

IDOL ODBC Connector

Software Version 12.10

Administration Guide



Document Release Date: October 2021
Software Release Date: October 2021

Legal notices

Copyright notice

© Copyright 2021 Micro Focus or one of its affiliates.

The only warranties for products and services of Micro Focus and its affiliates and licensors (“Micro Focus”) are as may be set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Micro Focus shall not be liable for technical or editorial errors or omissions contained herein. The information contained herein is subject to change without notice.

Documentation updates

The title page of this document contains the following identifying information:

- Software Version number, which indicates the software version.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

To check for updated documentation, visit <https://www.microfocus.com/support-and-services/documentation/>.

Support

Visit the [MySupport portal](#) to access contact information and details about the products, services, and support that Micro Focus offers.

This portal also provides customer self-solve capabilities. It gives you a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the MySupport portal to:

- Search for knowledge documents of interest
- Access product documentation
- View software vulnerability alerts
- Enter into discussions with other software customers
- Download software patches
- Manage software licenses, downloads, and support contracts
- Submit and track service requests
- Contact customer support
- View information about all services that Support offers

Many areas of the portal require you to sign in. If you need an account, you can create one when prompted to sign in. To learn about the different access levels the portal uses, see the [Access Levels descriptions](#).

About this PDF version of online Help

This document is a PDF version of the online Help.

This PDF file is provided so you can easily print multiple topics or read the online Help.

Because this content was originally created to be viewed as online help in a web browser, some topics may not be formatted properly. Some interactive topics may not be present in this PDF version. Those topics can be successfully printed from within the online Help.

Contents

Chapter 1: Introduction	7
ODBC Connector	7
Features and Capabilities	7
Supported Actions	8
Display Online Help	9
Connector Framework Server	9
The IDOL Platform	11
System Architecture	12
Related Documentation	13
Chapter 2: Install ODBC Connector	15
System Requirements	15
Permissions	16
Install ODBC Connector on Windows	16
Install ODBC Connector on Linux	18
Chapter 3: Configure ODBC Connector	19
ODBC Connector Configuration File	19
Modify Configuration Parameter Values	21
Include an External Configuration File	22
Include the Whole External Configuration File	23
Include Sections of an External Configuration File	23
Include Parameters from an External Configuration File	24
Merge a Section from an External Configuration File	24
Encrypt Passwords	25
Create a Key File	25
Encrypt a Password	26
Decrypt a Password	27
Configure Client Authorization	28
Register with a Distributed Connector	29
Set Up Secure Communication	30
Configure Outgoing SSL Connections	30
Configure Incoming SSL Connections	31
Backup and Restore the Connector's State	32
Backup a Connector's State	33

Restore a Connector's State	33
Validate the Configuration File	33
Chapter 4: Start and Stop the Connector	35
Start the Connector	35
Verify that ODBC Connector is Running	36
GetStatus	36
GetLicenseInfo	36
Stop the Connector	36
Chapter 5: Send Actions to ODBC Connector	38
Send Actions to ODBC Connector	38
Asynchronous Actions	38
Check the Status of an Asynchronous Action	39
Cancel an Asynchronous Action that is Queued	39
Stop an Asynchronous Action that is Running	39
Store Action Queues in an External Database	40
Prerequisites	40
Configure ODBC Connector	41
Store Action Queues in Memory	42
Use XSL Templates to Transform Action Responses	44
Example XSL Templates	45
Chapter 6: Use the Connector	46
Operating Modes	46
Non-Incremental Mode	46
Incremental Mode	46
Event Table Mode	47
Retrieve Information (Non-Incremental Mode)	47
Retrieve Information (Incremental Mode)	48
Retrieve Information from Event Tables	50
Schedule Fetch Tasks	52
Chapter 7: Construct Template Files	54
Template Files	54
Sub-Table Template Files	55
Chapter 8: Extract Data from a Database	57

Extract Data from a Single Table	57
Extract Data from Multiple Tables	59
Configure the Connector	59
Modify the Main Template File	60
Create the Sub Table Template File	61
Start the Connector	61
Extract Data from Multiple Tables using a JOIN	62
Configure the Connector	62
Modify the Main Template File	63
Create the Sub Table Template File	64
Start the Connector	64
Troubleshoot the Connector	65
Chapter 9: Manipulate Documents	68
Introduction	68
Add a Field to Documents using an Ingest Action	68
Customize Document Processing	69
Standardize Field Names	70
Configure Field Standardization	70
Customize Field Standardization	71
Run Lua Scripts	75
Write a Lua Script	76
Run a Lua Script using an Ingest Action	77
Example Lua Scripts	78
Add a Field to a Document	78
Merge Document Fields	78
Chapter 10: Ingestion	80
Introduction	80
Send Data to Connector Framework Server	81
Send Data to Another Repository	82
Index Documents Directly into IDOL Server	83
Index Documents into Vertica	84
Prepare the Vertica Database	85
Send Data to Vertica	86
Send Data to a MetaStore	87
Run a Lua Script after Ingestion	88
Chapter 11: Monitor the Connector	90

- IDOL Admin 90
 - Prerequisites 90
 - Install IDOL Admin 90
 - Access IDOL Admin 91
- View Connector Statistics 92
- Use the Connector Logs 93
 - Customize Logging 94
- Monitor the Progress of a Task 95
- Monitor Asynchronous Actions using Event Handlers 97
 - Configure an Event Handler 98
 - Write a Lua Script to Handle Events 99
- Set Up Performance Monitoring 99
 - Configure the Connector to Pause 99
 - Determine if an Action is Paused 100
- Set Up Document Tracking 101

- Glossary 103

- Send documentation feedback 106

Chapter 1: Introduction

This section provides an overview of the Micro Focus ODBC Connector.

- [ODBC Connector](#) 7
- [Connector Framework Server](#) 9
- [The IDOL Platform](#)11
- [System Architecture](#)12
- [Related Documentation](#) 13

ODBC Connector

ODBC Connector is an IDOL connector that automatically aggregates documents from an ODBC data source. The files are then sent to Connector Framework Server (CFS), which processes the information and indexes it into an IDOL Server.

After the documents are indexed, IDOL server automatically processes them, performing a number of intelligent operations in real time, such as:

- Agents
- Alerting
- Automatic Query Guidance
- Categorization
- Channels
- Clustering
- Collaboration
- Dynamic Clustering
- Dynamic Thesaurus
- Education
- Expertise
- Hyperlinking
- Mailing
- Profiling
- Retrieval
- Spelling Correction
- Summarization
- Taxonomy Generation

Features and Capabilities

The ODBC Connector (CFS) retrieves data from an ODBC data source, for example Microsoft SQL Server or MySQL.

Repository	Any ODBC data source, as long as the relevant drivers are available on the connector machine.
Data the connector can	The connector can retrieve string, numeric, date, and binary values from

- retrieve** the database.
 The connector can create documents by retrieving data from single tables or views, or by extracting data from multiple, related tables.
 The connector can extract binary files from binary large object (LOB) fields.
- Data the connector cannot retrieve**
 The connector cannot retrieve XML data types, but these can be transformed into strings by modifying the query used to retrieve the data.
 The connector cannot retrieve bit-fields from a MySQL database, but you can modify your query to convert the field value to an integer. For example: `SELECT bit_field+0 FROM mytable.`

Supported Actions

The ODBC Connector supports the following actions:

Action	Supported
Synchronize	✓
Synchronize (identifiers)	✗
Synchronize Groups	✗
Collect	✓
Identifiers	✗
Insert	✗
Delete/Remove	✗
Hold/ReleaseHold	✗
Update	✗
Stub	✗
GetURI	✗
View	✓

Display Online Help

You can display the ODBC Connector Reference by sending an action from your web browser. The ODBC Connector Reference describes the actions and configuration parameters that you can use with ODBC Connector.

For ODBC Connector to display help, the help data file (`help.dat`) must be available in the installation folder.

To display help for ODBC Connector

1. Start ODBC Connector.
2. Send the following action from your web browser:

```
http://host:port/action=Help
```

where:

host is the IP address or name of the machine on which ODBC Connector is installed.

port is the ACI port by which you send actions to ODBC Connector (set by the `Port` parameter in the [Server] section of the configuration file).

For example:

```
http://12.3.4.56:9000/action=help
```

Connector Framework Server

Connector Framework Server (CFS) processes the information that is retrieved by connectors, and then indexes the information into IDOL.

A single CFS can process information from any number of connectors. For example, a CFS might process files retrieved by a File System Connector, web pages retrieved by a Web Connector, and e-mail messages retrieved by an Exchange Connector.

To use the ODBC Connector to index documents into IDOL Server, you must have a CFS. When you install the ODBC Connector, you can choose to install a CFS or point the connector to an existing CFS.

For information about how to configure and use Connector Framework Server, refer to the *Connector Framework Server Administration Guide*.

Filter Documents and Extract Subfiles

The documents that are sent by connectors to CFS contain only metadata extracted from the repository, such as the location of a file or record that the connector has retrieved. CFS uses KeyView to extract the file content and file specific metadata from over 1000 different file types, and adds this

information to the documents. This allows IDOL to extract meaning from the information contained in the repository, without needing to process the information in its native format.

CFS also uses KeyView to extract and process sub-files. Sub-files are files that are contained within other files. For example, an e-mail message might contain attachments that you want to index, or a Microsoft Word document might contain embedded objects.

Manipulate and Enrich Documents

CFS provides features to manipulate and enrich documents before they are indexed into IDOL. For example, you can:

- add additional fields to a document.
- divide long documents into multiple sections.
- run tasks including Education, Optical Character Recognition, or Face Recognition, and add the information that is obtained to the document.
- run a custom Lua script to modify a document.

Index Documents

After CFS finishes processing documents, it automatically indexes them into one or more indexes. CFS can index documents into:

- **IDOL Server** (or send them to a *Distributed Index Handler*, so that they can be distributed across multiple IDOL servers).
- **Vertica**.

Import Process

This section describes the import process for new files that are added to IDOL through CFS.



1. Connectors aggregate documents from repositories and send the files to CFS. A single CFS can process documents from multiple connectors. For example, CFS might receive HTML files from HTTP Connectors, e-mail messages from Exchange Connector, and database records from ODBC Connector.
2. CFS runs pre-import tasks. Pre-Import tasks occur before document content and file-specific metadata is extracted by KeyView.
3. KeyView filters the document content, and extracts sub-files.
4. CFS runs post-import tasks. Post-Import tasks occur after KeyView has extracted document content and file-specific metadata.
5. The data is indexed into IDOL.

The IDOL Platform

At the core of ODBC Connector is the *Intelligent Data Operating Layer (IDOL)*.

IDOL gathers and processes unstructured, semi-structured, and structured information in any format from multiple repositories using IDOL connectors and a global relational index. It can automatically form a contextual understanding of the information in real time, linking disparate data sources together based on the concepts contained within them. For example, IDOL can automatically link concepts contained in an email message to a recorded phone conversation, that can be associated with a stock trade. This information is then imported into a format that is easily searchable, adding advanced retrieval, collaboration, and personalization to an application that integrates the technology.

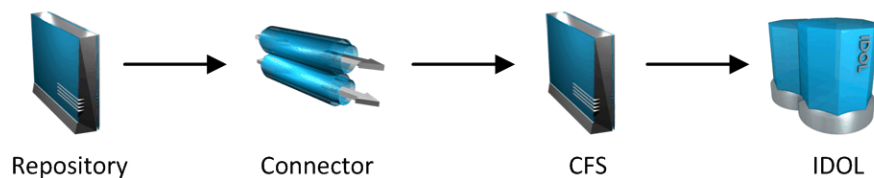
For more information on IDOL, see the *IDOL Getting Started Guide*.

System Architecture

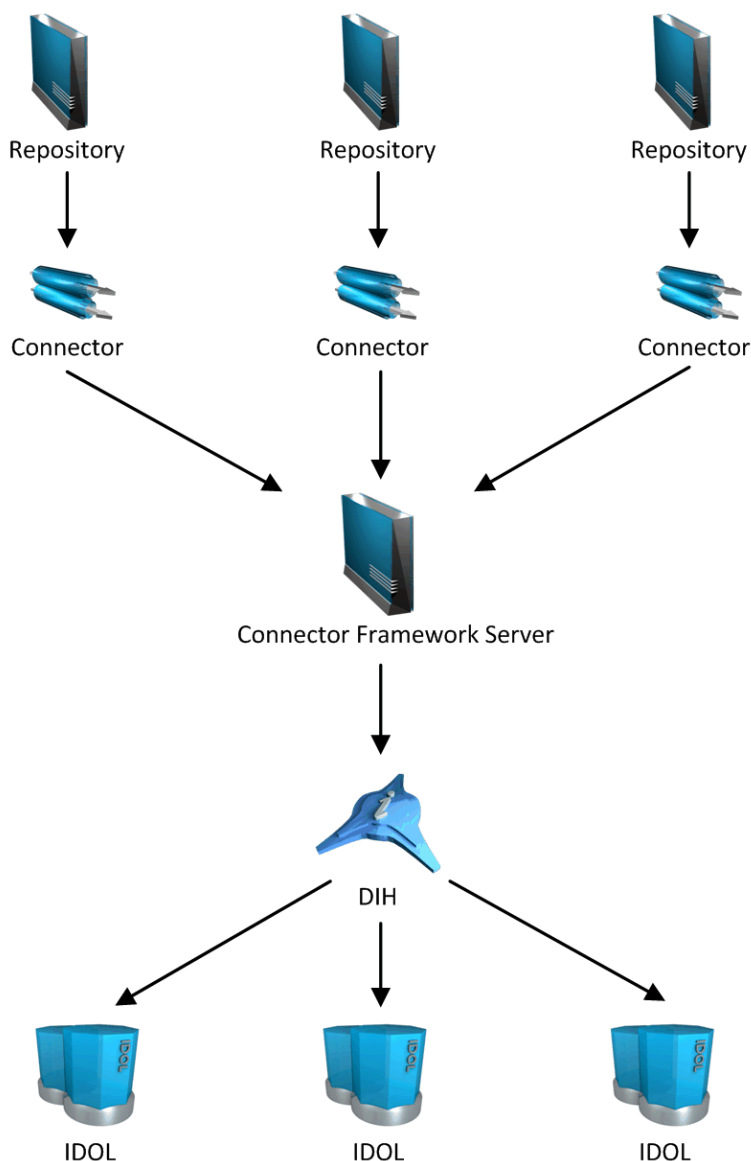
An IDOL infrastructure can include the following components:

- **Connectors.** Connectors aggregate data from repositories and send the data to CFS.
- **Connector Framework Server (CFS).** Connector Framework Server (CFS) processes and enriches the information that is retrieved by connectors.
- **IDOL Server.** IDOL stores and processes the information that is indexed into it by CFS.
- **Distributed Index Handler (DIH).** The Distributed Index Handler distributes data across multiple IDOL servers. Using multiple IDOL servers can increase the availability and scalability of the system.
- **License Server.** The License server licenses multiple products.

These components can be installed in many different configurations. The simplest installation consists of a single connector, a single CFS, and a single IDOL Server.



A more complex configuration might include more than one connector, or use a Distributed Index Handler (DIH) to index content across multiple IDOL Servers.



Related Documentation

The following documents provide further information related to ODBC Connector.

- [IDOL NiFi Ingest Help](#)

The *IDOL NiFi Ingest Help* describes how to ingest data using IDOL NiFi Ingest, a set of IDOL components for data retrieval and enrichment, that run within an open-source framework called Apache NiFi. NiFi Ingest provides a new way to ingest data into IDOL, and can be used instead of a Connector Framework Server.

- *Connector Framework Server Administration Guide*

Connector Framework Server (CFS) processes documents that are retrieved by connectors. CFS then indexes the documents into an IDOL index. The *Connector Framework Server Administration Guide* describes how to configure and use CFS.

- *IDOL Getting Started Guide*

The *IDOL Getting Started Guide* provides an introduction to IDOL. It describes the system architecture, how to install IDOL components, and introduces indexing and security.

- *IDOL Server Administration Guide*

The *IDOL Server Administration Guide* describes the operations that IDOL server can perform with detailed descriptions of how to set them up.

- *IDOL Document Security Administration Guide*

The *IDOL Document Security Administration Guide* describes how to protect the information that you index into IDOL Server.

- *License Server Administration Guide*

This guide describes how to use a License Server to license multiple services.

Chapter 2: Install ODBC Connector

This section describes how to install the ODBC Connector.

- [System Requirements](#) 15
- [Permissions](#) 16
- [Install ODBC Connector on Windows](#) 16
- [Install ODBC Connector on Linux](#) 18

System Requirements

ODBC Connector can be installed as part of a larger system that includes an IDOL Server and an interface for the information stored in IDOL Server. To maximize performance, Micro Focus recommends that you install IDOL Server and the connector on different machines.

The connector can be installed on any computer provided it can communicate with the database through ODBC.

For information about the minimum system requirements required to run IDOL components, including ODBC Connector, refer to the *IDOL Getting Started Guide*.

Prerequisites

To retrieve information through ODBC you must install an ODBC driver for the database that you want to retrieve data from. If you are installing the connector on Linux you must install the unixODBC driver manager, and configure the name and path of your ODBC driver in the unixODBC `odbcinst.ini` configuration file. This file is usually located at `/etc/odbcinst.ini`.

To connect to the database using a Data Source Name (DSN) rather than a full connection string, you must configure a DSN. On Windows, you can do this through the 64-bit ODBC Data Sources administration utility (**Windows Control Panel > Administrative Tools > ODBC Data Sources 64-bit**). On Linux, define a DSN in the unixODBC `odbc.ini` configuration file. This file is usually located at `/etc/odbc.ini`.

TIP: On Linux, you can use the environment variable `ODBCSYSINI` to set the path of the directory that contains both `odbcinst.ini` and `odbc.ini`.

TIP: The ODBC driver, unixODBC (if applicable), and the DSN should be installed or configured on the machine that hosts the connector, not on the database server.

The following example shows ODBC drivers configured in `odbcinst.ini`.

```
[PostgreSQL]
Driver=/usr/pgsql-11/lib/psqlodbcw.so
```

```
[MySQL ODBC 8.0 Unicode Driver]
Driver=/usr/lib64/libmyodbc8w.so
```

The following example shows a DSN configured in `odbc.ini`. The name of the DSN is `MyDSN`. Notice that the driver name matches one of the entries in `odbcinst.ini`.

```
[MyDSN]
Driver=PostgreSQL
ServerName=server.example.com
Port=5432
UserName=connector
Password=password
Database=db123
```

Setting the user name and password in the DSN is optional, because you can specify these in the connection string (in the connector configuration file) instead.

Permissions

This section describes the permissions that must be granted to the connector.

Action	Permissions Required
Synchronize	Micro Focus recommends that you set up a database user for the connector. The user must have SELECT permission on the database.
Collect	The same permissions as the synchronize action. The connector must also have write-access to the collect destination folder.
View	The same permissions as the synchronize action. Unless the connector communicates directly with the View server, the connector also requires access to the shared path for the IDOL View Server.

Install ODBC Connector on Windows

To install the ODBC Connector on Windows, use the following procedure.

To install the ODBC Connector

1. Run the ODBC Connector installation program.
The installation wizard opens.
2. Read the installation instructions and click **Next**.

The License Agreement dialog box opens.

3. Read the license agreement. If you agree to its terms, click **I accept the agreement** and click **Next**.

The Installation Directory dialog box opens.

4. Choose an installation folder for ODBC Connector and click **Next**.

The Service Name dialog box opens.

5. In the **Service name** box, type a name to use for the connector's Windows service and click **Next**.

The Service Port and ACI Port dialog box opens.

6. Type the following information, and click **Next**.

Service port The port used by the connector to listen for service actions.

ACI port The port used by the connector to listen for actions.

The License Server Configuration dialog box opens.

7. Type the following information, and click **Next**.

License server host The host name or IP address of your License server.

License server port The ACI port of your License server.

The IDOL database dialog box opens.

8. In the **IDOL Database** box, type the name of the IDOL database that you to index data into, and click **Next**.

The Connector Framework Server dialog box opens.

9. Choose whether to install a new CFS or use an existing CFS.

- To install a new CFS, select the **Install a new CFS** check box and click **Next**.

The Installation directory dialog box opens. Go to the next step.

- To use an existing CFS, clear the **Install a new CFS** check box and click **Next**.

Type the **Hostname** and **Port** of your existing CFS installation. Then, click **Next** and go to step 14.

10. Choose an installation folder for the Connector Framework Server and then click **Next**.

The Installation name dialog box opens.

11. In the **Service name** box, type a unique name for the Connector Framework service and click **Next**. The name must not contain any spaces.

The CFS dialog box opens.

12. Type the following information, and click **Next**.

Service port The port used by CFS to listen for service actions.

ACI port The port used by CFS to listen for actions.

13. Type the following information and click **Next**.

IDOL Server hostname The host name or IP address of the IDOL server that you want to index documents into.

ACI port The ACI port of the IDOL server.

The Pre-Installation Summary dialog box opens.

14. Review the installation settings. If necessary, click **Back** to go back and change any settings. If you are satisfied with the settings, click **Next**.

The connector is installed.

15. Click **Finish**.

You can now edit the connector's configuration file and start the connector.

Install ODBC Connector on Linux

To install the ODBC Connector, use the following procedure.

To install ODBC Connector on Linux

1. Open a terminal in the directory in which you have placed the installer, and run the following command:

```
./ConnectorName_VersionNumber_Platform.exe --mode text
```

2. Follow the on-screen instructions. For information about the options that are specified during installation, see [Install ODBC Connector on Windows](#). For more information about installing IDOL components, refer to the *IDOL Getting Started Guide*.

Chapter 3: Configure ODBC Connector

This section describes how to configure the ODBC Connector.

- [ODBC Connector Configuration File](#) 19
- [Modify Configuration Parameter Values](#) 21
- [Include an External Configuration File](#) 22
- [Encrypt Passwords](#) 25
- [Configure Client Authorization](#) 28
- [Register with a Distributed Connector](#) 29
- [Set Up Secure Communication](#) 30
- [Backup and Restore the Connector's State](#) 32
- [Validate the Configuration File](#) 33

ODBC Connector Configuration File

You can configure the ODBC Connector by editing the configuration file. The configuration file is located in the connector's installation folder. You can modify the file with a text editor.

The parameters in the configuration file are divided into sections that represent connector functionality.

Some parameters can be set in more than one section of the configuration file. If a parameter is set in more than one section, the value of the parameter located in the most specific section overrides the value of the parameter defined in the other sections. For example, if a parameter can be set in "*TaskName* or *FetchTasks* or *Default*", the value in the *TaskName* section overrides the value in the *FetchTasks* section, which in turn overrides the value in the *Default* section. This means that you can set a default value for a parameter, and then override that value for specific tasks.

For information about the parameters that you can use to configure the ODBC Connector, refer to the *ODBC Connector Reference*.

Server Section

The [Server] section specifies the ACI port of the connector. It can also contain parameters that control the way the connector handles ACI requests.

Service Section

The [Service] section specifies the service port of the connector.

Actions Section

The [Actions] section contains configuration parameters that specify how the connector processes actions that are sent to the ACI port. For example, you can configure event handlers that run when an action starts, finishes, or encounters an error.

Logging Section

The [Logging] section contains configuration parameters that determine how messages are logged. You can use *log streams* to send different types of message to separate log files. The configuration file also contains a section to configure each of the log streams.

Connector Section

The [Connector] section contains parameters that control general connector behavior. For example, you can specify a schedule for the fetch tasks that you configure.

Default Section

The [Default] section is used to define default settings for configuration parameters. For example, you can specify default settings for the tasks in the [FetchTasks] section.

FetchTasks Section

The [FetchTasks] section lists the fetch tasks that you want to run. A *fetch task* is a task that retrieves data from a repository. Fetch tasks are usually run automatically by the connector, but you can also run a fetch task by sending an action to the connector's ACI port.

In this section, enter the total number of fetch tasks in the Number parameter and then list the tasks in consecutive order starting from 0 (zero). For example:

```
[FetchTasks]
Number=2
0=MyTask0
1=MyTask1
```

[TaskName] Section

The [TaskName] section contains configuration parameters that apply to a specific task. There must be a [TaskName] section for every task listed in the [FetchTasks] section.

Ingestion Section

The [Ingestion] section specifies where to send the data that is extracted by the connector.

You can send data to a Connector Framework Server, IDOL NiFi Ingest, or another connector. For more information about ingestion, see [Ingestion, on page 80](#).

DistributedConnector Section

The [DistributedConnector] section configures the connector to operate with the Distributed Connector. The Distributed Connector is an ACI server that distributes actions (synchronize, collect and so on) between multiple connectors.

For more information about the Distributed Connector, refer to the *Distributed Connector Administration Guide*.

ViewServer Section

The [ViewServer] section contains parameters that allow the connector's *view* action to use a View Server. If necessary, the View Server converts files to HTML so that they can be viewed in a web browser.

License Section

The [License] section contains details about the License server (the server on which your license file is located).

Document Tracking Section

The [DocumentTracking] section contains parameters that enable the tracking of documents through import and indexing processes.

Related Topics

- [Modify Configuration Parameter Values, below](#)
- [Customize Logging, on page 94](#)

Modify Configuration Parameter Values

You modify ODBC Connector configuration parameters by directly editing the parameters in the configuration file. When you set configuration parameter values, you must use UTF-8.

CAUTION: You must stop and restart ODBC Connector for new configuration settings to take effect.

This section describes how to enter parameter values in the configuration file.

Enter Boolean Values

The following settings for Boolean parameters are interchangeable:

TRUE = true = ON = on = Y = y = 1

FALSE = false = OFF = off = N = n = 0

Enter String Values

To enter a comma-separated list of strings when one of the strings contains a comma, you can indicate the start and the end of the string with quotation marks, for example:

```
ParameterName=cat,dog,bird,"wing,beak",turtle
```

Alternatively, you can escape the comma with a backslash:

```
ParameterName=cat,dog,bird,wing\,beak,turtle
```

If any string in a comma-separated list contains quotation marks, you must put this string into quotation marks and escape each quotation mark in the string by inserting a backslash before it. For example:

```
ParameterName="<font face=\"arial\" size=\"+1\"><b>\", \"<p>"
```

Here, quotation marks indicate the beginning and end of the string. All quotation marks that are contained in the string are escaped.

Include an External Configuration File

You can share configuration sections or parameters between ACI server configuration files. The following sections describe different ways to include content from an external configuration file.

You can include a configuration file in its entirety, specified configuration sections, or a single parameter.

When you include content from an external configuration file, the `GetConfig` and `ValidateConfig` actions operate on the combined configuration, after any external content is merged in.

In the procedures in the following sections, you can specify external configuration file locations by using absolute paths, relative paths, and network locations. For example:

```
../sharedconfig.cfg  
K:\sharedconfig\sharedsettings.cfg  
\\example.com\shared\idol.cfg  
file://example.com/shared/idol.cfg
```

Relative paths are relative to the primary configuration file.

NOTE: You can use nested inclusions, for example, you can refer to a shared configuration file that references a third file. However, the external configuration files must not refer back to your original configuration file. These circular references result in an error, and ODBC Connector does not start.

Similarly, you cannot use any of these methods to refer to a different section in your primary configuration file.

Include the Whole External Configuration File

This method allows you to import the whole external configuration file at a specified point in your configuration file.

To include the whole external configuration file

1. Open your configuration file in a text editor.
2. Find the place in the configuration file where you want to add the external configuration file.
3. On a new line, type a left angle bracket (<), followed by the path to and name of the external configuration file, in quotation marks (""). You can use relative paths and network locations. For example:

```
< "K:\sharedconfig\sharedsettings.cfg"
```

4. Save and close the configuration file.

Include Sections of an External Configuration File

This method allows you to import one or more configuration sections (including the section headings) from an external configuration file at a specified point in your configuration file. You can include a whole configuration section in this way, but the configuration section name in the external file must exactly match what you want to use in your file. If you want to use a configuration section from the external file with a different name, see [Merge a Section from an External Configuration File, on the next page](#).

To include sections of an external configuration file

1. Open your configuration file in a text editor.
2. Find the place in the configuration file where you want to add the external configuration file section.
3. On a new line, type a left angle bracket (<), followed by the path of the external configuration file, in quotation marks (""). You can use relative paths and network locations. After the configuration file path, add the configuration section name that you want to include. For example:

```
< "K:\sharedconfig\extrasettings.cfg" [License]
```

NOTE: You cannot include a section that already exists in your configuration file.

4. Save and close the configuration file.

Include Parameters from an External Configuration File

This method allows you to import one or more parameters from an external configuration file at a specified point in your configuration file. You can import a single parameter or use wildcards to specify multiple parameters. The parameter values in the external file must match what you want to use in your file. This method does not import the section heading, such as [License] in the following examples.

To include parameters from an external configuration file

1. Open your configuration file in a text editor.
2. Find the place in the configuration file where you want to add the parameters from the external configuration file.
3. On a new line, type a left angle bracket (<), followed by the path of the external configuration file, in quotation marks (""). You can use relative paths and network locations. After the configuration file path, add the name of the section that contains the parameter, followed by the parameter name. For example:

```
< "license.cfg" [License] LicenseServerHost
```

To specify a default value for the parameter, in case it does not exist in the external configuration file, specify the configuration section, parameter name, and then an equals sign (=) followed by the default value. For example:

```
< "license.cfg" [License] LicenseServerHost=localhost
```

You can use wildcards to import multiple parameters, but this method does not support default values. The * wildcard matches zero or more characters. The ? wildcard matches any single character. Use the pipe character | as a separator between wildcard strings. For example:

```
< "license.cfg" [License] LicenseServer*
```

4. Save and close the configuration file.

Merge a Section from an External Configuration File

This method allows you to include a configuration section from an external configuration file as part of your ODBC Connector configuration file. For example, you might want to specify a standard SSL configuration section in an external file and share it between several servers. You can use this method if the configuration section that you want to import has a different name to the one you want to use.

To merge a configuration section from an external configuration file

1. Open your configuration file in a text editor.
2. Find or create the configuration section that you want to include from an external file. For example:

```
[SSLOptions1]
```


3. After the configuration section name, type a left angle bracket (<), followed by the path to and name of the external configuration file, in quotation marks (""). You can use relative paths and network locations. For example:

```
[SSLOptions1] < "../sharedconfig/ssloptions.cfg"
```

If the configuration section name in the external configuration file does not match the name that you want to use in your configuration file, specify the section to import after the configuration file name. For example:

```
[SSLOptions1] < "../sharedconfig/ssloptions.cfg" [SharedSSLOptions]
```

In this example, ODBC Connector uses the values in the [SharedSSLOptions] section of the external configuration file as the values in the [SSLOptions1] section of the ODBC Connector configuration file.

NOTE: You can include additional configuration parameters in the section in your file. If these parameters also exist in the imported external configuration file, ODBC Connector uses the values in the local configuration file. For example:

```
[SSLOptions1] < "ssloptions.cfg" [SharedSSLOptions]  
SSLCACertificatesPath=C:\IDOL\HTTPConnector\CACERTS\
```

4. Save and close the configuration file.

Encrypt Passwords

Micro Focus recommends that you encrypt all passwords that you enter into a configuration file.

NOTE: The AES encryption method has been hardened in version 12.9.0 and later. Micro Focus strongly recommends that you reencrypt all passwords in configuration files by using the updated tool.

The older AES encryption format and basic encryption methods are now deprecated. Passwords that you have encrypted with older versions continue to work, but ODBC Connector logs a warning. Support for these older encryption methods will be removed in future.

Create a Key File

A key file is required to use AES encryption.

To create a new key file

1. Open a command-line window and change directory to the ODBC Connector installation folder.
2. At the command line, type:

```
autpassword -x -tAES -oKeyFile=./MyKeyFile.ky
```

A new key file is created with the name `MyKeyFile.ky`

CAUTION: To keep your passwords secure, you must protect the key file. Set the permissions on the key file so that only authorized users and processes can read it. ODBC Connector must be able to read the key file to decrypt passwords, so do not move or rename it.

Encrypt a Password

The following procedure describes how to encrypt a password.

To encrypt a password

1. Open a command-line window and change directory to the ODBC Connector installation folder.
2. At the command line, type:

```
outpassword -e -tEncryptionType [-oKeyFile] [-cFILE -sSECTION -pPARAMETER] PasswordString
```

where:

Option	Description
<code>-t EncryptionType</code>	<p>The type of encryption to use:</p> <ul style="list-style-type: none">• AES - AES256• Basic <p>DEPRECATED: The basic encryption type is deprecated in version 12.9.0 and later. Use the more secure AES encryption instead.</p> <p>Passwords that you have encrypted with older versions continue to work, but ODBC Connector logs a warning. Support for this older encryption method will be removed in future.</p> <p>For example: <code>-tAES</code></p>
<code>-oKeyFile</code>	<p>AES encryption requires a key file. This option specifies the path and file name of a key file. The key file must contain 64 hexadecimal characters.</p> <p>For example: <code>-oKeyFile=./key.ky</code></p> <p>NOTE: The full (absolute) path of the key file is included in the encrypted value, because ODBC Connector requires the key to decrypt the password. If you move or rename the key file, this path becomes invalid and you must update the encrypted value.</p>

Option	Description
-cFILE - sSECTION - pPARAMETER	(Optional) You can use these options to write the password directly into a configuration file. You must specify all three options. <ul style="list-style-type: none"> -c. The configuration file in which to write the encrypted password. -s. The name of the section in the configuration file in which to write the password. -p. The name of the parameter in which to write the encrypted password. For example: -c./Config.cfg -sMyTask -pPassword
<i>PasswordString</i>	The password to encrypt.

For example:

```
autopassword -e -tBASIC MyPassword
```

```
autopassword -e -tAES -oKeyFile=./key.ky MyPassword
```

```
autopassword -e -tAES -oKeyFile=./key.ky -c./Config.cfg -sDefault -pPassword MyPassword
```

The password is returned, or written to the configuration file.

Decrypt a Password

The following procedure describes how to decrypt a password.

To decrypt a password

1. Open a command-line window and change directory to the ODBC Connector installation folder.
2. At the command line, type:

```
autopassword -d -tEncryptionType PasswordString
```

where:

Option	Description
-tEncryptionType	The type of encryption: <ul style="list-style-type: none"> Basic AES - AES256 For example: -tAES
<i>PasswordString</i>	The password to decrypt.

For example:

```
outpassword -d -tBASIC 9t3M3t7awt/J8A
```

```
outpassword -d -tAES PasswordString
```

The password is returned in plain text.

Configure Client Authorization

You can configure ODBC Connector to authorize different operations for different connections.

Authorization roles define a set of operations for a set of users. You define the operations by using the `StandardRoles` configuration parameter, or by explicitly defining a list of allowed actions in the `Actions` and `ServiceActions` parameters. You define the authorized users by using a client IP address, SSL identities, and GSS principals, depending on your security and system configuration.

For more information about the available parameters, see the *ODBC Connector Reference*.

IMPORTANT: To ensure that ODBC Connector allows only the options that you configure in `[AuthorizationRoles]`, make sure that you delete any deprecated `RoLeClients` parameters from your configuration (where `RoLe` corresponds to a standard role name, for example `AdminClients`).

To configure authorization roles

1. Open your configuration file in a text editor.
2. Find the `[AuthorizationRoles]` section, or create one if it does not exist.
3. In the `[AuthorizationRoles]` section, list the user authorization roles that you want to create. For example:

```
[AuthorizationRoles]  
0=AdminRole  
1=UserRole
```

4. Create a section for each authorization role that you listed. The section name must match the name that you set in the `[AuthorizationRoles]` list. For example:

```
[AdminRole]
```

5. In the section for each role, define the operations that you want the role to be able to perform. You can set `StandardRoles` to a list of appropriate values, or specify an explicit list of allowed actions by using `Actions`, and `ServiceActions`. For example:

```
[AdminRole]  
StandardRoles=Admin,ServiceControl,ServiceStatus
```

```
[UserRole]  
Actions=GetVersion  
ServiceActions=GetStatus
```

NOTE: The standard roles do not overlap. If you want a particular role to be able to perform all actions, you must include all the standard roles, or ensure that the clients, SSL identities, and so on, are assigned to all relevant roles.

6. In the section for each role, define the access permissions for the role, by setting `Clients`, `SSLIdentities`, and `GSSPrincipals`, as appropriate. If an incoming connection matches one of the allowed clients, principals, or SSL identities, the user has permission to perform the operations allowed by the role. For example:

```
[AdminRole]
StandardRoles=Admin,ServiceControl,ServiceStatus
Clients=localhost
SSLIdentities=admin.example.com
```

7. Save and close the configuration file.
8. Restart ODBC Connector for your changes to take effect.

IMPORTANT: If you do not provide any authorization roles for a standard role, ODBC Connector uses the default client authorization for the role (`localhost` for `Admin` and `ServiceControl`, all clients for `Query` and `ServiceStatus`). If you define authorization only by actions, Micro Focus recommends that you configure an authorization role that disallows all users for all roles by default. For example:

```
[ForbidAllRoles]
StandardRoles=*
Clients=""
```

This configuration ensures that ODBC Connector uses only your action-based authorizations.

Register with a Distributed Connector

To receive actions from a Distributed Connector, a connector must register with the Distributed Connector and join a *connector group*. A connector group is a group of similar connectors. The connectors in a group must be of the same type (for example, all HTTP Connectors), and must be able to access the same repository.

To configure a connector to register with a Distributed Connector, follow these steps. For more information about the Distributed Connector, refer to the *Distributed Connector Administration Guide*.

To register with a Distributed Connector

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. In the `[DistributedConnector]` section, set the following parameters:

<code>RegisterConnector</code>	(Required) To register with a Distributed Connector, set this parameter to true .
<code>HostN</code>	(Required) The host name or IP address of the Distributed Connector.
<code>PortN</code>	(Required) The ACI port of the Distributed Connector.
<code>DataPortN</code>	(Optional) The data port of the Distributed Connector.
<code>ConnectorGroup</code>	(Required) The name of the connector group to join. The value of this parameter is passed to the Distributed Connector.
<code>ConnectorPriority</code>	(Optional) The Distributed Connector can distribute actions to connectors based on a priority value. The lower the value assigned to <code>ConnectorPriority</code> , the higher the probability that an action is assigned to this connector, rather than other connectors in the same connector group.
<code>SharedPath</code>	(Optional) The location of a shared folder that is accessible to all of the connectors in the <code>ConnectorGroup</code> . This folder is used to store the connectors' datastore files, so that whichever connector in the group receives an action, it can access the information required to complete it. If you set the <code>DataPortN</code> parameter, the datastore file is streamed directly to the Distributed Connector, and this parameter is ignored.

4. Save and close the configuration file.
5. Start the connector.

The connector registers with the Distributed Connector. When actions are sent to the Distributed Connector for the connector group that you configured, they are forwarded to this connector or to another connector in the group.

Set Up Secure Communication

You can configure Secure Socket Layer (SSL) connections between the connector and other ACI servers.

Configure Outgoing SSL Connections

To configure the connector to send data to other components (for example Connector Framework Server) over SSL, follow these steps.

To configure outgoing SSL connections

1. Open the ODBC Connector configuration file in a text editor.
2. Specify the name of a section in the configuration file where the SSL settings are provided:

- To send data to an ingestion server over SSL, set the `IngestSSLConfig` parameter in the `[Ingestion]` section. To send data from a single fetch task to an ingestion server over SSL, set `IngestSSLConfig` in a `[TaskName]` section.
- To send data to a Distributed Connector over SSL, set the `SSLConfig` parameter in the `[DistributedConnector]` section.
- To send data to a View Server over SSL, set the `SSLConfig` parameter in the `[ViewServer]` section.

You can use the same settings for each connection. For example:

```
[Ingestion]
IngestSSLConfig=SSLOptions
```

```
[DistributedConnector]
SSLConfig=SSLOptions
```

3. Create a new section in the configuration file. The name of the section must match the name you specified in the `IngestSSLConfig` or `SSLConfig` parameter. Then specify the SSL settings to use.

<code>SSLMethod</code>	The SSL protocol to use.
<code>SSLCertificate</code>	(Optional) The SSL certificate to use (in PEM format).
<code>SSLPrivateKey</code>	(Optional) The private key for the SSL certificate (in PEM format).

For example:

```
[SSLOptions]
SSLMethod=TLSV1.3
SSLCertificate=host1.crt
SSLPrivateKey=host1.key
```

4. Save and close the configuration file.
5. Restart the connector.

Related Topics

- [Start and Stop the Connector, on page 35](#)

Configure Incoming SSL Connections

To configure a connector to accept data sent to its ACI port over SSL, follow these steps.

To configure an incoming SSL Connection

1. Stop the connector.
2. Open the configuration file in a text editor.

3. In the [Server] section set the SSLConfig parameter to specify the name of a section in the configuration file for the SSL settings. For example:

```
[Server]
SSLConfig=SSLOptions
```

4. Create a new section in the configuration file (the name must match the name you used in the SSLConfig parameter). Then, use the SSL configuration parameters to specify the details for the connection. You must set the following parameters:

```
SSLMethod      The SSL protocol to use.
SSLCertificate  The SSL certificate to use (in PEM format).
SSLPrivateKey   The private key for the SSL certificate (in PEM format).
```

For example:

```
[SSLOptions]
SSLMethod=TLSV1.3
SSLCertificate=host1.crt
SSLPrivateKey=host1.key
```

5. Save and close the configuration file.
6. Restart the connector.

Related Topics

- [Start and Stop the Connector, on page 35](#)

Backup and Restore the Connector's State

After configuring a connector, and while the connector is running, you can create a backup of the connector's state. In the event of a failure, you can restore the connector's state from the backup.

To create a backup, use the backupServer action. The backupServer action saves a ZIP file to a path that you specify. The backup includes:

- a copy of the actions folder, which stores information about actions that have been queued, are running, and have finished.
- a copy of the configuration file.
- a copy of the connector's datastore files, which contain information about the files, records, or other data that the connector has retrieved from a repository.

Backup a Connector's State

To create a backup of the connectors state

- In the address bar of your Web browser, type the following action and press **ENTER**:

`http://host:port/action=backupServer&path=path`

where,

host The host name or IP address of the machine where the connector is running.

port The connector's ACI port.

path The folder where you want to save the backup.

For example:

`http://localhost:1234/action=backupServer&path=./backups`

Restore a Connector's State

To restore a connector's state

- In the address bar of your Web browser, type the following action and press **ENTER**:

`http://host:port/action=restoreServer&filename=filename`

where,

host The host name or IP address of the machine where the connector is running.

port The connector's ACI port.

filename The path of the backup that you created.

For example:

`http://localhost:1234/action=restoreServer&filename=./backups/filename.zip`

Validate the Configuration File

You can use the `ValidateConfig` service action to check for errors in the configuration file.

NOTE: For the `ValidateConfig` action to validate a configuration section, ODBC Connector must have previously read that configuration. In some cases, the configuration might be read when a task is run, rather than when the component starts up. In these cases, `ValidateConfig` reports any

unread sections of the configuration file as unused.

To validate the configuration file

- Send the following action to ODBC Connector:

`http://Host:ServicePort/action=ValidateConfig`

where:

Host is the host name or IP address of the machine where ODBC Connector is installed.

ServicePort is the service port, as specified in the [Service] section of the configuration file.

Chapter 4: Start and Stop the Connector

This section describes how to start and stop the ODBC Connector.

- [Start the Connector](#)35
- [Verify that ODBC Connector is Running](#)36
- [Stop the Connector](#)36

NOTE: You must start and stop the Connector Framework Server separately from the ODBC Connector.

Start the Connector

After you have installed and configured a connector, you are ready to run it. Start the connector using one of the following methods.

Start the Connector on Windows

To start the connector using Windows Services

1. Open the Windows Services dialog box.
2. Select the connector service, and click **Start**.
3. Close the Windows Services dialog box.

To start the connector by running the executable

- In the connector installation directory, double-click the connector executable file.

Start the Connector on UNIX

To start the connector on a UNIX operating system, follow these steps.

To start the connector using the UNIX start script

1. Change to the installation directory.
2. Enter the following command:

```
./startconnector.sh
```

3. If you want to check the ODBC Connector service is running, enter the following command:

```
ps -aef | grep ConnectorInstallName
```

This command returns the ODBC Connector service process ID number if the service is running.

Verify that ODBC Connector is Running

After starting ODBC Connector, you can run the following actions to verify that ODBC Connector is running.

- [GetStatus](#)
- [GetLicenseInfo](#)

GetStatus

You can use the `GetStatus` service action to verify the ODBC Connector is running. For example:

```
http://Host:ServicePort/action=GetStatus
```

NOTE: You can send the `GetStatus` action to the ACI port instead of the service port. The `GetStatus` ACI action returns information about the ODBC Connector setup.

GetLicenseInfo

You can send a `GetLicenseInfo` action to ODBC Connector to return information about your license. This action checks whether your license is valid and returns the operations that your license includes.

Send the `GetLicenseInfo` action to the ODBC Connector ACI port. For example:

```
http://Host:ACIport/action=GetLicenseInfo
```

The following result indicates that your license is valid.

```
<autn:license>  
  <autn:validlicense>true</autn:validlicense>  
</autn:license>
```

As an alternative to submitting the `GetLicenseInfo` action, you can view information about your license, and about licensed and unlicensed actions, on the **License** tab in the Status section of IDOL Admin.

Stop the Connector

You must stop the connector before making any changes to the configuration file.

To stop the connector using Windows Services

1. Open the Windows Services dialog box.
2. Select the **ConnectorInstallName** service, and click **Stop**.
3. Close the Windows Services dialog box.

To stop the connector by sending an action to the service port

- Type the following command in the address bar of your Web browser, and press ENTER:

`http://host:ServicePort/action=stop`

host The IP address or host name of the machine where the connector is running.

ServicePort The connector's service port (specified in the [Service] section of the connector's configuration file).

Chapter 5: Send Actions to ODBC Connector

This section describes how to send actions to ODBC Connector.

- [Send Actions to ODBC Connector](#) 38
- [Asynchronous Actions](#) 38
- [Store Action Queues in an External Database](#) 40
- [Store Action Queues in Memory](#) 42
- [Use XSL Templates to Transform Action Responses](#) 44

Send Actions to ODBC Connector

ODBC Connector actions are HTTP requests, which you can send, for example, from your web browser. The general syntax of these actions is:

```
http://host:port/action=action&parameters
```

where:

- host* is the IP address or name of the machine where ODBC Connector is installed.
- port* is the ODBC Connector ACI port. The ACI port is specified by the Port parameter in the [Server] section of the ODBC Connector configuration file. For more information about the Port parameter, see the *ODBC Connector Reference*.
- action* is the name of the action you want to run.
- parameters* are the required and optional parameters for the action.

NOTE: Separate individual parameters with an ampersand (&). Separate parameter names from values with an equals sign (=). You must percent-encode all parameter values.

For more information about actions, see the *ODBC Connector Reference*.

Asynchronous Actions

When you send an asynchronous action to ODBC Connector, the connector adds the task to a queue and returns a token. ODBC Connector performs the task when a thread becomes available. You can use the token with the QueueInfo action to check the status of the action and retrieve the results of the action.

Most of the features provided by the connector are available through `action=fetch`, so when you use the `QueueInfo` action, query the `fetch` action queue, for example:

```
/action=QueueInfo&QueueName=Fetch&QueueAction=GetStatus
```

Check the Status of an Asynchronous Action

To check the status of an asynchronous action, use the token that was returned by ODBC Connector with the `QueueInfo` action. For more information about the `QueueInfo` action, refer to the *ODBC Connector Reference*.

To check the status of an asynchronous action

- Send the `QueueInfo` action to ODBC Connector with the following parameters.

<code>QueueName</code>	The name of the action queue that you want to check.
<code>QueueAction</code>	The action to perform. Set this parameter to GetStatus .
<code>Token</code>	(Optional) The token that the asynchronous action returned. If you do not specify a token, ODBC Connector returns the status of every action in the queue.

For example:

```
/action=QueueInfo&QueueName=fetch&QueueAction=getstatus&Token=...
```

Cancel an Asynchronous Action that is Queued

To cancel an asynchronous action that is waiting in a queue, use the following procedure.

To cancel an asynchronous action that is queued

- Send the `QueueInfo` action to ODBC Connector with the following parameters.

<code>QueueName</code>	The name of the action queue that contains the action to cancel.
<code>QueueAction</code>	The action to perform. Set this parameter to Cancel .
<code>Token</code>	The token that the asynchronous action returned.

For example:

```
/action=QueueInfo&QueueName=fetch&QueueAction=Cancel&Token=...
```

Stop an Asynchronous Action that is Running

You can stop an asynchronous action at any point.

To stop an asynchronous action that is running

- Send the QueueInfo action to ODBC Connector with the following parameters.

QueueName	The name of the action queue that contains the action to stop.
QueueAction	The action to perform. Set this parameter to Stop .
Token	The token that the asynchronous action returned.

For example:

```
/action=QueueInfo&QueueName=fetch&QueueAction=Stop&Token=...
```

Store Action Queues in an External Database

ODBC Connector provides asynchronous actions. Each asynchronous action has a queue to store requests until threads become available to process them. You can configure ODBC Connector to store these queues either in an internal database file, or in an external database hosted on a database server.

The default configuration stores queues in an internal database. Using this type of database does not require any additional configuration.

You might want to store the action queues in an external database so that several servers can share the same queues. In this configuration, sending a request to any of the servers adds the request to the shared queue. Whenever a server is ready to start processing a new request, it takes the next request from the shared queue, runs the action, and adds the results of the action back to the shared database so that they can be retrieved by any of the servers. You can therefore distribute requests between components without configuring a Distributed Action Handler (DAH).

NOTE: You cannot use multiple servers to process a single request. Each request is processed by one server.

NOTE: Although you can configure several connectors to share the same action queues, the connectors do not share fetch task data. If you share action queues between several connectors and distribute synchronize actions, the connector that processes a synchronize action cannot determine which items the other connectors have retrieved. This might result in some documents being ingested several times.

Prerequisites

- Supported databases:
 - PostgreSQL 9.0 or later.
 - MySQL 5.0 or later.

- On each machine that hosts ODBC Connector, you must install an ODBC driver for your chosen database. On Linux you must also install the unixODBC driver manager and configure the name and path of the ODBC driver in the unixODBC `odbcinst.ini` configuration file.
- If you use PostgreSQL, you must set the PostgreSQL ODBC driver setting `MaxVarChar` to 0 (zero). If you use a DSN, you can configure this parameter when you create the DSN. Otherwise, you can set the `MaxVarcharSize` parameter in the connection string.

Configure ODBC Connector

To configure ODBC Connector to use a shared action queue, follow these steps.

To store action queues in an external database

1. Stop ODBC Connector, if it is running.
2. Open the ODBC Connector configuration file.
3. Find the relevant section in the configuration file:
 - To store queues for all asynchronous actions in the external database, find the `[Actions]` section.
 - To store the queue for a single asynchronous action in the external database, find the section that configures that action.
4. Set the following configuration parameters.

`AsyncStoreLibraryDirectory` The path of the directory that contains the library to use to connect to the database. Specify either an absolute path, or a path relative to the server executable file.

`AsyncStoreLibraryName` The name of the library to use to connect to the database. You can omit the file extension. The following libraries are available:

- `postgresAsyncStoreLibrary` - for connecting to a PostgreSQL database.
- `mysqlAsyncStoreLibrary` - for connecting to a MySQL database.

`ConnectionString` The connection string to use to connect to the database. The user that you specify must have permission to create tables in the database. For example:

```
ConnectionString=DSN=ActionStore
```

or

```
ConnectionString=Driver={PostgreSQL};  
Server=10.0.0.1; Port=9876;  
Database=SharedActions; Uid=user; Pwd=password;
```

```
MaxVarcharSize=0;
```

If your connection string includes a password, Micro Focus recommends encrypting the value of the parameter before entering it into the configuration file. Encrypt the entire connection string. For information about how to encrypt parameter values, see [Encrypt Passwords, on page 25](#).

For example:

```
[Actions]
AsyncStoreLibraryDirectory=acidlls
AsyncStoreLibraryName=postgresAsyncStoreLibrary
ConnectionString=DSN=ActionStore
```

5. You can use the same database to store action queues for more than one type of IDOL component (for example, a group of File System Connectors and a group of Media Servers). To use a database for more than one type of component, set the following parameter in the [Actions] section of the configuration file.

DatastoreSharingGroupName The group of components to share actions with. You can set this parameter to any string, but the value must be the same for each server in the group. For example, to configure several ODBC Connectors to share their action queues, set this parameter to the same value in every ODBC Connector configuration. Micro Focus recommends setting this parameter to the name of the component.

CAUTION: Do not configure different components (for example, two different types of connector) to share the same action queues. This will result in unexpected behavior.

For example:

```
[Actions]
...
DatastoreSharingGroupName=MediaServer
```

6. Save and close the configuration file.

When you start ODBC Connector it connects to the shared database.

Store Action Queues in Memory

ODBC Connector provides asynchronous actions. Each asynchronous action has a queue to store requests until threads become available to process them. These queues are usually stored in a datastore file or in a database hosted on a database server, but in some cases you can increase performance by storing these queues in memory.

NOTE: Storing action queues in memory improves performance only when the server receives large numbers of actions that complete quickly. Before storing queues in memory, you should also consider the following:

- The queues (including queued actions and the results of finished actions) are lost if ODBC Connector stops unexpectedly, for example due to a power failure or the component being forcibly stopped. This could result in some requests being lost, and if the queues are restored to a previous state some actions could run more than once.
- Storing action queues in memory prevents multiple instances of a component being able to share the same queues.
- Storing action queues in memory increases memory use, so please ensure that the server has sufficient memory to complete actions and store the action queues.

If you stop ODBC Connector cleanly, ODBC Connector writes the action queues from memory to disk so that it can resume processing when it is next started.

To configure ODBC Connector to store asynchronous action queues in memory, follow these steps.

To store action queues in memory

1. Stop ODBC Connector, if it is running.
2. Open the ODBC Connector configuration file and find the [Actions] section.
3. If you have set any of the following parameters, remove them:
 - AsyncStoreLibraryDirectory
 - AsyncStoreLibraryName
 - ConnectionString
 - UseStringentDatastore
4. Set the following configuration parameters.

UseInMemoryDatastore

A Boolean value that specifies whether to keep the queues for asynchronous actions in memory. Set this parameter to **TRUE**.

InMemoryDatastoreBackupIntervalMins

(Optional) The time interval (in minutes) at which the action queues are written to disk. Writing the queues to disk can reduce the number of queued actions that would be lost if ODBC Connector stops unexpectedly, but configuring a frequent backup will increase the load on the datastore and might reduce performance.

For example:

```
[Actions]
UseInMemoryDatastore=TRUE
InMemoryDatastoreBackupIntervalMins=30
```

5. Save and close the configuration file.

When you start ODBC Connector, it stores action queues in memory.

Use XSL Templates to Transform Action Responses

You can transform the action responses returned by ODBC Connector using XSL templates. You must write your own XSL templates and save them with either an `.xsl` or `.tmp1` file extension.

After creating the templates, you must configure ODBC Connector to use them, and then apply them to the relevant actions.

To enable XSL transformations

1. Ensure that the `autnxs1t` library is located in the same directory as your configuration file. If the library is not included in your installation, you can obtain it from Micro Focus Support.
2. Open the ODBC Connector configuration file in a text editor.
3. In the `[Server]` section, ensure that the `XSLTemplates` parameter is set to `true`.

CAUTION: If `XSLTemplates` is set to `true` and the `autnxs1t` library is not present in the same directory as the configuration file, the server will not start.

4. (Optional) In the `[Paths]` section, set the `TemplateDirectory` parameter to the path to the directory that contains your XSL templates. The default directory is `acitemplates`.
5. Save and close the configuration file.
6. Restart ODBC Connector for your changes to take effect.

To apply a template to action output

- Add the following parameters to the action:

<code>Template</code>	The name of the template to use to transform the action output. Exclude the folder path and file extension.
<code>ForceTemplateRefresh</code>	(Optional) If you modified the template after the server started, set this parameter to <code>true</code> to force the ACI server to reload the template from disk rather than from the cache.

For example:

```
action=QueueInfo&QueueName=Fetch
      &QueueAction=GetStatus
      &Token=...
      &Template=myTemplate
```

In this example, ODBC Connector applies the XSL template `myTemplate` to the response from a `QueueInfo` action.

NOTE: If the action returns an error response, ODBC Connector does not apply the XSL template.

Example XSL Templates

ODBC Connector includes the following sample XSL templates, in the `acitemplates` folder:

XSL Template	Description
LuaDebug	Transforms the output from the <code>LuaDebug</code> action, to assist with debugging Lua scripts.

Chapter 6: Use the Connector

This section describes how to use the connector.

- [Operating Modes](#) 46
- [Retrieve Information \(Non-Incremental Mode\)](#) 47
- [Retrieve Information \(Incremental Mode\)](#) 48
- [Retrieve Information from Event Tables](#) 50
- [Schedule Fetch Tasks](#) 52

Operating Modes

The ODBC Connector has several modes of operation.

Non-Incremental Mode

In non-incremental mode, the connector performs a *full synchronize* every time you run a synchronize task. This is the default mode, used when `UseIncrementalStatements=false`.

Every time you run a synchronize task, the connector retrieves information from the database using the query specified by the SQL parameter. To identify new, updated, and deleted rows, the connector must process every row returned by this query.

The SQL query might return many rows that the connector has processed before, and that have not changed. The connector doesn't need to take any action for these rows but processing them does take time, especially if the query returns millions of rows.

Running a full synchronize on every cycle might be necessary if it is not possible to construct a query to extract only the new, modified, and deleted rows.

Incremental Mode

In incremental mode, the connector performs a *full synchronize* on the first cycle, and an *incremental synchronize* on subsequent cycles. This can be more efficient.

The first time the connector runs a synchronize task it sends the query specified by the `InitialStatement` parameter to the database and processes all of the rows that are returned. As the connector hasn't run the task before, all of the rows represent new documents and the connector sends an ingest-add command to the ingestion server (usually, a Connector Framework Server) for every row. This is a *full synchronize*, the same as in non-incremental mode.

TIP: If you do not set the `InitialStatement` parameter, the connector uses the query specified by `AddedAndUpdatedStatement` for the initial synchronize.

On subsequent synchronize cycles, the connector sends different queries to the database. The query specified by `AddedAndUpdatedStatement` is used to identify rows that have been added or updated. The query specified by `DeletedStatement` is used to identify rows that have been deleted.

An example `AddedAndUpdatedStatement` might be:

```
SELECT * FROM table_name WHERE last_modified > '@lastruntime'
```

The connector replaces the placeholder `@lastruntime` with the time of the last successful synchronize.

An example `DeletedStatement` might be:

```
SELECT * from table_name WHERE deleted=1
```

If your database stores items by modified date and identifies deleted rows, using incremental mode can increase performance because the incremental queries are likely to return fewer rows than the initial query. Also, in incremental mode the connector does not need to store information in its datastore about the rows that it has retrieved.

Event Table Mode

In event-table mode, applications add rows to an event table. On each synchronize cycle, the connector runs a query to extract documents from the table, processes the documents that are returned, and then deletes the rows that it has processed.

In event-table mode, use the `SQL` configuration parameter to specify a query to use to retrieve information from the event table, and the `EventTableType` parameter to specify what type of operation to perform on the returned documents. You must also set the `DeleteEventSql` parameter to specify the query to use to delete rows from the event table after the information has been ingested. For example:

```
[EventTableAdd]
ConnectionString=...
EventTableType=add
SQL=SELECT id, metavalue, content FROM event_adds
DeleteEventSql=DELETE FROM event_adds WHERE @Clause
PrimaryKeys=id
Template=document.tpl
```

The connector replaces the placeholder `@Clause` with a clause that identifies the rows that have been ingested.

To handle new, modified, and deleted documents, configure three separate fetch tasks (one with `EventTableType=add`, one with `EventTableType=update`, and one with `EventTableType=remove`).

Retrieve Information (Non-Incremental Mode)

To automatically retrieve content from a database, create a new fetch task by following these steps. The connector runs fetch tasks automatically, based on the schedule that is configured in the configuration file.

To create a new Fetch Task

1. Stop the connector.
2. Open the configuration file in a text editor.
3. In the [FetchTasks] section of the configuration file, specify the number of fetch tasks using the Number parameter. If you are configuring the first fetch task, type **Number=1**. If one or more fetch tasks have already been configured, increase the value of the Number parameter by one (1). Below the Number parameter, specify the names of the fetch tasks, starting from zero (0). For example:

```
[FetchTasks]
Number=1
0=MyTask
```

4. Below the [FetchTasks] section, create a new *TaskName* section. The name of the section must match the name of the new fetch task. For example:

```
[FetchTasks]
Number=1
0=MyTask
```

```
[MyTask]
```

5. In the new section, set the following parameters:

ConnectionString	The connection string to connect to the database.
SQL	The SQL command to execute to return the data from the database.
PrimaryKeys	The column, or combination of columns, used as the primary key for the table. The value of this parameter is case-sensitive.
Template	(Optional) The template file used to form the documents that are sent to CFS. For information about how to create a template file, see Construct Template Files, on page 54 .

6. Save and close the configuration file. You can now start the connector.

TIP: If you make changes to the configuration and want to reset the connector so that it retrieves all of your data again, use the PurgeDatastore action.

Retrieve Information (Incremental Mode)

To automatically retrieve content from a database in incremental mode, create a new fetch task by following these steps. The connector runs fetch tasks automatically, based on the schedule that is configured in the configuration file.

To create a new Fetch Task

1. Stop the connector.
2. Open the configuration file in a text editor.
3. In the [FetchTasks] section of the configuration file, specify the number of fetch tasks using the Number parameter. If you are configuring the first fetch task, type **Number=1**. If one or more fetch tasks have already been configured, increase the value of the Number parameter by one (1). Below the Number parameter, specify the names of the fetch tasks, starting from zero (0). For example:

```
[FetchTasks]
Number=1
0=MyTask
```

4. Below the [FetchTasks] section, create a new *TaskName* section. The name of the section must match the name of the new fetch task. For example:

```
[FetchTasks]
Number=1
0=MyTask
```

```
[MyTask]
```

5. In the new section, set the following parameters:

ConnectionString	The connection string to connect to the database.
UseIncrementalStatements	To use incremental mode, set this parameter to true .
InitialStatement	The SQL query to use to return the data from the database on the first synchronize cycle.
AddedAndUpdatedStatement	The SQL query to use to identify new and updated records on incremental synchronize cycles.
DeletedStatement	The SQL query to use to identify deleted records on incremental synchronize cycles.
PrimaryKeys	The column, or combination of columns, used as the primary key for the table. The value of this parameter is case-sensitive.
Template	(Optional) The template file used to form the documents that are sent to CFS. For information about how to create a template file, see Construct Template Files, on page 54 .

6. Save and close the configuration file. You can now start the connector.

TIP: If you make changes to the configuration and want to reset the connector so that it retrieves all of your data again, use the PurgeDatastore action.

Retrieve Information from Event Tables

To retrieve content from an event table, create a new fetch task by following these steps. The connector runs fetch tasks automatically, based on the schedule that is configured in the configuration file.

To retrieve information from an event table

1. Stop the connector.
2. Open the configuration file in a text editor.
3. In the `[FetchTasks]` section of the configuration file, specify the number of fetch tasks using the `Number` parameter. If you are configuring the first fetch task, type `Number=1`. If one or more fetch tasks have already been configured, increase the value of the `Number` parameter by one (1). Below the `Number` parameter, specify the names of the fetch tasks, starting from zero (0). For example:

```
[FetchTasks]
Number=3
0=EventTableAdd
1=EventTableUpdate
2=EventTableRemove
```

4. Below the `[FetchTasks]` section, create a new `TaskName` section. The name of the section must match the name of the new fetch task.
5. In the new section, set the following parameters:

<code>ConnectionString</code>	The connection string to use to connect to the database.
<code>EventTableType</code>	The type of operation to perform for each document that is returned by the query. To configure all three types of ingest operation, configure three separate fetch tasks. <ul style="list-style-type: none">• add - add a new document to the index.• update - update an existing document. This option supports both metadata and content changes. If the content has changed the connector performs an ingest-replace.• remove - delete an existing document.
<code>SQL</code>	The SQL query to use to return data from the event table.
<code>DeleteEventSql</code>	The SQL query to use to delete information from the event table after it has been ingested. The connector replaces the placeholder <code>@Clause</code> with a clause that identifies the rows that have been ingested.

If you use the same table for storing adds, updates, and deletes, ensure

that your DeleteEventSql queries do not delete rows corresponding to other operations/tasks.

PrimaryKeys	The column, or combination of columns, to use as the primary key for the table. The value of this parameter is case-sensitive.
Template	(Optional) The template file used to form the documents that are ingested. For information about how to create a template file, see Construct Template Files, on page 54 . Micro Focus recommends that you use the same template for EventTableType=add and EventTableType=update. You can also use the same template with EventTableType=remove, but this template only needs to include the DRREFERENCE document field.

For example:

```
[FetchTasks]
Number=3
0=EventTableAdd
1=EventTableUpdate
2=EventTableRemove

[EventTableAdd]
ConnectionString=...
EventTableType=add
SQL=SELECT id, content FROM event_adds
DeleteEventSql=DELETE FROM event_adds WHERE @Clause
PrimaryKeys=id
Template=document.tpl

[EventTableUpdate]
ConnectionString=...
EventTableType=update
SQL=SELECT id, content FROM event_updates
DeleteEventSql=DELETE FROM event_updates WHERE @Clause
PrimaryKeys=id
Template=document.tpl

[EventTableRemove]
ConnectionString=...
EventTableType=remove
SQL=SELECT id FROM event_deletes
DeleteEventSql=DELETE FROM event_deletes WHERE @Clause
PrimaryKeys=id
Template=remove.tpl
```

6. Save and close the configuration file. You can now start the connector.

Schedule Fetch Tasks

The connector automatically runs the fetch tasks that you have configured, based on the schedule in the configuration file. To modify the schedule, follow these steps.

To schedule fetch tasks

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. Find the [Connector] section.
4. The `EnableScheduleTasks` parameter specifies whether the connector should automatically run the fetch tasks that have been configured in the [FetchTasks] section. To run the tasks, set this parameter to `true`. For example:

```
[Connector]
EnableScheduledTasks=True
```

5. In the [Connector] section, set the following parameters:

<code>ScheduleStartTime</code>	The start time for the fetch task, the first time it runs after you start the connector. The connector runs subsequent synchronize cycles after the interval specified by <code>ScheduleRepeatSecs</code> . Specify the start time in the format <code>H[H][:MM][:SS]</code> . To start running tasks as soon as the connector starts, do not set this parameter or use the value <code>now</code> . Tasks scheduled to start at the same time run in the order that they are enumerated by the <code>N</code> parameter (in the [FetchTasks] section of the configuration file).
<code>ScheduleRepeatSecs</code>	The interval (in seconds) from the start of one scheduled synchronize cycle to the start of the next. If a previous synchronize cycle is still running when the interval elapses, the connector queues a maximum of one action.
<code>ScheduleCycles</code>	The number of times that each fetch task is run. To run the tasks continuously until the connector is stopped, set this parameter to <code>-1</code> . To run each task only one time, set this parameter to <code>1</code> .

For example:

```
[Connector]
EnableScheduledTasks=True
ScheduleStartTime=15:00:00
ScheduleRepeatSecs=3600
ScheduleCycles=-1
```

6. (Optional) To run a specific fetch task on a different schedule, you can override these parameters in a *TaskName* section of the configuration file. For example:

```
[Connector]
EnableScheduledTasks=TRUE
ScheduleStartTime=15:00:00
ScheduleRepeatSecs=3600
ScheduleCycles=-1
```

...

```
[FetchTasks]
Number=2
0=MyTask0
1=MyTask1
...
```

```
[MyTask1]
ScheduleStartTime=16:00:00
ScheduleRepeatSecs=60
ScheduleCycles=-1
```

In this example, MyTask0 follows the schedule defined in the [Connector] section, and MyTask1 follows the scheduled defined in the [MyTask1] *TaskName* section.

7. Save and close the configuration file. You can now start the connector.

Related Topics

- [Start and Stop the Connector, on page 35](#)

Chapter 7: Construct Template Files

A template file specifies how the data returned from a database is structured for indexing into IDOL Server. You can create template files to customize how information from the database is indexed into IDOL Server. This section describes how to construct template files.

- [Template Files](#) 54
- [Sub-Table Template Files](#) 55

Template Files

A template file specifies how the data returned from a database is structured for indexing into IDOL Server. You can create template files to customize how information from the database is transformed into IDOL documents.

NOTE: To retrieve information from sub-tables, you must create a template.

If you are not retrieving data from sub-tables, creating a template is optional. Without a template, the connector creates documents where the names of metadata fields match the names of the columns in the database.

The ODBC Connector runs the query defined in its configuration file, and uses the template to create a document for every row that is returned.

NOTE: The template must construct documents that conform to either IDX or Autonomy XML format.

The following is an example template file. Each HTML comment (`<!-- comment -->`) refers to a column name in the query results, and specifies that the information from that column should be inserted:

```
#DRREFERENCE <!--OrderID-->
#DREFIELD OrderDate="<!--Date-->"
#DREFIELD Customer="<!--CustomerID-->"
#DREFIELD Status="<!--Status-->"
#DRECONTENT
Order information
Date Received: <!--Date-->
Status: <!--Status-->
#DREENDDOC
```

A record retrieved from the table might produce the following IDX document:

```
#DRREFERENCE 012345
#DREFIELD OrderDate="16/10/2012 15:27:11"
#DREFIELD Customer="2563"
#DREFIELD Status="Order complete"
#DRECONTENT
```

```
Order information
Date Received: 16/10/2012 15:27:11
Status: Order complete
#DREENDDOC
```

As shown in the example above, you can add information to the document as metadata or content.

If a column in the database contains information that you want to use as the document content (for example a path to a file or base-64 encoded data), you can configure the connector to extract this data by setting the `ContentField` and `ContentFieldType` parameters. In this case, do not include a `DRECONTENT` section in the template.

Sub-Table Template Files

In a database, information about a single subject can be divided between multiple tables. This allows data to be stored more efficiently.

To extract data from multiple tables, you can configure sub-tables by setting the `SubTables` parameter. When you extract data from sub-tables, you need to create a template for the main table and a template for each sub-table.

In the main template file, specify the locations where the data from the sub-tables is included in the document. To do this, insert HTML comments (`<!--comment-->`) where *comment* is the name of a sub-table defined in the configuration file.

For example, if you set `SubTables=Customer` the main template might look like this:

```
#DREREFERENCE <!--OrderID-->
#DREFIELD Date="<!--Date-->"
#DREFIELD CustomerID="<!--CustomerID-->"
#DREFIELD Status="<!--Status-->"
<!--Customer-->
#DRECONTENT
Order information
Date Received: <!--Date-->
Status: <!--Status-->
#DREENDDOC
```

The sub-table template (referenced by `<!--Customer-->`) might look like this:

```
#DREFIELD Customer_Title="<!--Title-->"
#DREFIELD Customer_Name="<!--FirstName--> <!--LastName-->"
```

Each HTML comment in the sub-table template specifies that data should be inserted from a column in the sub table.

When the connector runs a fetch task, the templates are combined and used to create a single document for each row returned by the query. A resulting document might look like this:

```
#DREREFERENCE 012345
#DREFIELD OrderDate="16/10/2012 15:27:11"
#DREFIELD Customer="2563"
```

```
#DREFIELD Status="Order complete"  
#DREFIELD Customer_Title="Mr."  
#DREFIELD Customer_Name="John Smith"  
#DRECONTENT  
Order information  
Date Received: 16/10/2012 15:27:11  
Status: Order complete  
#DREENDDOC
```


Chapter 8: Extract Data from a Database

This section provides examples that demonstrate how to use the ODBC Connector. The examples show how to configure the connector, construct template files, and extract data from multiple tables.

- [Extract Data from a Single Table](#)57
- [Extract Data from Multiple Tables](#)59
- [Extract Data from Multiple Tables using a JOIN](#)62
- [Troubleshoot the Connector](#)65

Extract Data from a Single Table

This example shows how to retrieve data from a single database table:

Table: Orders
OrderID
Date
CustomerID
Status

To retrieve data from a single table

1. Stop the connector.
2. Open the connector's configuration file.
3. Find the [FetchTasks] section and create a new fetch task to extract the data from the table. Set the following parameters:

ConnectionString	The connection string required to connect to the database.
SQL	A SQL statement to retrieve the information from the table. In this example, the SQL statement retrieves every field and every row from the <i>Orders</i> table.
PrimaryKeys	The primary key of the <i>Orders</i> table.
Template	The path to the template file. The template file defines how the data is indexed into IDOL Server.

For example:

```
[Fetchtasks]
Number=1
Ø=ExampleDatabase

[ExampleDatabase]
ConnectionString=...
SQL=select * from orders
PrimaryKeys=OrderID
Template=template.tmp1
```

4. Save and close the configuration file.
5. In a text editor, create the template file:

```
#DRREFERENCE <!--OrderID-->
#DREFIELD OrderDate="<!--Date-->"
#DREFIELD Customer="<!--CustomerID-->"
#DREFIELD Status="<!--Status-->"
#DRECONTENT
Order information
Date Received: <!--Date-->
Status: <!--Status-->
#DREENDDOC
```

The template file defines how data extracted from the table is structured for indexing into IDOL. It must conform to IDX or Autonomy XML format. Each HTML comment in the template is replaced by data extracted from the corresponding column in the table. For more information about template files, see [Construct Template Files, on page 54](#).

6. Save the template file as `template.tmp1` in the connector's installation folder (the name you specified in the configuration file).
7. (Optional) If you want to view the data that is indexed into IDOL Server, configure Connector Framework Server to write an IDX file to disk. For example, in the CFS configuration file:

```
[ImportTasks]
PostØ=IdxWriter:database_records.idx
```

This example produces an IDX file with the name `database_records.idx`, in the CFS installation folder. For more information about Import Tasks, refer to the *Connector Framework Server Administration Guide*.

8. Start the CFS.
9. Start the ODBC Connector.
The ODBC Connector retrieves the data from the database and sends it to CFS.
10. To verify that the data has been extracted successfully, open the file `database_records.idx`.

Extract Data from Multiple Tables

In a relational database, information about a single subject can be divided between multiple tables. This allows data to be stored more efficiently.

Consider the following tables. You might need to extract data from the *Orders* and *Customers* tables:

Table: Orders	Table: Customers
OrderID	CustomerID
Date	Title
CustomerID	FirstName
Status	LastName
	Address1
	Address2
	Town
	Postcode

To extract data from multiple tables, you can use the `SubTables` parameter.

To extract data from multiple tables, complete the following tasks:

- [Configure the Connector, below](#)
- [Modify the Main Template File, on the next page](#)
- [Create the Sub Table Template File, on page 61](#)
- [Start the Connector, on page 61](#)

NOTE: These procedures assume that you have completed the steps in [Extract Data from a Single Table, on page 57](#).

Configure the Connector

This section describes how to use the `SubTables` parameter to retrieve data from a sub-table.

To retrieve data from a sub-table

1. Stop the connector.
2. Open the connector's configuration file and find the `[FetchTasks]` section.

3. Use the `SubTables` parameter to specify the name of a new section in the configuration file. The new section will contain parameters that instruct the connector to extract data from the sub-table. For example:

```
[ExampleDatabase]
ConnectionString=...
SQL=select * from orders
PrimaryKeys=OrderID
Template=template.tpl
SubTables=Customers
```

4. Create the new section, and set the following parameters.

`Template` The path to a template file. The template file defines how the data extracted from the table is indexed into IDOL Server.

`SQL` A SQL statement to retrieve the information from the sub-table.

For example:

```
[Customers]
Template=customers.tpl
SQL=select * from Customers where CustomerID=@CustomerID
```

NOTE: The connector runs this query for every row returned by the main SQL statement (`select * from orders`). The connector automatically replaces `@CustomerID` with the `CustomerID` retrieved from the main table (`orders`).

5. Save and close the configuration file.

Modify the Main Template File

Modify the main template file so that information extracted from the sub-table is inserted into the document.

To modify the main template file

1. Open the main template file in a text editor. In this example, the main template file is `template.tpl`.
2. Specify the location where data from the sub-table is included. To do this, insert an HTML comment (`<!--comment-->`) where `comment` is the name of the section in the configuration file that you specified in the `SubTables` parameter.

For example:

```
#DREREFERENCE <!--OrderID-->
#DREFIELD Date="<!--Date-->"
#DREFIELD CustomerID="<!--CustomerID-->"
#DREFIELD Status="<!--Status-->"
#DRECONTENT
Order information
```

```
Date Received: <!--Date-->  
Status: <!--Status-->
```

```
Customer information  
<!--Customers-->  
#DRENDDOC
```

3. Save and close the main template file.

Create the Sub Table Template File

Create a new template file for the information extracted from the sub table. When the connector runs the fetch task, this template is combined with the main template and used to generate a single document for each row returned from the main table.

To create the sub-table template file

1. In a text editor, create the sub-table template for data extracted from the *Customers* table:

```
Name: <!--Title--> <!--FirstName--> <!--LastName-->  
Address: <!--Address1-->, <!--Town-->, <!--Postcode-->
```

When the connector generates documents, each HTML comment in this template is replaced by data extracted from the corresponding column in the *Customers* sub-table.

2. Save the template as `customers.tmp1` in the connector's installation folder (this was the file name you specified in the configuration file).

Start the Connector

After you have configured the connector and your template files, you can start the connector and verify that the data is extracted successfully.

To start the connector

1. In the ODBC Connector installation folder, delete the file `connector_EXAMPLEDATABASE_datstore.db`. Deleting this file resets the connector so it retrieves the same data again (the data in the database has not changed).
2. Start the connector.
3. To verify that the data has been extracted successfully, open the file `database_records.idx` (in the CFS installation folder). The customer information should now be included in the document, for example:

```
#DRREFERENCE 012345  
#DREFIELD OrderDate="16/10/2012 15:27:11"  
#DREFIELD Customer="2563"  
#DREFIELD Status="Order complete"  
#DRECONTENT  
Order information  
Date Received: 16/10/2012 15:27:11
```

Status: Order complete

Customer information

Name: Mr. John Smith

Address: 1234 North Road, Cambridge, POST1234

#DREENDDOC

NOTE: The main template and the sub-table template have been combined and used to generate a single document, with data from both tables.

Extract Data from Multiple Tables using a JOIN

You can extract data from multiple tables using a JOIN command in your SQL statement.

This example shows how to configure the connector to retrieve data from both the *Items* and *Products* tables of an example database:

Table: Orders	Table: Items	Table: Products
OrderID	OrderID	ProductID
Date	ProductID	ProductName
CustomerID	Quantity	Description
Status		Price

This example includes the following tasks:

- [Configure the Connector, below](#)
- [Modify the Main Template File, on the next page](#)
- [Create the Sub Table Template File, on page 64](#)
- [Start the Connector, on page 64](#)

NOTE: This example assumes that you have completed the steps in [Extract Data from a Single Table, on page 57](#) and [Extract Data from Multiple Tables, on page 59](#).

Configure the Connector

This section describes how to configure the connector to extract data from multiple tables using a JOIN command in your SQL statement.

To extract data from multiple tables using a SQL JOIN

1. Stop the connector.
2. Open the ODBC Connector configuration file, and find the [FetchTasks] section.

```
[FetchTasks]
Number=1
0=ExampleDatabase

[ExampleDatabase]
ConnectionString=...
SQL=select * from orders
PrimaryKeys=OrderID
Template=template.tpl
SubTables=Customers
```

```
[Customers]
Template=customers.tpl
SQL=select * from Customers where CustomerID=@CustomerID
```

3. Modify the SubTables parameter so that it references a new section in the configuration file:

```
SubTables=Customers,ItemDetails
```

4. Create a new section in the configuration file, using the name you specified in the SubTables parameter. In the new section, specify the following parameters:

Template The path to a template file. The template file defines how the data is indexed into IDOL Server.

SQL A SQL statement to retrieve the information from the sub-tables. This example uses a JOIN command to extract data from both the Items and the Products tables.

For example:

```
[ItemDetails]
Template=items.tpl
SQL=SELECT * FROM Items INNER JOIN Products ON products.productID =
items.productID WHERE orderID=@orderID
```

NOTE: The connector runs this query for every row returned by the main query (select * from orders). When the connector runs the query, it automatically replaces @orderID with the OrderID retrieved from the main table (orders).

Modify the Main Template File

Modify the main template file to include the information extracted from the Items and Products tables. This example shows how to insert a reference to the sub-table template.

To modify the main template file

1. Open the main template file in a text editor. In this example, the main template file is `template.tmp1`, in the connector's installation folder.
2. Specify the location where data from the sub-tables should be included. To do this, insert an HTML comment (`<!--comment-->`) where *comment* is the name of the section in the configuration file that you specified in the `SubTables` parameter. For example:

```
#DREREFERENCE <!--OrderID-->
#DREFIELD Date="<!--Date-->"
#DREFIELD CustomerID="<!--CustomerID-->"
#DREFIELD Status="<!--Status-->"
#DRECONTENT
Order information
Date Received: <!--Date-->
Status: <!--Status-->

Customer information
<!--Customers-->

Items
<!--ItemDetails-->
#DREENDDOC
```

3. Save and close the main template file.

Create the Sub Table Template File

This section describes how to create the sub-table template file. This template file defines how the information extracted from the `Items` and `Products` table is structured.

When the connector runs the fetch task, this template is combined with the main template and used to generate a single document for each row returned from the main table (`orders`).

To create the sub-table template file

1. In a text editor, create the sub-table template for data extracted from the `Items` and `Products` tables:

```
ITEM <!--ProductID-->, <!--ProductName-->, QTY <!--Quantity-->, £<!--Price-->
```

Each HTML comment in the sub-table template is replaced by data extracted from the corresponding column (`ProductID`, `ProductName`, and so on) from the joined `Items` and `Products` tables.

2. Save the file as `items.tmp1` in the connector's installation folder (the file name you specified in the configuration file).

Start the Connector

After you have configured the connector and the template files, you can start the connector, and verify that the data is extracted successfully.

To start the connector

1. In the ODBC Connector installation folder, delete the file `connector_EXAMPLEDATABASE_datastore.db`. Deleting this file resets the connector so it retrieves the same data again (the data in the database has not changed).
2. Start the ODBC Connector.
3. To verify that the data has been extracted successfully, open the file `database_records.idx`, in the CFS installation folder. The new information should now be included in the document, for example:

```
#DRREFERENCE 012345
#DREFIELD OrderDate="16/10/2012 15:27:11"
#DREFIELD Customer="2563"
#DREFIELD Status="Order complete"
#DRECONTENT
Order information
Date Received: 16/10/2012 15:27:11
Status: Order complete

Customer information
Name: Mr. John Smith
Address: 1234 North Road, Cambridge, POST1234

Items
ITEM 5001, Item 5001 description, QTY 1, £399
ITEM 5002, Item 5002 description, QTY 1, £29

#DREENDDOC
```

NOTE: The main template and the two sub-table templates (for customer information and item information) have been combined and used to generate a single document.

In this example, the Item Details query has also returned two rows from the combined Items and Products tables.

Troubleshoot the Connector

This section describes how to troubleshoot common problems that might occur when you set up the ODBC Connector.

Use 64-bit ODBC Drivers

You must use a 64-bit ODBC driver. On Windows, define your Data Source Name (DSN) in the 64-bit ODBC Data Source Administration utility.

The number of connections is exceeded when using sub tables

The ODBC Connector opens a new connection to retrieve data from each sub-table that you specify in the connector's configuration file. However, some ODBC implementations limit the number of

connections. If this occurs, you can set the configuration parameter `UseSingleConnectionForSubtables` to `true`. This ensures that the connector uses only one connection for retrieving data from sub-tables.

Data is not returned as expected

If the connector does not return the data you expect, use a SQL tool or interface to run the query that you entered in the connector's configuration file. Check that the data returned matches what you want to retrieve. The connector cannot retrieve XML data types, but you can modify your `SELECT` statement to convert these data types into strings.

The connector does not populate a document field with the data from a content field

This is expected behavior. The information in the content field (specified by the `ContentField` parameter) is used to populate the document content. If your content field contains a file path and you want to write the path to a document field, you can modify your SQL query to return the column under another name. For example:

```
SELECT myfield, myfield AS "anotherfield" FROM tablename...
```

Then, in your template file, specify the alternate name:

```
#DREFIELD MyFieldName="<!--anotherfield-->"
```

Retrieve BLOB values from an IBM DB2 database ("unsupported column data type" error)

The connector might fail to retrieve BLOB data from an IBM DB2 database, and write the following message to the synchronize log:

```
Unsupported column data type
```

This is due to the data types returned by the IBM DB2 ODBC driver. To resolve this issue, set `LongDataCompat=1` in the DB2 ODBC driver configuration file `db2cli.ini`. This changes the types that are returned. For more information about this parameter, refer to the IBM DB2 documentation.

Conversion failed when converting from a character string to uniqueidentifier (SQL Server)

SQL Server has a `uniqueidentifier` column type. When the ODBC Connector retrieves data from the database, these values are automatically converted into strings. This is suitable for indexing the data into IDOL. However, you might want to use the value of a `uniqueidentifier` column when sending a query to a sub-table. For example:

```
SQL=SELECT id, something_else FROM table WHERE id = '@id'
```

In this case, you might see the error **Conversion failed when converting from a character string to uniqueidentifier**. This is because the query is executed server-side and the data types no longer match. The value sent by the connector, replacing the `@id` placeholder, is a string and not a `uniqueidentifier`. You can modify your query so that SQL Server converts a `uniqueidentifier` type into a string. For example:

```
SQL=SELECT id, something_else FROM table WHERE CONVERT(nvarchar(50), id) = '@id'
```

The server then attempts to compare two strings and the query is successful.

Known issue with Microsoft SQL Server ODBC Driver and OpenSSL on Linux

Some versions of the Microsoft ODBC driver for SQL Server load OpenSSL dynamically (using the latest version installed on the system). With some versions of the driver, if the versions of OpenSSL used by the application and driver are different, the application (the connector) can

terminate unexpectedly on startup. The workaround is to update the system version of OpenSSL to match what the connector uses. In some Linux distributions this might involve building OpenSSL from source. For more information, see the [Microsoft ODBC driver documentation](#). For information about the version of OpenSSL used in IDOL components, refer to the IDOL Open Source and Third-Party Components documentation.

Chapter 9: Manipulate Documents

This section describes how to manipulate documents that are created by the connector and sent for ingestion.

- [Introduction](#) 68
- [Add a Field to Documents using an Ingest Action](#) 68
- [Customize Document Processing](#) 69
- [Standardize Field Names](#) 70
- [Run Lua Scripts](#) 75
- [Example Lua Scripts](#) 78

Introduction

IDOL Connectors retrieve data from repositories and create documents that are sent to Connector Framework Server or another connector. You might want to manipulate the documents that are created. For example, you can:

- Add or modify document fields, to change the information that is indexed into IDOL Server.
- Add fields to a document to customize the way the document is processed by CFS.
- Convert information into another format so that it can be inserted into another repository by a connector that supports the Insert action.

When a connector sends documents to CFS, the documents only contain metadata extracted from the repository by the connector (for example, the location of the original files). To modify data extracted by KeyView, you must modify the documents using CFS. For information about how to manipulate documents with CFS, refer to the *Connector Framework Server Administration Guide*.

Add a Field to Documents using an Ingest Action

To add a field to all documents retrieved by a fetch task, or all documents sent for ingestion, you can use an Ingest Action.

NOTE: To add a field only to selected documents, use a Lua script (see [Run Lua Scripts, on page 75](#)). For an example Lua script that demonstrates how to add a field to a document, see [Add a Field to a Document, on page 78](#).

To add a field to documents using an Ingest Action

1. Open the connector's configuration file.
2. Find one of the following sections in the configuration file:
 - To add the field to all documents retrieved by a specific fetch task, find the `[TaskName]` section.
 - To add a field to all documents that are sent for ingestion, find the `[Ingestion]` section.

NOTE: If you set the `IngestActions` parameter in a `[TaskName]` section, the connector does not run any `IngestActions` set in the `[Ingestion]` section for documents retrieved by that task.

3. Use the `IngestActions` parameter to specify the name of the field to add, and the field value. For example, to add a field named `AUTN_NO_EXTRACT`, with the value `SET`, type:

```
IngestActions0=META:AUTN_NO_EXTRACT=SET
```

4. Save and close the configuration file.

Customize Document Processing

You can add the following fields to a document to control how the document is processed by CFS. Unless stated otherwise, you can add the fields with any value.

AUTN_FILTER_META_ONLY

Prevents KeyView extracting file content from a file. KeyView only extracts metadata and adds this information to the document.

AUTN_NO_FILTER

Prevents KeyView extracting file content and metadata from a file. You can use this field if you do not want to extract text from certain file types.

AUTN_NO_EXTRACT

Prevents KeyView extracting subfiles. You can use this field to prevent KeyView extracting the contents of ZIP archives and other container files.

AUTN_NEEDS_MEDIA_SERVER_ANALYSIS

Identifies media files (images, video, and documents such as PDF files that contain embedded images) that you want to send to Media Server for analysis, using a `MediaServerAnalysis` import task. You do not need to add this field if you are using a Lua script to run media analysis. For more information about running analysis on media, refer to the *Connector Framework Server Administration Guide*.

Standardize Field Names

Field standardization modifies documents so that they have a consistent structure and consistent field names. You can use field standardization so that documents indexed into IDOL through different connectors use the same fields to store the same type of information.

For example, documents created by the File System Connector can have a field named `FILEOWNER`. Documents created by the Documentum Connector can have a field named `owner_name`. Both of these fields store the name of the person who owns a file. Field standardization renames the fields so that they have the same name.

Field standardization only modifies fields that are specified in a dictionary, which is defined in XML format. A standard dictionary, named `dictionary.xml`, is supplied in the installation folder of every connector. If a connector does not have any entries in the dictionary, field standardization has no effect.

Configure Field Standardization

IDOL Connectors have several configuration parameters that control field standardization. All of these are set in the `[Connector]` section of the configuration file:

- `EnableFieldNameStandardization` specifies whether to run field standardization.
- `FieldNameDictionaryPath` specifies the path of the dictionary file to use.
- `FieldNameDictionaryNode` specifies the rules to use. The default value for this parameter matches the name of the connector, and Micro Focus recommends that you do not change it. This prevents one connector running field standardization rules that are intended for another.

To configure field standardization, use the following procedure.

NOTE: You can also configure CFS to run field standardization. To standardize all field names, you must run field standardization from both the connector and CFS.

To enable field standardization

1. Stop the connector.
2. Open the connector's configuration file.
3. In the `[Connector]` section, set the following parameters:

`EnableFieldNameStandardization` A Boolean value that specifies whether to enable field standardization. Set this parameter to **true**.

`FieldNameDictionaryPath` The path to the dictionary file that contains the rules to use to standardize documents. A standard dictionary is

included with the connector and is named `dictionary.xml`.

For example:

```
[Connector]
EnableFieldNameStandardization=true
FieldNameDictionaryPath=dictionary.xml
```

4. Save the configuration file and restart the connector.

Customize Field Standardization

Field standardization modifies documents so that they have a consistent structure and consistent field names. You can use field standardization so that documents indexed into IDOL through different connectors use the same fields to store the same type of information. Field standardization only modifies fields that are specified in a dictionary, which is defined in XML format. A standard dictionary, named `dictionary.xml`, is supplied in the installation folder of every connector.

In most cases you should not need to modify the standard dictionary, but you can modify it to suit your requirements or create dictionaries for different purposes. By modifying the dictionary, you can configure the connector to apply rules that modify documents before they are ingested. For example, you can move fields, delete fields, or change the format of field values.

The following examples demonstrate how to perform some operations with field standardization.

The following rule renames the field `Author` to `DOCUMENT_METADATA_AUTHOR_STRING`. This rule applies to all components that run field standardization and applies to all documents.

```
<FieldStandardization>
  <Field name="Author">
    <Move name="DOCUMENT_METADATA_AUTHOR_STRING"/>
  </Field>
</FieldStandardization>
```

The following rule demonstrates how to use the `Delete` operation. This rule instructs CFS to remove the field `KeyviewVersion` from all documents (the `Product` element with the attribute `key="ConnectorFramework"` ensures that this rule is run only by CFS).

```
<FieldStandardization>
  <Product key="ConnectorFramework">
    <Field name="KeyviewVersion">
      <Delete/>
    </Field>
  </Product>
</FieldStandardization>
```

There are several ways to select fields to process using the `Field` element.

Field element attribute	Description	Example
-------------------------	-------------	---------

name	Select a field where the field name matches a fixed value.	<p>Select the field MyField:</p> <pre><Field name="MyField"> ... </Field></pre> <p>Select the field Subfield, which is a subfield of MyField:</p> <pre><Field name="MyField"> <Field name="Subfield"> ... </Field> </Field></pre>
path	Select a field where its path matches a fixed value.	<p>Select the field Subfield, which is a subfield of MyField.</p> <pre><Field path="MyField/Subfield"> ... </Field></pre>
nameRegex	Select all fields at the current depth where the field name matches a regular expression.	<p>In this case the field name must begin with the word File:</p> <pre><Field nameRegex="File.*"> ... </Field></pre>
pathRegex	<p>Select all fields where the path of the field matches a regular expression.</p> <p>This operation can be inefficient because every metadata field must be checked. If possible, select the fields to process another way.</p>	<p>This example selects all subfields of MyField.</p> <pre><Field pathRegex="MyField/[^/]*"> ... </Field></pre> <p>This approach would be more efficient:</p> <pre><Field name="MyField"> <Field nameRegex=".*"> ... </Field> </Field></pre>

You can also limit the fields that are processed based on their value, by using one of the following:

Field element attribute	Description	Example
matches	Process a field if its value matches a fixed value.	<p>Process a field named MyField, if its value matches abc.</p> <pre><Field name="MyField" matches="abc"></pre>

		<pre> ... </Field> </pre>
matchesRegex	Process a field if its entire value matches a regular expression.	<pre> Process a field named MyField, if its value matches one or more digits. <Field name="MyField" matchesRegex="\d+"> ... </Field> </pre>
containsRegex	Process a field if its value contains a match to a regular expression.	<pre> Process a field named MyField if its value contains three consecutive digits. <Field name="MyField" containsRegex="\d{3}"> ... </Field> </pre>

The following rule deletes every field or subfield where the name of the field or subfield begins with temp.

```

<FieldStandardization>
  <Field pathRegex="(.*\/)?temp[^\/*]*">
    <Delete/>
  </Field>
</FieldStandardization>
  
```

The following rule instructs CFS to rename the field Author to DOCUMENT_METADATA_AUTHOR_STRING, but only when the document contains a field named DocumentType with the value 230 (the KeyView format code for a PDF file).

```

<FieldStandardization>
  <Product key="ConnectorFrameWork">
    <IfField name="DocumentType" matches="230"> <!-- PDF -->
      <Field name="Author">
        <Move name="DOCUMENT_METADATA_AUTHOR_STRING"/>
      </Field>
    </IfField>
  </Product>
</FieldStandardization>
  
```

TIP: In this example, the IfField element is used to check the value of the DocumentType field. The IfField element does not change the current position in the document. If you used the Field element, field standardization would attempt to find an Author field that is a subfield of DocumentType, instead of finding the Author field at the root of the document.

The following rules demonstrate how to use the ValueFormat operation to change the format of dates. The first rule transforms the value of a field named CreatedDate. The second rule transforms the value of an attribute named Created, on a field named Date.

```

<FieldStandardization>
  <Field name="CreatedDate">
    <ValueFormat type="autndate" format="YYYY-SHORTMONTH-DD HH:NN:SS"/>
  </Field>
</FieldStandardization>
  
```



```
<GetValue var="value"/>
<Field fieldId="parent">
  <AddField name="'name'" value="'value'"/>
</Field>
<Delete/>
</Attribute>
</Field>
</FieldStandardization>
```

The following rule demonstrates how to move all of the subfields of `UnwantedParentField` to the root of the document, and then delete the field `UnwantedParentField`.

```
<FieldStandardization id="root">
  <Product key="MyConnector">
    <Field name="UnwantedParentField">
      <Field nameRegex=".*">
        <Move destId="root"/>
      </Field>
      <Delete/>
    </Field>
  </Product>
</FieldStandardization>
```

Run Lua Scripts

IDOL Connectors can run custom scripts written in Lua, an embedded scripting language. You can use Lua scripts to process documents that are created by a connector, before they are sent to CFS and indexed into IDOL Server. For example, you can:

- Add or modify document fields.
- Manipulate the information that is indexed into IDOL.
- Call out to an external service, for example to alert a user.

There might be occasions when you do not want to send documents to a CFS. For example, you might use the `Collect` action to retrieve documents from one repository and then insert them into another. You can use a Lua script to transform the documents from the source repository so that they can be accepted by the destination repository.

To run a Lua script from a connector, use one of the following methods:

- Set the `IngestActions` configuration parameter in the connector's configuration file. For information about how to do this, see [Run a Lua Script using an Ingest Action, on page 77](#). The connector runs ingest actions on documents before they are sent for ingestion.
- Set the `IngestActions` action parameter when using the `Synchronize` action.
- Set the `CollectActions` action parameter when using the `Collect` action.

Write a Lua Script

A Lua script that is run from a connector must have the following structure:

```
function handler(config, document, params)
    ...
end
```

The handler function is called for each document and is passed the following arguments:

Argument	Description
config	A LuaConfig object that you can use to retrieve the values of configuration parameters from the connector's configuration file.
document	A LuaDocument object. The document object is an internal representation of the document being processed. Modifying this object changes the document.
params	The params argument is a table that contains additional information provided by the connector: <ul style="list-style-type: none">• TYPE. The type of task being performed. The possible values are ADD, UPDATE, DELETE, or COLLECT.• SECTION. The name of the section in the configuration file that contains configuration parameters for the task.• FILENAME. The document filename. The Lua script can modify this file, but must not delete it.• OWNFILE. Indicates whether the connector (and CFS) has ownership of the file. A value of true means that CFS deletes the file after it has been processed.

The following script demonstrates how you can use the config and params arguments:

```
function handler(config, document, params)
    -- Write all of the additional information to a log file
    for k,v in pairs(params) do
        log("logfile.txt", k..": "..tostring(v))
    end

    -- The following lines set variables from the params argument
    type = params["TYPE"]
    section = params["SECTION"]
    filename = params["FILENAME"]

    -- Read a configuration parameter from the configuration file
    -- If the parameter is not set, "DefaultValue" is returned
    val = config:getValue(section, "Parameter", "DefaultValue")

    -- If the document is not being deleted, set the field FieldName
    -- to the value of the configuration parameter
```

```
if type ~= "DELETE" then
    document:setFieldValue("FieldName", val)
end

-- If the document has a file (that is, not just metadata),
-- copy the file to a new location and write a stub idx file
-- containing the metadata.
if filename ~= "" then
    copytofilename = "./out/"..create_uuid(filename)
    copy_file(filename, copytofilename)
    document:writeStubIdx(copytofilename..".idx")
end

return true
end
```

For the connector to continue processing the document, the handler function must return **true**. If the function returns **false**, the document is discarded.

TIP: You can write a library of useful functions to share between multiple scripts. To include a library of functions in a script, add the code `dofile("library.lua")` to the top of the lua script, outside of the handler function.

Run a Lua Script using an Ingest Action

To run a Lua script on documents that are sent for ingestion, use an Ingest Action.

To run a Lua script using an Ingest Action

1. Open the connector's configuration file.
2. Find one of the following sections in the configuration file:
 - To run a Lua script on all documents retrieved by a specific task, find the [TaskName] section.
 - To run a Lua script on all documents that are sent for ingestion, find the [Ingestion] section.

NOTE: If you set the IngestActions parameter in a [TaskName] section, the connector does not run any IngestActions set in the [Ingestion] section for that task.

3. Use the IngestActions parameter to specify the path to your Lua script. For example:

```
IngestActions=LUA:C:\Autonomy\myScript.lua
```

4. Save and close the configuration file.

Related Topics

- [Write a Lua Script, on the previous page](#)

Example Lua Scripts

This section contains example Lua scripts.

- [Add a Field to a Document, below](#)
- [Merge Document Fields, below](#)

Add a Field to a Document

The following script demonstrates how to add a field named "MyField" to a document, with a value of "MyValue".

```
function handler(config, document, params)
    document:addField("MyField", "MyValue");
    return true;
end
```

The following script demonstrates how to add the field AUTN_NEEDS_MEDIA_SERVER_ANALYSIS to all JPEG, TIFF and BMP documents. This field indicates to CFS that the file should be sent to a Media Server for analysis (you must also define the MediaServerAnalysis task in the CFS configuration file).

The script finds the file type using the DRREFERENCE document field, so this field must contain the file extension for the script to work correctly.

```
function handler(config, document, params)
    local extensions_for_ocr = { jpg = 1 , tif = 1, bmp = 1 };
    local filename = document:getFieldValue("DRREFERENCE");
    local extension, extension_found = filename:gsub("^.*%.(%w+)$", "%1", 1);

    if extension_found > 0 then
        if extensions_for_ocr[extension:lower()] ~= nil then
            document:addField("AUTN_NEEDS_MEDIA_SERVER_ANALYSIS", "");
        end
    end

    return true;
end
```

Merge Document Fields

This script demonstrates how to merge the values of document fields.

When you extract data from a repository, the connector can produce documents that have multiple values for a single field, for example:

```
#DREFIELD ATTACHMENT="attachment.txt"  
#DREFIELD ATTACHMENT="image.jpg"  
#DREFIELD ATTACHMENT="document.pdf"
```

This script shows how to merge the values of these fields, so that the values are contained in a single field, for example:

```
#DREFIELD ATTACHMENTS="attachment.txt, image.jpg, document.pdf"
```

Example Script

```
function handler(config, document, params)  
    onefield(document,"ATTACHMENT","ATTACHMENTS")  
    return true;  
end  
  
function onefield(document,existingfield,newfield)  
    if document:hasField(existingfield) then  
        local values = { document:getFieldValues(existingfield) }  
  
        local newfieldvalue=""  
        for i,v in ipairs(values) do  
            if i>1 then  
                newfieldvalue = newfieldvalue ..", "  
            end  
  
            newfieldvalue = newfieldvalue..v  
        end  
  
        document:addField(newfield,newfieldvalue)  
    end  
  
    return true;  
end
```

Chapter 10: Ingestion

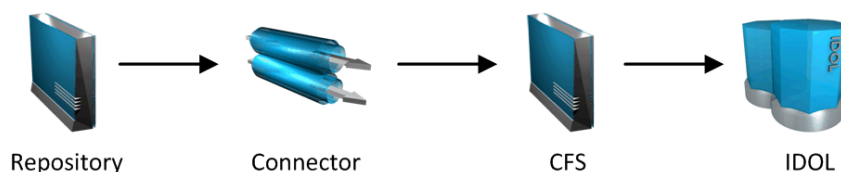
After a connector finds new documents in a repository, or documents that have been updated or deleted, it sends this information to another component called the *ingestion target*. This section describes where you can send the information retrieved by the ODBC Connector, and how to configure the ingestion target.

- [Introduction](#) 80
- [Send Data to Connector Framework Server](#) 81
- [Send Data to Another Repository](#) 82
- [Index Documents Directly into IDOL Server](#) 83
- [Index Documents into Vertica](#) 84
- [Send Data to a MetaStore](#) 87
- [Run a Lua Script after Ingestion](#) 88

Introduction

A connector can send information to a single ingestion target, which could be:

- **Connector Framework Server.** To process information and then index it into IDOL or Vertica, send the information to a Connector Framework Server (CFS). Any files retrieved by the connector are *imported* using KeyView, which means the information contained in the files is converted into a form that can be indexed. If the files are containers that contain *subfiles*, these are extracted. You can manipulate and enrich documents using Lua scripts and automated tasks such as field standardization, image analysis, and speech-to-text processing. CFS can index your documents into one or more indexes. For more information about CFS, refer to the *Connector Framework Server Administration Guide*.



- **Another Connector.** Use another connector to keep another repository up-to-date. When a connector receives documents, it inserts, updates, or deletes the information in the repository. For example, you could use an Exchange Connector to extract information from Microsoft Exchange, and send the documents to a Notes Connector so that the information is inserted, updated, or deleted in the Notes repository.

NOTE: The destination connector can only insert, update, and delete documents if it supports the insert, update, and delete fetch actions.

In most cases Micro Focus recommends ingesting documents through CFS, so that KeyView can extract content from any files retrieved by the connector and add this information to your documents. You can also use CFS to manipulate and enrich documents before they are indexed. However, if required you can configure the connector to index documents directly into:

- **IDOL Server.** You might index documents directly into IDOL Server when your connector produces metadata-only documents (documents that do not have associated files). In this case there is no need for the documents to be imported. Connectors that can produce metadata-only documents include ODBC Connector and Oracle Connector.
- **Vertica.** The metadata extracted by connectors is structured information held in structured fields, so you might use Vertica to analyze this information.
- **MetaStore.** You can index document metadata into a MetaStore for records management.

Send Data to Connector Framework Server

This section describes how to configure ingestion into Connector Framework Server (CFS).

To send data to a CFS

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. In the [Ingestion] section, set the following parameters:

`EnableIngestion` To enable ingestion, set this parameter to **true**.

`IngestType` To send data to CFS, set this parameter to **CFS**.

`IngestHost` The host name or IP address of the CFS.

`IngestPort` The ACI port of the CFS.

For example:

```
[Ingestion]
EnableIngestion=True
IngestType=CFS
IngestHost=localhost
IngestPort=7000
```

4. (Optional) If you are sending documents to CFS for indexing into IDOL Server, set the `IndexDatabase` parameter. When documents are indexed, IDOL adds each document to the database specified in the document's DREDBNAME field. The connector sets this field for each document, using the value of `IndexDatabase`.

`IndexDatabase` The name of the IDOL database into which documents are indexed. Ensure that this database exists in the IDOL Server configuration file.

- To index all documents retrieved by the connector into the same IDOL database, set this parameter in the [Ingestion] section.
 - To use a different database for documents retrieved by each task, set this parameter in the *TaskName* section.
5. Save and close the configuration file.

Send Data to Another Repository

You can configure a connector to send the information it retrieves to another connector. When the destination connector receives the documents, it inserts them into another repository. When documents are updated or deleted in the source repository, the source connector sends this information to the destination connector so that the documents can be updated or deleted in the other repository.

NOTE: The destination connector can only insert, update, and delete documents if it supports the insert, update, and delete fetch actions.

To send data to another connector for ingestion into another repository

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. In the [Ingestion] section, set the following parameters:

<code>EnableIngestion</code>	To enable ingestion, set this parameter to true .
<code>IngesterType</code>	To send data to another repository, set this parameter to Connector .
<code>IngestHost</code>	The host name or IP address of the machine hosting the destination connector.
<code>IngestPort</code>	The ACI port of the destination connector.
<code>IngestActions</code>	Set this parameter so that the source connector runs a Lua script to convert documents into form that can be used with the destination connector's insert action. For information about the required format, refer to the Administration Guide for the destination connector.

For example:

```
[Ingestion]
EnableIngestion=True
IngesterType=Connector
IngestHost=AnotherConnector
IngestPort=7010
IngestActions=Lua:transformation.lua
```

4. Save and close the configuration file.

Index Documents Directly into IDOL Server

This section describes how to index documents from a connector directly into IDOL Server.

TIP: In most cases, Micro Focus recommends sending documents to a Connector Framework Server (CFS). CFS extracts metadata and content from any files that the connector has retrieved, and can manipulate and enrich documents before they are indexed. CFS also has the capability to insert documents into more than one index, for example IDOL Server and a Vertica database. For information about sending documents to CFS, see [Send Data to Connector Framework Server, on page 81](#)

To index documents directly into IDOL Server

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. In the [Ingestion] section, set the following parameters:

`EnableIngestion` To enable ingestion, set this parameter to **true**.

`IngesterType` To send data to IDOL Server, set this parameter to **Indexer**.

`IndexDatabase` The name of the IDOL database to index documents into.

For example:

```
[Ingestion]
EnableIngestion=True
IngesterType=Indexer
IndexDatabase=News
```

4. In the [Indexing] section of the configuration file, set the following parameters:

`IndexerType` To send data to IDOL Server, set this parameter to **IDOL**.

`Host` The host name or IP address of the IDOL Server.

`Port` The IDOL Server ACI port.

`SSLConfig` (Optional) The name of a section in the connector's configuration file that contains SSL settings for connecting to IDOL.

For example:

```
[Indexing]
IndexerType=IDOL
Host=10.1.20.3
Port=9000
```

```
SSLConfig=SSLOptions
```

```
[SSLOptions]  
SSLMethod=SSLV23
```

5. Save and close the configuration file.

Index Documents into Vertica

ODBC Connector can index documents into Vertica, so that you can run queries on structured fields (document metadata).

Depending on the metadata contained in your documents, you could investigate the average age of documents in a repository. You might want to answer questions such as: How much time has passed since the documents were last updated? How many files are regularly updated? Does this represent a small proportion of the total number of documents? Who are the most active users?

TIP: In most cases, Micro Focus recommends sending documents to a Connector Framework Server (CFS). CFS extracts metadata and content from any files that the connector has retrieved, and can manipulate and enrich documents before they are indexed. CFS also has the capability to insert documents into more than one index, for example IDOL Server and a Vertica database. For information about sending documents to CFS, see [Send Data to Connector Framework Server, on page 81](#)

Prerequisites

- ODBC Connector supports indexing into Vertica 7.1 and later.
- You must install the appropriate Vertica ODBC drivers (version 7.1 or later) on the machine that hosts ODBC Connector. If you want to use an ODBC Data Source Name (DSN) in your connection string, you will also need to create the DSN. For more information about installing Vertica ODBC drivers and creating the DSN, refer to the [Vertica documentation](#).

New, Updated and Deleted Documents

When documents are indexed into Vertica, ODBC Connector adds a timestamp that contains the time when the document was indexed. The field is named `VERTICA_INDEXER_TIMESTAMP` and the timestamp is in the format `YYYY-MM-DD HH:NN:SS`.

When a document in a data repository is modified, ODBC Connector adds a new record to the database with a new timestamp. All of the fields are populated with the latest data. The record describing the older version of the document is not deleted. You can create a projection to make sure your queries only return the latest record for a document.

When ODBC Connector detects that a document has been deleted from a repository, the connector inserts a new record into the database. The record contains only the `DREREFERENCE` and the field `VERTICA_INDEXER_DELETED` set to `TRUE`.

Fields, Sub-Fields, and Field Attributes

Documents that are created by connectors can have multiple levels of fields, and field attributes. A database table has a flat structure, so this information is indexed into Vertica as follows:

- Document fields become columns in the flex table. An IDOL document field and the corresponding database column have the same name.
- Sub-fields become columns in the flex table. A document field named `my_field` with a sub-field named `subfield` results in two columns, `my_field` and `my_field.subfield`.
- Field attributes become columns in the flex table. A document field named `my_field`, with an attribute named `my_attribute` results in two columns, `my_field` holding the field value and `my_field.my_attribute` holding the attribute value.

Prepare the Vertica Database

Indexing documents into a standard database is problematic, because documents do not have a fixed schema. A document that represents an image has different metadata fields to a document that represents an e-mail message. Vertica databases solve this problem with *flex tables*. You can create a flex table without any column definitions, and you can insert a record regardless of whether a referenced column exists.

You must create a flex table before you index data into Vertica.

When creating the table, consider the following:

- Flex tables store entire records in a single column named `__raw__`. The default maximum size of the `__raw__` column is 128K. You might need to increase the maximum size if you are indexing documents with large amounts of metadata.
- Documents are identified by their `DRREFERENCE`. Micro Focus recommends that you do not restrict the size of any column that holds this value, because this could result in values being truncated. As a result, rows that represent different documents might appear to represent the same document. If you do restrict the size of the `DRREFERENCE` column, ensure that the length is sufficient to hold the longest `DRREFERENCE` that might be indexed.

To create a flex table without any column definitions, run the following query:

```
create flex table my_table();
```

To improve query performance, create real columns for the fields that you query frequently. For documents indexed by a connector, this is likely to include the `DRREFERENCE`:

```
create flex table my_table(DRREFERENCE varchar NOT NULL);
```

You can add new column definitions to a flex table at any time. Vertica automatically populates new columns with values for existing records. The values for existing records are extracted from the `__raw__` column.

For more information about creating and using flex tables, refer to the [Vertica Documentation](#) or contact Vertica technical support.

Send Data to Vertica

To send documents to a Vertica database, follow these steps.

To send data to Vertica

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. In the [Ingestion] section, set the following parameters:

`EnableIngestion` To enable ingestion, set this parameter to **true**.

`IngesterType` To send data to a Vertica database, set this parameter to **Indexer**.

For example:

```
[Ingestion]
EnableIngestion=TRUE
IngesterType=Indexer
```

4. In the [Indexing] section, set the following parameters:

`IndexerType` To send data to a Vertica database, set this parameter to **Library**.

`LibraryDirectory` The directory that contains the library to use to index data.

`LibraryName` The name of the library to use to index data. You can omit the `.dll` or `.so` file extension. Set this parameter to **verticaIndexer**.

`ConnectionString` The connection string to use to connect to the Vertica database.

`TableName` The name of the table in the Vertica database to index the documents into. The table must be a flex table and must exist before you start indexing documents. For more information, see [Prepare the Vertica Database, on the previous page](#).

For example:

```
[Indexing]
IndexerType=Library
LibraryDirectory=indexerdlls
LibraryName=verticaIndexer
ConnectionString=DSN=VERTICA
TableName=my_flex_table
```

5. Save and close the configuration file.

Send Data to a MetaStore

You can configure a connector to send documents to a MetaStore. When you send data to a Metastore, any files associated with documents are ignored.

TIP: In most cases, Micro Focus recommends sending documents to a Connector Framework Server (CFS). CFS extracts metadata and content from any files that the connector has retrieved, and can manipulate and enrich documents before they are indexed. CFS also has the capability to insert documents into more than one index, for example IDOL Server and a MetaStore. For information about sending documents to CFS, see [Send Data to Connector Framework Server, on page 81](#)

To send data to a MetaStore

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. In the [Ingestion] section, set the following parameters:

`EnableIngestion` To enable ingestion, set this parameter to **true**.

`IngestionType` To send data to a MetaStore, set this parameter to **Indexer**.

For example:

```
[Ingestion]
EnableIngestion=True
IngestionType=Indexer
```

4. In the [Indexing] section, set the following parameters:

`IndexerType` To send data to a MetaStore, set this parameter to **MetaStore**.

`Host` The host name of the machine hosting the MetaStore.

`Port` The port of the MetaStore.

For example:

```
[Indexing]
IndexerType=Metastore
Host=MyMetaStore
Port=8000
```

5. Save and close the configuration file.

Run a Lua Script after Ingestion

You can configure the connector to run a Lua script after batches of documents are successfully sent to the ingestion server. This can be useful if you need to log information about documents that were processed, for monitoring and reporting purposes.

To configure the file name of the Lua script to run, set the `IngestBatchActions` configuration parameter in the connector's configuration file.

- To run the script for all batches of documents that are ingested, set the parameter in the `[Ingestion]` section.
- To run the script for batches of documents retrieved by a specific task, set the parameter in the `[TaskName]` section.

NOTE: If you set the parameter in a `[TaskName]` section, the connector does not run any scripts specified in the `[Ingestion]` section for that task.

For example:

```
[Ingestion]
IngestBatchActions0=LUA:./scripts/myScript.lua
```

For more information about this parameter, refer to the *ODBC Connector Reference*.

The Lua script must have the following structure:

```
function batchhandler(documents, ingesttype)
    ...
end
```

The `batchhandler` function is called after each batch of documents is sent to the ingestion server. The function is passed the following arguments:

Argument	Description
<code>documents</code>	A table of document objects, where each object represents a document that was sent to the ingestion server. A document object is an internal representation of a document. You can modify the document object and this changes the document. However, as the script runs after the documents are sent to the ingestion server, any changes you make are not sent to CFS or IDOL.
<code>ingesttype</code>	A string that contains the ingest type for the documents. The <code>batchhandler</code> function is called multiple times if different document types are sent.

For example, the following script prints the ingest type (ADD, DELETE, or UPDATE) and the reference for all successfully processed documents to `stdout`:


```
function batchhandler(documents, ingesttype)
  for i,document in ipairs(documents) do
    local ref = document:getReference()
    print(ingesttype..": "..ref)
  end
end
```

Chapter 11: Monitor the Connector

This section describes how to monitor the connector.

• IDOL Admin	90
• View Connector Statistics	92
• Use the Connector Logs	93
• Monitor the Progress of a Task	95
• Monitor Asynchronous Actions using Event Handlers	97
• Set Up Performance Monitoring	99
• Set Up Document Tracking	101

IDOL Admin

IDOL Admin is an administration interface for performing ACI server administration tasks, such as gathering status information, monitoring performance, and controlling the service. IDOL Admin provides an alternative to constructing actions and sending them from your web browser.

Prerequisites

ODBC Connector includes the `admin.dat` file that is required to run IDOL Admin.

IDOL Admin supports the following browsers:

- Edge
- Chrome (latest version)
- Firefox (latest version)

Install IDOL Admin

You must install IDOL Admin on the same host that the ACI server or component is installed on. To set up a component to use IDOL Admin, you must configure the location of the `admin.dat` file and enable Cross Origin Resource Sharing.

To install IDOL Admin

1. Stop the ACI server.
2. Save the `admin.dat` file to any directory on the host.
3. Using a text editor, open the ACI server or component configuration file. For the location of the

configuration file, see the ACI server documentation.

4. In the [Paths] section of the configuration file, set the AdminFile parameter to the location of the admin.dat file. If you do not set this parameter, the ACI server attempts to find the admin.dat file in its working directory when you call the IDOL Admin interface.
5. Enable Cross Origin Resource Sharing.
6. In the [Service] section, add the Access-Control-Allow-Origin parameter and set its value to the URLs that you want to use to access the interface.

Each URL must include:

- the http:// or https:// prefix

NOTE: URLs can contain the https:// prefix if the ACI server or component has SSL enabled.

- The host that IDOL Admin is installed on
- The ACI port of the component that you are using IDOL Admin for

Separate multiple URLs with spaces.

For example, you could specify different URLs for the local host and remote hosts:

```
Access-Control-Allow-Origin=http://localhost:9010  
http://Computer1.Company.com:9010
```

Alternatively, you can set Access-Control-Allow-Origin=*, which allows you to access IDOL Admin using any valid URL (for example, localhost, direct IP address, or the host name). The wildcard character (*) is supported only if no other entries are specified.

If you do not set the Access-Control-Allow-Origin parameter, IDOL Admin can communicate only with the server's ACI port, and not the index or service ports.

7. Start the ACI server.

You can now access IDOL Admin (see [Access IDOL Admin, below](#)).

Access IDOL Admin

You access IDOL Admin from a web browser. You can access the interface only through URLs that are set in the Access-Control-Allow-Origin parameter in the ACI server or component configuration file. For more information about configuring URL access, see [Install IDOL Admin, on the previous page](#).

To access IDOL Admin

- Type the following URL into the address bar of your web browser:

```
http://host:port/action=admin
```

where:

host is the host name or IP address of the machine where the IDOL component is installed.

port is the ACI port of the IDOL component you want to administer.

View Connector Statistics

ODBC Connector collects statistics about the work it has completed. The statistics that are available depend on the connector you are using, but all connectors provide information about the number and frequency of ingest-adds, ingest-updates, and ingest-deletes.

To view connector statistics

- Use the `GetStatistics` service action, for example:

```
http://host:serviceport/action=GetStatistics
```

where *host* is the host name or IP address of the machine where the connector is installed, and *serviceport* is the connector's service port.

For information about the statistics that are returned, refer to the documentation for the `GetStatistics` service action.

The connector includes an XSL template (`ConnectorStatistics.tmp1`) that you can use to visualize the statistics. You can use the template by adding the `template` parameter to the request:

```
http://host:serviceport/action=GetStatistics&template=ConnectorStatistics
```

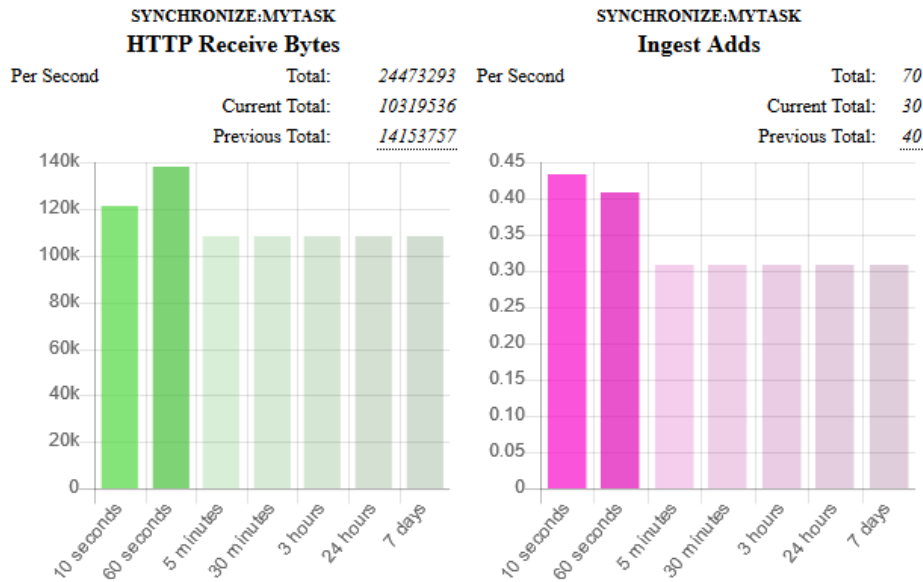
When you are using the `ConnectorStatistics` template, you can also add the `filter` parameter to the request to return specific statistics. The `filter` parameter accepts a regular expression that matches against the string `autnid::name`, where `autnid` and `name` are the values of the corresponding attributes in the XML returned by the `GetStatistics` action. For example, the following request returns statistics only for synchronize actions:

```
http://host:serviceport/action=GetStatistics&template=ConnectorStatistics  
&filter=^synchronize:
```

The following request returns statistics only for the task `mytask`:

```
http://host:serviceport/action=GetStatistics&template=ConnectorStatistics  
&filter=:mytask:
```

The following image shows some example statistics returned by a connector:



Above each chart is a title, for example SYNCHRONIZE:MYTASK, that specifies the action and task to which the statistics belong.

You can see from the example that in the last 60 seconds, the connector has generated an average of approximately 0.4 ingest-adds per second. In the charts, partially transparent bars indicate that the connector has not completed collecting information for those time intervals. The information used to generate statistics is stored in memory, so is lost if you stop the connector.

The following information is presented above the chart for each statistic:

- **Total** is a running total since the connector started. In the example above, there have been 70 ingest-adds in total.
- **Current Total** is the total for the actions that are currently running. In the example above, the synchronize action that is running has resulted in 30 ingest-adds being sent to CFS.
- **Previous Total** provides the totals for previous actions. In the example above, the previous synchronize cycle resulted in 40 ingest-adds. To see the totals for the 24 most recent actions, hover the mouse pointer over the value.

Use the Connector Logs

As the ODBC Connector runs, it outputs messages to its logs. Most log messages occur due to normal operation, for example when the connector starts, receives actions, or sends documents for ingestion. If the connector encounters an error, the logs are the first place to look for information to help troubleshoot the problem.

The connector separates messages into the following message types, each of which relates to specific features:

Log Message Type	Description
Action	Logs actions that are received by the connector, and related messages.
Application	Logs application-related occurrences, such as when the connector starts.
Collect	Messages related to the Collect fetch action.
Synchronize	Messages related to the Synchronize fetch action.
View	Messages related to the View action.

Customize Logging

You can customize logging by setting up your own *log streams*. Each log stream creates a separate log file in which specific log message types (for example, action, index, application, or import) are logged.

To set up log streams

1. Open the ODBC Connector configuration file in a text editor.
2. Find the [Logging] section. If the configuration file does not contain a [Logging] section, add one.
3. In the [Logging] section, create a list of the log streams that you want to set up, in the format *N=LogStreamName*. List the log streams in consecutive order, starting from 0 (zero). For example:

```
[Logging]
LogLevel=FULL
LogDirectory=logs
0=ApplicationLogStream
1=ActionLogStream
```

You can also use the [Logging] section to configure any default values for logging configuration parameters, such as LogLevel. For more information, see the *ODBC Connector Reference*.

4. Create a new section for each of the log streams. Each section must have the same name as the log stream. For example:

```
[ApplicationLogStream]
[ActionLogStream]
```

5. Specify the settings for each log stream in the appropriate section. You can specify the type of logging to perform (for example, full logging), whether to display log messages on the console, the maximum size of log files, and so on. For example:

```
[ApplicationLogStream]
LogTypeCSVs=application
LogFile=application.log
LogHistorySize=50
```

```
LogTime=True  
LogEcho=False  
LogMaxSizeKBs=1024  
  
[ActionLogStream]  
LogTypeCSVs=action  
LogFile=logs/action.log  
LogHistorySize=50  
LogTime=True  
LogEcho=False  
LogMaxSizeKBs=1024
```

6. Save and close the configuration file. Restart the service for your changes to take effect.

Monitor the Progress of a Task

This section describes how to monitor the progress of a task.

NOTE: Progress reporting is not available for every action.

To monitor the progress of a task

- Send the following action to the connector:

```
action=QueueInfo&QueueName=fetch&QueueAction=progress&Token=...
```

where,

Token The token of the task that you want to monitor. If you started the task by sending an action to the connector, the token was returned in the response. If the connector started the task according to the schedule in its configuration file, you can use the `QueueInfo` action to find the token (use `/action=QueueInfo&QueueName=fetch&QueueAction=getstatus`).

The connector returns the progress report, inside the `<progress>` element of the response. The following example is for a File System Connector synchronize task.

```
<autnresponse>  
  <action>QUEUEINFO</action>  
  <response>SUCCESS</response>  
  <responsedata>  
    <action>  
      <token>MTAuMi4xMDUuMTAzOjEyMzQ6RkVUQ0g6MTAxNzM0MzgzOQ==</token>  
      <status>Processing</status>  
      <progress>  
        <building_mode>>false</building_mode>  
        <percent>7.5595</percent>  
        <time_processing>18</time_processing>  
        <estimated_time_remaining>194</estimated_time_remaining>
```

```
        <stage title="MYTASK" status="Processing" weight="1"
percent="7.5595">
          <stage title="Ingestion" status="Processing" weight="999"
percent="7.567">
            <stage title="C:\Test Files\" status="Processing" weight="6601"
percent="7.567" progress="0" maximum="6601">
              <stage title="Folder01" status="Processing" weight="2317"
percent="43.116" progress="999" maximum="2317"/>
                <stage title="Folder02" status="Pending" weight="2567"/>
                <stage title="Folder03" status="Pending" weight="1715"/>
                <stage title="." status="Pending" weight="2"/>
              </stage>
            </stage>
          <stage title="Deletion" status="Pending" weight="1"/>
        </stage>
      </progress>
    </action>
  </responseData>
</autnresponse>
```

To read the progress report

The information provided in the progress report is unique to each connector and each action. For example, the File System Connector reports the progress of a synchronize task by listing the folders that require processing.

A progress report can include several *stages*:

- A *stage* represents part of a task.
- A stage can have sub-stages. In the previous example, the stage "C:\Test Files\" has three stages that represent sub-folders ("Folder01", "Folder02", and "Folder03") and one stage that represents the contents of the folder itself ("."). You can limit the depth of the sub-stages in the progress report by setting the `MaxDepth` parameter in the `QueueInfo` action.
- The `weight` attribute indicates the amount of work included in a stage, relative to other stages at the same level.
- The `status` attribute shows the status of a stage. The status can be "Pending", "Processing", or "Finished".
- The `progress` attribute shows the number of items that have been processed for the stage.
- The `maximum` attribute shows the total number of items that must be processed to complete the stage.
- The `percent` attribute shows the progress of a stage (percentage complete). In the previous example, the progress report shows that MYTASK is 7.5595% complete.
- Finished stages are grouped, and pending stages are not expanded into sub-stages, unless you set the action parameter `AllStages=true` in the `QueueInfo` action.

Monitor Asynchronous Actions using Event Handlers

The fetch actions sent to a connector are asynchronous. Asynchronous actions do not run immediately, but are added to a queue. This means that the person or application that sends the action does not receive an immediate response. However, you can configure the connector to call an event handler when an asynchronous action starts, finishes, or encounters an error.

You can use an event handler to:

- return data about an event back to the application that sent the action.
- write event data to a text file, to log any errors that occur.

You can also use event handlers to monitor the size of asynchronous action queues. If a queue becomes full this might indicate a problem, or that applications are making requests to ODBC Connector faster than they can be processed.

ODBC Connector can call an event handler for the following events.

OnStart	The <code>OnStart</code> event handler is called when ODBC Connector starts processing an asynchronous action.
OnFinish	The <code>OnFinish</code> event handler is called when ODBC Connector successfully finishes processing an asynchronous action.
OnError	The <code>OnError</code> event handler is called when an asynchronous action fails and cannot continue.
OnQueueEvent	The <code>OnQueueEvent</code> handler is called when an asynchronous action queue becomes full, becomes empty, or the queue size passes certain thresholds. <ul style="list-style-type: none">• A <code>QueueFull</code> event occurs when the action queue becomes full.• A <code>QueueFilling</code> event occurs when the queue size exceeds a configurable threshold (<code>QueueFillingThreshold</code>) and the last event was a <code>QueueEmpty</code> or <code>QueueEmptying</code> event.• A <code>QueueEmptying</code> event occurs when the queue size falls below a configurable threshold (<code>QueueEmptyingThreshold</code>) and the last event was a <code>QueueFull</code> or <code>QueueFilling</code> event.• A <code>QueueEmpty</code> event occurs when the action queue becomes empty.

ODBC Connector supports the following types of event handler:

- The `TextFileHandler` writes event data to a text file.
- The `HttpHandler` sends event data to a URL.
- The `LuaHandler` runs a Lua script. The event data is passed into the script.

Configure an Event Handler

To configure an event handler, follow these steps.

To configure an event handler

1. Stop the connector.
2. Open the connector's configuration file in a text editor.
3. Set the `OnStart`, `OnFinish`, `OnError`, or `OnQueueEvent` parameter to specify the name of a section in the configuration file that contains the event handler settings.

- To run an event handler for all asynchronous actions, set these parameters in the `[Actions]` section. For example:

```
[Actions]
OnStart=NormalEvents
OnFinish=NormalEvents
OnError=ErrorEvents
```

- To run an event handler for specific actions, use the action name as a section in the configuration file. The following example calls an event handler when the `Fetch` action starts and finishes successfully:

```
[Fetch]
OnStart=NormalEvents
OnFinish=NormalEvents
```

4. Create a new section in the configuration file to contain the settings for your event handler. You must name the section using the name you specified with the `OnStart`, `OnFinish`, `OnError`, or `OnQueueEvent` parameter.
5. In the new section, set the `LibraryName` parameter.

`LibraryName` The type of event handler to use to handle the event:

- To write event data to a text file, set this parameter to `TextFileHandler`, and then set the `FilePath` parameter to specify the path of the file.
- To send event data to a URL, set this parameter to `HttpHandler`, and then use the HTTP event handler parameters to specify the URL, proxy server settings, credentials and so on.
- To run a Lua script, set this parameter to `LuaHandler`, and then set the `LuaScript` parameter to specify the script to run. For information about writing the script, see [Write a Lua Script to Handle Events, on the next page](#).

For example:

```
[NormalEvents]
LibraryName=TextFileHandler
```

```
FilePath=./events.txt
```

```
[ErrorEvents]  
LibraryName=LuaHandler  
LuaScript=./error.lua
```

6. Save and close the configuration file. You must restart ODBC Connector for your changes to take effect.

Write a Lua Script to Handle Events

The Lua event handler runs a Lua script to handle events. The Lua script must contain a function named `handler` with the arguments `request` and `xml`, as shown below:

```
function handler(request, xml)  
    ...  
end
```

- `request` is a table holding the request parameters. For example, if the request was `action=Example&MyParam=Value`, the table will contain a key `MyParam` with the value `Value`. Some events, for example queue size events, are not related to a specific action and so the table might be empty.
- `xml` is a string of XML that contains information about the event.

Set Up Performance Monitoring

You can configure a connector to pause tasks temporarily if performance indicators on the local machine or a remote machine breach certain limits. For example, if there is a high load on the CPU or memory of the repository from which you are retrieving information, you might want the connector to pause until the machine recovers.

NOTE: Performance monitoring is available on Windows platforms only. To monitor a remote machine, both the connector machine and remote machine must be running Windows.

Configure the Connector to Pause

To configure the connector to pause

1. Open the configuration file in a text editor.
2. Find the `[FetchTasks]` section, or a `[TaskName]` section.
 - To pause all tasks, use the `[FetchTasks]` section.
 - To specify settings for a single task, find the `[TaskName]` section for the task.

3. Set the following configuration parameters:

PerfMonCounterNameN	The names of the performance counters that you want the connector to monitor. You can use any counter that is available in the Windows perfmon utility.
PerfMonCounterMinN	The minimum value permitted for the specified performance counter. If the counter falls below this value, the connector pauses until the counter meets the limits again. This parameter is optional but you should set a minimum value, maximum value (with PerfMonCounterMaxN), or both.
PerfMonCounterMaxN	The maximum value permitted for the specified performance counter. If the counter exceeds this value, the connector pauses until the counter meets the limits again. This parameter is optional but you should set a maximum value, minimum value (with PerfMonCounterMinN), or both.
PerfMonAvgOverReadings	(Optional) The number of readings that the connector averages before checking a performance counter against the specified limits. For example, if you set this parameter to 5, the connector averages the last five readings and pauses only if the average breaches the limits. Increasing this value makes the connector less likely to pause if the limits are breached for a short time. Decreasing this value allows the connector to continue working faster following a pause.
PerfMonQueryFrequency	(Optional) The amount of time, in seconds, that the connector waits between taking readings from a performance counter.

For example:

```
[FetchTasks]
PerfMonCounterName0=\\machine-hostname\Memory\Available MBytes
PerfMonCounterMin0=1024

PerfMonCounterName1=\\machine-hostname\Processor(_Total)\% Processor Time
PerfMonCounterMax1=70

PerfMonAvgOverReadings=5
PerfMonQueryFrequency=10
```

4. Save and close the configuration file.

Determine if an Action is Paused

To determine whether an action has been paused for performance reasons, use the QueueInfo action:

```
/action=queueInfo&queueAction=getStatus&queueName=fetch
```

You can also include the optional token parameter to return information about a single action:

```
/action=queueInfo&queueAction=getStatus&queueName=fetch&token=...
```

The connector returns the status, for example:

```
<autnresponse>
  <action>QUEUEINFO</action>
  <response>SUCCESS</response>
  <responsedata>
    <actions>
      <action owner="2266112570">
        <status>Processing</status>
        <queued_time>2016-Jul-27 14:49:40</queued_time>
        <time_in_queue>1</time_in_queue>
        <process_start_time>2016-Jul-27 14:49:41</process_start_time>
        <time_processing>219</time_processing>
        <documentcounts>
          <documentcount errors="0" task="MYTASK"/>
        </documentcounts>
        <fetchaction>SYNCHRONIZE</fetchaction>
        <pausedforperformance>true</pausedforperformance>
        <token>...</token>
      </action>
    </actions>
  </responsedata>
</autnresponse>
```

When the element `pausedforperformance` has a value of `true`, the connector has paused the task for performance reasons. If the `pausedforperformance` element is not present in the response, the connector has not paused the task.

Set Up Document Tracking

Document tracking reports metadata about documents when they pass through various stages in the indexing process. For example, when a connector finds a new document and sends it for ingestion, a document tracking event is created that shows the document has been added. Document tracking can help you detect problems with the indexing process.

You can write document tracking events to a database, log file, or IDOL Server. For information about how to set up a database to store document tracking events, refer to the *IDOL Server Administration Guide*.

To enable Document Tracking

1. Open the connector's configuration file.
2. Create a new section in the configuration file, named `[DocumentTracking]`.
3. In the new section, specify where the document tracking events are sent.
 - To send document tracking events to a database through ODBC, set the following parameters:

Backend	To send document tracking events to a database, set this parameter to Library .
LibraryPath	Specify the location of the ODBC document tracking library. This is included with IDOL Server.
ConnectionString	The ODBC connection string for the database.

For example:

```
[DocumentTracking]
Backend=Library
LibraryPath=C:\Autonomy\IDOLServer\IDOL\modules\dt_odbc.dll
ConnectionString=DSN=MyDatabase
```

- To send document tracking events to the connector's synchronize log, set the following parameters:

Backend	To send document tracking events to the connector's logs, set this parameter to Log .
DatabaseName	The name of the log stream to send the document tracking events to. Set this parameter to synchronize .

For example:

```
[DocumentTracking]
Backend=Log
DatabaseName=synchronize
```

- To send document tracking events to an IDOL Server, set the following parameters:

Backend	To send document tracking events to an IDOL Server, set this parameter to IDOL .
TargetHost	The host name or IP address of the IDOL Server.
TargetPort	The index port of the IDOL Server.

For example:

```
[DocumentTracking]
Backend=IDOL
TargetHost=idol
TargetPort=9001
```

For more information about the parameters you can use to configure document tracking, refer to the *ODBC Connector Reference*.

4. Save and close the configuration file.

Glossary

A

ACI (Autonomy Content Infrastructure)

A technology layer that automates operations on unstructured information for cross-enterprise applications. ACI enables an automated and compatible business-to-business, peer-to-peer infrastructure. The ACI allows enterprise applications to understand and process content that exists in unstructured formats, such as email, Web pages, Microsoft Office documents, and IBM Notes.

ACI Server

A server component that runs on the Autonomy Content Infrastructure (ACI).

ACL (access control list)

An ACL is metadata associated with a document that defines which users and groups are permitted to access the document.

action

A request sent to an ACI server.

active directory

A domain controller for the Microsoft Windows operating system, which uses LDAP to authenticate users and computers on a network.

C

Category component

The IDOL Server component that manages categorization and clustering.

Community component

The IDOL Server component that manages users and communities.

connector

An IDOL component (for example File System Connector) that retrieves information from a local or remote repository (for example, a file system, database, or Web site).

Connector Framework Server (CFS)

Connector Framework Server processes the information that is retrieved by connectors. Connector Framework Server uses KeyView to extract document content and metadata from over 1,000 different file types. When the information has been processed, it is sent to an IDOL Server or Distributed Index Handler (DIH).

Content component

The IDOL Server component that manages the data index and performs most of the search and retrieval operations from the index.

D

DAH (Distributed Action Handler)

DAH distributes actions to multiple copies of IDOL Server or a component. It allows you to use failover, load balancing, or distributed content.

DIH (Distributed Index Handler)

DIH allows you to efficiently split and index extremely large quantities of data into multiple copies of IDOL Server or the Content component. DIH allows you to create a scalable solution that delivers high performance and high availability. It provides a flexible way to batch, route, and categorize the indexing of internal and external content into IDOL Server.

I

IDOL

The Intelligent Data Operating Layer (IDOL) Server, which integrates unstructured, semi-structured and structured information from multiple repositories through an understanding of the content. It delivers a real-time environment in which operations across applications and content are automated.

IDOL Proxy component

An IDOL Server component that accepts incoming actions and distributes them to the appropriate subcomponent. IDOL Proxy also performs some maintenance operations to make sure that the subcomponents are running, and to start and stop them when necessary.

Import

Importing is the process where CFS, using KeyView, extracts metadata, content, and sub-files from items retrieved by a connector. CFS adds the information to documents so that it is indexed into IDOL Server. Importing allows IDOL server to use the information in a repository, without needing to process the information in its native format.

Ingest

Ingestion converts information that exists in a repository into documents that can be indexed into IDOL Server. Ingestion starts when a connector finds new documents in a repository, or documents that have been updated or deleted, and sends this information to CFS. Ingestion includes the import process, and processing tasks that can modify and enrich the information in a document.

Intellectual Asset Protection System (IAS)

An integrated security solution to protect your data. At the front end, authentication checks that users are allowed to access the system that contains the result data. At the back end, entitlement checking and authentication combine to ensure that query results contain only documents that the user is allowed to see, from repositories that the user has permission to access. For more information, refer to the IDOL Document Security Administration Guide.

K

KeyView

The IDOL component that extracts data, including text, metadata, and subfiles from over 1,000 different file types. KeyView can also convert documents to HTML format for viewing in a Web browser.

L

LDAP

Lightweight Directory Access Protocol. Applications can use LDAP to retrieve information from a server. LDAP is used for directory services (such as corporate email and telephone directories) and user authentication. See also: active directory, primary domain controller.

License Server

License Server enables you to license and run multiple IDOL solutions. You must have a License Server on a machine with a known, static IP address.

O

OmniGroupServer (OGS)

A server that manages access permissions for your users. It communicates with your

repositories and IDOL Server to apply access permissions to documents.

P

primary domain controller

A server computer in a Microsoft Windows domain that controls various computer resources. See also: active directory, LDAP.

V

View

An IDOL component that converts files in a repository to HTML formats for viewing in a Web browser.

W

Wildcard

A character that stands in for any character or group of characters in a query.

X

XML

Extensible Markup Language. XML is a language that defines the different attributes of document content in a format that can be read by humans and machines. In IDOL Server, you can index documents in XML format. IDOL Server also returns action responses in XML format.

Send documentation feedback

If you have comments about this document, you can [contact the documentation team](#) by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

Feedback on Micro Focus IDOL ODBC Connector 12.10 Administration Guide

Add your feedback to the email and click **Send**.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to swpdl.idoldocsfeedback@microfocus.com.

We appreciate your feedback!