIRI database, then the custom user attributes are also displayed under the Advanced section. You can search the values of the custom attributes and include them in the selected criteria for the role mining task. See Importing Custom Attributes to OIRI Database for information about importing custom attributes to OIRI.

f. Similarly, select all the users you want based on the filter criteria.

g. In the Selected Criteria tile, verify that the correct filters and subfilters have been selected. Alternatively, if you want to exclude any criteria from selection, then click the cross icon to remove it.

3. Click the **Applications** tab. The applications are listed in this tab based on the user selection on the Users tab.

> **Note:**
>
> The Applications tab lists the applications with associated entitlements assigned to users. It does not list the applications although users have accounts but no corresponding entitlements.

4. Select one or more applications in the left column to include in the role mining task. The selected applications are included in the Selected Criteria tile.
5. Click the **Entitlements** tab. The entitlements are listed in this tab based on the user and application selection on the Users and Applications tabs.

> **Note:**
>
> The Entitlements tab lists the entitlements that have been assigned to users. This tab does not list all the entitlements in the OIRI database.

6. Select one or more entitlements in the left column to include in the role mining task. The selected entitlements are included in the Selected Criteria tile.
7. After completing all selections, click any one of the following:
   - **Save for later:** Click to save the role mining task for later use. The Save Task dialog box appears. In the Name field, enter a name for the role mining task. This is a required field. In the Description field, enter a description for the role mining task. Then, click **Save**. A message is displayed stating that the role mining task has been saved successfully.
   - **Mine Roles:** Click to mine the roles based on the user, application, and entitlement selection in the role mining task. The Save Task and Mine Roles dialog box appears with the following options:
     Name: Enter a name for the role mining task. This is a required field.

     Description: Enter a description for the role mining task.

     Fine-tuning slider: Drag to minimize or maximize the number of candidate roles. Dragging the slider to the left minimizes the number of candidate roles. In other words, more users will get the permissions provided by the roles. Whereas, dragging the slider to the right maximizes the number of candidate roles. In other words, less misaligned entitlements and users are provided by the roles.

     Mine Roles: Click to run the role mining task and discover candidate roles. A message appears stating that a request for running the task has been submitted. Alternatively, click **Cancel** to close the Save Task and Mine Role dialog box without mining roles.

4.3 Searching Role Mining Tasks

To search for role mining tasks:

1. Navigate to the Manage Tasks page by performing any one of the following steps:
   - On the Identity Role Intelligence home page, click the Application Navigation menu icon on the top left of the page, and then click **All Tasks**.
   - On the Identity Role Intelligence home page, click any one of the following:
     - **In-progress Tasks:** Click to open the Manage Tasks page with a list of tasks that have been saved for later use.
     - **Executed Tasks:** Click to open the Manage Tasks page with a list of tasks that are in successful, failed, ready to run, or running states.
     - **All Tasks:** Click to open the Manage Tasks page with a list of all role mining tasks, both in-progress and executed.
2. In the Name field, enter the complete or partial name of the role mining task that you want to search. The tasks beginning with the string you entered are listed.
3. From the Last updated list, select any one of the **All**, **1 Day**, **7 Days**, **1 Month**, **6 Months** options to specify the duration within which the task you want to search was created.
4. Click the Status field, and then select or enter any one of the following status options:
   - **Saved:** Filters the role mining tasks that have been saved for later use
   - **Ready To Run:** Filters the role mining tasks for which role mining jobs have not started. This is an intermediate status between Saved and Running.
   - **Running:** Filters the role mining tasks that are currently running
   - **Successful:** Filters the role mining tasks that have run successfully to mine roles.
   - **Failed:** Filters the role mining tasks that have failed while running.
5. From the filtered list of tasks, locate the task that you are looking for.

4.4 Modifying Role Mining Tasks

To modify a role mining task that you saved for later use:

1. On the Identity Role Intelligence home page, in the Continue, something is in progress tile, click **In-progress Tasks**. The Manage Tasks page appears with a list of all the role mining tasks that have been saved for later use.

   Alternatively, you can click the Application Navigation menu icon, and then click **All Tasks**. The Manage Tasks page appears with a list of all role mining tasks, both in-progress and completed.
2. Filter the saved tasks, and search for the saved task that you want to modify.
3. Click the Edit icon on the right side of the saved task.

4. In the Users, Applications, and Entitlements tabs, add or remove the selection criteria for users, applications, and entitlements respectively. See steps 2 through 6 in Creating Role Mining Tasks for information about specifying the selection criteria for users, applications, and entitlements.
5. Click any one of the following:
   - **Save for later:** Click to save the role mining task for later use. Clicking this option displays a message that the task has been saved successfully, and the Manage Tasks page appears.
   - **Mine roles:** Click to mine the roles based on the user, application, and entitlement selection in the role mining task. The Save Task and Mine Roles dialog box appears with the following options:
     Name: Enter a name for the role mining task. This is a required field.

     Description: Enter a description for the role mining task.

     Fine-tuning slider: Drag to minimize or maximize the number of candidate roles. Dragging the slider to the left minimizes the number of candidate roles. In other words, more users will get the permissions provided by the roles. Whereas, dragging the slider to the right maximizes the number of candidate roles. In other words, more users will get new entitlements provided by the roles.

     Mine Roles: Click to run the role mining task and discover candidate roles. A message appears stating that a request for running the task has been submitted. Alternatively, click **Cancel** to close the Save Task and Mine Role dialog box without mining roles.

4.5 Copying Role Mining Tasks

To copy a role mining task:

1. On the Manage Tasks page, search for the task that you want to copy.
2. Click the Copy icon to the right of the task row. The task is copied, and the data selection page for users, applications, and entitlements appears.
3. In the Users, Applications, and Entitlements tabs, add or remove the selection criteria for users, applications, and entitlements respectively. See steps 2 through 6 in Creating Role Mining Tasks for information about specifying the selection criteria for users, applications, and entitlements.
4. Click any one of the following:
   - **Save for later:** Click to save the role mining task for later use. When you click this option, the Save Task dialog box appears. In the name field, enter a name for the role mining task. This is a required field. In the Description field, enter a description for the role mining task. Then, click **OK**. A message is displayed stating that the role mining task has been saved successfully.
   - **Mine roles:** Click to mine the roles based on the user, application, and entitlement selection in the role mining task. the Save Task and Mine Roles dialog box appears with the following options:
     Name: Enter a name for the role mining task. This is a required field.

     Description: Enter a description for the role mining task.

     Fine-tuning slider: Drag to minimize or maximize the number of candidate roles. Dragging the slider to the left minimizes the number of candidate roles. In other words, more users will get the permissions provided by the roles. Whereas, dragging

the slider to the right maximizes the number of candidate roles. In other words, more users will get new entitlements provided by the roles.

Mine Roles: Click to run the role mining task and discover candidate roles. A message appears stating that a request for running the task has been submitted. Alternatively, click **Cancel** to close the Save Task and Mine Roles dialog box without mining roles.

4.6 Mining Roles

To mine roles for candidate role discovery:

1. Run the role mining task in any one of the following ways:
   - On the page for creating a role mining task, after selecting user, application, and entitlement criteria, click **Mine Roles**.
   - On the Manage Tasks page, search for the in-progress or executed task that you want to run, and then click **Mine Roles**.

   The Mine Role dialog box appears.
2. Drag the Fine-tuning slider to minimize or maximize the number of candidate roles.

   Dragging the slider to the left minimizes the number of candidate roles. In other words, more users will get the permissions provided by the roles. Whereas, dragging the slider to the right maximizes the number of candidate roles. In other words, less users will get the permissions by the roles.
3. Click **Mine Roles**. A message appears stating that a request for running the task has been submitted.

4.7 Managing Outdated Data

Data import into Oracle Identity Role Intelligence (OIRI) is an ongoing process where entities stored in the OIRI schema may be added, modified, or removed over a period of time. Custom attributes may also be added, modified, or removed at different stages in the process. If changes to entities or custom attributes are made, they may impact on existing role mining tasks that were based on the data that has since changed. Management of outdated data allows the role mining administrator to determine whether a particular role mining outcome (task or candidate role) is based on outdated data by flagging this in the OIRI application.

Table 4-1 shows the usecases that can be associated with outdated data and how such situations are flagged in tasks and candidate roles.

Table 4-1 Managing Outdated Data Usecases

Usecase	Summary	Outcome
Delete custom attribute	1. Role administrator defines a customer attribute, 'Company Code'. 2. Role administrator creates and runs a task which utilizes the 'Company Code' custom attribute. 3. Role administrator deletes the 'Company Code' custom attribute.	• The task that uses the custom attribute will be marked as outdated. • A warning flag and message will be displayed with the affected task. • The attribute will be removed from – **View Task** – **Copy Task** – **Edit Task** • If the outdated task is run the role administrator will see an error message associated with the missing data.

Note: the outdated data feature flags issues with the underlying data, it will not 'fix' the problem in the backend.

Table 4-1 (Cont.) Managing Outdated Data Usecases

Usecase	Summary	Outcome
		Role administrators should take relevant action such as running a new task if outdated data is flagged.

Table 4-1 (Cont.) Managing Outdated Data Usecases

Usecase	Summary	Outcome
Delete entity data • User • Entitlement • Assignment • Role • Role User Membership • Role Entitlement	1. Role administrator creates a role mining task 'MyTask'. 2. 'MyTask' is run multiple times and outputs candidate roles 'CR1', 'CR2'…'CR5'. 3. A data load is run where entities that make up part of the criteria for 'MyTask' have been deleted from the source.	• All candidate roles 'CR1', 'CR2'... 'CR5' will be marked as outdated. • A warning flag and message will be displayed with the affected candidate roles. • Deleted entitles will not be displayed in the Candidate Roles detail screen. **Note:** User and Entitlement counts in **Task**, **Candidate Roles**, and **Published Roles** will remain the same as analytics for the mis

Table 4-1 (Cont.) Managing Outdated Data Usecases

Usecase	Summary	Outcome
		sing entities will not be regenerated.
Accept outdated task	1. Task and its candidate roles have been marked as outdated.	• Role administrator can accept the change by clicking the **Accept Outdated Data** option and then selecting **Accept** in the dialog box. When confirmed this will remove the outdated data flag from the task and its candidate roles.
Accept outdated candidate role	1. Task and its candidate roles have been marked as outdated.	• Role administrator can accept the change by clicking the **Accept Outdated Data** option and then selecting **Accept** in the dialog box. When confirmed this will remove the outdated data flag from the candidate role.

5

Reviewing and Publishing Candidate Roles

Review and modify candidate roles, export the roles to files, publish the roles to Oracle Identity Governance, and view the details of published and imported roles.

This section contains the following topics:

5.1 Viewing Candidate Roles for Role Mining

To view candidate roles for role mining:

1. In the Manage Tasks page, search for the role mining task that you submitted for running.
2. If the task status shows that it has been completed, then click **View Candidate Roles**.

   The Results for role mining task page appears. In this page, the line at the top provides a summary of the role mining task run. It indicates the number of users and entitlements for which the task has been run, and how many candidate roles have been identified. For example:

   ```
   <TASK_NAME> executed and found 10 Candidate Roles covering for 105 Users and 57 Entitlements
   ```

   This page also shows information about the candidate roles in the following sections:

   - **Candidate Roles Distribution Chart:** Provides a distribution chart of the candidate roles with weightage on the number of entitlements and users picked up by each candidate role. As a result, a role with higher number of entitlements and users picked up by the role is represented by a larger box in the distribution chart.
   - **Candidate Roles:** Provides a list of the candidate roles with options to review, export, or discard the roles. The list of candidate roles is grouped by status. The options displayed for each row is based on the status of the candidate role. The options are **Rule**, **Review Role**, **Export**, **Discard**, **Modify and Publish**, and **Undo Discard**.
3. Click the number of users in the results summary line. The Users tab of the Review Users and Entitlements for <TASK_NAME> page opens with a list of users for which the task has run.

   If you want to verify whether a particular user has been included in the task, then filter the user names to find the user. To do so:

   a. Enter the complete or partial user login name or user display name in the Search field, and press Enter.

b. Optionally, click the **Entitlements** tab to review the entitlements included in the task. Otherwise, click the Go back icon at the top of the page to navigate back to the Results for role mining task page.

4. Click the number of entitlements in the results summary line. The Entitlements tab of the Review Users and Entitlements for <TASK_NAME> page opens with a list of entitlements for which the task has run. The applications to which the entitlements are associated are listed on the right side of the list.

   If you want to verify whether a particular entitlement has been included in the task, then filter the entitlements to find the entitlement. To do so:

   a. With **Entitlements** selected by default, enter the complete or partial entitlement name in the search field, and press Enter.

   b. Alternatively, to filter by the applications, select **Applications**.

   c. Enter the complete or partial application name in the search field, and press Enter.

   d. Optionally, click the **Users** tab to review the users included in the task. Otherwise, click the Go back icon at the top of the page to navigate back to the Results for role mining task page.

5. In the Candidate Roles Distribution Chart section, place your mouse pointer on the roles in the distribution chart. Details of the roles with the number of users and entitlements is displayed, for example, **Entitlements 5, Users 11**.

6. In the Candidate Roles Distribution Chart, click a role. The candidate roles are listed in the Candidate Roles section, which are classified as the following:

   - **Review started:** The candidate roles that have been modified while reviewing. Modification can include setting names for the candidate roles, or configuring the attributes for role analytics. See Reviewing and Adjusting Candidate Roles for information about reviewing and adjusting candidate roles.
   - **Review not started:** The candidate roles that have not been modified as part of the review.
   - **Published roles:** The candidate roles that have been published to Oracle Identity Governance.
   - **Discarded roles:** The candidate roles that have been removed from the distribution chart and the list of candidate roles.

7. In the Candidate Roles section, expand **Review started** if it is not already expanded.

8. For each candidate role, you can click any one of the following:

   - **Rule:** Click to view the User Assignment Rule associated with the selected candidate role.
   - **Continue Reviewing:** Click to open the role analytics page and continue the review or modification of the candidate role. See Reviewing and Adjusting Candidate Roles for information about reviewing and adjusting candidate roles.
   - The **Export** icon: Click to export the role data in a CSV file, which you can open or save for future use. The file is named `role.csv` by default. You can change the file name and download the file.

- **Discard Role:** Click to remove the candidate role. The role is displayed in the Discarded roles section, where you can export the role or bring it back to the candidate roles list by clicking **Undo Discard**.

9. In the Candidate Roles section, expand **Review not started** if it is not already expanded.
10. For each candidate role, the options to export the role to a CSV file and discard the role are the same as described in step 8. Click **Review Role** to open the Review and Adjust a Candidate Role page that lets you review and modify the candidate role before exporting and publishing. See Reviewing and Adjusting Candidate Roles for information about reviewing and adjusting candidate roles.
11. In the Candidate Roles section, expand **Published roles** if it is not already expanded.
12. For each candidate role, you can click any one of the following:
    - **Modify and Publish:** Click to open the Review and Adjust a Candidate Role page that lets you modify the candidate role and publish it again to Oracle Identity Governance.
    - The **Export** icon: Click to export the role data in a CSV file, which you can open or save for future use. The file is named `role.csv` by default. You can change the file name and download the file.
13. In the Candidate Roles section, expand **Discarded roles** if it is not already expanded.
14. For each candidate role, you can click any one of the following options:
    - The **Export** icon: Click to export the role data in a CSV file, which you can open or save for future use. The file is named `role.csv` by default. You can change the file name and download the file.
    - **Undo Discard:** Click to bring the candidate role back to the distribution chart and in the list of candidate roles.

5.2 Reviewing and Adjusting Candidate Roles

To review and adjust candidate roles:

1. In the Candidate Roles section of the Results for role mining task page, click **Review Role** or **Continue Reviewing**.

   The Review and adjust a Candidate Role page appears.
2. To specify a name for the candidate role:
   a. Click **Set Name** adjacent to the Review and Adjust Candidate Role label.
   b. In the Candidate Role Name field, enter a name for the candidate role.
   c. Click **Save**.

   When you set the name of the candidate role or make any other modification, the candidate role moves to the Review started category, and the candidate role name is displayed in the Review started section of the Results for role mining task page.

   In addition, when you set the name of the candidate role, the title of the Review and adjust a Candidate Role changes to the candidate role name you specified. If you want to change the candidate role name, then click **Change Name**, specify a new name, and click **Save**.
3. The Entitlements horizontal bar shows the number of entitlements that are part of the candidate role out of the total number of entitlements included in the role mining task. To

view the entitlements, click **Show**. The Entitlements tab of the Review Users and Entitlements for *CANDIDATE_ROLE_NAME* page appears with a list of the entitlements that are part of the candidate role. You can filter and review the entitlements. When finished, click the Go Back icon to navigate back to the Review and Adjust Candidate Role page.

4. The Users horizontal bar shows the number of users that are part of the candidate role out of the total number of users included in the role mining task. To view the users, click **Show**. The Users tab of the Review Users and Entitlements for *CANDIDATE_ROLE_NAME* page appears with a list of the users that are part of the candidate role. You can filter and review the users. When finished, click the Go Back icon to navigate back to the Review and Adjust Candidate Role page.
5. The Role Analytics section displays the percentage of top three attributes in the candidate role based on configuration. For example, Top Managers represent the top managers among the users that are part of the candidate role. If all users belong to one organization, then 100 percent is shown in the Top Organization. To configure the attributes for role analytics:
   a. Click the Configure Attributes for Analytics icon to the right in the Role Analytics section. The Configure Role Analytics Graph dialog box appears.
   b. Select any one of **3**, **5**, or **10** options to display the analytics for Top values for the attributes you specify.
   c. Under Select user attributes to view analytics (Maximum 3 supported), select any three attributes for which you want to display the analytics.
      The analytics can be shown for a maximum three attributes, and Oracle Identity Role Intelligence does not allow you to select more than three attributes.
   d. Click **Apply**. The role analytics is displayed for the attributes you selected.
6. In the User Assignment Rule section, you can view the assignment rule associated with the candidate role. The criteria forming the rule are displayed. User attributes participating in the User Assignment Rule will be sourced from the role mining job filter, and user attributes for which the `userMembershipRule` flag is enabled. Where enabled, user custom attributes will be included as well. The number of users matching the rule in the rule in the candidate role, and those matching the rule in the system, are displayed.

   In this section you can select and deselect the attribute conditions that make up the rule and see the corresponding effect on the number of users in the target system. If enabled, this will include custom attributes. By default, the checkbox will be deselected for those attributes which have null values within the data. If you want to save the changes to the rule click on **Apply** and then **Save**. On saving your changes, all unselected user attributes will be removed and the User Assignment Rule will be updated only with the selected user attributes.
7. In the Similar roles section, review the top three similar roles existing in the system. The similarity is determined by a minimum of 50 percent entitlement and user similarity. For example, if the entitlements and users that are part of a candidate role are 27 and 13 respectively, then roles with 14 entitlements and 7 users is considered similar.

   In OIRI, the data import job imports only those roles from OIG that are associated with an access policy in OIG. These imported roles in OIRI are only used to calculate the role similarity.

8. Click the similar role name. The Role Similarity page appears with details of the similar role.

   Alternatively, you can click the **See all similar roles that could be leveraged for this purpose** link to open the Role Similarity page with the details of all the similar roles.

9. In the Role Similarity page, expand the similar role name to display its details.

   The Entitlements horizontal bar shows the percentage of entitlements in the candidate role that are similar to the entitlements in the similar role. Similarly, the Users horizontal bar shows the percentage of users in the candidate role that are similar to the users in the similar role.

10. Click the **Entitlements** tab, and then view the following types of entitlements:

    - **Common Entitlements:** Click to display the entitlements that are common to the candidate role and the similar role.
    - **Entitlements in Candidate Role only:** Click to display the entitlements that belong only to the candidate role.
    - **Entitlements in *SIMILAR_ROLE* only:** Click to display the entitlements that belong only to the similar role. Here. *SIMILAR_ROLE* is the placeholder for the name of the similar role.

11. Click the **Users** tab, and then view the following types of users:

    - **Common Users:** Click to display the users that are common to the candidate role and the similar role.
    - **Users in Candidate Role only:** Click to display the users that belong only to the candidate role.
    - **Users in *SIMILAR_ROLE* only:** Click to display the users that belong only to the similar role. Here. *SIMILAR_ROLE* is the placeholder for the name of the similar role.

12. Click the Go back icon to navigate back to the Review and Adjust Candidate Role page.

13. In the Entitlement gaining users section, review the number of entitlements that are gaining users. For example, if this section shows `9 of 27 Entitlements are gaining users`, then it means that 9 entitlements will be assigned to users who currently do not have these entitlements when the candidate role is published. In other words, if you publish this candidate role, then these 9 entitlements will be granted to users.

    Below this line, the Entitlement gaining users section also lists the entitlements gaining users, the application to which each one is associated, and the number of users that are gaining access to the entitlements.

14. To view the users that are gaining access to an entitlement, click the number of new users in the Summary column. The Entitlement gaining users dialog box is displayed with a list of the users who will gain access to the entitlement. Click **Close**.

15. Optionally, to remove entitlements from the candidate role:

    a. Select one or more entitlements, and click **Exclude Selected Entitlements**. The Selected Entitlements dialog box appears.

    b. Click **Confirm Remove and Save**. The selected entitlements are removed from the candidate role, and the **Review Excluded Entitlements** link is displayed in the Entitlement gaining users section.
    Alternatively, click **Do not remove** to retain the selected entitlements in the candidate role.

c. If you want to bring the discarded entitlements back to the candidate role, then click **Review Excluded Entitlements**. In the Excluded Entitlements dialog box, click **Recover** for each entitlement you want to include in the candidate role, and then click **Close**.

16. In the User gaining entitlements section, review the number of users that are gaining entitlements. For example, if this section shows `7 of 14 users are gaining entitlements`, then it means that 7 users will get access to new entitlements when the candidate role is published.

    While reviewing the users, you can exclude and recover the users in a similar way as described in step 10.

17. After completing the review and modification of the candidate role, click **Looks Good! Publish the role** at the top of the page. See Publishing Candidate Roles for information about publishing candidate roles to Oracle Identity Governance or offline publishing to a CSV file.

18. Optionally, click **Export** at the top of the page to export the role data in a CSV file, which you can open or save for future use. The file is named `role.csv` by default. You can change the file name and download the file.

5.3 Publishing Candidate Roles

To publish a candidate role:

1. In the Review and Adjust Candidate Role page, click **Looks Good! Publish the role.** The Publish Role dialog box appears.
2. In the Candidate Role Name field, enter a name for the candidate role. This is a required field.

   If you have already set the name for the candidate role, then this section is not visible.
3. Select the **Publish Role without User assignment** option to publish the candidate role only with entitlement assignment and exclude user assignment.

   If you do not select this option, then the candidate role will be published by default with user and entitlement assignment as defined in the candidate role.
4. Select the **Publish Role with User Assignment Rule** option to publish the candidate role together with the user assignment rule. This will publish the rule as well as the role, meaning that users satisfying the criteria of the rule will be assigned the role automatically. Where enabled, the rule will contain custom attributes. Default value for this is not to publish so this must be selected if you want to publish the User Assignment Rule with the Candidate Role.
5. Select the **Offline to file** option to publish the candidate role to a file.

   If you do not select this option, then the candidate role is published to Oracle Identity Governance by default.
6. Click **Confirm Publish**. Depending on your selection to publish the role online or offline, the candidate role is published to Oracle Identity Governance or to a CSV file respectively.
7. Click the Go Back icon to navigate to the Results for role mining task page, and scroll down to the Candidate Roles section. Verify that the newly published role is displayed under Published Roles.

5.4 Viewing Role Details

You can view the role details of the published roles and imported roles.

This section contains the following topics:

- Viewing the Details of Published Roles
- Viewing the Details of Imported Roles

5.4.1 Viewing the Details of Published Roles

To view the details of the roles published to Oracle Identity Governance:

1. On the Identity Role Intelligence home page, click the Application Navigation menu icon, and then click **Published Roles**. Alternatively, on the Explore all tasks and roles tile on the home page, click **Published Roles**.

   The Published Roles page is displayed with a cumulative list of roles that have been published offline and to Oracle Identity Governance.
2. Search for the published role you want to review. To do so, enter the complete or partial role name in the Search field, and press Enter.
3. Click the role you want to review. Alternatively, you can click the view role icon on the right.

   The Role Details page is displayed.
4. Click the **Rule** icon if it is already not active..

   This section displays the details of the published role user assignement rule role.
5. Click the **Info** tab if it is already not active.

   This tab displays the role information, such as role name, description, and the number of users, applications, and entitlements in the role.
6. Click the **Users** tab.

   The list of users in the role is displayed. You can search for particular users by using the Search field.
7. Click the **Applications** tab.

   The list of applications in the role is displayed.
8. Click the **Entitlements** tab.

   The list of entitlements in the role along with the associated applications is displayed. You can filter the entitlements by entitlement name or application name, and search for particular entitlements by using the Search field.

5.4.2 Viewing the Details of Imported Roles

To view the details of the roles imported from flat files:

1. On the Identity Role Intelligence home page, click the Application Navigation menu icon, and then click **Imported Roles**. Alternatively, on the Explore all tasks and roles tile on the home page, click **Imported Roles**.

The Imported Roles page is displayed with a list of roles that have been imported from OIG and flat files. The data import job imports only those roles from OIG that are associated with an access policy in the OIG. The risk level associated with each role, such as low, medium, or high, is displayed on the right of the page.

2. Search for the imported role you want to review. To do so, enter the complete or partial role name in the Search field, and press Enter.
3. Click the role you want to review. Alternatively, you can click the View Role icon on the right.

   The Role Details page is displayed.
4. Click the **Info** tab if it is already not active.

   This tab displays the role information, such as role name, display name, risk score, inherited from, and inherited to.

   The User Assignment Rule section provides information about the user assignment rule of that imported role.
5. Click the **Users** tab.

   The list of users in the role is displayed. You can search for particular users by using the Search field.
6. Click the **Applications** tab.

   The list of applications in the role is displayed.
7. Click the **Entitlements** tab.

   The list of entitlements in the role along with the associated applications is displayed. You can filter the entitlements by entitlement name or application name, and search for particular entitlements by using the Search field.

6
Tuning Performance

This chapter provides fine tuning considerations for OIRI.

Tuning Spark and Kubernetes Configuration

The following table lists the parameters for fine tuning Spark and Kubernetes configuration and the specific values for small, medium, and large scale implementations.

Parameter	Description	Small Scale	Medium Scale	Large Scale
executorInstances	Specify the number of executor pods.	3	5	7
driverRequestCores	Specify the CPU request for the driver pod.	2	3	4
driverLimitCores	Specify the hard CPU limit of the driver pod.	2	3	4
executorRequestCore	Specify the CPU request for each executor pod.	2	3	4
executorLimitCore	Specify the hard CPU limit of each executor pod.	2	3	4
driverMemory	Specify the hard memory limit of the driver pod.	2g	3g	4g
executorMemory	Specify the hard memory limit of each executor pod.	2g	3g	4g

Tuning Entities Configuration

When the source of data import is flat files, then specify the following parameter values:

- lowerBound: The lowest value of the *EXTERNAL_ENTITY_ID*
- upperBound: The largest value of the *EXTERNAL_ENTITY_ID*
- numPartitions: Specify 3 for small scale, 5 for medium scale, and 7 for large scale

Here, the value of the *EXTERNAL_ENTITY_ID* for various entities are as follows:

- Users: `EXT_USER_ID`
- Applications: `EXT_APP_ID`
- Entitlements: `EXT_ENT_ID`
- Accounts: `EXT_ACCOUNT_ID`
- Assigned Entitlements: `EXT_USER_ID`
- Roles: `EXT_ROLE_ID`

- Role User Memberships: `EXT_ROLE_ID`
- Role Entitlement Composition: `EXT_ROLE_ID`

When the source of the data import is Oracle Identity Governance database, specify the following parameter values:

- lowerBound: 0
- upperBound: Total number of rows in the entity OIG table
- numPartitions: 3 for small scale, 5 for medium scale, 7 for large scale

The OIG tables for various entities and the SQL queries to get the number of rows are as follows:

- Users:

  ```
  select count (*) from usr;
  ```

- Applications:

  ```
  select count (*) from app_instance;
  ```

- Entitlements:

  ```
  select count (*) from ent_list;
  ```

- Accounts:

  ```
  select count (*) from orc;
  ```

- Assigned Entitlements:

  ```
  select count (*) from ent_assign;
  ```

- Roles:

  ```
  select count (*) from ugp;
  ```

- Role User Memberships:

  ```
  select count (*) from usg;
  ```

- Role Entitlement Composition:

  ```
  select count (*) from poc;
  ```

7

Accessibility Features and Tips

Currently, there are no accessibility features in Oracle Identity Role Intelligence. However, you can use the following accessibility tip in the Identity Role Intelligence user interface:

Navigating Through the UI By Using the Keyboard

You can navigate through the elements of the Identity Role Intelligence user interface by using the keyboard. For example, in the Manage Data Import page, you can navigate in the following way:

> **Note:**
>
> This is applicable for all lists that have action buttons or names as link, such as:
>
> - Tasks list
> - Candidate Roles list
> - Published Roles list
> - Imported Roles list

1. Navigate to a row and press Enter to select the row.
2. Press `F2` to switch to actionable mode.
3. Navigate by pressing `Tab`.

You can navigate through a list item by pressing the following keys:

- `F2`: Enters actionable mode. This enables keyboard action on elements inside the item, including navigation between focusable elements inside the item.
- `Esc`: Exits actionable mode.
- `Tab`: When in actionable mode, navigates to the next focusable element within the item. If the last focusable element is reached, shift focuses back to the first focusable element. When not in actionable mode, it navigates to the next focusable element on the page outside of list view.
- `Shift+Tab`: When in actionable mode, navigates to the previous focusable element within the item. If the first focusable element is reached, it shifts the focus back to the last focusable element. When not in actionable mode, it navigates to the previous focusable element on the page outside of list view.

A

Attribute Mapping of Entities

This appendix provides the attribute mapping of Oracle Identity Role Intelligence (OIRI) and Oracle Identity Governance (OIG) for each entities, which are user, application, role, entitlement, account, assigned entitlement, role user membership, role hierarchy, and role entitlement composition.

OIRI and OIG User Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_USER_ID	user key
USER_NAME	user login
LAST_NAME	user last name
FIRST_NAME	user first name
MIDDLE_NAME	user middle name
DISPLAY_NAME	user display name
TITLE	user title
LOCALE	user locale
PREFERRED_LANGUAGE	user language
STATUS	user status
WORK_EMAIL	user email
PRIMARY_EMAIL_TYPE	If the value of user email is not null, then the value of this attribute is Work. Otherwise, the value of this attribute is blank.
WORK_STATE	user state
WORK_POSTAL_CODE	user postal code
WORK_COUNTRY	user country
EMPLOYEE_NUMBER	user employee number
EMPLOYEE_TYPE	user employee type
JOB_CODE	user job code
ORGANIZATION	user organization name
PARENT_ORG_NAME	user parent organization
DIVISION	user organization division
DEPARTMENT	user department number
MANAGER_NAME	manager login
MANAGER_DISPLAY_NAME	manager display name
DEPROVISIONED_DATE	user deprovisioned date
DEPROVISIONING_DATE	user deprovisioning date
DESCRIPTION	user description
FULL_NAME	user full name
OFFICE_NAME	user office name
TERRITORY	user territory

OIRI and OIG Application Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_APP_ID	application instance key
NAME	application name
DISPLAY_NAME	application display name
TYPE	Disconnected / object name
DESCRIPTION	application description
RISK_SCORE	catalog item risk

OIRI and OIG Role Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_ROLE_ID	role key
NAME	role name
DISPLAY_NAME	role display name
DESCRIPTION	role description
RISK_SCORE	catalog item risk

OIRI and OIG Entitlement Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_ENT_ID	entitlement key
NAME	entitlement name(lookup code)
DISPLAY_NAME	entitlement display name(lookup decode)
APPLICATION_NAME	application name
GRANTEE_TYPE	process form description
EXT_GRANTEE_ID	resource object key
GRANTEE_NAME	process form entitlement field label
RISK_SCORE	catalog item risk

OIRI and OIG Account Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_ACCOUNT_ID	account id
ACCOUNT_NAME	account name
ACCOUNT_TYPE	account type
USER_NAME	user login
APPLICATION_NAME	application name

OIRI and OIG Assigned Entitlement Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_USER_ID	user key
USER_NAME	user login
ENTITLEMENT_NAME	entitlement name(lookup code)

OIRI Attribute	OIG Attribute
APPLICATION_NAME	application name

OIRI and OIG Role User Membership Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_ROLE_ID	role key
ROLE_NAME	role name
USER_NAME	user login

OIRI and OIG Role Hierarchy Attribute Mapping

OIRI Attribute	OIG Attribute
ROLE_NAME	role name
NESTED_ROLE_NAME	child role name

OIRI and OIG Role Entitlement Composition Attribute Mapping

OIRI Attribute	OIG Attribute
EXT_ROLE_ID	role key
ROLE_NAME	role name
ENTITLEMENT_NAME	entitlement name(lookup code)
APPLICATION_NAME	application name