MICRO FOCUS

Enterprise Sync 2.2

Enterprise Sync Installation and Administration Guide

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Introduction

Enterprise Sync delivers fast, efficient change management for mainframe development teams. By replicating mainframe source code to a distributed software configuration management platform, Enterprise Sync increases the effectiveness of parallel application development activities. Modern GUI-based tooling improves code change through automation, increased visibility, and simplified conflict and change resolution. Changes made to the distributed source management platform synchronize automatically with the mainframe software change management system. This ensures software change and configuration management processes and mainframe application source code remain the primary system of record.

Key Benefits

Increased Efficiency	Developer efficiency can be increased dramatically by working directly from a modern Eclipse-based development IDE and using modern tools for automated code merge and code change visualization.
Reduced Mainframe Reliance	Integration with Windows-based Continuous Integration and access to mainframe test regions running on Micro Focus Enterprise Test Server ensures improved delivery without additional mainframe resources.
Improved Quality	Removing error-prone manual processes for retrofitting changes across different parallel source streams reduces the risk of introducing errors.
Accelerated Developer Adoption	By integrating and synchronizing with current mainframe delivery processes and source hierarchies, Enterprise Sync offers an easy-to-learn improvement to tried and trusted practices.

For more information, refer to the *Data Sheet*.

Complementary Enterprise Products

Enterprise Sync is part of the Micro Focus Enterprise Portfolio which includes:

Micro Focus Enterprise Analyzer	A comprehensive solution for understanding application portfolios. It provides a centralized repository offering technical insight into application inventory, structure and dependencies, while providing insight into the impact of change across enterprise systems.
Enterprise Developer for z Systems	A full-function mainframe development environment for Eclipse or Microsoft Visual Studio. It offers developers modern tools to develop, compile, debug and test applications on or off the mainframe with no wait times or resource contention. The installation of Enterprise Developer is a pre-requisite for Enterprise Sync.
Enterprise Test Server	A mainframe application test execution environment on Windows offering mainframe testing on low cost commodity hardware. Test capacity can be scaled up on demand to easily to meet business-driven delivery time-lines.

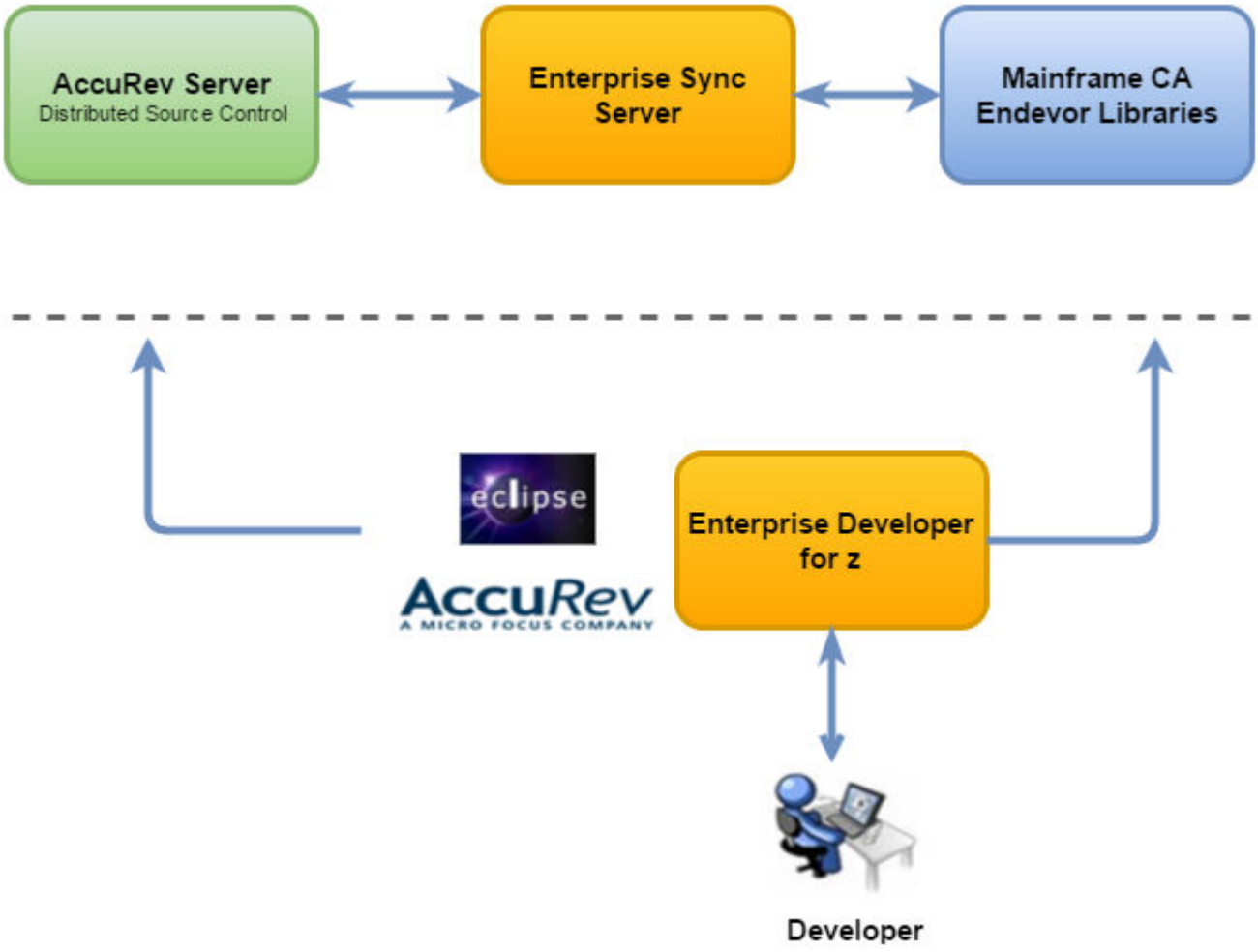
Components

Enterprise Sync is a series of components that allows you to connect your mainframe Endevor system to a distributed source control system. The bundle is comprised of the following products. Part of this document will walk you through the installation process.

There are two key parts to Enterprise Sync:

- The server piece that mirrors and synchronizes Endevor assets in a distributed platform.
- The client tools that are driven from Enterprise Developer for z Systems that provide modern SCM tooling regardless of where the source resides - mainframe or distributed.

The components in the Enterprise Sync solution communicate with each other in the following manner:



Server Components

Micro Focus Mainframe Access Server

Mainframe Access Server is a mainframe server component that communicates with Endevor.

Enterprise Sync Server

The Micro Focus Enterprise Sync Server components synchronize sources and meta data between the SCM on the mainframe and sources managed on a distributed platform. The server components that make up Enterprise Sync include:

Mainframe Access Client	Communicates with Mainframe SCCM through the MFA Server.
AccuRev Client	End-users and client programs perform operations on the AccuRev client. Operations can take place from the command line, AccuRev GUI, Web UI, or through an IDE Plugin. The client process is installed as part of the installation and communicates with the server process.
Micro Focus Connect	Manages and performs the synchronization process. It is the web-based interface for creating your configurations. It is often referred to as the *Dashboard* in this documentation.

AccuRev Server

AccuRev is a centralized version control system which uses a client/server model. The AccuRev Server maintains all the source and metadata within a data repository. The data repository is built around a database technology that is transaction-based and manages the tables as append-only. There is a server process installed as part of the AccuRev Server that manages the AccuRev repositories and handles all communication between the server and the AccuRev clients.

Micro Focus Workflow Manager Endevor Attachment

An Application Workflow Manager model that provides integration to Endevor and AccuRev tools and processes directly from an Enterprise Developer Eclipse project. Refer to the Enterprise Developer documentation for more details.

Client Components

AccuRev Client

Windows based GUI to allow developer to access version controlled source assets managed in the AccuRev Server.

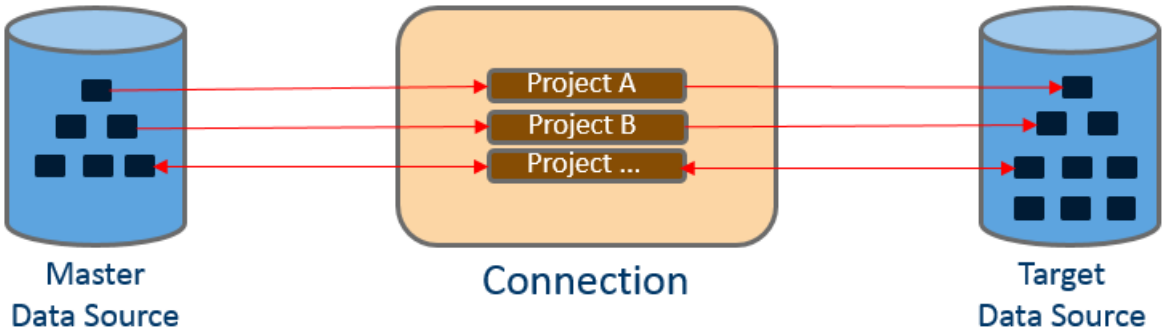
AccuRev Eclipse and AWM AccuRev Integration Plugin

Provides access to version controlled source assets directly from the Enterprise Developer Eclipse IDE.

Concepts

General Concepts

Enterprise Sync mirrors a mainframe SCM system with a distributed SCM system based on the following general concepts:



Data Source

An Enterprise Sync *Data Source* is representing an external SCM systems. Typical values which have to be associated when describing a Data Source are:

- Information how to access the SCM system (server address, port).
- Required credentials to get access to the SCM system.

Connection

An Enterprise Sync *Connection* defines two external SCM systems for synchronization by associating two Data Sources to the connection. One Data Source must be defined as the *Master* and the other as *Target*.

Normally the mainframe SCM system with the already existing files will be defined as Master within a connection and the distributed SCM system which will receive the files during an initial synchronization will be defined as the Target.

It depends on the specific connection, which rules apply for Master and Target Data Sources. Following are examples which could be implemented:

- In case of conflicts, for example a file is changed in parallel in both SCM systems, the conflict has to be resolved in the target SCM system.
- Deleted files in the target SCM system relevant for synchronizing are not deleted in the master system, but synchronized again from the master to the target system.

At least one Project must be added to a connection (see Project), before the synchronization process can be started.

A synchronization process is enabled by starting a Connection and disabled by stopping a Connection.

A *Connector* is a software implementation providing access to an external SCM system.

It depends on the specific implementation of a Connector whether the synchronization process is executed based on a configured time interval, for example all 30 minutes, or is executed on demand based on user actions, for example an executed check-in function could trigger the synchronization process for the corresponding files.

Project

Projects are associated to a connection. One project defines a specific synchronization rule, for example:

- Synchronize all production files belonging to the Finance application from the Master Data Source to the Target Data Source.
- Synchronize all files of the Staff application which were added to a Test stage between Master and Target Data Source (bi-directional).

One Project defines unique criteria for identifying assets in the corresponding SCM systems and defines unique mapping rules how to map these assets between both SCM systems.

A project can define a one-directional or a bi-directional synchronization rule, either:

- From Master
- From Target
- Bi-directional

Within a connection, a specific project can be enabled or disabled. If disabled, this project definition is not used for synchronizing assets.

Endevor/AccuRev Synchronization Support

General Considerations

Enterprise Sync contains connectors for Micro Focus AccuRev and CA Endevor Software Change Manager. Based on these connectors, the synchronization process between both products can be configured and implemented.

An Endevor/AccuRev Connection supports the following main synchronization features:

- Endevor can be defined as the Master Data Source and AccuRev as the Target Data Source when creating a connection.

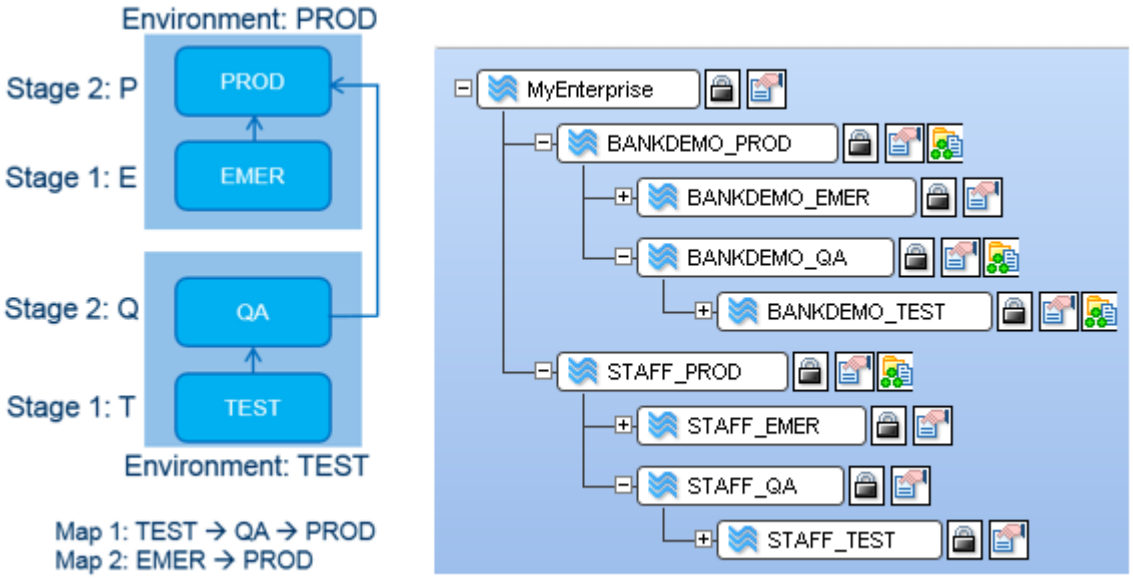
  Note: The current release does not support AccuRev as Master.

- One or more combinations of an Endevor environment, stage, system and subsystem can be mapped to one AccuRev stream.

  Normally the AccuRev stream hierarchy would be defined similar to the stage hierarchy (map) in Endevor. It depends on the specific use case whether Endevor systems/subsystems are mapped into one to different streams.

  For clearness reasons Micro Focus recommends to map different Endevor systems to different AccuRev streams.

  The following sample shows an Endevor stage structure mapped to an AccuRev stream structure, where the Endevor systems Bankdemo and Staff are mapped to different stream sets.



Note: We recommend not synchronizing Endevor elements directly into the AccuRev root stream. Keeping the AccuRev root stream empty has advantages if a stream restructuring is required.

- The default stream `directory structure` contains the Endevor system as the root folder name which contains the Endevor subsystem folder, which contains the Endevor type folder. Any other directory structure can be configured with the following restrictions:
  - The Endevor type name must be the stream a folder which contains the synchronized Endevor elements.
  - The directory structure must support a unique file mapping between AccuRev and Endevor.

  Example: If a stream contains only files of one Endevor subsystem, it is not required to configure the Endevor system and subsystem name in the directory structure.
- The synchronization rules can be defined one- or bi-directional.

Projects | Types and Fields | Relationships | High WaterMarks | Connection Messages

Target Project	Direction	Master Project
BANKDEMO_PROD	←	env=SMPLPROD:stage=PROD:sys=MFIUPH:subsys=BANKDEMO
BANKDEMO_EMER	↔	env=SMPLPROD:stage=EMER:sys=MFIUPH:subsys=BANKDEMO
BANKDEMO_QA	←	env=SMPLTEST:stage=QA:sys=MFIUPH:subsys=BANKDEMO
BANKDEMO_TEST	↔	env=SMPLTEST:stage=TEST:sys=MFIUPH:subsys=BANKDEMO

- The synchronization from Endevor to AccuRev is triggered based on a configured time interval (for example all 30 minutes).

Note: Enterprise Sync does not support an on demand synchronization from Endevor to AccuRev. This synchronization direction is always based on a configured time interval.

Enterprise Syncs searches changed Endevor elements and changed Endevor metadata in all configured environments, stages, systems and subsystems. If only metadata have changed then only the metadata are synchronized and not the file content.

- The synchronization from AccuRev to Endevor is either triggered based on a configured time interval (for example all 30 minutes) or on demand when promoting files to an AccuRev **gated stream** whose parent stream is supporting a synchronization to Endevor.

Metadata Synchronization Support

The synchronization process supports metadata changes in Endevor and the synchronization of the following file based metadata:

Metadata name	Description	Sample value
ContentType	The synchronized Type in AccuRev. Text or Ptext or Binary	Text
Component VVLL	the component's version and level number	0105
Element Name		BBANK10P
Element Type		COBOL
Element VVLL	the element's version and level number	0100
Endevor Environment		SMPLPROD
Endevor Subsystem		BANKDEMO
Endevor System		MFISYS
Generate Date	Last generation date	16/11/15
Generate Time	Last generation time	04:02:00
Generate User	Last user who has generated the file	MFIXXX
Last Action CCID		SYNCDEMO
Last Action Comment		SYNC DEMONSTRATION
Last Action Date		16/11/15
Last Action Name		SIGNIN
Last Action RC	Last action return code	00000
Last Action Time		04:03:01
Last Action User		MFIXXX
Nosource	Is true, if no source is associated to the element in Endevor	false
Processor Group		CICS
Processor RC	Return code of the processor	00004
ReadOnly	Is true, if the file is configured to be read-only in AccuRev. This value is a result of a configuration rule.	false
Signout User	Contains only a user value, if the element is signed-out	MFIXXX
Stage ID		P
Stage Name		PROD
Stage Number		2
Update Date		16/11/15
Update Time		04:03:01

In addition the following environment, stage, system or type specific metadata are synchronized to AccuRev:

Metadata name	Description	Sample value
Extension	The element extension from Endevor (not the extension configured in Enterprise Sync)	CBL
Processor Group Name	List of valid Processor Groups	CICS, CICSSP, CLENBL
Record Length	Valid record length	00080
Text/Binary	The content type in Endevor: T or B	T

Some metadata are required by Enterprise Sync functions, for example:

- Creating files in AccuRev with the required file extension
- Validating the record length of a file edited in Enterprise Developer mainframe projects.
- Offering a selection field for valid Processor Groups when promoting files to a gated stream.

The metadata are managed in AccuRev as stream properties. The file specific metadata are stored in the same stream where the file exists.

Enterprise Sync related project metadata are also stored in the corresponding stream.

All other metadata are stored as stream properties in the root stream.

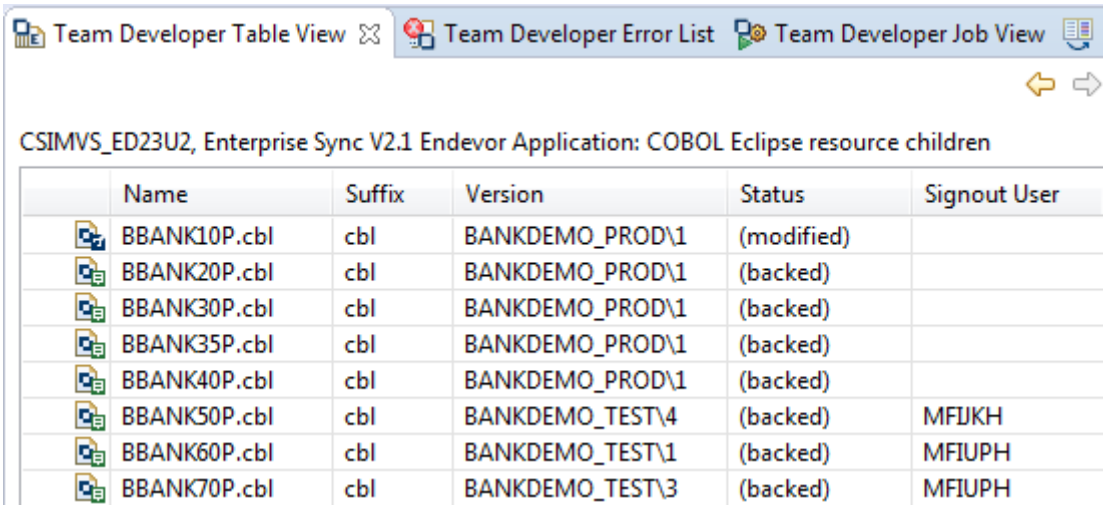
Most of the metadata are displayed in the Enterprise Developer's Property View when selecting a file in the Team Developer perspective which is linked to AccuRev.

Although AccuRev file metadata are not synchronized to Endevor, Enterprise Sync supports accessing these metadata in Enterprise Developer.

The Properties view displays the following AccuRev metadata:

Metadata name	Description	Sample value
Element-ID	This is a unique identifier for an AccuRev resource within its depot	388
Element Type	Describes the content type of the resource in AccuRev. The valid values for the properties are TEXT, PTEXT or BINARY.	PTEXT
Is Project shared with AccuRev	Whether the corresponding Eclipse project is shared with AccuRev. Valid values are true or false	00080
Pathname	Describes the location of an AccuRev resource.	\.\COBOL\BBANK10P.cbl
Status	File statuses in AccuRev are for example: backed or modified .	(backed)
Stream	The (backed) stream name of an AccuRev resource	BANKDEMO_TEST
Stream Version	The stream version of an AccuRev resource	2
Version	The AccuRev Version name which is a concatenation of Stream and Stream Version	BANKDEMO_TEST/2

The AWM model based integration of AccuRev and Endevor in Enterprise Developer supports accessing the corresponding file metadata where required. By default the supported metadata are displayed in the Properties view, some are visible as label decorators in the tree view and others as column values in the table views.



On-Demand Synchronization Support

The synchronization from AccuRev to Endevor is either triggered based on a configured time interval (for example all 30 minutes) or on demand when promoting files to an AccuRev *gated stream* whose parent stream is supporting a synchronization to Endevor.

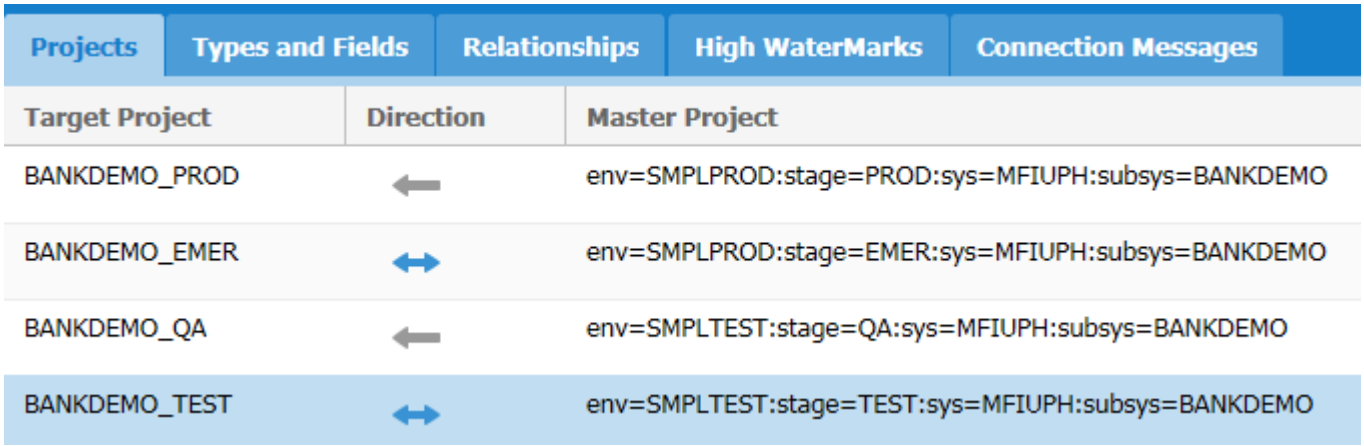
Note: Based on the Endevor technology for adding files to an Endevor repository Micro Focus strongly recommends to configure an **on demand** synchronization process for all synchronizations from AccuRev to Endevor, because the on demand synchronization process uses the credentials of the user who has executed the promote in AccuRev and his corresponding mainframe credentials are used to sign-out the elements in Endevor.

In addition, the on demand synchronization process has some other advantages.

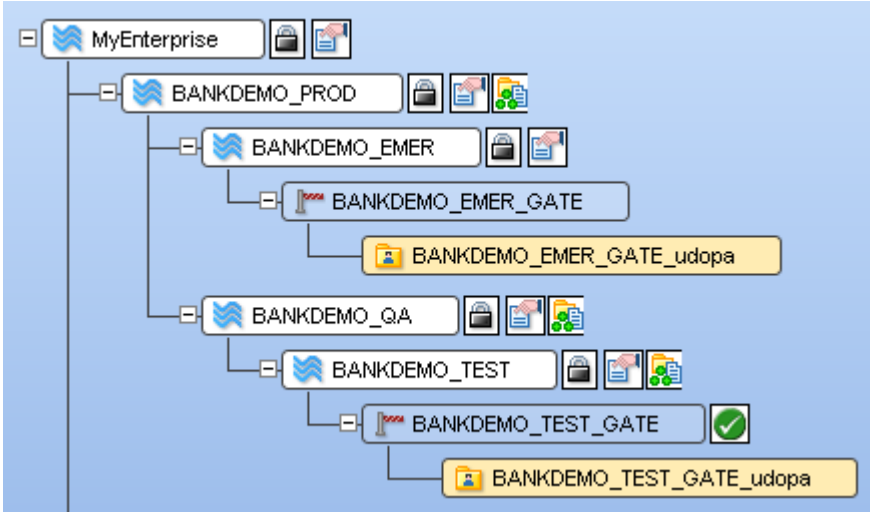
- Enterprise Developer users get immediate feedback when their changes are synchronized to Endevor.
- Enterprise Developer get visible reasons why a synchronization failed, for example
  - On demand synchronization failed because of overlapped elements `\.\COBOL\MYFILEA.CBL`.
  - On demand synchronization failed because the Endevor element `MYFILEA` is signed-out to `MFIXXX`.
- The user can perform typical actions to resolve synchronization failures, for example:
  - Demote change back to workspace.
  - Merge changes.
  - Re-promote.

The following is required for supporting on demand synchronizations:

- The Enterprise Sync projects definition requires a defined bi-directional synchronization rule from an AccuRev dynamic stream to Endevor like in the following sample:



- Based on the projects definition show in the sample above the stream structure which would support an on demand synchronization to the Endevor TEST and EMER stage could be defined like in the following sample:



  In this sample, the stream `BANKDEMO_TEST` is mapped to the Endevor stage `TEST` bi-directionally. It is required to define gated streams as children for all such streams to support on demand synchronizations.

Thus, promoting files to the gated stream `BANKDEMO_TEST_GATE` triggers the on demand synchronization to Endevor, and only if this synchronization is executed successfully, the files are promoted to the target stream `BANKDEMO_TEST`.

When changes are promoted to the gated stream, the AccuRev server invokes a server-side trigger which provides the on demand synchronization support. Therefore the following rules apply:

- Enterprise Sync pauses the synchronization process which is based on time intervals.
- Enterprise Sync synchronizes the current change to Endevor:
  - If the Endevor element is not signed-out, it is first signed-out to the user who has executed the promote function.
  - If the Endevor element is signed-out to another user and override sign-out is not specified on the promote dialog, then a synchronization error will occur.
- Enterprise Sync resumes typical syncing iterations

If AccuRev detects that a promote function will lead to an on demand synchronization, a specific promote dialog pops up in Enterprise Developer which supports Endevor specific parameters:

- The comment field is limited to 40 characters and entered text will be passed to the Endevor Comment field.
- The CCID is passed to Endevor when adding the related elements.
- If the promote user is authorized in Endevor he could set a flag overriding existing sign-outs.
- The user has the option to generate the element directly in Endevor.
- For each single element in the promote list the processor group could be changed, if required. Normally it is not required to select a processor group.

  Note also the following processing rules relevant for the on demand synchronization process:
- The promote dialog shown above has been optimized in Enterprise Developer, but is also available with limited validations in the AccuRev Windows GUI.
- If the Generate option is selected on the promote dialog, the Generate function is directly executed when adding files to Endevor. This means it is executed synchronously within the Micro Focus Access Server. If the Generate function fails, the element synchronization was still successful and Enterprise Sync will return a warning message. Enterprise Developer supports accessing the compiler listing directly on the mainframe, assuming that Endevor manages compiler listings.

- Specific Endevor processors which are creating and running in a TSO or ISPF environment are supported.
- Submitting a Generate function for Batch execution is not supported.
- If AccuRev change package support is activated, the promote dialog might look a little bit different (see AccuRev Change Package Support).
- If an on demand synchronization has been executed successfully, Enterprise Developer displays the storage decorator on the AccuRev workspace icon with a green background , otherwise with a red background and once a popup message is displayed containing the Endevor error message and the Endevor message text.

Required Credentials

For an on demand synchronization process Enterprise Sync requires the AccuRev as well as the mainframe credentials of the user who promotes files to the gated stream.

These credentials are prompted only once per session in Enterprise Developer. The second promote should neither ask for the AccuRev nor for the mainframe credentials. If the Enterprise Developer user is already connected to the mainframe (green background of the connection icons visible in the Remote Systems view), then the Enterprise Sync authentication dialog will only prompt for once for the AccuRev credentials.

Content Type Support

Enterprise Sync maintains the Endevor element types (text/binary) during synchronizations. If a file is binary in Endevor, it will also be a binary file in AccuRev after it is synchronized (and vice versa). If a file is text in Endevor, it will be a ptext file in AccuRev and ptext files or text files in AccuRev will become text files in Endevor.

Enterprise Sync accomplishes this via the following:

- At initialization time, Enterprise Sync reads the Endevor configuration information and stores it as stream properties in the mapped AccuRev depot (root stream).
- When the AccuRev connector is generating change sets to be synchronized with Endevor, it will set the content type for each file based on the info in the depot properties.
- Similarly, when the AccuRev connector is applying change sets from Endevor, it will set the appropriate content type when adding/updating elements in AccuRev.

Change Package Support

AccuRev change package support can be turned on in Enterprise Sync by setting specific attributes in the AccuRev Data Source definition (see Creating a Data Source).

This support maps AccuRev change packages with Endevor elements which have a specific CCID value associated.

There are two configuration options in Enterprise Sync:

- You may want to associate files which are synchronized from Endevor to an AccuRev change package depending on the last action CCID in Endevor.

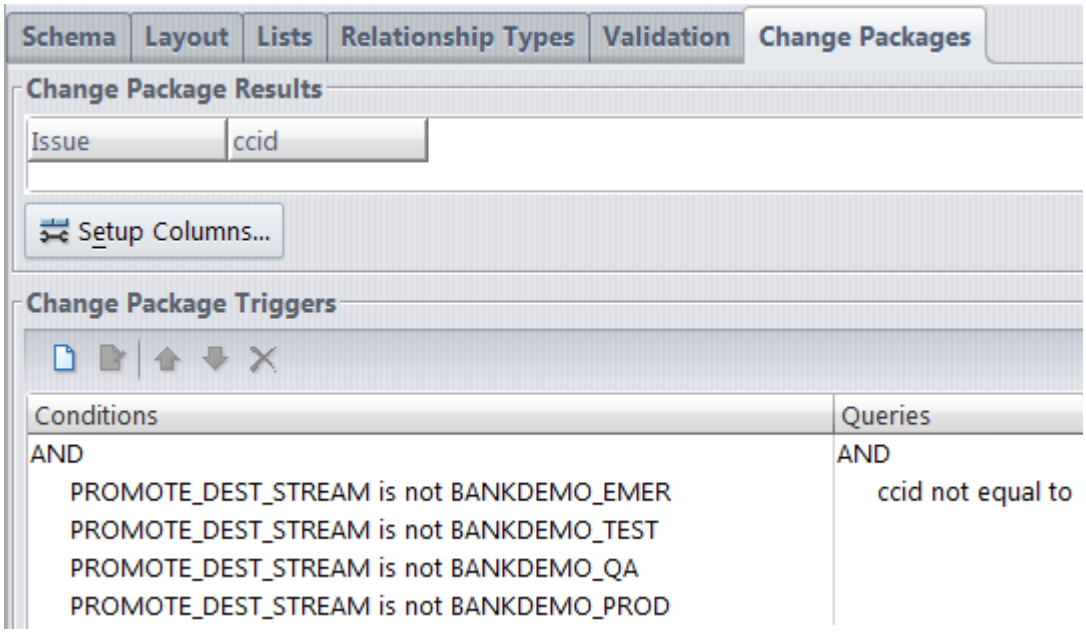
  Enterprise Sync supports this based on the following rules:

  - During an initial synchronization, Enterprise Sync does not assign the synchronized files to change packages. This feature is only supported for incremental synchronizations.

    Note: Before running an initial sync, make sure that the AccuRev schema definition is defined in such a way that the synchronization user is allowed to add files to the streams without enforcing the association to change package.

When defining the change package triggers condition in your AccuRev schema you could, for example, explicitly exclude the AccuRev streams which are mapped in Enterprise Sync to Endevor stages:



- If an AccuRev schema does not exist Enterprise Sync will generate a default schema.

  Note: If change packages are used in AccuRev, we recommend creating the appropriate schema with the required fields, queries and status rules before activating the change package support in Enterprise Sync.
- If an AccuRev schema exists, but does not have the configured CCID field associated, then Enterprise Sync will add this field automatically to the schema.
- During the synchronization Enterprise Sync detects the last action CCID associated to the Endevor element.
- If no change package has been created for that target stream which has the CCID value associated, Enterprise Sync will create a new change package and will associate the file to that change package.

  Note: The corresponding change package depends on the target stream to avoid conflicts in parallel development scenarios. Endevor doesn't assure that different CCIDs have to be used if a file is changed in parallel in different Endevor stages. To avoid logical conflicts in AccuRev different change packages are used in such constellations.
- If change packages already exist for that target stream which has the CCID value associated, then the file will be added to all those change packages.

  Note: normally only one change package will exist related to the target stream which has a specific CCID value associated. Anyhow, Enterprise Sync does not disallow additional manually created change packages with the same CCID value.

- You may want to associate the change package's CCID value to the Endevor elements for all files which are synchronized from AccuRev to Endevor.
  - If the user promotes files to a gated stream and AccuRev is configured to force a change package selection when promoting, then Enterprise Sync uses the CCID value which is associated to the change package and associates this CCID to all synchronized Endevor elements.
  - If more than one change package has been selected when promoting files, then Enterprise Sync uses the CCID value of the first selected change package.

    Note: Although AccuRev allows the association of several change packages when promoting files, Endevor does only support the association of one CCID value when adding an element to the repository. To avoid logical conflicts it would be best practice implementing an

(organizational) rule and allowing only the association of one change package when promoting files.

- If the user has selected a change package with an associated CCID value when promoting, the promote dialog in Enterprise Developer will protect the CCID field, because the change package's CCID value will be used. This value cannot be overridden by the promote user.

Note: Don't mix up the support for AccuRev change packages with Endevor packages. Enterprise Sync does support AccuRev change packages mapped to Endevor CCIDs, but does not support the generation or interpretation of Endevor packages. Of course, it is possible to create a custom procedure which generates, an Endevor package with `Move` commands based on the synchronized elements by interpreting the associated CCID value.

Mapping Rules

Endevor Stages are mapped to streams in AccuRev.

By default, when synchronizing files from Endevor to AccuRev, the Endevor logical element structure in stages using system, subsystem and type are converted into directories within streams.

System `FINANCE`
Subsystem `ACCTPAY`
Type `COBOL`
File `FINAPP01`

This is translated to the following path structure: `FINANCE\ACCTPAY\COBOL\FINAPP01.cbl`.

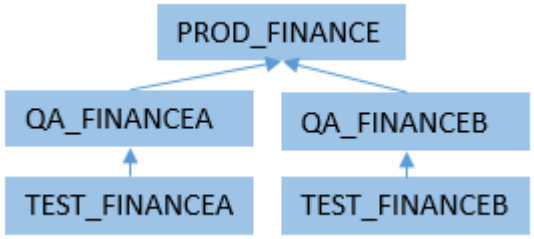
There are, however, cases when you would want to overwrite this default behavior:

- The AccuRev stream structure has been designed using different streams for each Endevor system. Therefore there is no need to have the system name in the path structure.
- The Endevor system or subsystem name changes when moving files in Endevor to the next stage.

Environment	SMPLPROD	SMPLTEST	SMPLTEST	SMPLTEST	SMPLTEST
Stage	PROD	QA	QA	TEST	TEST
System	FINANCE	FINANCEA	FINANCEB	FINANCEA	FINANCEB
Subsystem	ACCTPAY	ACCTPAY	ACCTPAY	ACCTPAY	ACCTPAY
Type	COBOL	COBOL	COBOL	COBOL	COBOL
File	FINAPP01	FINAPP01	FINAPP01	FINAPP01	FINAPP01

The sample above shows a typical Endevor scenario which can be used to support parallel development in one Endevor environment by using a specific suffix in the system's name. When moving files to the next environment the suffix is omitted.

For synchronizing files from Endevor to AccuRev you would normally require for the three stages used in the sample above three corresponding AccuRev streams. But because Endevor system names were used to support parallel release development it is required to create parallel streams in AccuRev. Even more AccuRev requires a consistent directory structure in a stream hierarchy. This means the directory structure cannot change when promoting files to the next stream. Therefore a stream structure like the one shown below is required. The directory structure cannot be calculated by the default rules, but should look like this one in all streams: `ACCTPAY\COBOL\FINAPP01.cbl`



Enterprise Sync supports any kind of mappings from one or more combinations of Endevor environment, stage, system and subsystem to a corresponding stream and any kind of mappings from a combination of environment, system and subsystem to a configured directory path.

Using the example above you would create a property file with the following content:

```
SMPLPROD.FINANCE.ACCTPAY=acctpay
SMPLPROD.FINANCEA.ACCTPAY=acctpay
SMPLPROD.FINANCEB.ACCTPAY=acctpay
```

See *Creating a Data Source* for details how to configure this in Enterprise Sync.

Note: This path mapping does neither depend on the Endevor type nor on the stage. The Endevor type must be part of the AccuRev directory structure and is therefore not required in the properties file. The Endevor stage is not relevant, because a synchronization from AccuRev to Endevor only updates the Endevor entry stage in an environment and therefore it is not required for Enterprise Sync to know in which Endevor stage within an environment the systems and subsystems are valid names.

Promote/Move Synchronization Rules

The basic concept of Enterprise Sync is based on detecting and synchronizing changes between two SCM systems.

Moving Files in Endevor

Enterprise Sync tries to synchronize an Endevor Move action as an AccuRev promote, if possible, although the synchronization process is not triggered by the Endevor Move.

The following rules apply when Enterprise Sync detects a file change in a target stage:

If Enterprise Sync detects a file change in Endevor which should be synchronized to an AccuRev stream, then it is verified whether this file version has been deleted in a source stage which is mapped to an AccuRev child stream.

- If so, then the file is promoted in AccuRev from the source stream to the target stream.
- If either the file is not deleted in the source stage or the file content in the target stage differs from the content in the AccuRev source stream, then the changes are updated in the corresponding streams and no promote from the source stream to the target stream is executed.
- Metadata are synchronized as usual. If a file is promoted or purged from a source stream then the corresponding metadata are removed from this stream as well.

Promoting Change Sets in AccuRev

A file synchronization from AccuRev to Endevor always means adding this file to the corresponding entry stage in Endevor.

Note: Based on Endevor rules updates in a stage 2 of an environment are not allowed and Enterprise Sync does not support a Move operation in Endevor.

Therefore, the following mapping restrictions apply:

- For an on demand synchronization the target stream for an AccuRev promote must be a gated stream which is a child of a target stream mapped to an Endevor entry stage (stage 1).
- For a synchronization based on time intervals the target stream for an AccuRev promote must be mapped to an Endevor entry stage (stage 1).

Processing Endevor Sourceless Elements

Endevor supports *sourceless* elements. A sourceless element is like a linked element pointing to an existing one in a higher stage. A sourceless element can only be created in Endevor using the `Generate` command with the Nosource option.

The synchronization process from AccuRev to Endevor will never create a sourceless element in Endevor.

If Enterprise Sync detects a sourceless element in an Endevor stage mapped to an AccuRev stream, then Enterprise Sync synchronizes the corresponding physical file to AccuRev and associates the Endevor metadata of the sourceless element.

Installation

The topics in the section will walk you through configuring your systems and installing the required components.

Note: Because Enterprise Sync 2.1 is a 32-bit application and Enterprise Sync 2.2 is a native 64-bit application, there is no direct upgrade. Uninstall Enterprise Sync 2.1 before installing Enterprise Sync 2.2.

Installing Enterprise Sync Server

You will need the AccuRev Host Name/IP Address and Port during this installation.

Micro Focus supports the installation of the Enterprise Sync server on one of the following operating systems:

- Microsoft Windows Server 2012 SP2.
- Microsoft Windows Server 2012.
- Microsoft Windows Server 2008 (64-bit).

Required hardware:

- 64-bit, quad-core systems with 8-16 GB of memory.

If AccuRev is installed on one of the supported operating systems which are also supported by Enterprise Sync, you could install the Enterprise Sync server on the same machine. If the Enterprise Sync server is installed on another machine, make sure that your network connection to the AccuRev server provides sufficient performance.

Use the following steps to install Enterprise Sync.

1. Using Administrator credentials, double click the installation media (`enterprise-sync-<version#>-win-64.exe`) to start the install.
2. Click **Next** on the Introduction screen.
3. Read and accept the license agreement. Then click **Next**.
4. On the Choose Install Folder screen, either accept the default location or choose another one. If Enterprise Sync is already installed you have to check the upgrade flag or uninstall Enterprise Sync first if you would like to start from scratch. Click **Next**.
5. If it's an installation from scratch you have to specify the AccuRev server's access parameter. The default port for accessing the AccuRev server is 5050. This dialog doesn't pop up when upgrading an existing installation. Enter the **Host Name** and **Port** of the AccuRev server. Click **Next**.
6. On the **Choose Shortcut Folder**, enter the location for the product icons. Click **Next**.
7. Review the **Pre-Installation Summary** page and click **Install** to install the components.
8. When the wizard is finished, click **Done**.

Two Enterprise Sync Services were started automatically: `Enterprise Sync Web Service` and `EnterpriseSyncConnect`.

To verify the installation:

1. Open the page `http://localhost:8081/ConnectWeb` in your browser.
2. Enter user `Administrator` and password `Administrator`.
3. Use the `DefaultAuthenticator`.

4. Click **Login**.

Note: User name and password are case sensitive.

By installation default, the `Enterprise Sync Web Service` listens on port 8081. If you like to change this port execute the following steps:

1. Stop the `Enterprise Sync Web Service` using the Windows Services utility.
2. Edit the file `server.xml` located in the installation directory, by default.

   `C:\Program Files\Micro Focus\Enterprise Sync\WebServer\conf`.
3. Change the port 8081 using an appropriate port of your choice and then save the file.
4. Restart the `Enterprise Sync Web Service`.

Installing the AccuRev Server

Enterprise Sync requires the special AccuRev release `6.2.3-ES-HF1`.

Note: Enterprise Sync does not support AccuRev 6.2.3 or AccuRev 7.

For the general system requirements for AccuRev and the installation instructions, please refer to the *AccuRev Installation and Release Notes*: *https://supportline.microfocus.com/productdoc.aspx* .

If the AccuRev Server is installed on a Microsoft Windows-supported platform, Perl support has to be installed in addition. Download the Perl distribution from *https://www.perl.org/get.html*. Use either the commercial ActiveState Perl or the Strawberry Perl distribution.

Important: Some specific installation options are required when installing the AccuRev server. Therefore, read the following instruction carefully before installing the AccuRev server.

Important: Disable Replica Support

If you are installing the AccuRev server on an existing database:

When installing and pointing to existing storage, you must truncate the `site.row_history_deleted` table. There will be a log message at server startup: `Enabling/Disabling site replica triggers`. For Enterprise Sync installation it needs to be `disabling`.

Use the following `psql` command from the command line:

```
…\AccuRev\postgresql\bin\ psql -U postgres -d accurev -p 5075 -c "TRUNCATE site.row_deleted_history;"
```

Verify the state of the replica triggers in the second line in `acserver.log`.

If this hasn't been done in the main AccuRev server log at the very beginning it will show:

```
yyyy/mm/dd 13:51:05.154+00:00 Enabled the site replica triggers
```

If it's fixed it show:

```
yyyy/mm/dd 07:27:48.103+00:00 Disabled the site replica triggers
```

1. Replicas are not supported in combination with Enterprise Sync. Therefore you must select the option `No replication` when installing the AccuRev server.
2. The integration of Enterprise Sync in Enterprise Developer requires the AccuRev WebUI server. At the end of your AccuRev server installation you may want to start the WebUI server directly.

Additional AccuRev server configuration steps are required for Enterprise Sync and for accessing the AccuRev WebUI through Enterprise Developer. See chapter *AccuRev Server Configuration* for details

Installing the AccuRev Windows Client

Enterprise Sync requires the special AccuRev release `6.2.3-ES-HF1`.

Note: Enterprise Sync does neither support AccuRev 6.2.3 nor AccuRev 7

For the general system requirements for AccuRev and the installation instructions, please refer to the *AccuRev Installation and Release Notes*: *https://supportline.microfocus.com/productdoc.aspx* .

Note: Although Micro Focus recommends to access AccuRev through the Enterprise Developer's Eclipse based IDE, it is still required to have the AccuRev Windows client installed on the machine where Enterprise Developer is installed.

Installing Enterprise Developer

The installation of Enterprise Developer for Eclipse is a pre-requisite for using Enterprise Sync. Refer to the *Release Notes* for the supported version.

You will find the installation instructions for Enterprise Developer in the *Micro Focus Documentation Info Center* .

The following installations are required:

Mainframe installations	**Mainframe Access Server**	Supports the synchronization with CA Endevor as well as accessing mainframe functions through Enterprise Developer. The Enterprise Sync synchronization process requires the communication with this server.
	z/Server	Supports the direct access to Endevor through Enterprise Developer. If a direct mainframe connection in Enterprise Developer is not required, then the z/Server installation is not necessary. The Enterprise Sync synchronization process doesn't use the z/Server.
Client installations	**Enterprise Developer for Eclipse Client**	The component has to be installed on all developer machines. The integration with Enterprise Sync requires additional installations. See: • Installing the AccuRev Eclipse Plugin • Installing the AWM AccuRev Function Package

Installing the Enterprise Sync Add Pack

The AccuRev Plug-In for Eclipse and the AWM AccuRev integration are included in the Enterprise Sync Add Pack found in the Enterprise Sync distribution package. Open `enterprise-sync-addpack-x86.msi` and follow the prompts to install.

Installing the Workflow Manager Endevor Model

The Workflow Manager (AWM) Endevor Attachment release 3.0 must be installed and configured.

1. The specific AWM model `NDVAC30` - which is part of the Workflow Manager Endevor Attachment - has to be used to support the full integration of AccuRev, Endevor and Enterprise Development Projects into Enterprise Developer.
2. You will find the installation instructions for the Workflow Manager Endevor Attachment in the *Micro Focus Documentation Info Center* under *Enterprise>Micro Focus Enterprise Developer for Eclipse>General Reference>Application Workflow Manager>Workflow Manager Endeavor Attachment*.

The Workflow Manager Endevor Attachment is installed on the mainframe and requires that Enterprise Developer is fully installed and configured. The installation of this Endevor Attachment requires changes to the z/Server installation.

Administration

The topics in the section will walk you through configuring your systems and required components. It is important to follow these procedures in the order that they are listed.

AccuRev Configuration

Enterprise Sync works with the AccuRev 6.2.3 release. For full installation/configuration procedures for the AccuRev client and server, refer to the *AccuRev Installation and Release Notes*: *https://supportline.microfocus.com/productdoc.aspx*.

The following sections are required to configure AccuRev with Enterprise Sync.

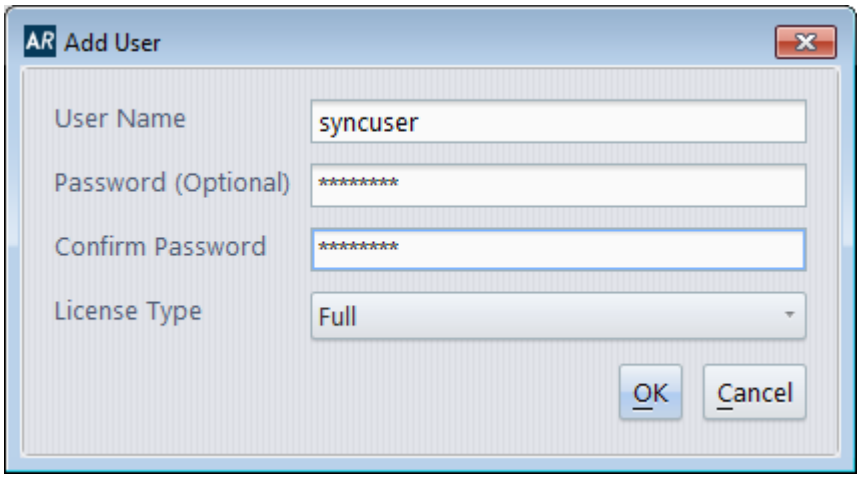
Define AccuRev User

When Enterprise Sync synchronizes files, it performs actions, such as *adds* and *updates*, as the correct user. For example:

- User AAA in Endevor is mapped to user `aaa` in AccuRev.
- If Endevor user AAA adds file `FOO.CBL` in Endevor, Enterprise Sync will attempt the addition of `FOO.CBL` in AccuRev as `aaa`.

The same is true for the opposite direction (AccuRev to Endevor). For this reason, it is important to follow the procedures in this section to properly create and manage your users for all of your systems.

1. Define an AccuRev user that will be used later during the synchronization process. This user must have a password defined (not optional).



   Tip: You should define another user, named `triggeruser` with password `triggeruser` used in the Perl script to trigger an on-demand synchronization process. Although you could use the same user as defined above, we recommend using another user within the trigger because this has advantages when debugging the synchronization process.

2. Create one AccuRev user for each Endevor user.

   For each Endevor user (mainframe userid) who is updating elements in Endevor which are relevant for the synchronization process it is strongly recommended to define a corresponding AccuRev user.

If you don't do this you can still use Enterprise Sync for synchronizing Endevor elements with AccuRev, but you will not see in AccuRev which file changes a specific mainframe user has done in Endevor. This means that the AccuRev Annotate function would contain less specific information.

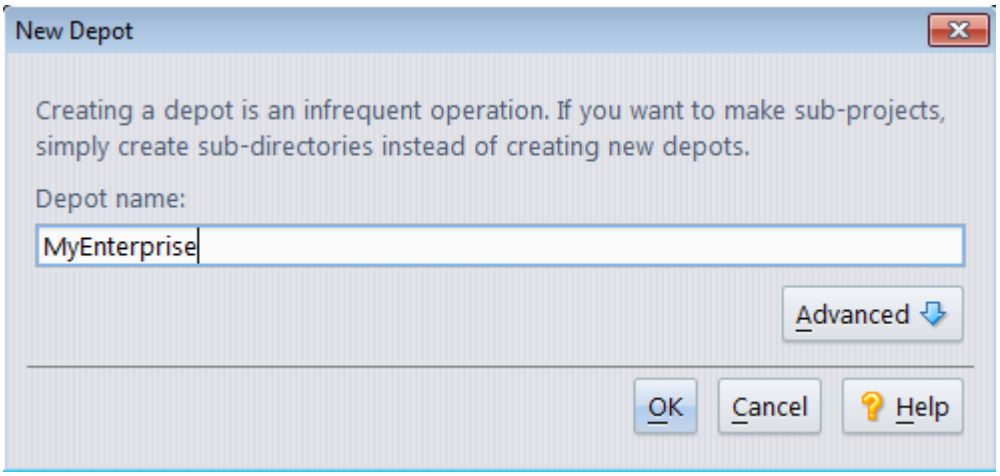
Following rules apply for defining this user:

- No password is required.
- Any valid AccuRev user name can be used. The mapping to the corresponding mainframe user is done later when configuring Enterprise Sync.

Tip: We recommend defining at least one user group in AccuRev for all these users. This will allow you to easily prevent the complete group from updating streams which are managed by the synchronization process. But don't add the synchronization user and the trigger user to this group.

Define AccuRev Depot

Define at least one depot used as a target for synchronizing Endevor elements (we will use `MyEnterprise` in these samples). In the AccuRev client use **File** > **New** > **Depot…**' to create a new depot.



Define AccuRev Stream Structure

A Bankdemo sample is used to illustrate how to define one possible stream structure which is consistent with the structure defined in Endevor. It is assumed that there are two Endevor environments with the stages TEST and QA in environment SMPLTEST and with the stages EMER and PROD in environment SMPLPROD. Further on we want to manage Endevor subsystems in different streams.

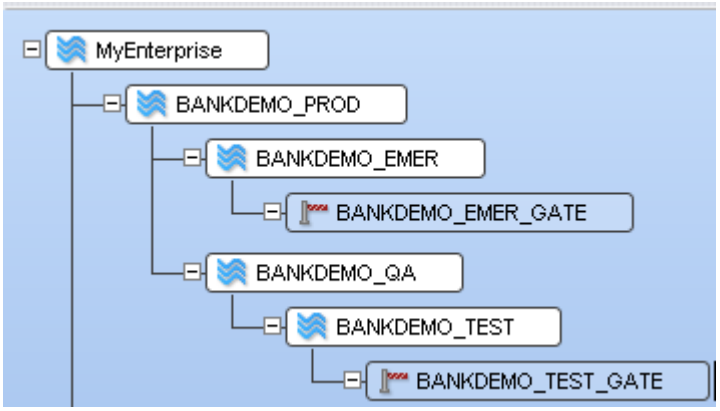
Note: This rule used here is not a restriction of Enterprise Sync, it's a design decision for this specific sample. In general it is possible to synchronize several Endevor systems or subsystems into only one AccuRev stream.

The following sample uses the streams BANKDEMO_PROD, BANKDEMO_EMER, BANKDEMO_QA, BANKDEMO_TEST, BANKDEMO_TEST_GATE and BANKDEMO_EMER_GATE structured as shown in the image below. It is assumed that the corresponding Endevor installation contains two Endevor environments: environment SMPLPROD with the stage 1 EMER and stage 2 PROD and environment SMPLTEST with stage 1 TEST and stage 2 QA.

Note:

- All streams used for synchronization must be defined in AccuRev before configuring the synchronization rules.
- We do not recommend using the root stream MyEnterprise as the stream used for synchronization of the Endevor production stage.

- It is required to define a gated stream as a child of a dynamic stream, if you want to synchronize the content of this stream from AccuRev to Endevor. No gated streams are used if you want to synchronize files from Endevor to AccuRev.



To define a stream, select an existing stream and use **File** > **New** > **Stream**. Don't forget to select the **Stream Type** `Gated Stream` where required.

AccuRev Server Configuration

The following steps have to be execute on the machine where the AccuRev server is installed.

1. Stop the AccuRev Server and AccuRev Tomcat. The user interface for starting and stopping the services varies by platform: • : • :

UNIX/Linux	The `acserverctl` command-line utility.
Windows	The **Services** control panel.

   You will find details in the *AccuRev Administraor's Guide* .
2. It is required to define the AccuRev synchronization user in the AccuRev server's configuration file. To do this, edit the `acserver.cnf` file and add a `CC_USER` line referencing the defined AccuRev user which should be used to support the synchronization process. You will find this configuration file in the `bin` directory of the AccuRev installation path, by default `C:\Program Files\AccuRev\bin`. A sample entry looks like this one:

   ```
   # Enterprise Sync User
   CC_USER = syncuser
   ```

   Important: The `CC_USER` and the user configured later during the Enterprise Sync configuration in the AccuRev data source must be the same.

   Then save and close this file.
3. In addition it's required to make the AccuRev WebUI available through Enterprise Developer. Create a settings file `settings.xml` in the config directory where the AccuRev database is installed, by default in: `C:\Program Files\AccuRev\storage\site_slice\dispatch\config`.

   Add the following content to the file:

   ```
   <settings>
   <webui url="http://###.#.#.#:####/accurev"/>
   </settings>
   ```

   Note: Replace the numbers with the IP Address of the AccuRev server followed by the AccuRev Tomcat server's port number. The default port number is 8080.
4. Restart the AccuRev server and AccuRev Tomcat.

Installing the AccuRev Triggers

Enterprise Sync includes two Perl AccuRev server triggers: one must be installed and the other is recommended to be installed. You will find more details about AccuRev triggers and also how to install the triggers on Unix/Linux in the AccuRev Administrator's guide.

The following pages explain how to install the Perl scripts in AccuRev on a Windows server environment.

The AccuRev server and the Enterprise Sync server must be installed before installing and customizing the triggers, but configuring the Enterprise Sync server is not a pre-requisite for this step.

Before starting with this step make sure that Perl is installed on the AccuRev server machine. If running on a Windows server also make sure that a Perl utility is available (e.g. PL2BAT) which is required to create an executable Perl script.

General Preparation before Customizing and Installing the Triggers

Do the following steps on the machine where the AccuRev server is installed:

1. Create a new Windows folder `C:\users\triggeruser`.

   You have to use the AccuRev user name which you have created in the section "Define AccuRev User". Here we are using the name `triggeruser`.
2. Open a Windows command prompt as Administrator, and enter the following commands:

   ```
   set HOMEDRIVE=c:
   set HOMEPATH=\users\triggeruser
   accurev login -n triggeruser triggeruser
   ```
3. Verify that a session token has been created in the `.accurev` folder.
4. Make sure that a temporary directory is the current one (e.g. C:\temp) and then execute the java command

   ```
   java -DLOG_HOME=c:\temp -cp “C:\Program Files\AccuRev\bin\mfcTriggers-2.2.0-all.jar” com.microfocus.main.Main --command getTriggers
   ```
5. Open the temporary path and verify that two Perl scripts have been extracted to this folder.

Installing the Trigger Supporting the On Demand Sync

The trigger `server_master_trig.pl` contains a sample which triggers the on demand synchronization process if a user promotes files to a gated stream and the target stream is configured for synchronization from AccuRev to Endevor. It's required to install this trigger, otherwise it is neither possible to synchronize files from AccuRev to Endevor with the mainframe authorization of the promote user nor an on demand synchronization process is supported when promoting to the gated stream.

1. Edit the file `server_master_trig.pl` in the temporary folder, navigate to `Windows configuration` and make the following customizations:
   a) Verify and, if necessary customize the path to the AccuRev executable:

      ```
      $::AccuRev = "C:\\progra~1\\accurev\\bin\\accurev.exe";
      ```
   b) Verify and, if necessary customize the `homepath`, which must point to the previously defined `triggeruser` folder.
   c) If you have changed the default authenticator credentials which are installed with Enterprise Sync, then you have to customize the login user and password for Enterprise Sync.
   d) Verify and, if necessary customize the directory where the trigger logs will be created. We recommend using the existing `site_slice\logs` directory in the path where the AccuRev database is installed, therefore by installation default:

      ```
      my $triggerLogDirectory = "C:\\progra~1\\AccuRev\\storage\\site_slice\
      \logs";
      ```

e) Verify and, if necessary customize the location where the trigger jar file is located, by installation default:

```
my $triggerJar = "C:\\progra~1\\accurev\\bin\\mfcTriggers-2.2.0-all.jar";
```

Note: You have to use Windows short names, if a folder contains spaces. Verify the names using DIR /X on the command prompt.

2. Save the Perl script and copy this trigger from the temporary folder to the `site_slice\triggers` , by installation default: `C:\Program Files\AccuRev\storage\site_slice\triggers`.

   Create the triggers folder first, if it doesn't exist.

3. Enter the following commands in the command window:

```
cd C:\Progra Files\AccuRev\storage\site_slice\triggers
pl2bat server_master_trig.pl
perl -wc server_master_trig.pl
```

Note: The last command verifies that the syntax of the Perl script. You should receive the message `server_master_trig.pl syntax OK`.

4. Verify that a bat file `server_master_trig.bat` has been generated in the `triggers` folder.

Note: The existence of the bat file is sufficient to activate this master trigger. You would have to change the file name (not the suffix!) if you want to deactivate this trigger.

Installing the Trigger for Defunct Deactivation and Read-Only Type Support

The trigger `server_preop_trig.pl` contains two samples which are deactivating the AccuRev Defunct function and disallowing the Keep Function for files associated to Endevor Types which are defined as read-only.

Note: Endevor doesn't support an equivalent function for the AccuRev Defunct command. Therefore a Defunct cannot be synchronized to Endevor. Therefore we strongly recommend deactivating Defunct in Depots which are connected to Endevor.

If you are using text files in Endevor which a developer should not update, then Enterprise Sync allows you configures such rules. For example you want to synchronize generated DB2 DCLGEN files to AccuRev, but do not want to allow updates to these generated sources. This trigger verify those configured rules and rejects the Keep command for corresponding read-only files.

1. Edit the file server_preop_trig.pl in the temporary folder and make the following customizations:

   - Verify, and if necessary, customize the path to the AccuRev executable:

```
$::AccuRev = "C:\\PROGRA~1\\accurev\\bin\\accurev.exe";
```

   - Customize the `homepath` to the defined `triggeruser` folder:

```
# Windows Example
$ENV{'HOMEDRIVE'} = "c:";
$ENV{'HOMEPATH'} = "\\Users\\triggeruser";
```

Note: You have to use Windows short names, if a folder contains spaces. Verify the names using `DIR /X` on the command prompt.

2. Save the Perl script and copy this trigger from the temporary folder to the triggers folder under the depot folder. For our sample depot this would be by installation default the path: `C:\Program Files \AccuRev\storage\depots\MyEnterprise\triggers` Create the triggers folder first, if it doesn't exist.

3. Enter the following commands in the command window

```
cd C:\Program Files\AccuRev\storage\depots\MyEnterprise\triggers
pl2bat server_preop_trig.pl
perl -wc server_preop_trig.pl
```

Note: The last command verifies that the syntax of the Perl script. You should receive the message `server_master_trig.pl syntax OK`.

4. Verify that a bat file `server_preop_trig.bat` has been generated in the `triggers` folder.

Note: The existence of the bat file is sufficient to activate this master trigger. You would have to change the file name (not the suffix!) if you want to deactivate this trigger.

Enterprise Sync Server Configuration

This chapter describes how to start the Enterprise Sync configuration user interface (Micro Focus Connect), and it provides an overview of the dashboard and how it is used to configure data sources and connections, and how to run and manage synchronizations.

Starting the UI

Before starting the user interface, the Enterprise Sync server and the Enterprise Sync Web Service must be running. See *Enterprise Sync Server Installation* for more information.

1. Navigate to: `http://<machine name>:<port>/ConnectWeb`. The default port is `8081`. The login page appears.
2. For the first login use the `Default Authenticator` user `Administrator` with password `Administrator`.

Note: User name and password are case sensitive.

After accessing the configuration dialog once with these credentials, you will define an AccuRev Authenticator within the next configurations steps which allows using your AccuRev credentials the next time instead of the Default Authenticator.

3. Click the **Log Out** button to log out.

The Dashboard

The main page is referred to as the *Dashboard*. The dashboard consists of four main pages that are accessed via tabs:

Connections	Displays a list of your configured connections and a summary of their synchronization attributes: the connection's data source, the direction in which assets are synchronized, the last time a synchronization was run, the last time a synchronization succeeded, and the current status. The **Connection Details** panel shows detailed information about the currently selected connection. You can use this page to edit and create new connections, which requires that you have created the corresponding data sources first.
Data Sources	Displays a list of currently defined data sources. An **Update Data Source Property Values** panel shows detailed information for the currently selected data source. The information displayed on this panel varies based on the data source. You can directly change and save values on this update page. Also use this page to create new data sources.
User Maps	User maps define users that have different user names across multiple data sources. For example, a user may be `User1` in one data source and `UserA` in another. User maps allow you to map these two users together so that the system knows they are the same user.

Authenticators	Authenticators are used to enforce which product's users are allowed to log in. A default authenticator is installed with the following credentials: user (`Administrator`) , password (`Administrator`). Both, user and password are case sensitive.

Dashboard Toolbar

The dashboard toolbar contains the following icons:

- **Log out** - Logging out has no effect on the status of Enterprise Sync server.
- **Settings** - Display the **Settings** dialog box, from which you can configure general system settings such as resources and error notification.
- **Help** - Get help for the Enterprise Sync server, either by displaying the *Using Micro Focus Connect* guide, or accessing the Micro Focus Connect community

Setting Synchronization Frequency

1. Click **Actions** () and then select **Settings**. The **Global Settings** screen appears.
2. In the **Sync Settings** group, enter `30` to specify the time in minutes, between synchronizations. The default is 30 minutes.
3. Click **Save**.

Note: The system may support on-demand synchronizations. For configured on-demand synchronization rules, the frequency value defined here has no meaning.

Setting Up Error Notification

You can generate email messages when system and synchronization errors occur. You specify default values for settings that are used by both types of errors on the **Error Notification** tab of the **Settings** dialog box. You will specify your SMTP server settings, who you want to receive error notification emails, and how often. If you want, you can override email settings on an individual connection basis as described in *Creating a Connection*.

1. Click **Actions** () and then select **Settings**. The **Global Settings** screen appears.
2. In the **SMTP Configuration** and **Email Settings** groups, complete the fields as described below.

SMTP Configuration	Use these fields to specify information needed to identify and connect to your SMTP server.	
	Host	The email system's host name.
	Port	The email system's port number.
	Login Name	The email user
	Password	The password for the email user.
	From Address	The email address from which notification emails will be sent.
Email Settings	Use these fields to specify email recipients and how often you want to send error notification email.	
	Send Email To	Email addresses for the users you want to receive error notification email. Separate addresses with a semicolon `;`.
	Frequency	The frequency with which you want the system to send error notification email. The default is 60 minutes.

Data Sources

The topics in this section describe how to use the dashboard to:

- Create a data source.
- Enter the data source connection details.
- How to define an AccuRev specific data source.
- How to define an Endevor specific data source.

Defining a Data Source

1. On the dashboard, click the **Data Sources** tab.
2. Above the **Data Sources** list, click **Create New Data Source**.
3. On the dialog box that opens, complete the **Name** and **Product** fields:

New Data Source Name	Enter a unique name for your data source.
Data Source Product	The products that are available in the list are the connectors provided by Enterprise Sync.

4. Click **Add Data Source**. Your data source is added to the list of data sources. Select it to edit it. The data source pane is refreshed with additional fields that are specific to that product. Refer to the next chapters for defining the data sources of the supported products.
5. After editing the data source fields click **Save Changes**.

Note: The bottom pane already displays a Type with the name `ChangeSet`. There is no need for making any changes within this pane.

AccuRev Data Source Fields

Before defining the AccuRev data source, make sure that AccuRev is installed and configured.

Then, define a new data source for AccuRev using the **Create New Data Source** button with a unique name (for example `AccuRevDS`) and by selecting the product `AccuRev` from the list of the supported products.

Enter the following values on the **Update Data Source Property Values** pane and don't forget to save the changes after entering the values. Saving the changes will already verify some values entered on the pane and will also verify the connection to the AccuRev server.

Note: After saving the AccuRev data source Micro Focus strongly recommends to define an AccuRev Authenticator for this data source. This authenticator is required to support the on demand synchronization process from AccuRev and in addition an AccuRev user can be used for accessing the Enterprise Sync configuration user interface next time instead of using the default authenticator.

AccuRev Port	The AccuRev server's port, by installation default 5050.
AccuRev Server	The AccuRev's server address
Change Package CCID Field Name	If AccuRev issue tracking is used and Enterprise Sync is configured to synchronize issues between two data sources, then this is a property that must exist on AccuRev issues. The default value is `ccid` . If this property does not exist in the AccuRev schema, it will be automatically added. If an AccuRev schema does not exist in the AccuRev Depot, then a default one will be installed automatically, if required.
Change Package Stream-Name Field Name	This contains the entry stream when synchronizing from Endevor to AccuRev with Change Package support. For more information, see *Change Package Support*.

Depot Name	The AccuRev depot which is source or target of a synchronization connection which uses this data source. **Note:** If you want to support different AccuRev depots, then you have to define one AccuRev data source for each depot.
Exclude List	This is a colon separated string that does pattern matching against files and can be used to exclude files from sync operations. If you add a directory named source in AccuRev and you don't want it to sync, the exclude list would include source. If there was a specific file in directory docs you don't want it to sync, for example, `docs\readme.txt` you would include that in the string. So multiples would look like: `source:docs\readme.txt:bin` This would exclude elements at the root of your AccuRev streams and workspaces source, bin and the file `docs\readme.txt`.
Full Path to AccuRev Executables	If AccuRev is not installed separately on this machine, you will find the path to the AccuRev executable in a sub directory of the Enterprise Sync installation path, by installation default here: `C:\Program Files\Micro Focus\Enterprise Sync\connectors\accurev\accurev`.
Password	The AccuRev password for the user defined below.
Retrieve Changes Using Change Package	This is only relevant for synchronizations to AccuRev and only applies when a CCID value is provided from changes during synchronizations to AccuRev. If true, a synchronized file will be associated to all AccuRev Issues having the specified CCID value (see **Change Package Field Name** above). If no Issue exists with the specified CCID value, a new Issue will be generated, with the specified CCID value, and the file will be associated to the new Issue. If false , file changes are synchronized to AccuRev, but not associated to an Issue, even if an AccuRev Issue with the specified CCID value exists.
Store Changes Using Change Package	This is only relevant for synchronizations from AccuRev and only applies when the CCID field is associated to the AccuRev schema and a user selects at least one AccuRev issue which has a CCID value associated when promoting files. If true , a synchronized file from AccuRev will provide the target system with the first issue's CCID (see Change Package Field Name above).
Time OffSet	You can leave this blank.
User Name	This AccuRev user name is used by Enterprise Sync as the login user. This user name must match the `CC_USER` name required in the AccuRev server's configuration file (see *Modify the acserver.cnf File* .)

Endevor Data Source Fields

Before defining the Endevor data source, make sure that Mainframe Access server is installed and configured for accessing the corresponding Endevor instance.

Then define a new data source for Endevor using the **Create New Data Source** button with a unique name (for example EndevorDS) and by selecting the product `Endevor` from the list of the supported products.

Enter following values on the **Update Data Source Property Values** pane:

Code Page File	Pointing to this optional file supports specific mainframe code pages on an Endevor element type level. This is only required if the session code page defined below does not apply to all Endevor element types. If the element type name is mapped in the referenced properties file, then the code page value from the file will override the default session value. If the element type name is not mapped in the properties file, then the session code page value will be used.

The format of the file is: `"Endevor element type name"="Code page value"`

You can use any code page value which is supported as session code page value (see list below). In addition following code page values are supported only for Endevor element types, but not as a session code page:

x-IBM1380
x-IBM300
x-IBM834
x-IBM835
x-IBM837
x-IBM927
x-IBM947
x-IBM951

Example: assuming the German code page `IBM01141` is defined as the session code page, but should not be used for C files. Then create a code page file with the following entry: `C=IBM01140`.

The field entry in the data source points to this file, for example: `C:\EnterpriseSync \config\codepage.txt`

Extensions File

Connect queries Endevor and provides default extension sets within Endevor. If you need additional extensions, or changes to the extensions, then you would use the file extensions file to include these settings. For example if you want Endevor files to use a setting not immediately provided by Endevor, you could create the file extensions file with an assembler entry.

The format of this file is: "Endevor element type name"="file extension value"

If you are configuring this extension file, then Enterprise Sync will only use the values specified in this file and not use the values defined in Endevor. Enterprise Sync will use the values from Endevor only if this file doesn't exist. No file extension is created during the synchronization process, if it is not defined for a specific type.

Examples:

```
COBOL=cbl
PLI=pli
INCLUDE=inc
COPY=cpy
EXE=bin
MACRO=mac
ASM=asm
BMS=bms
JCL=jcl
JCLPROC=jcl
LINKCARD=txt
PARM=txt
LOAD=txt
```

The field entry in the data source points to this file, for example: `C:\EnterpriseSync \config\fileext.txt`.

Include SubSystem in Path

The standard path (folder structure) created by Enterprise Sync when synchronizing Endevor elements to path structured target system would include the three folder levels Endevor System, Subsystem and Type. Select `True` if you want to include Endevor

subsystem names in the synchronization path. Normally you would select `False` if an Endevor system has exactly one subsystem, and the subsystem name is not relevant in this context. You can override the path mapping rule specified here using the **Logical Path Value Mapping file** (see below).

Logical Path Value Mapping File

This path value mapping is only required if the default path containing the Endevor System, (Subsystem) and Type is not sufficient. In this referenced file you can map any combination of Endevor environment/system/subsystem to any folder structure (path). The usage of a specific path mapping file may be required if Endevor is configured in a way that system or subsystem names are changing when moving elements from one stage to another. With this path mapping you can assure a stable path structure.

Examples:

```
SMPLPROD.ESNCTST.BANKDEMO=esnctst\bankdemo
SMPLTEST.ESNCTST1.BANKDEMO=esnctst\bankdemo
SMPLTEST.ESNCTST2.BANKDEMO=esnctst\bankdemo
```

The field entry in the data source points to this file, for example: `C:\EnterpriseSync \config\pathmap.txt`.

Mainframe Node

This is the node to your mainframe system accessible via TCP/IP. It could be a TCP/IP address or a logical name, but it should be the same name which is used in Micro Focus Enterprise Developer for accessing the mainframe. If both names are not identical, it is possible that the mainframe credentials dialog pops up twice per session within Enterprise Developer.

Mainframe Port

This is the Mainframe Access Server port.

Mainframe Server

This field must contain a unique server name for this mainframe connection (any unique value).

Password

The password for the mainframe user defined below.

Note: We recommend using an administrator mainframe user with a password which does not expire.

Read Only Element Types

If you want to synchronize Endevor elements, but you do not want to allow updates to these files in the synchronized target system, then specify the corresponding Endevor element types in this field separated by comma. Example: Assuming the Endevor element type DCLGEN would contain generated Cobol copybooks, then you would enter DCLGEN into this configuration field.

Session Code Page

If a session code page is not specified, then the installation default from the Mainframe Access Server is used. Following code pages are supported.

IBM01140
IBM01141
IBM01142
IBM01143
IBM01144
IBM01145
IBM01146
IBM01147
IBM01148
IBM01149
IBM037
IBM1026

IBM1047
IBM273
IBM277
IBM278
IBM280
IBM284
IBM285
IBM297
IBM500
IBM870
IBM871

The standard data translation between the mainframe and the Enterprise Sync server is based on this code page. This includes the file translation, as long as the Endevor element type doesn't have the binary attribute associated and as long as not another code page is configured for a specific Endevor type in the Code Page file (see above).

Time OffSet You can leave this blank.

User Name This Mainframe user name is used by Enterprise Sync as the login user to the Mainframe Access Server and for accessing Endevor. The mainframe user is mainly used for supporting a time interval based synchronization process or for retrieving general information from the Endevor instance. Enterprise Sync also supports the synchronization to Endevor on demand triggered from the IDE, for example from Enterprise Developer. An on demand synchronization uses the mainframe credentials of the mainframe user working in the IDE and not the mainframe credentials specified here in the data source.

Defining an Authenticator

Authenticators are used to enforce which product's users are allowed to log in and edit configurations. A default authenticator is installed with the following user name (`Administrator`) and password (`Administrator`). Both, user name and password are case sensitive.

To define an Authenticator:

1. On the dashboard, click the **Authenticators** tab.
2. Above the **Configured Authenticators** list, click **Add Authentication Provider**.
3. On the dialog box that opens, select valid values on the **Product** and **Data Source** fields and then click **OK**.

Defining the AccuRev Authenticator

Note: This is a required step before using the on-demand synchronization support in AccuRev.

Before defining this authenticator, you have to create an AccuRev data source first. Then, add a new Enterprise Sync authentication provider by selecting the product AccuRev and the AccuRev data source.

Refresh the dashboard and verify that you can access the Enterprise Sync configuration user interface with your AccuRev credentials.

Defining the Endevor Authenticator

Before defining this authenticator you have to create an Endevor data source first. Then add a new Enterprise Sync authentication provider by selecting the product Endevor and the Endevor data source.

Refresh the dashboard and verify that you can access the Enterprise Sync configuration user interface with your mainframe credentials.

Creating User Maps

User Maps define users that have different user names across multiple data sources. For example, a user may be `UserA` in one data source and `UserB` in another. User maps allow you to map these two users together so that the system knows they are the same user. Use the following section to learn how to create a user map.

1. On the dashboard, click the **User Maps** tab.
2. Click **Add User Map**. A row is added to the list.
3. Double click on the **User Map** text in the **Name** field.
4. Rename the user map. This value is only used in Micro Focus Connect and can be whatever you want it to be.
5. In the user map row, click on the **Add User** button. A new user name row is added as a child to the user map.
6. In the **Data Source** column, double click the new row to enable the list. Select the proper data source for the user.
7. Double click the **User Name** text in the **Name** field and type in the user name as it exists in that data source.
8. Follow the same steps to add additional users to the user map.

Mapping Mainframe Users with AccuRev Users

Before synchronizing mainframe files with AccuRev, you should define user maps for all mainframe users changing files on the mainframe to the corresponding AccuRev user (see the chapter on how to define the AccuRev user).

Based on these defined user maps, the system enables AccuRev to provide the information about who has done the latest changes when a file is synchronized from the mainframe. With this, the AccuRev history support will provide the user for all managed versions with the information who has changed specific records within a file (see AccuRev Annotate function).

Note: The AccuRev supported on demand synchronization process requires a defined user map for the AccuRev and mainframe user who is triggering the on demand synchronization. This user map is generated automatically during the on demand synchronization, if it doesn't exist.

Important: Do not define conflicting user mappings, for example one user map for the mainframe `UserA` mapped to the AccuRev `UserB` and another user map for the same mainframe `UserA` mapped to the AccuRev `UserC` .

In case you have to create a lot of user mappings you may want to create a script which generates the Enterprise Sync user mappings. To do this create a script which generates an XML file with a format like in the following sample:

```
<UserMaps>
 <UserMap>
  <name>User Map for usera</name>
  <User>
        <type>DataSource</type>
        <value>AccuRevDS</value>
        <name>usera</name>
  </User>
  <User>
        <type>DataSource</type>
        <value>EndevorDS</value>
        <name>USERB</name>
  </User>
  </UserMap>
  <UserMap>
  ...
```

```
  </UserMap>
  ...
</UserMaps>
```

For activating these generated user map definitions execute the following steps:

1. Disable any running connections.
2. Logout from the dashboard.
3. Create a manual backup of the system's configuration XML file `Connect.xml`, located here: `C:\Users\<winuser>\AppData\Local\Micro Focus\Enterprise Sync\Connect.xml`.
4. Copy the generated XML into the `Connect.xml` file before the `<Authenticators>` entry. If the `<UserMaps>` entries already exist, integrate your generated XML into the existing definitions as required.
5. Login to the system and verify that the **User Maps** tab displays all your generated user mappings correctly.

Working with Connections

A *Connection* represents the relationship between two data sources. You use the connection to:

- Identify the data source whose assets you plan to synchronize.
- Specify the projects you want to synchronize.
- Start/stop the synchronization process.

Creating and Editing Connections

You perform these tasks using the **Create Connection Wizard**.

Note: The data sources you want to use for a connection must exist before you can complete a connection. See *Defining a Data Source* for more information.

1. From the **Connections** tab, click the **Add Connection** button. The **Create Connection Wizard** appears.
2. On the **Data Source** tab, enter a name in the **Connection Name** field.
3. n the **Master Name** field, select a data source to use as the master data source. Define this data source as the master which should win in case of conflict situations. In case of parallel file changes done in both data sources Enterprise Sync will assure that the file in the master data source is not replaced with the version coming from the other data source.
4. In the **Target Name** field, select a data source to use as the data source which is used for synchronizing data from and to the master data source.
5. Optionally, use the fields in the **Error Notification** group to override error notification email settings specified in **Settings**
   - Enter email addresses (separated by a semicolon (`;`)) in the **Send Email To** field.
   - Change the value in the **Frequency** field.

   Tip: Email addresses and frequency values established on the Settings page are not displayed here.
6. Click the **Next** button which displays the **Types and Fields** tab. The current version of Enterprise Sync doesn't support any specific mappings on this page. A *Type Mapping* called **ChangeSet** is already pre-configured. Do not change this and do not add a new Type Mapping.

   You may want to select the `Default Sync Direction`. This is a default value only and can be changed on a project level later on. The three values have the following meaning:

   - A bi-directional synchronization supports data transfers in both directions, from and to the master data source.

- As an alternative you may want to synchronize only in one direction, either from the master to the target data source or vice versa.

7. Click the **Next** button again which displays the Projects tab. A Project defines a specific synchronization rule for the previously selected data sources. You can defines several projects within one connection and each single project can be activated for synchronization separately.
8. Click the **Add** button. A new row is added to the list.
9. Select the project you want to map from the **Target** list.

Tip: The data source product name is displayed on the list column title. The values displayed on the list depend on the product associated with the data source.

Note: Depending on the selected data source multi selection may be allowed or disallowed.

10. Select the corresponding Master project from the **Master Project** list. Depending on the selected data source multi selection may be allowed or disallowed.
11. The direction is pre-defined corresponding to the default value selected on the **Types and Fields** tab (inherit). You can select and associate another valid direction for this project, either `From Master`, `To Master` or `Bi-directional`.
12. Project synchronizations are enabled by default. If you wish to disable it, clear the check box.
13. Some data sources for SCM tools allow you to specify a deeper directory level synchronization. If it's available and you want to specify a directory deeper than the root directory for synchronization, click the project path button and enter path in the fields provided.
14. Once you have added all projects you want to synchronize, click the **Save** button to save your changes.

Once a connection defined and saved, you can use the **Connections** tab on the dashboard for editing the connection's configuration data. Select one connection and click on the edit button to open the connection wizard again. We strongly recommend that you disable a connection first before editing it.

If you are changing configuration data which have an impact on the synchronization process, but some synchronization have already been executed, then it might be required to verify all executed synchronizations and, if required, execute the synchronization again based on the changed configuration data. It depends on the data sources which configuration changes are allowed and supported.

It might be required to run the synchronization once again on all files. This can be enforced by clearing the connection's synchronization watermarks . If you click on this button you have to confirm that you really want to delete the water marks.

Important: Clearing the water marks might have a significant impact on the next synchronization runtime, because the synchronization is checked and, if required, executed once again for all files.

Displaying Connection Information

Once a connection is defined, use the **Connections** tab on the dashboard to display the connection details. After selecting one connection, there are several tabs available on the bottom part which displays information about the connection's configuration and about the synchronization status.

1. The **Projects** tab displays a list with all defined projects. The **Enabled** column shows whether a specific project is currently enabled for synchronization.
2. The **High Water Marks** tab displays for each defined project the current synchronization status.

Importing Project Definitions

Depending on the product, some connections may require creating many projects. Importing the project definitions from an external XML file is supported for this. The import XML file has to be created like in following sample:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ProjectMapping xmlns=" http://www.example.org/ConnectConfig2 ">
  <ProjectMaps>
```

```
    <ProjectMap>
      <source>source project value 1</source>
      <target>target project value 1</target>
      <enabled>true/false</enabled>
      <direction>fromSource/fromTarget/both</direction>
    </ProjectMap>
    <ProjectMap>
      <source>source project value 2</source>
      <target>target project value 2</target>
      <enabled>true/false</enabled>
    </ProjectMap>
    <ProjectMap>
    ...
    </ProjectMap>
    ...
  </ProjectMaps>
</ProjectMapping>
```

- `Source/target` depend on which product is the master (source) for the synchronization process and which is target.
- `Enabled` determines whether or not that particular project map entry is active.

If multi selection is supported for source or target, then use the comma `,` for separating the values.

`Direction` is an optional parameter. If not used the value is inherited from the connection definition. Valid values are:

- `fromSource`
- `fromTarget`
- `both`

Project Map File Includes/Excludes

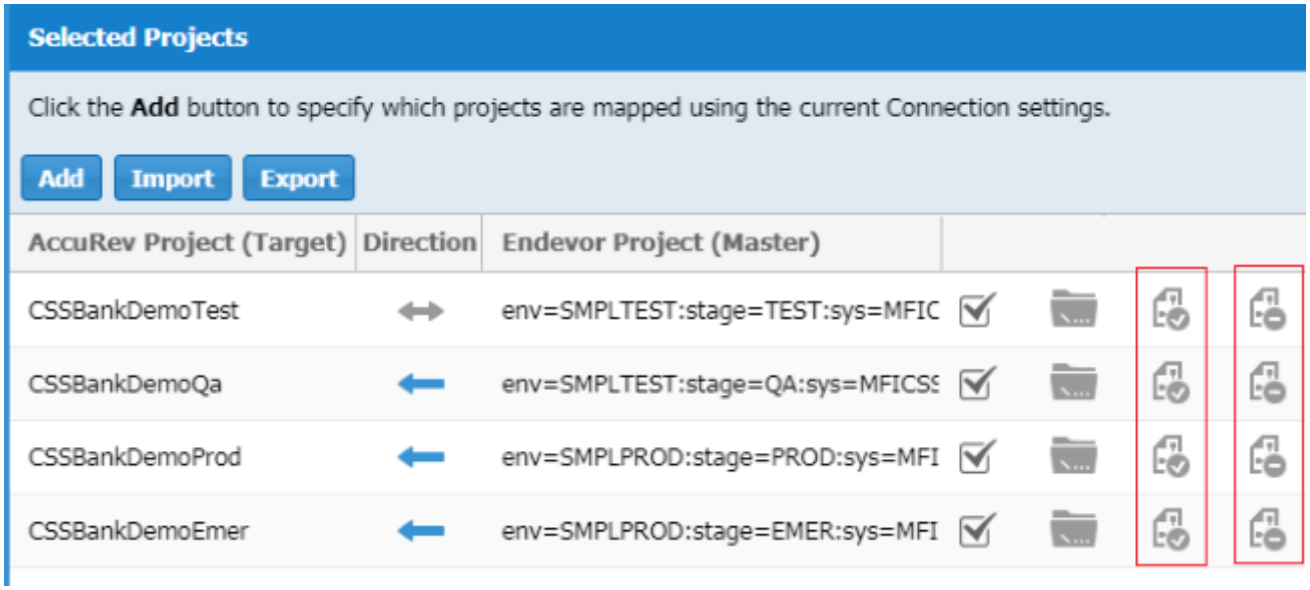
By default, when a project is mapped, all files are included in the synchronization. In cases where you only want certain directories or file types, you can explicitly include/exclude any file type/directory from a synchronization for a project map.

For example, if an include directory is `TEST/BANKDEMO`, then all files contained in that directory only will be synchronized.

Similarly, if an include directory is `TEST/BANKDEMO` and the exclude directory is `TEST/BANKDEMO/ACCTS`, then all files in `TEST/BANKDEMO` will be synchronized except for the files in `TEST/BANKDEMO/ACCTS`.

You can also restrict the files to be synchronized by specifying file-extensions to be included and excluded.

Use the **Include** or **Exclude** icons on the **Selected Projects** lists:



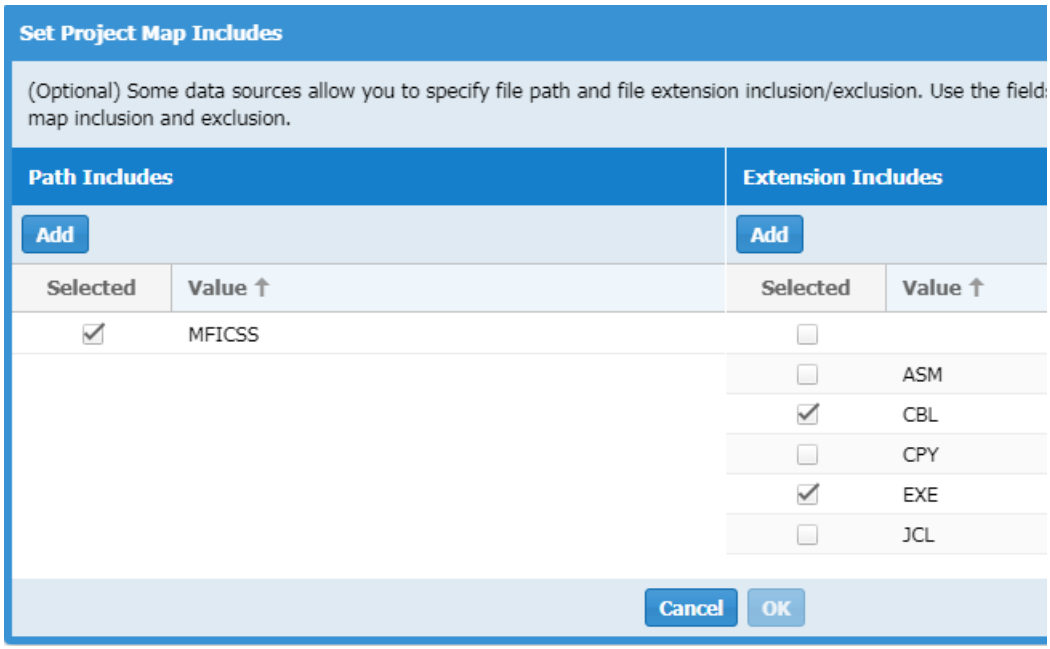
For the highlighted columns above:

- The first column contains the Includes files/directories .
- The second column contains the Excludes files/directories .

Click one of the icons to either add or edit an Includes or Excludes for a directory or an extension.

When values have been set for the project map, the icon is blue.

Path/Extension Includes Dialog box



Path Includes

- Specify a list of path inclusions. Example: `TEST/BANKDEMO/ACCTS`.
- The initial starting values come from the connectors themselves (both sides of the project map).
- Items can be checked or unchecked (only checked saved to XML file).

- Double-click to edit or click **Add** to add a new row.

Extension Includes

- Specify a list of file extension inclusions. Example: `EXE`, `CBL`, …
- The initial starting values come from the connectors themselves (both sides of the project map).
- Items can be checked or unchecked (only checked saved to XML file).
- Double-click to edit or click **Add** to add a new row.

Path/Extension Excludes Dialog Box

Path Excludes

- Specify a list of path exclusions. Example: `TEST/BANKDEMO/ACCTS`.
- The initial starting values come from the connectors themselves (both sides of the project map).
- Items can be checked or unchecked (only checked saved to XML file).
- Double-click to edit or click **Add** to add a new row.

Extension Excludes

- Specify a list of file extension inclusions. Example: `EXE`, `CBL`, …
- The initial starting values come from the connectors themselves (both sides of the project map).
- Items can be checked or unchecked (only checked saved to XML file).
- Double-click to edit or click **Add** to add a new row.

Starting and Stopping Connections

A connection needs to be fully defined before you can start it. You can see a connection's status on the dashboard.

To start a connection, click its **Start** button  on the dashboard.

To stop a connection, click its **Stop** button  on the dashboard.

Connection Status Values

The **Connections** page contains a grid listing each of your connections. One of the columns in the grid is **Status**. The following are the available values:

Disabled	This status is displayed if you have stopped successfully the connection or you have defined and not started a new connection. In this status, the synchronization process is not running.
Failed	One or more projects associated with this synchronization have failed and no subsequent iterations have succeeded. See the `Running` status for an example.
Idle	There are no projects to synchronize or the project maps are disabled.
Restarting	The application is re-reading the configuration file and is restarting all of the synchronizations. When the sync is complete, the status will change to `Running` or `Failed`. If you are starting a synchronization which was in disabled mode, then the status changes to `Restarting` first. But there may be also occasions where a running process restarts automatically.
Running	The status will be `Running` when the last available status for all projects is `Success` .

```
Example: A synchronization has projects (p1, p2, p3):
Case 1 RUNNING:
Iteration 2: p1=success, p2=success, p3=success
Iteration 3: p1=ongoing
Case 2 FAILED
Iteration 2: p1=failed, p2=success, p3=success
Iteration 3: p1=ongoing
Case 3 RUNNING:
Iteration 2: p1=failed, p2=success, p3=success
Iteration 3: p1=success, p2=ongoing
```

Server Reinitializing	The application is reinitializing after changes to the configuration file. This status will display for all connections until the application has re-read the configuration file and created the associated projects.
Unknown	The synchronization status is not known to the application. There is an error.

Specific Considerations when Defining AccuRev to Endevor Connections

Enter the prerequisites here (optional).

The following rules apply when defining connections based on an AccuRev and an Endevor data source:

1. The Enterprise Sync server needs access to the AccuRev server and to the Mainframe Access Server when defining the connection.
2. Endevor must be master in such a connection, the current release of Enterprise Sync does not support defining AccuRev as the master.
3. Before defining projects, you have to create all required streams in AccuRev first because the project list requires the selection of exactly one stream as a project value. Multi selection of AccuRev streams is not supported when defining one project.

   Tip: The list displays all streams defined in AccuRev, but based on the implementation design you would normally select a dynamic stream as the target for a synchronization process with Endevor. Do not select a gated stream as the target. Although an AccuRev user may promote files to a gated stream, and by doing this triggering an on demand synchronization process, it is correct to define the corresponding project mapping with the parent dynamic stream.
4. The selection list for an Endevor project displays all combinations of Endevor environments, stages, systems and subsystems for selection. Endevor subsystems are only displayed on this list, if the Endevor data source attribute **Include Subsystem in Path** is selected as `true`. Multi selection is supported. This allows mapping several Endevor systems and subsystems to one AccuRev stream.

   Note: For mapping several Endevor systems/subsystems to one stream, define only one project as described above instead of defining several projects with the same AccuRev stream.

Changing the Configuration and Clearing Watermarks

Clearing the watermarks might have a significant impact on the next synchronization runtime, because the synchronization is checked and, if required, executed once again for all files. If the file content is identical in Endevor and AccuRev, then no new element revision is created in AccuRev during the next synchronization iteration. If metadata has changed then these metadata are synchronized to AccuRev, even if the file content has not changed.

Some configuration changes may have an impact on the file content, on the path or on the metadata stored in AccuRev.

As a general rule Enterprise Sync will only interpret the changed configuration fields for new synchronized files, which means that you have to clear the watermarks to assure that a configuration change has an impact on all already synchronized files.

Endevor Data Source

Configuration Change	Description
Session code page changed	Clear the watermarks to assure that all files with different content caused by the code page change are synchronized correctly to AccuRev.
Code page file changed	Clear the watermarks to assure that all files with different content caused by the code page change are synchronized correctly to AccuRev. As an alternative purge the corresponding folders, because only specific Endevor Types are affected by this change. Enterprise Sync will recreate the folders with the latest Endevor version, but the AccuRev history is not available anymore when using this alternative.
Extension file changes	It's recommended to clear the watermarks to assure that all AccuRev elements with an old file extension are recreated and the corresponding metadata are updated correctly. **Note:** Synchronized AccuRev elements with old extensions are purged after restarting the synchronization process. The elements with old extensions are even purged if you don't clear the watermarks, because Enterprise Sync will purge all AccuRev files which are not mapped to Endevor elements.
Include subsystem in path	You should avoid changing this field value because Enterprise Sync would purge the complete stream content and recreate the elements in the new path, even if you don't clear the watermarks.
Local path value mapping file	You should avoid changing existing entries in this file because Enterprise Sync would purge the corresponding stream content and recreate the elements in the new paths, even if you don't clear the watermarks. Of course it is never an issue to add additional mappings to this file, for example after defining new connection projects.
Mainframe node, port and server name	You can change these values as long as the mainframe connection points to the same Endevor repository. This change does not have an impact on synchronized AccuRev elements. There are some AccuRev stream properties containing these values which are updated automatically by Enterprise Sync. It is not necessary to clear the watermarks.
Mainframe userid and password	You can change these values. It does not have an impact on synchronized AccuRev elements.
Read-only element types	If you change the list of the read-only element types this has a direct impact on new synchronized AccuRev elements. To assure that all already synchronized files have the correct read-only flag associated you will have to clear the watermarks.

AccuRev Data Source

Configuration Change	Description
Depot name	Clear the watermarks to assure that a new clean initial synchronization is done into the new depot.

Configuration Change	Description
	The depot has to be prepared to support the connection project targets (streams).
AccuRev server and port	As long as the new connection points to the same AccuRev database, this change does not have an impact on synchronized AccuRev elements. There are some AccuRev stream properties containing these values which are updated automatically by Enterprise Sync. It is not necessary to clear the watermarks. If the connection points to a new AccuRev database clear the watermarks to assure that a new clean initial synchronization is done into the new database. The depot has to be prepared to support the connection project targets (streams).
Exclude list	If you delete entries from the exclude list, but these entries are pointing to existing paths in AccuRev which are not mapped to logical paths in Endevor, then Enterprise Sync would purge the corresponding folders and files. It is not necessary to clear the watermarks.
All Change Package related fields	You can change these values. Such a change does not have an impact on already synchronized AccuRev elements, it only has an impact on the future Change Package processing. It is not necessary to clear the watermarks.
Full path to AccuRev executables	You can change this value, if required. It does not have an impact on synchronized AccuRev elements.
AccuRev user name and password	You can change these values, but you have to make sure that a new user name is also updated in the AccuRev server configuration file. This change does not have an impact on synchronized AccuRev elements.

Connection

Configuration Change	Description
Deleting, enabling, disabling a project	This change does not have an impact on already synchronized AccuRev elements.
Adding a project	Adding and enabling a new project to a connection will be processed in the next iteration. It is not necessary to clear the watermarks.
Changing a project	You should avoid changing an enabled project with already synchronized elements. If you still want to change an existing project you have to clear the watermarks as well before restarting the synchronization process. Depending on your change this could lead to purged folders in AccuRev. Instead of changing and project we recommend to delete or disable the project and to add a new project. By doing this it is not required to clear the watermarks.

Verifying the Installation and Configuration in Enterprise Developer

Use the following procedure for verifying the installation and configuration process based on a defined Enterprise Sync connection which synchronizes Endevor elements with AccuRev files. The following must be installed and configured before continuing this procedure:

Enterprise Sync	The installation must be complete and configured successfully for the synchronization process. The synchronization process should be running. See Enterprise Sync Server Configuration.
Enterprise Developer	The installation must be complete and the AccuRev Eclipse Plugin as well as the AWM AccuRev Integration Plugin must be installed on top of Enterprise Developer
Workflow Manager (AWM) Endevor Attachment	The installation must be complete and configured successfully.
AccuRev Client	The AccuRev client must be installed on the same machine where the Enterprise Developer is installed

1. Start Enterprise Developer.
2. On the **Workspace Launcher** dialog box, enter a workspace name of your choice. Then click **OK**.
3. If this is the first time you start Enterprise Developer, you are presented with the **Eclipse Welcome** page. Click **Open Team Developer Perspective** to close the **Welcome** page and open the **Team Developer Perspective**.

   If the Welcome page is not opened, click **Window** > **Open Perspective** > **Other**, select the **Team Developer** (default) and click **OK**.
4. Click the **Remote Systems** tab.
5. Create a remote system (mainframe) connection (if a connection to your mainframe has not been pre-configured and is therefore not listed):
   a) On the **Remote Systems** tab, click  .
   b) Select `Micro Focus z/Server`, then click **Next**.
   c) Enter the details of the mainframe that has z/Server and MFA server installed.

      Important: Enter exactly the same host name which has been used when configuring the Endevor data source on the Enterprise Sync server.
   d) Click **Next**, enter the MFA port number for the installation on the mainframe, and edit the host code pages, as required, and then click **Finish**.

      Note: It should be the same port and the same session code page which has been used when configuring the Endevor data source on the Enterprise Sync server.
6. Connect to your mainframe system with your mainframe credentials.
7. The mainframe connection was successful if the background color of the icons is displayed in green. Verify your Enterprise Developer mainframe installation (Mainframe Access Server and z/Server installation) and the network connectivity, if the connection cannot be established.
8. The Application Explorer view should display a mainframe system entry after the mainframe connection has been established. If the system entry is not visible select, **Add system(s)...** from the context menu and select the previously created mainframe system. If this mainframe system entry is still not visible, then verify that the z/Server User server configuration and that the Workflow Manager Endevor Attachment has been correctly configured.
9. When expanding the mainframe system entry in the Application Explorer view, an application with the name **Enterprise Sync V2.2 Endevor Application** should be visible. Select **Load Application** from the context menu.

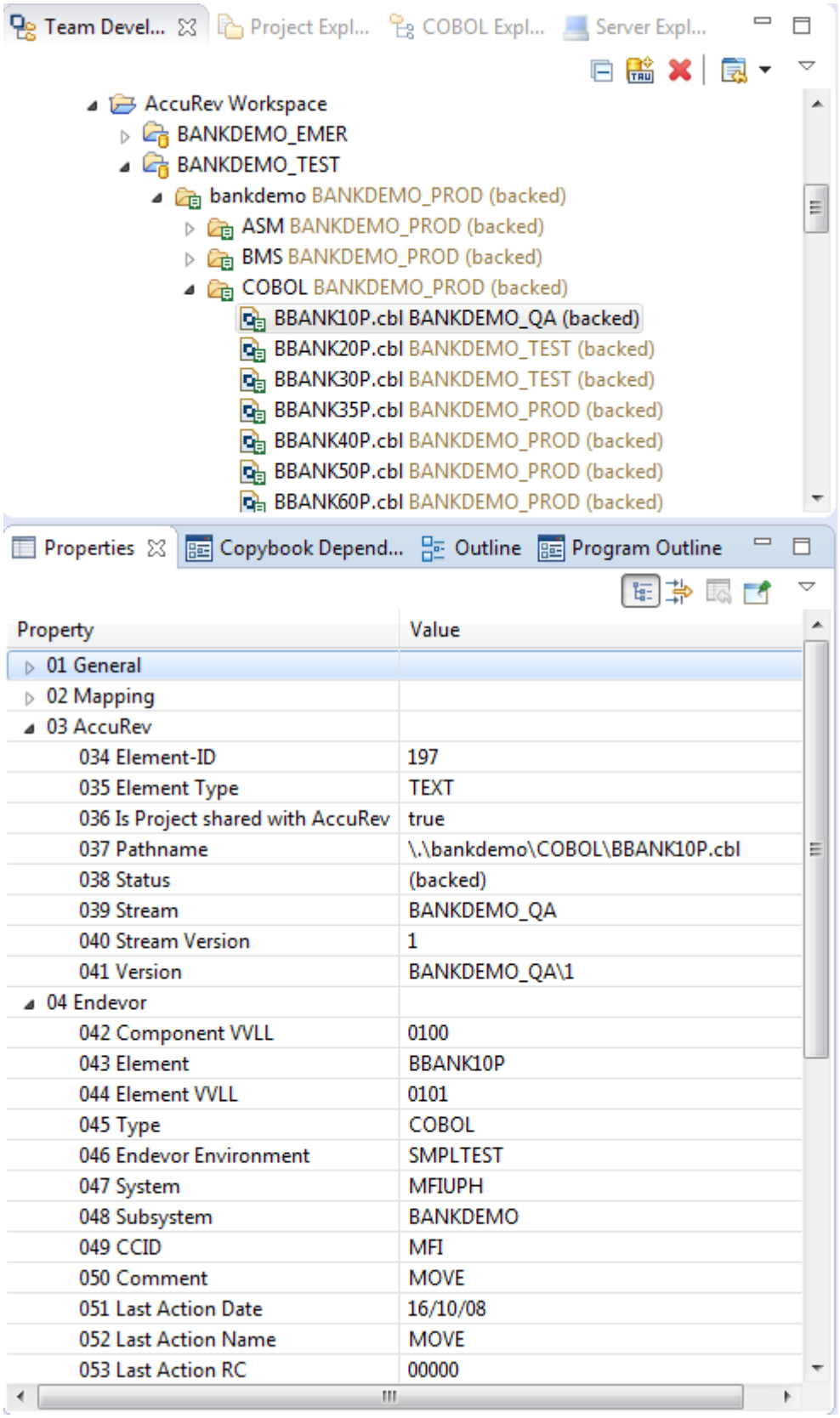
   If this application entry is not visible, then verify that the Workflow Manager Endevor Attachment has been correctly configured and the application has been added correctly to the Workflow Manager's **Master Configuration** file.

   Note: The application name might be different in your installation.

10. Expand the **Endevor** entry a few times until Endevor elements are listed in the tree view. If this doesn't work, verify that the Workflow Manager Endevor Attachment has been correctly installed and configured and the z/Server user server has access to the Endevor installation.
11. On the **AccuRev Workspace** entry select **New** > **Project …** from the context menu.
12. In the **New Project** wizard, select **AccuRev>Project from AccuRev** and click **Next**. If this project is not visible, verify that the AccuRev Eclipse plugin has been correctly installed on top of Enterprise Developer.
13. Select the AccuRev server address and port (port 5050 is default). Then select the AccuRev depot and a gated stream which you want to use as a basis for creating an AccuRev workspace. You may have to login to AccuRev first. Then click **Next**.

    If no depot is visible or no streams are displayed verify the following:

    a) Verify that your AccuRev login credentials were correct (logout/login).
    b) Verify that an AccuRev depot exists on the server.
    c) Verify that the stream structure has been defined in this AccuRev depot including the required gated streams.
14. Enter the AccuRev **Workspace Name**. This could be the same name as the parent stream, because AccuRev will add your user name automatically. Specify a path on your disk outside the Eclipse workspace (e.g. `c:\microfocus\esd\`) and then click **Next**.
15. Enter an Eclipse **Project Name** and then click **Next**.
16. Create the workspace in a General Eclipse Project. Then click **Next** and then **Finish** to create the AccuRev workspace in a general Eclipse project.
17. Refresh the workspace entry in the Application Explorer view.
18. Expand the workspace a few times and navigate to a folder where you would expect the synchronized Endevor elements. Select one COBOL file any verify that the **Properties** view contains values for the AccuRev and Endevor properties. This means that the Endevor metadata have been correctly synchronized to AccuRev.



If you don't see the folder structure when expanding the stream, verify that the Enterprise Sync server has been configured correctly and that the initial synchronization has been executed.

If the properties view doesn't contain AccuRev and Endevor metadata verify that the AWM AccuRev integration plugin has been installed on top of Enterprise Developer.

19. Verify that the AccuRev WebUI works by selecting **Team** > **WebUI** from the context menu.
20. The WebUI window should open. Click on the Stream Browser which should display the stream structure. If the WebUI window doesn't open verify that the AccuRev server's `settings.xml` file has been created correctly and the AccuRev Web Service is running.

Glossary

AccuRev Workspace	Private developer work area.
AWM	See Workflow Manager.
CCID	An Endevor short name for Change Control Identifier, which is an attribute associated to Endevor elements.
Change package	A set of AccuRev elements. The change package records the changes to one or more elements. Each entry in the change package describes changes to one element: the changes between the basis version and the head version.
Connection	The configuration that permits synchronization of specific assets. A connection defines a master and a target data source and several specific mapping rules defined as projects.
Connector	Software that interacts with an SCM system (CA Endevor, for example) to perform synchronizations.
Connector type	The name of the third-party repository with which a connector interacts.
Content type	The content type specifies how data are stored in AccuRev or Endevor (for example `binary` or `text`).
Data source	A specific instance of an Enterprise Sync connector.
Depot	Main repository on an AccuRev server for all related source code.
Eclipse Project	AWM applications, Enterprise Developer Cobol or PL/I projects and AccuRev workspaces are managed in Enterprise Developer in Eclipse projects.
Element type	A type is a category of source code that is used as part of the classification of an Endevor element. For example, there are types for COBOL, COPYBOOK, JCL.
Endevor	A short name for CA's Endevor Software Change Manager product.
Enterprise Sync Project	An Enterprise Sync project is a specific configuration defined in a connection which defines mapping rules for SCM assets. A connection may define several projects, for example depending of the stages, application systems, etc.
Environment	An environment is the top level of the logical structure used to classify elements in Endevor.
Eclipse Workspace	A developer local workspace used by Enterprise Developer to manage Eclipse project data.
Element	A file or directory that is under version control. This term is used in AccuRev for files and directories and used in Endevor for files.
Gated stream	A special AccuRev stream which is used by Enterprise Sync to support on demand synchronizations (see also Stream).
Master data source	The primary and leading data source defined in a connection. In case of a bi-directional synchronization the assets of the master data source are treated with precedence, for example when a conflict situation occurs.
Processor Group	A *processor group* identifies a set of processors for a specific element type in Endevor. A group can include up to three processors (one generate, one delete, and one move processor, or any combination).

Project	See Enterprise Sync Project or Eclipse Project.
SCM	Software change and configuration management: a third party product managing software assets relevant for application development. This typically includes features like versioning, change management, build management and process management.
Stage	A stage in Endevor is a step in the software life-cycle. There are two stages defined for each Endevor environment.
Stream	Configuration of related elements in AccuRev. Code may be promoted into or inherited from streams.
Subsystem	A subsystem is a part of the Endevor classification of an element. Subsystems are used for specific applications within a system.
Synchronization	The process of mirroring and synchronizing assets (one- or bi-directional) between two third-party SCM systems (for example between AccuRev and Endevor).
System	An Endevor system is a way to classify elements in Endevor. A system typically represents the applications.
Target data source	The second defined data source in a connection, which is not the master data source.
Type	See Content type or Element type.
Workspace	See AccuRev Workspace or Eclipse Workspace.
Workflow Manager	A feature in Enterprise Developer for Eclipse which generates a user interface and integrates custom applications, for example the third party SCM systems.
Version	A particular revision of an element in AccuRev. In Endevor the term VVLL (version/level) is used to identify a revision in an environment.

Troubleshooting

Use the topics in this section to troubleshoot common issues.

Contacting Micro Focus

Micro Focus is committed to providing world-class technical support and consulting services. Micro Focus provides worldwide support, delivering timely, reliable service to ensure every customer's business success.

All customers who are under a maintenance and support contract, as well as prospective customers who are evaluating products, are eligible for customer support. Our highly trained staff respond to your requests as quickly and professionally as possible.

Visit *http://supportline.microfocus.com/assistedservices.asp* to communicate directly with Micro Focus SupportLine to resolve your issues, or email supportline@microfocus.com.

Visit Micro Focus SupportLine at *http://supportline.microfocus.com* for up-to-date support news and access to other support information. First time users may be required to register to the site.

Creating a Dump File

If reporting a protection violation you might be asked to provide a dump (.dmp) file. To produce a dump file you use the Unexpected Error dialog box that is displayed when a protection violation occurs. Unless requested by Micro Focus SupportLine, leave the dump setting as `Normal` (recommended), click **Dump**, then specify a location and name for the dump file. Once the dump file has been written you can email it to Micro Focus SupportLine

You may also be asked to provide a log file created by the Consolidated Tracing Facility (CTF) - a tracing infrastructure that enables you to quickly and easily produce diagnostic information detailing the operation of a number of Micro Focus software components.

Reviewing Log Files

Do the following to locate the log files:

1. Open `<install path>\Micro Focus\Enterprise Sync\local.properties`.
2. Find the `USER_DIRECTORY=` entry. It will be something similar to:

   ```
   c:/users/<winuser>/AppData/Local/Micro Focus/Enterprise Sync
   ```
3. Open that directory and you will find a `logs` directory.

Changing the Logs to Debug Level

If you require more detailed log file information, change the logging level to DEBUG:

1. Find and open for editing the `log4j.xml` file in the `C:\Program Files\Micro Focus \Enterprise Sync` directory.
2. Locate the `<logger ...` elements. There are many. They each contain a `<level>` element. One full entry will look similar to:

   ```
   <logger name="stderr" additivity="false">
       <level value="INFO"/>
   ```

```
    <appender-ref ref="DEFAULT"/>
    <appender-ref ref="ERROR"/>
</logger>
```

3. Change the `value="INFO"` to `value="DEBUG"`.
4. Save and close the file.
5. Re-start the `EnterpriseSyncConnect` service.

Note: In addition, there is a rest server log available in `<install path>\Micro Focus \Enterprise Sync\WebServer\webapps\connectRest\logs`, which might be required if issues are related to the Enterprise Sync Web Service interface.

Debugging the AccuRev Eclipse Plugin

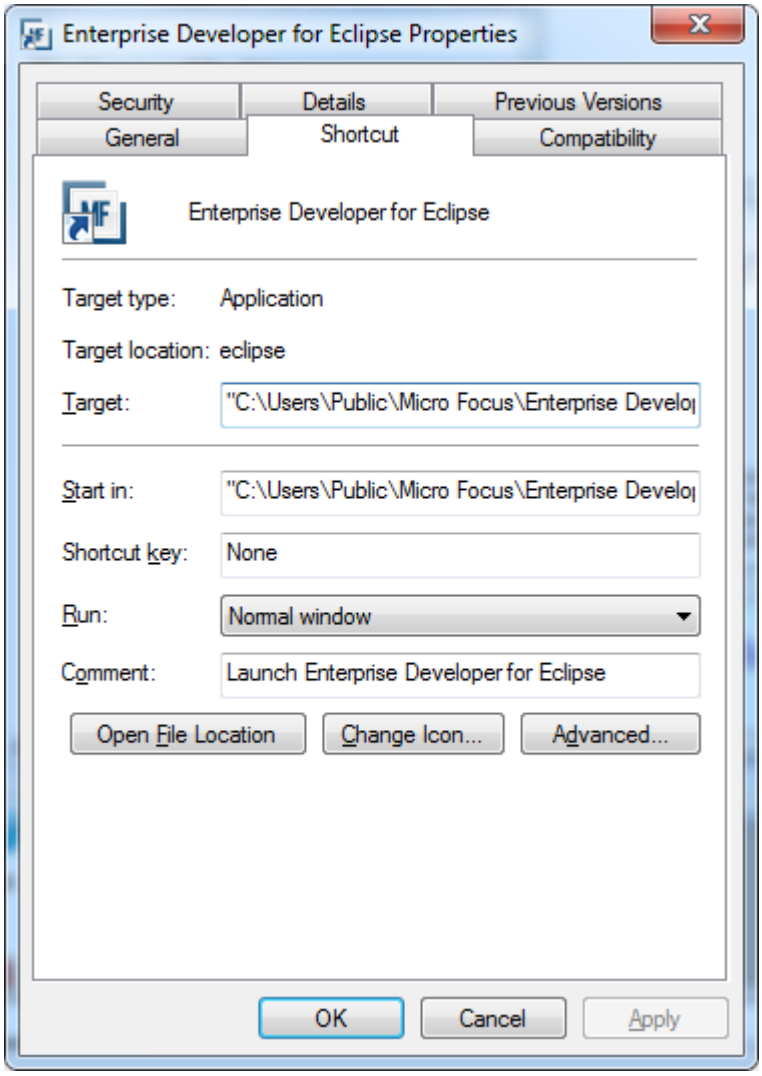
1. In Enterprise Developer, select **Window** > **Preferences** and navigate to **Team** > **AccuRev**. Then check **Enable debug in log**.
2. You will find the log information in the `User's` folder (`C:\Users\<winuser>`).

Enterprise Developer and AWM Related Logs

1. Ensure that a `.options` file is available in the Eclipse directory of the Enterprise Developer installation. The `.options` file is copied to the `Eclipse` directory with the product installation. It must contain the following information:

   ```
   com.microfocus.awm/debug=true
   com.microfocus.awm/debug/flag=true
   com.microfocus.awm.mvssystem/debug=true
   com.microfocus.zserver.communicator/tracing=true
   ```

   If the file is not available in the Eclipse directory of Enterprise Developer you can edit it with Notepad or any similar text editor. To quickly find the Eclipse directory, click **Open File Location** from the Enterprise Developer shortcut.



2. Start the Eclipse workbench with the -debug option (append -debug to the Target field shown above).
3. Reproduce the error and export the error log to a local file (click **Error Log View** from the Eclipse workbench).
4. Add the exported file to all the other information (problem description, screen shots, etc.) for SupportLine, and zip it up ready to attach to an incident raised with Micro Focus SupportLine.
5. Remove the –debug option from the Target field.

AccuRev Server Logs

You will find the AccuRev Server log information in a subdirectory of the AccuRev database directory, which is by installation default: `C:\Program Files\AccuRev\storage\site_slice\logs`.

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