



# Release Notes

/ OpenIDM 4

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## Abstract

Notes covering OpenIDM software requirements, fixes, known issues. The OpenIDM project offers flexible, open source services for automating management of the identity life cycle.



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# Table of Contents

1. What's New in OpenIDM 4 .....	1
1.1. Security Advisories .....	3
2. Before You Install OpenIDM Software .....	4
3. OpenIDM Fixes, Limitations, & Known Issues .....	8
3.1. Fixed Issues .....	8
3.2. Limitations .....	9
3.3. Known Issues .....	9
4. OpenIDM Compatibility .....	14
4.1. Major Changes to Existing Functionality .....	14
4.2. Minor Changes to Existing Functionality .....	16
4.3. Changes in Database Schema .....	17
4.4. Deprecated Functionality .....	24
4.5. Removed Functionality .....	25
4.6. Functionality That Will Change in the Future .....	25
4.7. Added and Deleted Samples .....	25
5. Documentation Updates .....	28
6. How to Report Problems & Provide Feedback .....	29
7. Support .....	30

## Chapter 1

# What's New in OpenIDM 4

OpenIDM 4 provides many new features and product enhancements. The following list describes the main new features affecting an end user.

### Getting Started Guide

If you are new to OpenIDM, you can now start exploring OpenIDM with the following document: [Getting Started](#).

### Samples Guide

To test OpenIDM in a variety of configurations, read the [Samples Guide](#). This document replaces the samples that were previously described in the *Installation Guide*.

### Enhanced Administrative UI

You can configure more OpenIDM features from the Administrative User Interface, also known as the Admin UI. For example, you can manage:

- Audit Event Handlers and Event Topics
- Outbound Email (SMTP) Service
- User Self-service (Self-registration and Password Reset)
- Managed Roles and Assignments
- Workflow Tasks and Processes

We have highlighted most of these features elsewhere in these Release Notes, with links to appropriate documentation.

Of course, you can still administer these features from appropriate configuration files.

The new Web UI includes three additional components: the Bootstrap front-end framework, a Font Awesome font, and an associated CSS toolkit. You can now customize the OpenIDM UIs with the *Bootstrap* themes and *Font Awesome* icons. For information about the new customization process, see "Customizing the UI" in the *Integrator's Guide*. Given the availability and flexibility of Bootstrap, ForgeRock does not support upgrades of custom UI themes from earlier versions of OpenIDM.

## New User Self-Service UI

OpenIDM 4 includes a new system for user self-service that is common across ForgeRock's Identity Platform. The current implementation includes user self-registration, password reset, and knowledge-based authentication. You can configure user self-registration and password reset from the Admin UI, and see the results in the Self-Service UI login screen. For more information, see "Configuring User Self-Service" in the *Integrator's Guide*.

## Multi-Account Linking

OpenIDM 4 supports the correlation of a single source entry with multiple target entries. For more information, see "Correlating Multiple Target Objects" in the *Integrator's Guide* and "The Multi-Account Linking Sample" in the *Samples Guide*.

## Automated Updates

OpenIDM 4 supports automated updates. If you need to migrate from or install a patch for OpenIDM 4, read "Updating OpenIDM" in the *Installation Guide*.

## Relationships as a Resource

OpenIDM 4 supports managed relationship objects. For example, you can have an object for relationships between a manager and an employee. For more information, see "Managing Relationships Between Objects" in the *Integrator's Guide*.

Also, see the following JIRA issues:

- OPENIDM-3507: Provide mechanism to store relationships with arbitrary metadata
- OPENIDM-3896: Update the managed object parent schema to reflect the relationship resource representation
- OPENIDM-4043: Add support for bidirectional relationships
- OPENIDM-4042: Verify relationship reference objects
- OPENIDM-4040: Implement PATCH support on relationship objects
- OPENIDM-4134: Move relationships to generic object

OpenIDM 4 includes two different types of roles: **provisioning roles** that specify how objects are provisioned to an external system, and **authorization roles** that specify the authorization rights of a managed object, internal to OpenIDM. You may still associate provisioning roles with the **roles** property.

In contrast, authorization roles are now stored in the **authzRoles** property for that object. For more information, see "Working With Managed Roles" in the *Integrator's Guide*.

## Integration of a Common Audit Facility

OpenIDM 4 incorporates a new audit facility that is common across ForgeRock's Identity Platform. The audit facility now logs authentication and configuration events by default, and supports the addition of custom audit event handlers.

For information about the common audit facility, see *"Using Audit Logs"* in the *Integrator's Guide*.

For details about changes required for existing OpenIDM deployments, see *"Major Changes to Existing Functionality"*.

### **IBM DB2 Database Support**

OpenIDM 4 supports the use of the IBM DB2 Database as an internal repository. For more information, see *"To Set Up OpenIDM With IBM DB2"* in the *Installation Guide*.

### **Support for Oracle 12c as a Repository**

See OPENIDM-3514: Support Oracle 12C as a Repo.

### **Scripted Password Generation for Users**

For more information, see *"Managing Passwords"* in the *Integrator's Guide*.

### **Support for Java 8**

For information about supported systems, see *"Before You Install OpenIDM Software"*.

### **Read-Only Installation**

You can now configure OpenIDM on a Linux/UNIX read-only volume. For guidance, see *"Installing OpenIDM on a Read-Only Volume"* in the *Installation Guide*.

### **Improved Performance for Queries**

For more information, see OPENIDM-2413: Support for paging and sorting results with queryFilter against repo-based endpoints.

For installation instructions and several samples to familiarize you with the OpenIDM features, see *"Installing OpenIDM Services"* in the *Installation Guide*.

For an architectural overview and high-level presentation of OpenIDM, see *"Architectural Overview"* in the *Integrator's Guide*.

## **1.1. Security Advisories**

ForgeRock issues security advisories in collaboration with our customers and the open source community to address any security vulnerabilities transparently and rapidly. ForgeRock's security advisory policy governs the process on how security issues are submitted, received, and evaluated as well as the timeline for the issuance of security advisories and patches.

For details of all the security advisories across ForgeRock products, see Security Advisories in the *Knowledge Base library*.

## Chapter 2

# Before You Install OpenIDM Software

This chapter covers prerequisites for installing and running OpenIDM software.

For OpenIDM 4, the following configurations are supported for use in production.

### Repository

The following JDBC repositories are supported for use in production:

- MySQL version 5.x with MySQL JDBC Driver Connector/J 5.1.18 or later
- Microsoft SQL Server 2012, 2014
- Oracle Database 11gR2, 12c
- PostgreSQL 9.3 and above
- IBM DB2, 10.x

OrientDB is provided for evaluation only.

### Stand-alone installation

You must install OpenIDM as a stand-alone service, using Apache Felix and Jetty, as provided. Alternate containers are not supported.

OpenIDM 4 bundles Jetty version 9.2.

### Connectors

OpenIDM 4 comes packaged with these OpenICF connectors:

- CSV File Connector
- Database Table Connector
- Generic LDAP Connector
- XML File Connector
- Groovy Connector Toolkit

This toolkit enables you to create scripted connectors to virtually any resource

A corresponding PowerShell Connector Toolkit is available for download from [ForgeRock Backstage](#), and enables you to create scripted connectors to address the requirements of your Microsoft Windows ecosystem.

The following connectors are bundled only with the OpenIDM Enterprise release:

- Google Apps Connector
- Salesforce Connector

ForgeRock provides additional connectors, as listed on the [OpenICF project connectors site](#).

When using the LDAP connector to provision to Active Directory, OpenIDM 4 supports Active Directory Domain Controllers, Active Directory Global Catalogues, and Active Directory Lightweight Directory Services (LDS).

OpenIDM 4 also provides support for Windows 2012 R2 as the remote system for connectors and password synchronization plugins.

The following table lists the supported connector, connector server, and password synchronization plugins for this OpenIDM release.

### *Supported Connectors, Connector Servers, and Plugins*

Connector	Version
CSV File Connector	1.5.0.0
Database Table Connector	1.1.0.1
Google Apps Connector	1.4.1.0
Generic LDAP Connector	1.4.1.0
XML Connector	1.1.0.2
Active Directory Connector	1.4.0.0
Java Connector Server	1.5.0.0, 1.4.1.0
.NET Connector Server	1.5.0.0, 1.4.1.0
OpenDJ Password Synchronization Plugin	1.1.1, supported with OpenDJ version 3.0.0
OpenDJ Password Synchronization Plugin	1.0.3, supported with OpenDJ version 2.6.x
Active Directory Password Synchronization Plugin	1.1.0, supported on Windows 2008 R2 and Windows 2012 R2

OpenIDM 4 supports version 1.5.0.0 of the OpenICF Framework. Therefore, you must use version 1.5.0.0 of the .NET Connector Server, or the Java Connector Server. The 1.5.0.0 Java Connector Server is backward compatible with the version 1.1.x connectors. The 1.5.0.0 .NET Connector Server is compatible only with the 1.4.x and 1.5.x connectors.

The 1.5.0.0 .NET connector server requires the .NET framework (version 4.5 or later) and is supported on Windows Server 2008 R2 and 2012 R2.



While the following connector toolkits are also supported, any connectors that you build with these toolkits are not supported. However, we do provide examples for how you can build connectors with these toolkits in "*Samples That Use the Groovy Connector Toolkit to Create Scripted Connectors*" in the *Samples Guide* and "*Samples That Use the PowerShell Connector Toolkit to Create Scripted Connectors*" in the *Samples Guide*.

### *Included Connector Toolkits*

Connector	Version
Scripted Groovy Connector Toolkit	1.4.2.0
PowerShell Connector Toolkit	1.4.2.0

## Browsers

ForgeRock has tested many browsers with the OpenIDM UI, including the following browsers.

- Chrome and Chromium, latest stable version
- Firefox, latest stable version
- Safari, latest stable version
- Internet Explorer 9 and later

## Operating Systems

ForgeRock supports the use of OpenIDM 4 on the following operating systems:

- Red Hat Enterprise Linux 6.x/7.x (CentOS Linux 6.x/7.x)
- Ubuntu Linux 14.04
- Windows 2008 R2
- Windows 2012 R2

## Java Environment

OpenIDM requires Java 7 or Java 8, specifically at least the Java Standard Edition runtime environment. ForgeRock has performed most testing with Oracle Java Platform, Standard Edition.

ForgeRock recommends that you keep your Java installation up to date with the latest security fixes.

When using the Oracle JDK, you also need the Java Cryptography Extension (JCE) policy files.

On Windows systems, use Java SE JDK 7 update 6 or later, to take advantage of the JVM fix relating to non-blocking sockets with the default Jetty configuration.

OpenIDM 4 also supports OpenJDK 1.7 and OpenJDK 1.8.

If you have a special request to support a component or combination not listed here, contact ForgeRock at [info@forgerock.com](mailto:info@forgerock.com).

You need 250 MB disk space and 1 GB memory for an evaluation installation. For a production installation, disk space and memory requirements will depend on the size of any internal and external repositories, as well as the size of the audit and service log files that OpenIDM creates.

## Chapter 3

# OpenIDM Fixes, Limitations, & Known Issues

This chapter covers the status of key issues and limitations for OpenIDM 4. For details and information on other issues, see the [OpenIDM issue tracker](#).

## 3.1. Fixed Issues

OpenIDM 4 includes fixes to the following major issues:

- OPENIDM-4768: Index for links table (Oracle) should be unique
- OPENIDM-4766: Reduce default logging in IDM log files
- OPENIDM-4678: Recon may fail if source object is deleted during recon and a correlation query is defined
- OPENIDM-4584: Infinite loop while attempting to create default config/sync object from within mappingDetails endpoint
- OPENIDM-4542: Incorrect conversion of CREST QueryFilters to ICF Filters by the OpenIDM ICF Provisioner Service
- OPENIDM-4497: Column definitions for postgresql auditaccess table have wrong length
- OPENIDM-4471: openidm.patch returns null when a no effect patch is called
- OPENIDM-4121: Audit sample does not support sorting, page sizes, or paged results
- OPENIDM-4083: ReconciliationService unable to query audit data from remote SQL server
- OPENIDM-4078: '400 Bad Request error' can occur when try to display Mapping page in UI with audit-sample
- OPENIDM-3980: Duplicate source IDs with source system break reconciliation
- OPENIDM-3914: Mishandling system object identifiers with slash character
- OPENIDM-3611: Action dropdown on connector detail page renders outside of browser pane
- OPENIDM-3512: ICF Provisioner Service needs to support system objects with path expression as ID

- OPENIDM-3338: workflow.json configuration without a mail username and password throws a NPE
- OPENIDM-2427: Pagination on managed users not working with MS-SQL, DB2 and Oracle as repo

## 3.2. Limitations

OpenIDM 4 has the following known limitations:

- Asynchronous reconciliation does not work on Linux with Java 8. (OPENIDM-3076)
- When you add or edit a connector through the Admin UI, the list of required **Base Connector Details** is not necessarily accurate for your deployment. Some of these details might be required for specific deployment scenarios only. If you need a connector configuration where not all the Base Connector Details are required, you must create your connector configuration file over REST (see "Creating Default Connector Configurations" in the *Integrator's Guide*) or edit the connector configuration file (`conf/provisioner.openicf-connector-type.json`) directly.
- For OracleDB repositories, queries that use the `queryFilter` syntax do not work on CLOB columns in explicit tables.
- A conditional GET request, with the `If-Match` request header, is not currently supported.
- OpenIDM provides an embedded workflow and business process engine based on Activiti and the Business Process Model and Notation (BPMN) 2.0 standard. As an embedded system, local integration is supported. Remote integration is not currently supported.
- For updates and patches *from* OpenIDM 4, you can use the CLI, and any supported browser listed in "*Before You Install OpenIDM Software*", except Internet Explorer 9.

## 3.3. Known Issues

OpenIDM 4 has the following known issues.

- OPENIDM-6509: JMX enable prevents GC of discarded BoneCPDataSource objects
- OPENIDM-6481: OpenIDM creates redundant BoneCPDataSource
- OPENIDM-5033: No validation is done when using the Admin UI to configure an LDAP connector
- OPENIDM-5032: Workflow sample: unable to complete manager task, due to startup issues

*Workaround:* Disable and re-enable Password Reset. For more information, see "Configuring User Self-Service" in the *Integrator's Guide*.

- OPENIDM-4969: Admin UI, Bad Link when reconciling an XML file resource
- OPENIDM-4961: `enableFilteredResultsHandler:true` causes NPEs when using `queryFilter=true`

- OPENIDM-4957: OpenAM Auth Module, UI doesn't reflect change in Require OpenAM Authentication setting, after saving (refresh required)
- OPENIDM-4954: In Admin UI, Audit Event config, "passed variables" added to the script are not saved

*Workaround:* Edit the corresponding JSON file directly.

- OPENIDM-4946: Admin UI -- CSV Audit Handler: if tamper-evident security is disabled and signature interval is blank, other security entries lead to audit service failure

*Workaround:* Open the `audit.json` file for your project and remove the "signatureInterval" entry in the security section, or change it to a formatted string of appropriate duration.

- OPENIDM-4945: Newline character was not saved correctly when configured through UI and caused only one line in csv audit files

*Workaround:* Open the `audit.json` file for your project, and change "endOfLineSymbols" : "\\n" to "endOfLineSymbols" : "\n".

- OPENIDM-4933: Tamper-evident audit logs: Verification command does not give meaningful results
- OPENIDM-4926: Scriptedcrest2Dj and Scriptedrest2Dj samples do not work with OpenDJ 3.0.0
- OPENIDM-4919: Script eval action doesn't handle ResourceExceptions thrown by scripts
- OPENIDM-4918: Attempt by openidm-admin to add Security Questions leads to Problem During Profile Update error
- OPENIDM-4917: Scripted CREST Sample - UI connector template is missing descriptions
- OPENIDM-4914: In Admin UI, deleting connector for sample5 fails with internal error
- OPENIDM-4913: TaskScanner not working when using Oracle as a repo
- OPENIDM-4908: KBA settings can cause Password Reset to fail with a 500 Internal Server Error: "Exception intercepted"
- OPENIDM-4879: Workflow sample usecase specific repo config file is missing for Oracle and postgresSQL
- OPENIDM-4856: Role edit page doesn't load when openidm-authorized, Basic minimum user clicked
- OPENIDM-4855: Clicking disabled Save button on Role edit page takes you to Dashboard
- OPENIDM-4830: Admin UI, double conflicting pop-up windows are possible
- OPENIDM-4829: Admin UI, Audit, CSV Handler configuration, fails without proper signatureInterval entry

- OPENIDM-4828: CSV Connector does not handle multi-line attributes
- OPENIDM-4812: Admin UI: 500 error from Invalid Search in Mapping Detail Properties attribute grid text box
- OPENIDM-4799: with OrientDB repo, reading managed user with encoded quote in ID is failing with server error on policy
- OPENIDM-4798: Command to create a managed user with encoded percentage in ID fails with server error on policy
- OPENIDM-4797: Connector info provider needs to be updated to connect to .NET server

*Workaround:* Add a space or a line to the `provisioner.openicf.connectorinfoprovider.json` file, which reloads the associated bundle.

- OPENIDM-4792: When a sync mapping references source or target routes other than "managed" or "system", the Mapping UI won't render
- OPENIDM-4777: A patch on one cluster system is not replicated on the other members of the cluster
- OPENIDM-4693: Creating a Managed Object with a semicolon leads to an error
- OPENIDM-4692: ALL\_GONE situation for deleted entries leads to NPE in JS
- OPENIDM-4624: MS SQL database script creates the openidm user with the wrong password

*Workaround:* In `/path/to/openidm/db/mssql/scripts/openidm.sql`, change `PASSWORD=N'Passw0rd'` to `PASSWORD=N'openidm'`.

- OPENIDM-4549: Warnings when importing MS-SQL schema
- OPENIDM-4521: Custom attributes submitted in request to store in jdbc repo are not stored but the request returns them.
- OPENIDM-4473: Activiti does not pick up DataSource configuration changes.
- OPENIDM-4462: Delete request with HTTP "If-Match \*" header does not work on repo endpoints
- OPENIDM-4388: repo/scheduler not found exception, when Oracle DB is the repo
- OPENIDM-4386: Update process: cli.sh should include info on new / updated / backed up files in update.log
- OPENIDM-4369: Viewing data for an LDAP/Group in the UI throws an error
- OPENIDM-4321: Unable to use cli.sh for remote administration over a secure port
- OPENIDM-4315: Unable to run queries on managed/user using CLIENT\_CERT module with openidm-admin role

- OPENIDM-4261: Setting relationship properties to empty string throws NPE
- OPENIDM-4227: Use value of managed object prior to save for sync events to use hashed values
- OPENIDM-4149: availableConnectors are not updated after remote ICF shut down
- OPENIDM-4127: Endpoint system/os returns cpu usage above available
- OPENIDM-4110: Multiple servlets map to path stacktraces on startup with MySQL/DB2/MSSQL as repo  
*Workaround:* If you observe this error, restart OpenIDM. The error should not reoccur after a restart.
- OPENIDM-4080: Deleting a custom Certificate in Trustore via REST now returns a broken response
- OPENIDM-4049: User list doesn't filter as input is typed into the filter fields
- OPENIDM-4020: "My group's tasks" not showing tasks from different processes
- OPENIDM-3983: Target reconciliation broken when `_targetQuery` results contain full objects
- OPENIDM-3974: Unable to update/add a property in response.content object in Javascript script (launched from router onResponse hook)
- OPENIDM-3972: Sync Failure handling calls to `onSyncFailure.js-deadLetterQueue` do not work
- OPENIDM-3969: Response size of POST is limited to 1MB
- OPENIDM-3941: PATCH via REST with operation increment with invalid value returns 500 instead of 400
- OPENIDM-3937: RESTful calls, HEAD method no longer works (OpenIDM/CREST 3)
- OPENIDM-3857: Cannot pass along custom context when making router requests from script
- OPENIDM-3745: UI doesn't display msg related to failedPolicyRequirements when attempting to add new process
- OPENIDM-3667: `openidm/managed/user/openidm-admin` 404 (Not Found) when selecting process instance created by `openidm-admin`
- OPENIDM-3613: BoneCP: unexplained connections getting created
- OPENIDM-3525: Endpoint reconResults not working with MS-SQL/DB2 as repo (internal error 500)
- OPENIDM-3450: CLI.SH `configimport` does not work with the `--replaceAll` option
- OPENIDM-3357: In Admin UI / Edit XML Connector, LiveSync schedule is not saved properly
- OPENIDM-3199: When a mailtask can't be completed in an Activiti workflow, an exception is thrown

- OPENIDM-3197: '%' character in object id of openidm.read calls has to be encoded
- OPENIDM-3187: Custom authentication headers cannot handle Unicode characters
- OPENIDM-3149: Custom Endpoint Example: object request.patchOperations is wrong for Groovy scripts
- OPENIDM-2348: Implement external webapp for the remote Activiti server
- OPENIDM-2028: The .NET Connector Server Exception displays an incorrect connector error
- OPENIDM-2016: Sync on unsupported object class with remote java connector returns 500 instead of 400
- OPENIDM-1898: Representation of request-object differs between code and json-representation
- OPENIDM-1823: getScriptBindings function of ServiceScript (ScriptRegistryImpl.java) slows down extremely when accessed in parallel from multiple threads
- OPENIDM-1664: Memory usage of AD connector continue to increase.
- OPENIDM-1488: XDate locales could not be initialized correctly
- OPENIDM-1445: Provisioner service does not decrypt encrypted attributes before passing them to OpenICF framework
- OPENIDM-1430: OpenIDM needs a restart after importing a new cert via REST API
- OPENIDM-1269: some issues with Case Sensitivity options for Sync
- OPENIDM-1165: EXCEPTION action when doing liveSync stops the synctoken processing
- OPENIDM-1074: Disabling automatic polling for changes of config file not possible on new install
- OPENIDM-848: Conflicting behavior might be observed between the default fields set by the onCreate script and policy enforcement
- OPENIDM-470: OpenIDM cannot rename objects - if the identifier of the object changes, the associated link breaks



## Chapter 4

# OpenIDM Compatibility

This chapter covers major and minor changes to existing functionality, as well as deprecated and removed functionality in this release of OpenIDM. You must read this chapter before commencing a migration from a previous OpenIDM release.

## 4.1. Major Changes to Existing Functionality

The following changes will have an impact on existing deployments. Read these changes carefully and adjust existing scripts and clients accordingly.

### Bootstrap-based UI

To simplify the customization of UI themes, OpenIDM 4 uses the Bootstrap front-end framework and a Font Awesome font. As you can now more easily customize the OpenIDM UI, we have not retained any of the features associated with the OpenIDM-3.1 UI.

### Changes to the audit facility

OpenIDM 4 replaces the existing audit facility with a new facility that is common across ForgeRock's Identity Platform. This change has the following effect on the JDBC schema of existing OpenIDM deployments:

- New `auditauthentication` and `auditconfig` tables for the authentication log.
- Changes to the object to column mapping for the `auditaccess`, `auditactivity`, `auditrecon`, and `auditsync` tables.

You can review the new mapping in the configuration file for your JDBC repository, typically `repo.jdbc.json`. The mappings have changed significantly relative to OpenIDM-3.1.

For more information, see "Using Audit Logs" in the *Integrator's Guide*.

### Changes to the JDBC Repository Configuration

The way in which you configure a JDBC database as the OpenIDM repository has changed. This change separates the connection configuration from the database (table) configuration. Previously, both the connection configuration and the database table configuration were located in the file `repo.jdbc.json`. Now, the connection configuration is in the file `datasource.jdbc-`

`default.json` and the database table configuration in the file `repo.jdbc.json`. For more information, see "Installing a Repository For Production" in the *Installation Guide*.

## Changes to user self-service

OpenIDM 4 incorporates a system for user self-registration and password reset that is common for ForgeRock products, known as Commons User Self-Service.

## Updated REST API

OpenIDM has migrated to an updated version of the ForgeRock Common REST API. This update entails the following migration requirements for existing deployments.

- The `resourceName` object has been renamed to `resourcePath`. Custom scripts that request this object must be updated accordingly, for example `request.resourceName` must be replaced with `request.resourcePath`.

Implementations that use a scripted CREST connector must also update their scripts with this change. For example, note the change to the following line in the `UpdateScript.groovy` script, provided in the `scriptedcrest2dj` sample.

```
UpdateRequest updateRequest = Requests.newUpdateRequest(request.resourcePath, resource.content)
```

- The way in which context IDs are constructed has changed. OpenIDM now concatenates a 36-character UUID with a 64-bit sequence number. The context ID is therefore of variable length (37-56 characters). This will impact existing implementations where the `transactionId` and `reconId` are stored in a database column that uses a fixed schema. Corresponding column sizes will need to be increased.

In addition, the `reconId` of a reconciliation operation is now constructed from the root context ID of the invocation.

For details of the updated schema definitions, see the schema definition script for your repository (`/path/to/openidm/db/repo-name/scripts/openidm.sql`).

- The paging implementation has changed to improve the performance when counting results. Previously, the default behavior was to return the number of *remaining results*, which necessitated a time-consuming calculation for every request. In OpenIDM 4, the default behavior is to return the *total results*. Any clients that rely on *remaining results* must be updated accordingly.

The updated REST API implementation includes a configurable *count policy*, that can be set per request.

For more information about the paging implementation in OpenIDM 4, see "Paging and Counting Query Results" in the *Integrator's Guide*.

## Changes to the Scripted Groovy Connector

OpenIDM 4 bundles a new version of the scripted Groovy connector (1.4.2.0). In terms of the OpenIDM configuration, any connector configuration files for the Groovy connector must now use

the `"scriptRoots"` property and not the `"classpath"` property to specify the location or locations of the Groovy scripts used by the connector.

For example, an old `provisioner.openicf-scriptedsql.json` would have the following line:

```
"classpath" : [{"&{launcher.project.location}/tools"},
```

In OpenIDM 4, that line should be:

```
"scriptRoots" : [{"&{launcher.project.location}/tools"},
```

## Changes to Roles

OpenIDM 4 now includes two different role types: `authorization roles` and `provisioning roles`. Authorization roles are assigned to managed user objects, as values of the `"authzRoles"` property for that object.

## Changes to the Security Context

The access control element of the security context is now denoted by the attribute named `authorization`, rather than `authorizationId`. This means that any scripts that called the `authorizationId` attribute must be changed to call the `authorization` attribute.

For more information, see "Roles, Authentication, and the Security Context" in the *Integrator's Guide*.

## Changes to the PowerShell Connector

The previous version of the PowerShell connector (1.4.1.0) sent passwords to the Authenticate action script in clear text. The PowerShell connector version 1.4.2.0 sends passwords as a `GuardedString`.

## Change to `sourceCondition` property in a mapping

The `sourceCondition` property in a mapping must now take a `queryFilter` string, or a script configuration, as a value.

For more information, see "Filtering Synchronized Objects" in the *Integrator's Guide*.

# 4.2. Minor Changes to Existing Functionality

The following changes should not have an impact on existing deployment configurations.

## Addition of an explicit internal role for repositories

Now that OpenIDM includes separate provisioning and authorization roles, each supported repository now includes an explicit mapping to `internal/roles`.

## Removal of predefined queries for audits

As the functionality exists with `queryFilter`, the following pre-defined queries have been removed from the default configuration: `audit-last-recon-for-mapping`, `audit-by-recon-id-situations-latest`, and `audit-by-recon-id-situations-latest-filtered`.

## Changes to the database schema

A new column, `linkQualifier`, has been added to the `links` table. This column enables correlation between a single source object and multiple target objects. Predefined queries on the links table have been adjusted accordingly.

## Changes to Logging Output

The reconciliation and synchronization logs now include an additional `linkQualifier` field, which is used in the context of mapping a single source object to multiple target objects.

# 4.3. Changes in Database Schema

For users who are updating from OpenIDM 3.1 to OpenIDM 4, "Differences Between Data Definition Language (DDL) Scripts" details the differences in the respective internal repositories. It does not address any changes that you've made in your production repository.

You can also examine "Comparing Repositories", which compares the differences between the OpenIDM 3.1 and OpenIDM 4 repositories in the `repo.jdbc.json` file in your `/path/to/openidm/db/repo/conf` directory.

For the procedure to upgrade from OpenIDM 3.1 to OpenIDM 4, see "Migrating from OpenIDM 3.1 to OpenIDM 4" in the *Installation Guide*.

## 4.3.1. Differences Between Data Definition Language (DDL) Scripts

For each supported repository, OpenIDM includes a DDL script in the `openidm/db/repo/scripts` directory. Each DDL script is named either `openidm.sql` or `openidm.pgsql`. This section is subdivided by supported repository:

- "MSSQL DDL Scripts".
- "MySQL DDL Scripts".
- "Oracle DDL Scripts".
- "PostgreSQL DDL Scripts".

IBM DB2 is not included in this list, as it is new for OpenIDM 4.

### 4.3.1.1. MSSQL DDL Scripts

The following table enumerates the differences between the MSSQL instance of `openidm.sql` for OpenIDM 3.1 and OpenIDM 4.

#### *Changes in `openidm.sql` for MSSQL*

Subject	OpenIDM 3.1	OpenIDM 4	Explanation
<code>openidm_proxy</code> , second user for DB-only access	Included entries to create an <code>openidm_proxy</code> user	Removed for OpenIDM 4	No longer used
<code>propkey</code> , <code>propvalue</code> , in the following tables: <code>genericobjectproperties</code> , <code>managedobjectproperties</code> , <code>configobjectproperties</code> , <code>relationshipproperties</code> , <code>schedulerobjectproperties</code> , <code>clusterobjectproperties</code> , <code>updateobjectproperties</code>	<code>propkey</code> , <code>propvalue</code> combined in an index	<code>propkey</code> , <code>propvalue</code> in separate indexes	Enables independent use by the query engine for searchable properties, where <code>propkey</code> is the name, and <code>propvalue</code> is the value
Relationship metadata	Not available	<code>relationship</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
Relationship metadata	Not available	<code>relationshipproperties</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
<code>links</code> table	UNIQUE INDEX with <code>linktype</code>	Added <code>linkqualifier</code>	Supports correlation queries per link
<code>auditrecon</code> table	Reconciliation table	Reconciliation table, extensively revised	Supports common transaction ID with other audit data
<code>auditsync</code> table	Synchronization table	Synchronization table, extensively revised	Supports common transaction ID with other audit data
<code>auditconfig</code> table	Not available	New for OpenIDM 4	Logs configuration changes
<code>auditactivity</code> table	Audit Activity table	Audit Activity table, extensively revised	Logs OpenIDM activity
<code>auditaccess</code> table	Audit Access table	Audit Access table, extensively revised	Supports common transaction ID with other audit data
<code>auditauthentication</code> table	Not available	New for OpenIDM 4	Logs authentication attempts
<code>internalrole</code> table	Not available	New for OpenIDM 4	Table for internal roles, as described in "Roles and Authentication" in the <i>Integrator's Guide</i> .
<code>updateobjects</code> table	Not available	New for OpenIDM 4	Supports update features

Subject	OpenIDM 3.1	OpenIDM 4	Explanation
<code>updateobjectproperties</code> table	Not available	New for OpenIDM 4	Supports update features

### 4.3.1.2. MySQL DDL Scripts

The following table enumerates the differences between the MySQL instance of `openidm.sql` for OpenIDM 3.1 and OpenIDM 4.

#### *Changes in `openidm.sql` for MYSQL*

Subject	OpenIDM 3.1	OpenIDM 4	Explanation
<code>propkey</code> , <code>propvalue</code> , in the following tables: <code>genericobjectproperties</code> , <code>managedobjectproperties</code> , <code>configobjectproperties</code> , <code>relationshipproperties</code> , <code>schedulerobjectproperties</code> , <code>clusterobjectproperties</code> , <code>updateobjectproperties</code>	<code>propkey</code> , <code>propvalue</code> combined in an index	<code>propkey</code> , <code>propvalue</code> in separate indexes	Enables independent use by the query engine for searchable properties, where <code>propkey</code> is the name, and <code>propvalue</code> is the value
Relationship metadata	Not available	<code>relationship</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
Relationship metadata	Not available	<code>relationshipproperties</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
<code>links</code> table	UNIQUE INDEX with <code>linktype</code>	Added <code>linkqualifier</code>	Supports correlation queries per link
<code>auditauthentication</code> table	Not available	New for OpenIDM 4	Logs authentication attempts
<code>auditrecon</code> table	Reconciliation table	Reconciliation table, extensively revised	Supports common transaction ID with other audit data
<code>auditsync</code> table	Synchronization table	Synchronization table, extensively revised	Supports common transaction ID with other audit data
<code>auditconfig</code> table	Not available	New for OpenIDM 4	Logs configuration changes
<code>auditactivity</code> table	Audit Activity table	Audit Activity table, extensively revised	Logs OpenIDM activity
<code>auditaccess</code> table	Audit Access table	Audit Access table, extensively revised	Supports common transaction ID with other audit data
<code>internalrole</code> table	Not available	New for OpenIDM 4	Table for internal roles, as described in "Roles and Authentication" in the <i>Integrator's Guide</i> .

Subject	OpenIDM 3.1	OpenIDM 4	Explanation
<code>updateobjects</code> table	Not available	New for OpenIDM 4	Supports update features
<code>updateobjectproperties</code> table	Not available	New for OpenIDM 4	Supports update features
Data for <code>internaluser</code> table	Includes <code>openidm-admin</code> , <code>openidm-authorized</code> users	Updated with references for internal roles	Includes references for internal roles

### 4.3.1.3. Oracle DDL Scripts

The following table enumerates the differences between the Oracle instance of `openidm.sql` for OpenIDM 3.1 and OpenIDM 4.

#### *Changes in `openidm.sql` for Oracle DB*

Subject	OpenIDM 3.1	OpenIDM 4	Explanation
Relationship metadata	Not available	<code>relationship</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
Relationship metadata	Not available	<code>relationshipproperties</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
<code>updateobjects</code> table	Not available	New for OpenIDM 4	Supports update features
<code>updateobjectproperties</code> table	Not available	New for OpenIDM 4	Supports update features
<code>auditaccess</code> table	Audit Access table	Audit Access table, extensively revised	Supports common transaction ID with other audit data
<code>auditauthentication</code> table	Not available	New for OpenIDM 4	Logs authentication attempts
<code>auditconfig</code> table	Not available	New for OpenIDM 4	Logs configuration changes
<code>auditactivity</code> table	Audit Activity table	Audit Activity table, extensively revised	Logs OpenIDM activity
<code>auditrecon</code> table	Reconciliation table	Reconciliation table, extensively revised	Supports common transaction ID with other audit data
<code>auditsync</code> table	Synchronization table	Synchronization table, extensively revised	Supports common transaction ID with other audit data
<code>propkey</code> , <code>propvalue</code> , in the following tables: <code>genericobjectproperties</code> , <code>managedobjectproperties</code> , <code>configobjectproperties</code> , <code>relationshipproperties</code> , <code>schedulerobjectproperties</code> , <code>clusterobjectproperties</code> , <code>updateobjectproperties</code>	<code>propkey</code> , <code>propvalue</code> combined in an index	<code>propkey</code> , <code>propvalue</code> in separate indexes	Enables independent use by the query engine, for generic, managed, and config object properties

Subject	OpenIDM 3.1	OpenIDM 4	Explanation
<code>internalrole</code> table	Not available	New for OpenIDM 4	Table for internal roles, as described in "Roles and Authentication" in the <i>Integrator's Guide</i> .
<code>links</code> table	Includes <code>linktype</code>	Added <code>linkqualifier</code>	Supports correlation queries per link

#### 4.3.1.4. PostgreSQL DDL Scripts

The following table enumerates the differences between the PostgreSQL instance of `openidm.pgsql` for OpenIDM 3.1 and OpenIDM 4.

##### *Changes in `openidm.sql` for PostgreSQL*

Subject	OpenIDM 3.1	OpenIDM 4	Explanation
Clear existing schema	Commented out: <code>--DROP SCHEMA IF EXISTS openidm CASCADE;</code>	Active: <code>DROP SCHEMA IF EXISTS openidm CASCADE;</code>	Remove schema from database, then create it
Relationship metadata	Not available	<code>relationship</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
Relationship metadata	Not available	<code>relationshipproperties</code> table, new for OpenIDM 4	Metadata supports relationship features such as temporal constraints
<code>links</code> table	UNIQUE INDEX with <code>linktype</code>	Added <code>linkqualifier</code>	Supports correlation queries per link
<code>auditauthentication</code> table	Not available	New for OpenIDM 4	Logs authentication attempts
<code>auditaccess</code> table	Audit Access table	Audit Access table, extensively revised	Supports common transaction ID with other audit data
<code>auditconfig</code> table	Not available	New for OpenIDM 4	Logs configuration changes
<code>auditactivity</code> table	Audit Activity table	Audit Activity table, extensively revised	Logs OpenIDM activity
<code>auditrecon</code> table	Reconciliation table	Reconciliation table, extensively revised	Supports common transaction ID with other audit data
<code>auditsync</code> table	Synchronization table	Synchronization table, extensively revised	Supports common transaction ID with other audit data
<code>internalrole</code> table	Not available	New for OpenIDM 4	Table for internal roles, as described in "Roles and Authentication" in the <i>Integrator's Guide</i> .



Subject	OpenIDM 3.1	OpenIDM 4	Explanation
<code>updateobjects</code> table	Not available	New for OpenIDM 4	Supports update features
<code>updateobjectproperties</code> table	Not available	New for OpenIDM 4	Supports update features

### 4.3.2. Comparing Repositories

The following tables include a generic comparison between the `repo.jdbc.json` files, between OpenIDM 3.1 and OpenIDM 4. The tables cover the databases that have changed between those two releases: MSSQL, MySQL, Oracle SQL, and PostgreSQL. When the changes do not affect all repositories, the difference is shown in the notes.

The following tables detail those differences, specifically:

- "Changes in Query IDs, Generic Tables" details changes in query IDs.
- "Changes in Query IDs, Explicit Tables" details changes in explicit tables.
- "New Tables" describes new tables, including those related to auditing. These tables can help you verify differences shown by schema comparison tools.
- "Data Schema Changes" includes information on two revised schema fields.

#### *Changes in Query IDs, Generic Tables*

Query ID	Status	Explanation
<code>get-users-of-direct-role</code>	Removed for OpenIDM 4	Info available via <code>queryFilter</code>
<code>get-managed-users</code>	Removed for OpenIDM 4	Used in OpenIDM 3.1 only for the UI
<code>get-managed-users-filtered</code>	Removed for OpenIDM 4	Used in OpenIDM 3.1 only for the UI
<code>get-managed-users-count</code>	Removed for OpenIDM 4	Used in OpenIDM 3.1 only for the UI
<code>get-managed-users-filtered-count</code>	Removed for OpenIDM 4	Used in OpenIDM 3.1 only for the UI
<code>query-all</code>	Updated for OpenIDM 4 (MySQL only)	Added pagination
<code>query-all-ids</code>	Updated for OpenIDM 4 (MSSQL only)	Added pagination
<code>find-relationships-for-resource</code>	Added for OpenIDM 4	Added relationships search on two repositories

#### *Changes in Query IDs, Explicit Tables*

Query ID	Status	Explanation
<code>audit-by-mapping</code>	Removed for OpenIDM 4 (MySQL and Oracle)	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>

Query ID	Status	Explanation
<code>audit-by-recon-id</code>	Removed for OpenIDM 4 (MySQL and Oracle)	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>
<code>audit-by-recon-id-type</code>	Removed for OpenIDM 4 (MySQL and Oracle)	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>
<code>audit-by-recon-id-situation</code>	Removed for OpenIDM 4 (MySQL and Oracle)	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>
<code>audit-by-activity-parent-action</code>	Removed for OpenIDM 4 (MySQL and Oracle)	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>
<code>audit-last-recon-for-mapping</code>	Removed for OpenIDM 4	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>
<code>audit-by-recon-id-situations-latest</code>	Removed for OpenIDM 4	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>
<code>audit-by-recon-id-situations-latest-filtered</code>	Removed for OpenIDM 4	Functionality available in <code>queryFilter</code> , as described in "Constructing Queries" in the <i>Integrator's Guide</i>

### New Tables

Table	Status	Explanation
<code>updateobjects</code>	New for OpenIDM 4	A <code>genericMapping</code> table for updates
<code>relationships</code>	New for OpenIDM 4	A <code>genericMapping</code> table for relationships
<code>auditauthentication</code>	New for OpenIDM 4	Table for authentication attempts; for an overview, see "OpenIDM Audit Event Topics" in the <i>Integrator's Guide</i> .
<code>auditconfig</code>	New for OpenIDM 4	Table for configuration changes; for an overview, see "OpenIDM Audit Event Topics" in the <i>Integrator's Guide</i> .
<code>auditactivity</code>	Extensively revised for OpenIDM 4	Table for operations on internal and external objects; for an overview, see "OpenIDM Audit Event Topics" in the <i>Integrator's Guide</i> .
<code>auditrecon</code>	Extensively revised for OpenIDM 4	Table for reconciliations; for an overview, see "OpenIDM Audit Event Topics" in the <i>Integrator's Guide</i> .
<code>auditsync</code>	Extensively revised for OpenIDM 4	Table for synchronizations; for an overview, see "OpenIDM Audit Event Topics" in the <i>Integrator's Guide</i> .

Table	Status	Explanation
<code>auditaccess</code>	Extensively revised for OpenIDM 4	Table for access requests; for an overview, see "OpenIDM Audit Event Topics" in the <i>Integrator's Guide</i> .

### Data Schema Changes

Schema	Status	Explanation
<code>linkQualifier</code> in the <code>links</code> table	Added for OpenIDM 4	New column; if migrating from OpenIDM 3.1, include <code>default</code> as a value for that entry.
<code>roles</code> in the <code>internaluser</code> table	Changed for OpenIDM 4	Revised column; now supports an array

If you're using OrientDB, which is *not* supported in production, the names for the audit tables are listed in "Repository Audit Event Handler" in the *Integrator's Guide*.

## 4.4. Deprecated Functionality

The following functionality has been deprecated in OpenIDM 4 and is likely to be removed in a future release.

- When configuring connectors, (see "Configuring Connectors" in the *Integrator's Guide*), you can set up `nativeType` property level extensions. The `JAVA_TYPE_DATE` extension is deprecated.
- Support for a POST request with `?_action=patch` is deprecated. Clients that do not support the regular PATCH verb should use the `X-HTTP-Method-Override` header instead.

For example, the following POST request uses the `X-HTTP-Method-Override` header to patch user `jdoe`'s entry:

```
$ curl \
--cacert self-signed.crt \
--header "X-OpenIDM-Username: openidm-admin" \
--header "X-OpenIDM-Password: openidm-admin" \
--header "Content-Type: application/json" \
--request POST \
--header "X-HTTP-Method-Override: PATCH" \
--data '[
  {
    "operation":"replace",
    "field":"/description",
    "value":"The new description for Jdoe"
  }
]' \
"https://localhost:8443/openidm/managed/user/jdoe"
```

No additional functionality is deprecated at this time.

## 4.5. Removed Functionality

### UI Themes from OpenIDM 3.1

As OpenIDM 4 now supports only the Bootstrap front-end framework, the "look and feel" of the UI will change. If you had customized the UI for previous versions of OpenIDM, we are confident that it will take less effort to customize the UI for OpenIDM 4 within the Bootstrap framework.

### User Self-Service Features from OpenIDM 3.1

OpenIDM 4 replaces the user self-service features from OpenIDM 3.1, as described in "Working With the Self-Service UI" in the *Integrator's Guide*.

## 4.6. Functionality That Will Change in the Future

The *Active Directory (AD) .NET Connector* will be deprecated in a future OpenICF release, and, ultimately, support for its use with OpenIDM will be discontinued. For more information, see "Active Directory Connector" in the *Integrator's Guide*.

For simple Active Directory (and Active Directory LDS) deployments, examine "Generic LDAP Connector" in the *Integrator's Guide*. In most circumstances, it works better than the Active Directory connector.

For more complex Active Directory deployments, examine the option described in "PowerShell Connector Toolkit" in the *Integrator's Guide*.

## 4.7. Added and Deleted Samples

For OpenIDM 4.0, we have organized our sample configuration documentation into a single document: *Samples Guide*.

As the capabilities of OpenIDM evolve, we have added and removed samples relative to the previous release.

The new samples include:

### Full Stack Sample

You can integrate OpenIDM with two other components of the ForgeRock identity platform: OpenAM and OpenDJ. With the OpenAM Session authentication module, you can route authentication and authorization requests to OpenAM, protect managed users in OpenIDM, based on a data store of users in OpenDJ. For more information, see "*Full Stack Sample - Using OpenIDM in the ForgeRock Identity Platform*" in the *Samples Guide*.

This replaces the OpenAM sample included with OpenIDM 3.1.

## Multiaccount Relationships

OpenIDM 4 supports links from a single account in one resource to multiple accounts in a second resource, based on roles. For example, you can link one user account to two roles such as an insurance agent and a customer. For more information, see "*Managing Users, Groups, Roles and Relationships*" in the *Integrator's Guide*.

To see how this works, follow the instructions in: "*The Multi-Account Linking Sample*" in the *Samples Guide*.

## Linking Historical Accounts

OpenIDM 4 supports links from a single account to inactive (historical) LDAP accounts, based on relationships to past and current LDAP accounts. For more information about relationship objects, see "*Managing Relationships Between Objects*" in the *Integrator's Guide*.

To see how this works, follow the instructions in the following sample: "*Linking Historical Accounts*" in the *Samples Guide*.

## Multiple Passwords

OpenIDM 4 supports the configuration of separate passwords per external resource. This means that you can configure different rules for password complexity and history, depending on the resource to which you are connecting. For more information, see "*Storing Multiple Passwords For Managed Users*" in the *Samples Guide*.

## Trusted Filter Servlet Sample

You can integrate OpenIDM with other authentication services, with the help of the trusted request attribute authentication module. For an excerpt of the configuration, see "*Supported Session Module*" in the *Integrator's Guide*.

For an example of how this works, see "*The Trusted Servlet Filter Sample*" in the *Samples Guide*.

The deleted samples include:

## OpenAM

The functionality of the OpenAM sample for OpenIDM 3.1 has been replaced by "*Full Stack Sample - Using OpenIDM in the ForgeRock Identity Platform*" in the *Samples Guide*.

## Sample 7

OpenIDM documentation no longer includes Sample 7, which demonstrated how you can use OpenIDM to expose user data with schema associated with the [System for Cross-Domain Identity Management: Core Schema 1.1](#) (SCIM). That standard is being superseded by SCIM 2.0.

## Scripted Azure

OpenIDM no longer includes a dedicated provisioner for Microsoft Azure AD. For OpenIDM 4, we suggest that you start with the "*PowerShell Connector Toolkit*" in the *Integrator's Guide*.

## Usecase 5

OpenIDM no longer includes a certification workflow for users. The certification workflow usecase sample has been removed pending improvements to our workflow implementation.

## Chapter 5

# Documentation Updates

The following table tracks changes to the documentation set following the release of OpenIDM `${serverDocTargetVersion}`:

### *Documentation Change Log*

Date	Description
2021-03-11	<code>integer</code> is a supported managed object type.
2019-09-10	Revised the logging documentation to include security advice on logging levels. See "Specifying the Logging Level" in the <i>Integrator's Guide</i> and Step 5 in the <i>Installation Guide</i> .
2019-08-19	Added information on restricting the maximum payload size in HTTP requests ("Restrict the HTTP Payload Size" in the <i>Integrator's Guide</i> ).
2017-10-10	Refreshed formatting.
2016-09-01	Added OPENIDM-6481 and OPENDIM-6509 to "Known Issues".
2016-03-14	<ul style="list-style-type: none"><li>The list of "Limitations" in the OpenIDM Release Notes was not complete. This section has been updated.</li><li>The procedure to change the password of the default OpenIDM administrative user had errors, and has been updated ("Change the Default Administrator Password" in the <i>Integrator's Guide</i>).</li></ul>

## Chapter 6

# How to Report Problems & Provide Feedback

If you have questions regarding OpenIDM software that are not answered by the documentation, you can ask questions on the forum at <https://forgerock.org/forum/fr-projects/openidm/>.

If you have found issues or reproducible bugs within OpenIDM 4, report them in <https://bugster.forgerock.org>.

When requesting help with a problem, please include the following information:

- Description of the problem, including when the problem occurs and its impact on your operation
- Machine type, operating system version, Java version, and OpenIDM release version, including any patches or other software that might be affecting the problem
- Steps to reproduce the problem
- Any relevant access and error logs, stack traces, or core dumps



## Chapter 7

# Support

You can purchase OpenIDM support subscriptions and training courses from ForgeRock and from consulting partners around the world and in your area. To contact ForgeRock, send mail to [info@forgerock.com](mailto:info@forgerock.com). To find a partner in your area, use the ForgeRock website.