Sterling Commerce
An IBM Company

Sterling Multi-Channel Fulfillment Solution

Configuration Deployment Tool Guide

Release 8.0

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Preface

This manual explains how to deploy configuration data using the Sterling Configuration Deployment Tool.

Intended Audience

This manual is intended for use by those who are responsible for maintaining the deployments of the Sterling Multi-Channel Fulfillment Solution.

Structure

This manual contains the following chapters:

Chapter 1, "Deployment Tools Overview"

This chapter discusses the Configuration Deployment Tool and its purpose.

Chapter 2, "Concepts"

This chapter explains some high level concepts related to the Configuration Deployment Tool.

Chapter 3, "Understanding the CDT Interface"

This chapter explains features of the Configuration Deployment Tool user interface.

Chapter 4, "Before Using the Configuration Deployment Tool"

This chapter describes the prerequisites necessary to run the Configuration Deployment Tool.

Chapter 5, "Running the CDT and Setting Up the Preference Settings"

This chapter describes the steps necessary to successfully set up and run the Configuration Deployment Tool.

Chapter 6, "Transforming Elements Using the CDT"

This chapter describes the concepts and steps behind transforming elements.

Chapter 7, "Comparing Source and Target Databases"

This chapter describes how to compare source and target databases, and the steps you can take after this has been completed.

Chapter 8, "Configuration Data Versioning Tool"

This chapter describes the steps necessary to track changes in configuration data.

Chapter 9, "Deploying Your Configuration Data"

This chapter explains how to deploy configuration data gathered by the Configuration Deployment Tool.

Chapter 10, "Troubleshooting"

This chapter provides some common troubleshooting steps.

Sterling Multi-Channel Fulfillment Solution Documentation

For more information about the Sterling Multi-Channel Fulfillment Solution® components, see the following manuals:

- *Sterling Multi-Channel Fulfillment Solution® Release Notes*

- *Sterling Selling and Fulfillment Suite® Release Notes*
- *Sterling Multi-Channel Fulfillment Solution® Installation Guide*
- *Sterling Multi-Channel Fulfillment Solution® Upgrade Guide*
- *Sterling Multi-Channel Fulfillment Solution® Configuration Deployment Tool Guide*
- *Sterling Multi-Channel Fulfillment Solution® Performance Management Guide*
- *Sterling Multi-Channel Fulfillment Solution® High Availability Guide*
- *Sterling Multi-Channel Fulfillment Solution® System Management Guide*
- *Sterling Multi-Channel Fulfillment Solution® Localization Guide*
- *Sterling Multi-Channel Fulfillment Solution® Customization Guide*
- *Sterling Multi-Channel Fulfillment Solution® Integration Guide*
- *Sterling Selling and Fulfillment Suite® Integration Guide*
- *Sterling Multi-Channel Fulfillment Solution® Product Concepts*
- *Sterling Warehouse Management System® Concepts Guide*
- *Sterling Multi-Channel Fulfillment Solution Platform® Configuration Guide*
- *Sterling Distributed Order Management® Configuration Guide*
- *Sterling Supply Collaboration® Configuration Guide*
- *Sterling Global Inventory Visibility® Configuration Guide*
- *Sterling Product Management® Configuration Guide*
- *Sterling Logistics Management® Configuration Guide*
- *Sterling Reverse Logistics® Configuration Guide*
- *Sterling Warehouse Management System® Configuration Guide*
- *Sterling Multi-Channel Fulfillment Solution Platform® User Guide*
- *Sterling Distributed Order Management® User Guide*
- *Sterling Supply Collaboration® User Guide*
- *Sterling Global Inventory Visibility® User Guide*

- *Sterling Logistics Management® User Guide*
- *Sterling Reverse Logistics® User Guide*
- *Sterling Warehouse Management System® User Guide*
- *Sterling Multi-Channel Fulfillment Solution Mobile Application® User Guide*
- *Sterling Multi-Channel Fulfillment Solution Analytics® Guide*
- *Sterling Multi-Channel Fulfillment Solution® Javadocs*
- *Sterling Multi-Channel Fulfillment Solution® Glossary*
- *Sterling Parcel Carrier Adapter® Guide*

Conventions

The following conventions may be used in this manual:

Convention	Meaning
. . .	Ellipsis represents information that has been omitted.
< >	Angle brackets indicate user-supplied input.
`mono-spaced text`	Mono-spaced text indicates a file name, directory path, attribute name, or an inline code example or command.
/ or \	Slashes and backslashes are file separators for Windows, UNIX, and Linux operating systems. The file separator for the Windows operating system is "\" and the file separator for UNIX and Linux systems is "/". The UNIX convention is used unless otherwise mentioned.
<INSTALL_DIR>	User-supplied location of the Sterling Multi-Channel Fulfillment Solution installation directory. This is only applicable for Release 8.0 or above.
<INSTALL_DIR_OLD>	User-supplied location of the Sterling Multi-Channel Fulfillment Solution installation directory for previously installed releases. This is only applicable for Release 8.0 or above.

Convention	Meaning
<YANTRA_HOME>	User-supplied location of the Sterling Supply Chain Applications installation directory. This is only applicable for Release 7.7, 7.9, and 7.11.
<YANTRA_HOME_OLD>	User-supplied location of the Sterling Supply Chain Applications installation directory for previously installed releases. This is only applicable for Releases 7.7, 7.9, and 7.11.
<YFS_HOME>	For releases 7.3, 7.5, and 7.5 SP1, this is the user-supplied location of the Sterling Supply Chain Applications installation directory. For releases 7.7, 7.9, and 7.11, this is the user-supplied location of the <YANTRA_HOME>/Runtime directory. For release 8.0, the <YANTRA_HOME>/Runtime directory is no longer used and this is the same location as <INSTALL_DIR>.
<YFS_HOME_OLD>	This is the <YANTRA_HOME>/Runtime directory of previously installed releases. This is only applicable for Releases 7.7, 7.9, and 7.11.
<ANALYTICS_HOME>	User-supplied location of the Sterling Multi-Channel Fulfillment Solution Analytics installation directory. **Note:** This convention is used only in the *Sterling Multi-Channel Fulfillment Solution Analytics Guide*.
<COGNOS_HOME>	User-supplied location of the Cognos installation directory. **Note:** This convention is used only in the *Sterling Multi-Channel Fulfillment Solution Analytics Guide*.
<MQ_JAVA_INSTALL_PATH>	User-supplied location of the IBM WebSphere MQ Java components installation directory. **Note:** This convention is used only in the *Sterling Multi-Channel Fulfillment Solution System Management Guide*.
<DB>	Refers to the Oracle, DB2, or MSSQL depending on the database server.

Convention	Meaning
<DB_TYPE>	Depending on the database used, considers the value oracle, db2, or sqlserver.

1

Deployment Tools Overview

During incremental configurations of Sterling Multi-Channel Fulfillment Solution, changes are typically developed in a test environment and then they are rolled out into production. Migrating configuration data can be fairly cumbersome and time consuming. Sterling Multi-Channel Fulfillment Solution provide a Configuration Deployment Tool that enables you to migrate configuration data. This tool ensures data integrity while reducing the system downtime to transfer data and minimizing the effort needed to ensure accuracy.

This tool is designed to migrate data that is modified as part of a normal day-to-day operation. Note that the Configuration Deployment Tool can be used to deploy configuration data that is the result of an upgrade, but it should not be used to perform the data upgrade itself.

Configuration Deployment Tool Features

The Configuration Deployment Tool (CDT) can be accessed from the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench (also known as the "WorkBench").

> **Note:** The GUI mode of the Sterling Multi-Channel Fulfillment Solution Configuration Deployment Tool is only available on Windows.

CDT provides the following capabilities:

- Transfer complete and partial sets of configuration data or discrete logical portions.
- Transfer data to and from XML files or databases.

- Transform certain data-like IP addresses and port numbers that are different in two environments, depending upon network configuration.
- Generate a report of configuration differences by comparing the two systems.

2

Concepts

This chapter presents and defines terms relevant to the Configuration Deployment Tool, and explains how they apply.

2.1 Source and Target Environments

The Sterling Multi-Channel Fulfillment Solution Configuration Deployment Tool deploys data from one Sterling Multi-Channel Fulfillment Solution environment to another. The deployment could occur from development to test environments, from staging to production environments, and so forth. The environment that serves as the point of origin for the data is known as the "source" environment. The destination environment into which data is deployed is defined as the "target" environment. This deployment can be in the form of importing and exporting data to and from databases or XML files.

> **Note:** If you make any changes to the configuration data in the source database, the existing transactions in the CDT may get affected.
>
> Also, for the YFS_TRAN_LOCN_ATTRS table, only the configuration data is copied to the target database and the transaction data columns such as Pend_in_volume, Pend_in_weight, and Freeze on variance are not copied to the target database. The weight and volume are recalculated and updated in the target database.

Example 2–1 shows the required format of these XML files.

Example 2–1 Configuration Data XML

```
<?xml version="1.0" encoding="UTF-8" ?>
<YFS_ATP_RULESList TableName="YFS_ATP_RULES">
    <AtpRules AccumulationDays="730" AdvanceNotificationTime="0"
    AtpRule="DEFAULT" AtpRuleKey="DEFAULT" AtpRuleName="DEFAULT"
    BackwardConsumptionDays="730" ConsiderPoForAlloc="N" Createprogid=""
    Createts="" Createuserid="SYSTEM" ForwardConsumptionDays="730" Lockid="0"
    MaxInventoryHoldDays="730" Modifyprogid="SYSTEM" Modifyts=""
    Modifyuserid="SYSTEM" OrganizationCode="DEFAULT" PastDueDemandDays="730"
    PastDueSupplyDays="730" ProcessingTime="0" />
</YFS_ATP_RULESList>
```

2.2 Configuration Groups and Driver Entities

The entire set of the Sterling Multi-Channel Fulfillment Solution configuration data is broken down into logical subsets called "configuration groups" and "driver entities". Configuration groups and driver entities are predefined and cannot be changed.

During the deployment process, if you need to perform more granular inserts, updates, and deletes so that your target database matches your source, you choose these configuration groups or driver entities.

Driver Entities

Most of the Sterling Multi-Channel Fulfillment Solution configuration data can be deployed starting with a logical entity, for example, an organization or a pipeline. These logical entities are called "driver entities". Driver entities represent the most granular level of information that can be deployed from the source to the target without loss of data integrity.

Only driver entities allow deployment at a record level. For other tables either of the following conditions apply:

- The table is completely deployed if it is not dependent on any driver entity.
- Only records corresponding to the driver entity are deployed.

Information about driver entities can be stored in multiple tables and when deploying an entity, data in all related tables is deployed together in one transaction boundary to preserve data consistency.

Configuration Groups

Logically related tables or driver entities are also grouped together into "configuration groups" that typically represent larger, significant logical data models within the Sterling Multi-Channel Fulfillment Solution. Examples include the Business Process Model or the Participant Model. These groups are provided for convenience and for ease of navigation on the user interface.

2.3 Externally Maintained Configuration Data

In your implementation of the Sterling Multi-Channel Fulfillment Solution, you may be required to import certain data into your target that is not part of your source Sterling Multi-Channel Fulfillment Solution database. For these tables, you should not use CDT to deploy data as it does not have access to the correct data.

Best Practices

If you must use the Configuration Deployment Tool to deploy externally maintained data, the recommended way to handle this is to import this data into the source and then use CDT to deploy it into the target. This guarantees data integrity.

If you cannot import this data into your source database, the Sterling Multi-Channel Fulfillment Solution supplies features that enable you to work with external data by ensuring that the target database either ignores these tables or appends them. Use the Ignore and Append-only features only if you have tried all other available options and only after subjecting your environment to rigorous testing.

Caution: When using the Ignore or Append-only features, CDT cannot guarantee the integrity of any external data. In order to ensure data integrity, CDT must have complete access to the configuration data.

Ignore

In cases where data in tables is maintained externally, you can omit these tables from the deployment operation by specifying a preference for them to be ignored.

Ignoring a table or a driver entity also automatically ignores all its dependent tables. However, there are some tables that store data for multiple driver entities and are present in multiple groups. An example of this is the YFS_GRAPH_UI table that contains data for pipelines, services and statuses. Ignoring one of these tables causes CDT to incorrectly mark the corresponding records for deletion.

Append-only

In cases where some tables are partially maintained externally, you can specify preferences to ensure that these tables are deployed in an "append-only" mode.

For append-only tables, the dependent tables are not ignored. Marking a table as append-only implies that only a few rows in the target database are maintained on the source system—other rows are externally imported. In such cases, it is extremely important that there is no overlap between the data present in the source and the external system. For example, if you maintain your shipping nodes in the source database and import store information directly into the target, you must not have any stores in the source database. This leads to unpredictable results.

2.4 Deploying Custom Tables

The CDT automatically deploys the configuration tables and extensions defined within the Sterling Multi-Channel Fulfillment Solution database framework. If you have custom (non-Sterling Multi-Channel Fulfillment Solution) configuration tables defined in your installation, CDT needs to be specially configured to deploy these tables. To enable CDT to deploy these tables, the tables need to be registered with CDT by creating a

special custom deployment XML file, called `cdt_custom.xml`. A sample of this file can be found in your `<INSTALL_DIR>/resources/ydkresources` directory. This file defines a group named "Custom Tables" and should include a list of your custom tables. CDT automatically compares, displays, and deploys changes to custom records for all tables that have one or more primary key columns.

This tool does not support custom tables as drivers or the representation of custom tables in a dependency tree structure. As a result, all custom tables can only be deployed together as part of the "Custom Tables" group. It also does not support custom tables without a primary key.

The `cdt_custom.xml` file contains the following:

```
<Group Name="Custom Tables">
    <Table Name="CUSTOM_CONFIG_TABLE_1"/>
    <Table Name="CUSTOM_CONFIG_TABLE_2"/>
</Group>
```

2.5 Foreign Key Checks

The CDT enforces data consistency by deploying all related tables that define an entity together in one operation. In addition, to ensure data integrity, the CDT also checks the required foreign key constraints for each table - which could potentially be defined for a table in a completely different group. Therefore, when deploying a small subset of data, it is possible that you may see error messages indicating foreign key constraint violations if the corresponding data in the independent table is not being deployed in the same operation. In this case, you should try deploying a bigger set of data. Note that foreign key constraints are not defined or checked for custom tables.

To provide the best performance, foreign key constraints are not checked when deploying the complete Sterling Multi-Channel Fulfillment Solution configuration.

2.6 Data Transformations

Frequently, the development and production environments have different values for network settings such as server names and IP addresses. Some configuration data tables in the Sterling Multi-Channel Fulfillment Solution store host names, IP addresses, and URLs. While these are valid for your source environment, when deploying this data into the target

environment, the configuration must be updated with the corresponding values applicable to the target environment. The CDT enables you to automatically transform these data elements into target-appropriate values by letting you specify transformations to be carried out on the source data *before* it is deployed into the target.

2.7 Resource Files

The CDT-specific resource files are located in the `<INSTALL_DIR>/resources/ydkresources` directory. These resource files allow you to modify the CDT preference settings, database-specific settings, and so forth.

cdt_custom.xml.sample

The `cdt_custom.xml.sample` is a sample of the special custom deployment XML file that can be used to deploy the custom tables defined in your installation. For more information about deploying custom tables, see Section 2.4, "Deploying Custom Tables".

cdt_dbdefaults.properties

This cdt_dbdefaults.properties file is used to provide extra database pool options for given database types. It contains default values for various databases that are used while configuring the CDT. The CDT uses this file to handle the database connections.

ydkprefs.xml

The `ydkprefs.xml` file contains the preference settings defined for the CDT. It conatains the configure preferences (such as a Reports Directory) and parameters that determine the behavior of the comparison operation of the CDT.

3

Understanding the CDT Interface

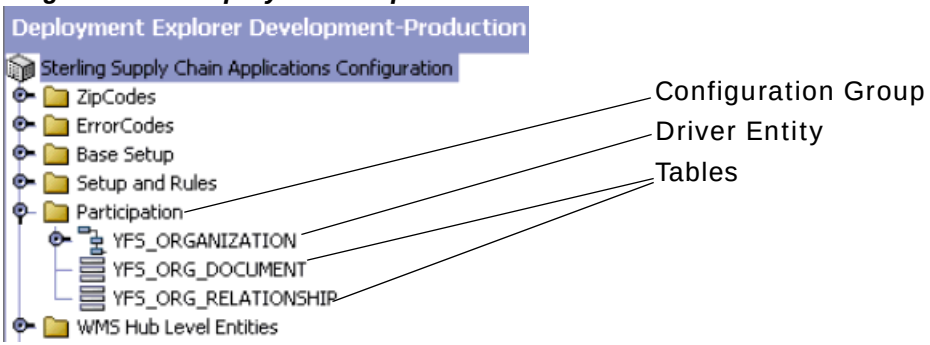
When the Configuration Deployment Tool starts, it prompts you to specify the details about your source and target databases to use during the session. After you have successfully connected to your source and target databases, the Deployment Explorer window appears.

3.1 The Deployment Explorer

The Deployment Explorer window displays the list of configuration groups, driver entities, and tables that can be deployed. The names you define for the source and target databases are displayed in the heading panel.

Each time you log into the Configuration Deployment Tool there is one instance of this window.

Figure 3–1 Deployment Explorer Window



You can choose the configuration group or the driver entity that you want to compare between the source and target databases.

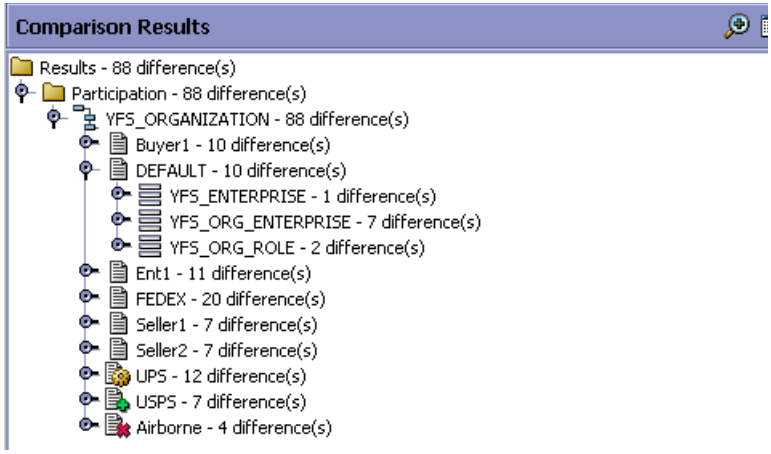
During the compare operation, the progress and the results of the comparison operation are displayed in the Comparison Results window and in the Status panel.

3.2 Comparison Results Window

The Comparison Results window displays the outcome of the comparison between the source and target databases.

The Comparison Results window displays information pertaining to the current session. Only one Comparison Results window can be displayed during each session. After viewing the results of one comparison, you must close the window before you can compare a different set of tables.

Figure 3–2 Comparison Results Window



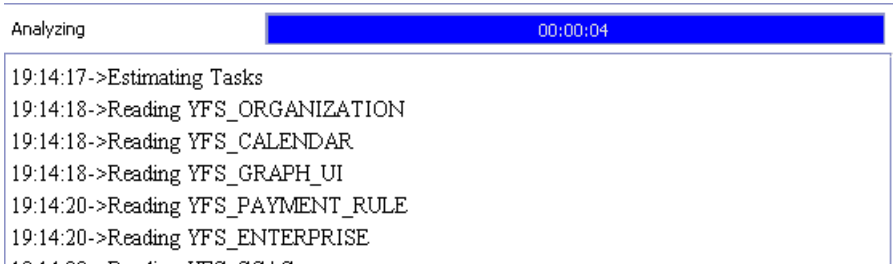
After generating comparison results, you can carry out any one of the following tasks:

- Generate a report of the differences
- View the details of each difference
- Deploy configuration data from the source database into the target database

3.3 The Deployment Tool Status Panel

The Status panel displays information about operations while they are carried out.

Figure 3–3 Configuration Deployment Tool Status Panel



4

Before Using the Configuration Deployment Tool

Before you begin using the Configuration Deployment Tool, ensure that you have addressed the policies and system requirements described in this section.

4.1 System Requirements

The RAM requirements of the Configuration Deployment Tool depend on the size of your database and the distribution of your configuration data.

4.1.1 Time Estimates

The time required for the Configuration Deployment Tool to perform comparison and deployment tasks varies according to your system resources and the size and distribution of your configuration data. For example, processing time may increase when there are many records in a table that are referenced by foreign key constraints from other tables, or when there are many records in a table that serves as a driver entity.

During tests of the Configuration Deployment Tool, the Sterling Multi-Channel Fulfillment Solution measures the amount of time it takes to perform tasks on a Pentium class machine with 512 MB of RAM and running at 550 MHz. The Configuration Deployment Tool performed as described in Table 4–1, "Time Estimates using the Configuration Deployment Tool".

Table 4–1 Time Estimates using the Configuration Deployment Tool

Task	Description of Databases	Time
Comparison	Source database - 110,000 records Target database - 110,000 records	7 minutes
Comparison	Source database - 110,000 records Target database - empty	4 minutes
Deployment	110,000 differences	11 minutes

4.1.2 Installation

The Configuration Deployment Tool is installed automatically during the installation of Sterling Multi-Channel Fulfillment Solution.

4.1.3 Environment State

The Configuration Deployment Tool assumes that your source and target environments match exactly in the following respects:

- Release of the Sterling Multi-Channel Fulfillment Solution (including hot fixes)
- Release of JDBC drivers
- Release of database software
- Database structure (schema objects such as tables, indexes, and sequences)

As this Configuration Deployment Tool is used by technical professionals for tasks they perform on an occasional basis, it is **not** localizable or customizable. However, you can specify configuration preferences as described in this chapter.

4.2 Security Strategy

The Configuration Deployment Tool makes use of the user authentication and authorization supplied by your database provider. Access control and authorization are not specified through the Configuration Deployment Tool.

Ensure that the person using the Configuration Deployment Tool has sufficient authentication privileges (select, insert, update, and delete) for both databases; full DBA privileges are not required.

4.3 CDT Change Management Strategy

The Configuration Deployment Tool does **not** enforce checks to restrict configuration data modification on the source or the target schemas using other means. You must develop and enforce your own methodology.

For example, if you use the Configuration Deployment Tool to migrate data from staging to production, it is **not** expected that the configuration in production is modified by means other than this tool. In such a case those changes are overwritten the next time CDT is run. Also, this could potentially lead to data integrity issues if the changes are performed in either the source or target while CDT is being run.

The Configuration Deployment Tool is **not** supported for implementations where configuration data is directly modified in production using the Configurator or any other means. For exceptional cases like urgent or critical fixes to configuration data in production, you must update the staging database with the same changes.

4.4 Rollback Strategy

To prevent application failure and downtime, implement a rigorous rollback methodology that involves creating a backup snapshot of your configuration data in production before you use the Configuration Deployment Tool to deploy changes. This backup is accomplished by using the database-specific export and import utilities. The Sterling Multi-Channel Fulfillment Solution provides some samples for Oracle, DB2, and SQL Server databases that you can customize for your own use. For more information on data rollback, see Section 10.4, "Data Rollback Scripts"

4.5 Upgrades and Maintenance

Using the Configuration Deployment Tool should not impact the methodology for applying upgrades or hot fixes in a multi-step staging environment.

The upgrade methodology being followed should not change for environments already set up for staging before production. However, the Configuration Deployment Tool by itself does **not** provide support for all of the processes and methodologies required for supporting a multi-step application staging and deployment environment because it is only capable of deploying configuration data.

The process of applying product upgrades and patches is especially complex in an environment where the staging area must be kept synchronized with production. One way to keep these environments harmonious is to apply software patches to both systems simultaneously and reverse deploy the data upgrades. This is because application data upgrades may behave differently and produce different results based on the transactional data they encounter. If this application data upgrade is run independently on production and staging, the results may be significantly different as a result of the differences in transactional data that the upgrade program encountered. In such a case, the production snapshot should be treated as the baseline and reverse deployed into staging. This can be accomplished by configuring your production database as the source and your staging database as the target.

4.5.1 Example Upgrade Scenario

In an example upgrade scenario, the Sterling Multi-Channel Fulfillment Solution introduces a feature that recognizes the various attributes for order types. For example, an Order_type "URGENT" implies that the order should be displayed in the user interface with a specific icon that enables you to distinguish it from other orders. However, in previous releases, you may have been using the Order_type field to classify orders into other types because this field was designed for order classification.

When the Sterling Multi-Channel Fulfillment Solution provides an upgrade toolkit, one component of the toolkit handles upgrades to the Order_type field.

The upgrade logic may flow as follows:

1. Read all the distinct values of the Order_type field from the YFS_ORDER table.
2. For each different Order_type in the your system, create entries in the Order_Type_Master configuration table and assign a default icon to it.

If this data upgrade is run on the staging system, it will **not** find any orders, so the Order_Type_Master table will only contain "URGENT" which is provided by default.

However, when the same data upgrade is run in production, the Order_Type_Master table will contain multiple entries, one for each type of order that is in the transaction database.

Then, when the Configuration Deployment Tool is run again, it marks all of these new records for deletion because the source is assumed to be the most up-to-date configuration.

As a result, you should design upgrade kit or hot-fixes for transaction dependent configuration data as follows:

1. The upgrade kit (or hot-fix) should have one script to prepare input for upgrade of transaction-dependent configuration data (for example, prepared list of distinct order types). Then you can run this script on the production database. You can also run this script in the test database and can take the union of the two.
2. The next step in the upgrade should use this as input and upgrade the configuration data accordingly. For example, inserting into ORDER_TYPE_MASTER table.

If you have identified any changes in the configuration data, please contact the Sterling Multi-Channel Fulfillment Solution Technical Support team at: http://www.sterlingcommerce.com/scm_support/ for instructions on how to proceed.

5

Running the CDT and Setting Up the Preference Settings

5.1 Running the Configuration Deployment Tool

This section describes how to start and stop the Configuration Deployment Tool.

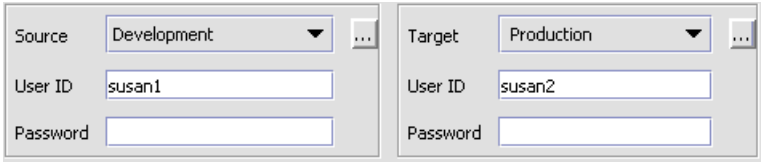
> **Note:** To run the UI for the Configuration Deployment Tool on a UNIX server from a windows client, the UNIX server must have XWindows installed on it.

To start the Configuration Deployment Tool:

1. Start the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench. On Microsoft Windows, run the `ydk.cmd` script for windows (`ydk.sh` for UNIX/Linux) from the `<INSTALL_DIR>\bin` directory.

   > **Note:** The Windows console displays WorkBench startup information. Do not close the console while the WorkBench is running. Closing the console closes the tool, and your work is lost.

2. From the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench menu, choose Tools > Deployment > Configuration Data Deployment. This opens the Configuration Deployment Tool Logon dialog box.



3. Choose the Source button and enter the values appropriate for the source database. Then choose the Target button and enter the values appropriate for the target database.

   When you are finished, close the dialog box. The values you specified are saved automatically and persist from one session to the next.

> **Note:** If you change the name of either source or target database, the transformation settings are lost. To get back your old transformation settings, revert to the old source and target database name.

In the Source database and Target database windows, specify the applicable values as described in Table 5–1.

Table 5–1 Configuration Deployment Tool Logon Dialog Box

Field	Detail
Name	Specify a logical database identifier. For the source, specify the database you want to copy data from. For the target, specify the database to write the data to.
className	Specify the class name of your database driver as follows: • If using Oracle, set to: `oracle.jdbc.OracleDriver` • If using Microsoft SQL Server 2000, set to: `com.microsoft.jdbc.sqlserver.SQLServerDriver` • If using Microsoft SQL Server 2005, set to: `com.microsoft.sqlserver.jdbc.SQLServerDriver` • If using DB2, set to: `com.ibm.db2.jcc.DB2Driver`

Table 5–1 Configuration Deployment Tool Logon Dialog Box

Field	Detail
jdbcURL	Specify the URL to connect to the database: • If using Oracle, set to: `jdbc:oracle:thin:@<DatabaseServerHostname/IP address>:<TNSListenerPortNumber>:<DatabaseSID>.` • If using MS SQL Server 2000 or MS SQL Server 2005, set to: `jdbc:sqlserver://<Database Server Hostname>:<Port Number>;DatabaseName=<Database name>.` • If using DB2, set to: `jdbc:db2://<Database Server Hostname>:<Port Number>/<Database name>.`
dbType	Specify the type of database you are running. Enter it in all lower case, as shown: • For Oracle, specify `oracle` • For SQL Server, specify `sqlserver` • For DB2, specify `db2` • For an XML datasource, specify `xml`
folder	If using an XML datasource, specify the complete path of the folder location for the XML files.
httpurl	Only applicable for the target database. Specify a URL for the application server whose data cache is to be refreshed after data is deployed into the target database. Use the syntax: `http://<hostname/ip-address>:<port-number>/[Application]/interop/InteropHttpServlet`, where hostname, IP-address and port-number are the parameters used to connect to the application server.
schema	Specify the schema owner as follows: • If you are using Oracle or DB2 database, and the user you specify is different from the Sterling Multi-Channel Fulfillment Solution schema owner, specify the owner of the Sterling Multi-Channel Fulfillment Solution schema. • If you are using SQL Server, leave this blank.
user	Specify the user name associated with the database.

4. In the Logon dialog box, enter the passwords associated with the user names.

   The Deployment Explorer window displays.

To stop the Configuration Deployment Tool:

From the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench menu, choose File > Exit.

This closes the Configuration Deployment Tool and the Windows console.

5.2 Setting Preference Settings

You can configure preferences (such as a reports directory) and parameters that determine the behavior of the comparison operation. When you modify these properties, the changes persist, so you do not need to reset them each time you use CDT. These changes are saved in the `<INSTALL_DIR>/resources/ydkresources/ydkprefs.xml` file.

> **Note:** The `ydkprefs.xml` file is created the first time you start the CDT.

To specify Configuration Deployment Tool settings:

1. Start the Configuration Deployment Tool. For more information about starting the Configuration Deployment Tool, see the Section 5.1, "Running the Configuration Deployment Tool".
2. From the Deployment Explorer action bar, choose the *Preferences* icon.
3. In the Preferences window, fill in values using the descriptions provided in Table 5–2.

Table 5–2 Configuration Deployment Tool Preference Settings

Control	Description
Settings Tab	
Reports Directory (for CDT)	If you are running CDT, specify the absolute path where you want reports to be generated.

Table 5–2 Configuration Deployment Tool Preference Settings

Control	Description
Reports Directory (for CDV Tool)	If you are running CDV Tool, specify the absolute path where you want to export the comparison results report.
Custom Deployment Class	Specify the name of the class that should be invoked for deploying custom tables not handled by CDT.
Max Changes to Display	Specify the maximum number of differences to be displayed. The default display number is 100.
Audit Version Deployment	
Validate Old Values	If you select this check box, the system detects conflict based on the expected old value of an attribute of a record of the obtained changes from the source database against the current value of the corresponding record in the target database.
Validate Lockid	If you select this check box, the system detects conflict based on the expected LockID of a record of the obtained changes from the source database against the current LockID of the corresponding record in the target database.
Validate Record Exists Before Delete	If you select this check box, the system validates the record exists in the target database before it attempts to delete it. If the record is not there, the operation will be marked as a conflict.
Transformations Tab	
Table Element	Tables that can be added or deleted.
Table Name Attribute	Specify the name of the table on which you want to carry out the transformation. The syntax and case must match the name of the table used in the Sterling Multi-Channel Fulfillment Solution ERDs. Custom tables cannot be transformed. Choose the Details icon to specify a value.
Column Element	Columns that can be added or deleted.
Column Name Attribute	Specify the name of the column containing the data to be transformed. The syntax and case must match the name of the column used in the Sterling Multi-Channel Fulfillment Solution ERDs. Extended columns can be transformed. Choose the Details icon to specify a value.

Table 5–2 Configuration Deployment Tool Preference Settings

Control	Description
Transform Element	Define the transformation for this column. For each column, you can define one or more transformations. These transformations are applied to data in this column in sequential order. You can specify multiple transformations for each column, using the delete action to remove the parent element.
Match Attribute	Specify the pattern to search for in the source data. All matching occurrences of this pattern are replaced with the value specified in the Replace attribute. Choose the Details icon to specify a value.
Replace Attribute	Specify the value to replace the pattern with. Choose the Details icon to specify a value.
XPath Attribute	Conditional. If the column to be transformed contains non-XML data, you do not need to specify this XPath attribute. However, some configuration information in the Sterling Multi-Channel Fulfillment Solution is stored as XML in the database. If the column to be transformed contains XML data, use this attribute to specify the location of the exact attribute to be transformed. Use the syntax: `xml:/Configuration/Connection/Host/@IPAddress`. Choose the Details icon to specify a value.
Append-only Tables Tab	
Append-only Tables	Specify configuration table, if any, in which *some* rows maintain data that is external to the Sterling Multi-Channel Fulfillment Solution. This prevents the data from being deleted during deployment. Specify that table and all of its dependent tables. **Note**: Rows that are maintained externally should never be present in your source database, since this can lead to unpredictable results.
Ignore Tables Tab	
Ignore Tables	Specify any external configuration tables that you do not want the tool to deploy from the source to the target. Ignoring a table automatically ignores all dependent tables as well.

6

Transforming Elements Using the CDT

When deploying data from one database instance to another, you can override the values of certain data elements. For example, if your source and target environment network settings (host names, port numbers, and IP addresses) are different, the Configuration Deployment Tool can transform the settings in order to make them appropriate for the target environment.

Transformations are carried out as a pattern match and replace the data in the source database before it is deployed into the target.

> **Note:** The match and replace are carried out for the complete string literal and no wild card search for characters is allowed.

Example Transformation

For example, consider the following configuration XML in the source database:

```
<SubFlowConfig>
  <Link>
    <Properties DeliveryMode=""
     InitialContextFactory="weblogic.jndi.WLInitialContextFactory"
     ProviderURL="t3://localhost:7001" QCFLookup="TEST_AGENT_QCF"
     QName="DefaultAgentQueue" TimeToLive=""/>
   </Link>
</SubFlowConfig>
```

The target database has values for port number as 7221 and QCFLookup as AGENT_QCF, which you do not want overridden by values in the source

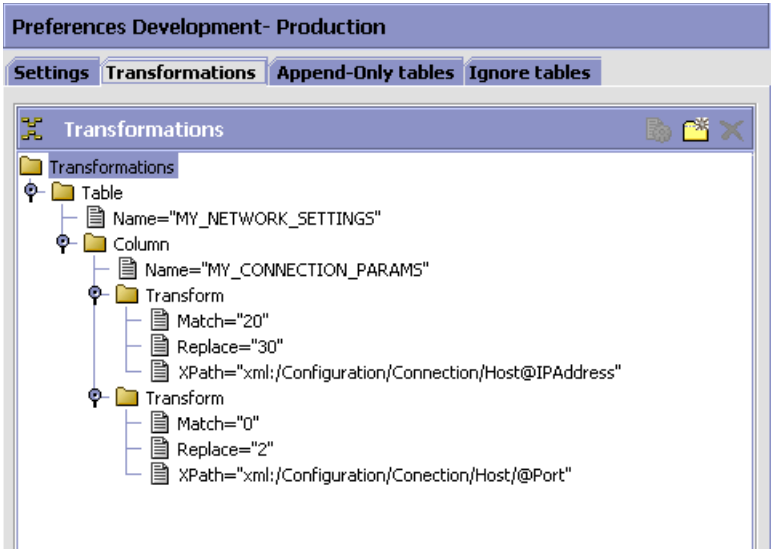
database. To transform these values, specify the values as described in Table 6–1.

Table 6–1 Transforming Elements

Element	Attribute	Value
ProviderURL		
	Match	Specify 7001 (or 0 to find all occurrences of 0).
	Replace	Specify 7221 (or 2 to replace all occurrences of 2).
	XPath	`xml:/SubFlowConfig/Link/Properties/@ProviderURL`
QCFLookup		
	Match	Specify TEST_ to find all occurrences of TEST_.
	Replace	Leave blank to ensure that TEST_ is removed.
	XPath	`xml:/SubFlowConfig/Link/Properties/@QCFLookup`

Using this example, the Transformation tab would look as shown in Figure 6–1.

Figure 6–1 Transformations Example



To transform elements of the configuration data:

1. From the Deployment Explorer window action bar, choose the *Preferences* icon.
2. In the Preferences window, select the Transformations tab and fill in values, using the information provided in Table 6–1. When you deploy data, these transformation values you specify are deployed along with configuration data.

   Before you deploy data, you must first perform a database comparison as described in Chapter 7, "Comparing Source and Target Databases".

7

Comparing Source and Target Databases

In order to deploy configuration data into production, you must first compare the two databases and then deploy your changes.

> **Note:** The CDT considers special characters as data when both source and target environment are databases.

After completing the comparison, you can perform any of the following actions:

- Examine any differences, using the instructions in Section 7.2, "Examining Database Differences".
- Export the report, using the instructions in Section 7.3, "Exporting Comparison Results".
- Generate a report, using the instructions in Section 7.4, "Generating a Report of Differences".
- Deploy your changes, using the instructions in Chapter 9, "Deploying Your Configuration Data".

7.1 Comparing Data

To compare the source and target databases:

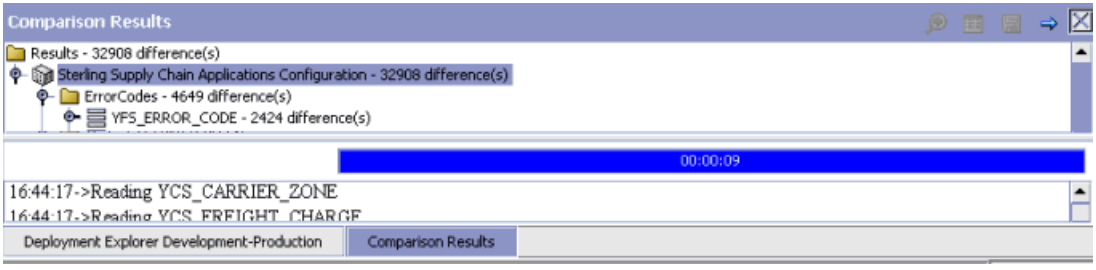
1. From the Deployment Explorer tree, select the data you want to compare.

Tip: When you are deploying data for the ***first*** time, compare the entire database. Compare smaller increments only ***after*** you are certain that your source and target databases have relatively few differences.

The available comparison groups are as follows:

- For the entire database, choose the *Sterling Multi-Channel Fulfillment Solution Configuration* icon.
- For a specific configuration group, choose the *Configuration Group* icon.
- For a specific driver entity, choose the *Driver Entity* icon.

2. From the Deployment Explorer action bar, choose the *Compare* icon. The Comparison Results window displays on the top right and lists all differences. The Comparison Results Status panel displays on the bottom right.



Note: If a table is present in multiple groups or under multiple entities, its difference may be counted multiple times in the total number.

7.2 Examining Database Differences

To examine the differences between databases:

1. Choose to compare the two databases. For more information about comparing databases, see Section 7.1, "Comparing Data".
2. From the Comparison Results tree, expand the corresponding entity and select the table that you want to examine.
3. From the Comparison Results action bar, choose . The range of possible results are as follows:

   - The *Unchanged* icon indicates that an entity contains dependent tables that have differences.

   - The *Add* icon indicates that a record is inserted to the target database, as shown in Figure 7–1.

Figure 7–1 Record Details Insert Window

Record Details

Inserted

Name	Value
OrganizationCode	USPS
CatalogOrganizationCode	DEFAULT
PrimaryUrl	

The *Remove* icon indicates that a record is deleted from the target database, as shown in Figure 7–2.

Figure 7–2 Record Details Delete Window

Record Details

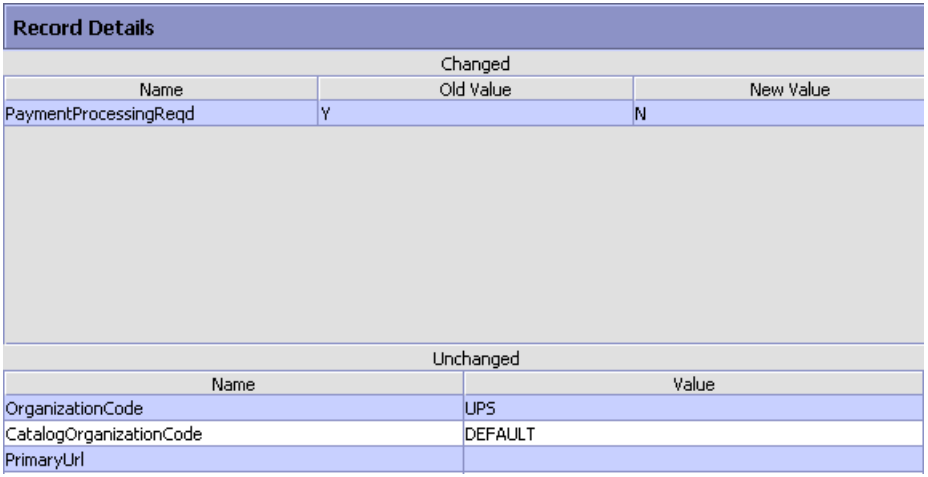
Deleted

Name	Value
OrganizationCode	Airborne
CatalogOrganizationCode	DEFAULT
PrimaryUrl	

The *Modify* icon indicates columns that are updated on the target database as shown in Figure 7–3. It displays information in sections as follows:

- Top section - displays values that are changed on the target database
- Bottom section - displays values that remain the same

Figure 7–3 Record Details Change Window



4. After examining your data, you may want to generate a report of these differences as described in Section 7.4, "Generating a Report of Differences".

7.3 Exporting Comparison Results

You can export the configuration differences for comparison at a later time or as a backup for your existing configuration.

To export the comparison results into an XML file:

1. Ensure that you have specified a directory location where the comparison report is generated in the Reports Directory field in the Settings tab of your Sterling Multi-Channel Fulfillment Solution Configuration Deployment Tool Preferences. For more information about specifying these preferences settings, see Section 5.2, "Setting Preference Settings".

2. From the Comparison Results action bar, choose . From the Windows Explorer, browse to the location specified in the Reports Directory field.

   The Sterling Multi-Channel Fulfillment Solution Configuration Deployment Tool automatically creates a subdirectory in this directory. For example, if you have specified `D:/reports` in the Reports Directory field and exported the comparison results at 3:40 pm on May 23, 2003, CDT creates the subdirectory as: `D:/reports/export20030523154024`. This new subdirectory contains the `ydkexport.xml` file, which contains the comparison results.

   After the comparison completes, you can perform any of the following actions:

   - Examine the differences using the instructions in Section 7.2, "Examining Database Differences".
   - Generate a report of the differences, using the instructions in Section 7.4, "Generating a Report of Differences".
   - Deploy your changes using the instructions in Chapter 9, "Deploying Your Configuration Data".

7.4 Generating a Report of Differences

You can generate a report of differences between the source and target databases.

To generate a report of differences:

1. Choose to ensure that you have specified a `reports` directory. For more information about specifying CDT settings, see Section 5.2, "Setting Preference Settings".
2. Choose to compare the two databases. For more information about comparing databases, see Section 7.1, "Comparing Data".
3. In the Comparison Results tree, select the Results node.
4. From the Comparison Results action bar, choose . The Status panel displays trace messages that enable you to determine the success of the report generation process. The location of the report displays along with a message of the successful creation of reports.

5. From the Windows Explorer, browse to your reports directory. Within the directory you specified, the Configuration Deployment Tool creates a subdirectory named according to the time it was created.

   For example, if you have specified `d:/reports` as the reports directory and generate a report at 3:40 p.m. on May 23, 2003, the CDT creates a subdirectory called `20030523154024` within the `d:/reports` directory.

   This new subdirectory contains the following:

   - An `index.xml` file contains an overall summary of changes as displayed on the UI
   - One XML file for each table that has changes with the details of each change

6. Open the XML files to see the differences.

If you generate another report, a new directory is created and populated with another set of XML files.

7.5 Importing Configuration Differences

You can import configuration differences that are obtained by exporting comparison results.

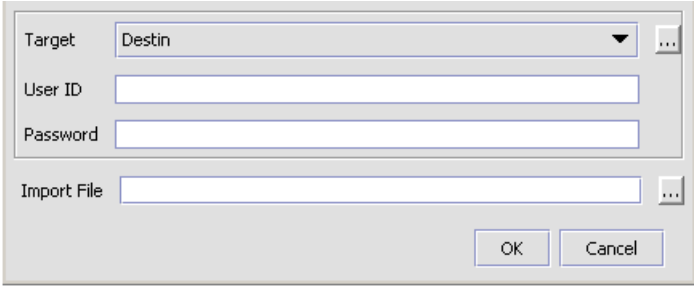
> **Note:** The Configuration Deployment Tool does not support data that contains special characters when comparing databases, exporting comparison results or importing comparison results.

For more information about exporting comparison results, see Section 7.3, "Exporting Comparison Results".

To import configuration differences:

1. Run the `<INSTALL_DIR>/bin/ydk.cmd` script. This script opens a Microsoft Windows console and starts the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench.
2. From the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench menu, choose Tools > Deployment > Import

Results. The Sterling Multi-Channel Fulfillment Solution Configuration Deployment Tool Import dialog box displays.



3. Choose the Target button and enter the values appropriate for the Target database. Then choose the Import File and enter the path of the file to be imported.

   When you are finished, close the dialog box by clicking OK.

4. After the comparison results are loaded, you can perform any of the following actions:

   - Examine any differences, using instructions as specified in Section 7.2, "Examining Database Differences".
   - Generate a report, using the instructions as specified in Section 7.4, "Generating a Report of Differences".
   - Deploy your changes, using instructions as specified in Section 7.5, "Importing Configuration Differences".

8

Configuration Data Versioning Tool

8.1 Versioning Tool Overview

Configuration data is an integral part of all implementations. Often, there is a need to track changes to an implementation's configuration. Furthermore, if the changes in configuration data are found to be inadequate, there is no easy way of rolling back changes to their original states.

In an offsite and onsite implementation model, master configuration data is maintained onsite, which is where the production environment is hosted. When a patch must be applied to the production environment, offsite test developers must write instructions regarding any configuration data changes for the patch and pass it to the onsite configuration manager; that is, certain values of business rules need to be changed. The onsite configuration manager has to replicate the configuration changes onto the production environment.

To make it easier to track versions of configuration data or sets of changes to configuration data, the Sterling Multi-Channel Fulfillment Solution includes the Configuration Data Versioning Tool. It enables you to capture changes from a source database, compare and deploy them onto a target database (this can be the same or a different database).

The config table must have AuditRequired set to Y and the table name must exist in config_db.xml

Note: To enable this functionality the configuration table must have `AuditRequired` flag set to Y. By default, most of the configuration tables have `AuditRequired` flag set to Y.

You can create version labels in the Configurator to represent timestamps in a time line when changes occur in configuration data. The system can then identify any changes in the configuration data between timestamps of version labels based on the audit information in the system.

Note: When configuring the audit purges, if you purge the YFS_AUDIT table records from the deployable tables, the Configuration Data Versioning Tool will not deploy those changes.

Configuration Data Versioning Tool Features

The Configuration Data Versioning (CDV) Tool can be accessed from the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench (also known as the "WorkBench").

The Configuration Data Versioning Tool allows you to select different version labels from a source database, compare the data and apply them to a target database. The system identifies modifications made to the source database between two version labels. You can see the details of each modification and detect conflicts. These modifications are applied to the target database while checking for conflicts. Once all conflicts are resolved, you can deploy the changes.

Version label data is stored in the YFS_CONFIG_VERSION_LABEL table. The manageConfigVersionLabel API and getConfigVersionLabel API are used to manage and search for config version labels.

8.1.1 Version Labels Examples

The following table shows two version labels, VersionLabel_1 and VersionLabel_2, and some samples of their associated changes and timestamps:

Table 8–1 Version Label Example

Version Label	Audited Changes	Timestamp
	Org1 is created.	5/1/2007 9:00
	Org2 is created.	5/1/2007 9:10
VersionLabel_1		5/1/2007 9:20

Table 8–1 Version Label Example

Version Label	Audited Changes	Timestamp
	Org1's DefaultFulfillmentType is updated from "A" to "B"	5/1/2007 9:30
	Org1's DefaultFulfillmentType is updated from "B" to "C"	5/1/2007 9:40
	Org2 is deleted	5/1/2007 9:50
	Org3 is created	5/1/2007 10:00
VersionLabel_2		5/1/2007 10:10
	Org4 is created	5/1/2007 10:20
		Current Timestamp

You can obtain the changes based on the configured version labels in the Sterling Development and Deployment WorkBench, including both forward and backward changes.

8.1.1.1 Forward Changes

These are changes from an earlier version label to a later version label (or the latest changes).

In this case, it can be from VersionLabel_1 to VersionLabel_2 or Version Label_1 to current timestamp. This can be used in the scenario where users want to capture the certain changes from one system and deploy those changes onto another system.

8.1.1.2 Forward Changes Example

Using the Version Labels table as the basis for this example, if the user wants to obtain changes from VersionLabel_1 to VersionLabel_2, the following changes will be captured to be applied later on another system:

Changes To Be Applied

Update Org1's DefaultFulfillmentType from “A” to “C”

Delete Org2

Create Org3

8.1.1.3 Backward Changes

These are changes from a later version label to an earlier version label.

This can be used in term of rolling back changes from one version label to another or completely rollback changes to an earlier version label. The audit data will be translated in the **reverse logic** as the changes to be applied later.

8.1.1.4 Backward Changes Example

Using the Version Labels table as the basis for this example, if a user wants to obtain all changes from the current timestamp to VersionLabel_1 so that those changes can be used in rolling back all changes modified after VersionLabel_1. The following changes will be obtained.

Changes To Be Applied

Delete Org4

Delete Org3

Create Org2

Update Org1's DefaultFulfillmentType from “C” to “A”

8.2 How the Configuration Data Versioning Tool Works

This section describes how to configure preferences (such as a Reports Directory) and parameters for resolving conflicts for the Configuration Data Versioning.

8.2.1 Setting Up Configuration Data Versioning Tool

Before you can use the comparison tools, you must create version labels for the databases using the Configurator. For more information about creating configuration version labels, see the *Sterling Multi-Channel Fulfillment Solution Platform Configuration Guide.*

8.2.2 Setting Preferences for Configuration Data Versioning Tool

1. Start the Configuration Data Versioning Tool. For more information about using the Configuration Data Versioning Tool, see the Section 8.3, "Using the Configuration Data Versioning Tool".
2. Select Tools > Configuration Data Version Deployment.
3. The Logon screen displays. Select the names of the desired source and target databases, and enter the password for each. Click **OK**.
4. The Compare screen displays. Click Preferences.

   In the Preferences window, you can define preferences for the Configuration Data Versioning tool. For field value descriptions, see Table 5–2.

8.2.3 Conflict Handling

You can enable conflict handling by selecting **Conflict Handling for Version Deployment** in Preferences. This is used to prevent overriding of any subsequent changes that occur on the target database.

For example, TaxPayerID has changed from “A” to “B” based on the audit information on the source database. However, on the target database the TaxPayerID has been changed from “A” to “C.” When the change is obtained from the source database and compared with the current value in the target database, the system will detect that the value is no longer “A” and present that to the user for validation.

There are three levels of enforcement:

- Validate Old Values: When enabled, the system will detect conflict based on the expected old value of an attribute of a record of the obtained changes from the source database vs. the current value of the corresponding record in the target database. The details screen displays the conflicting attributes.
- Validate Lockid: When enabled, the system detects conflict based on the expected LockID of a record of the obtained changes from the source database vs. the current LockID of the corresponding record in the target database. When a conflict is detected, you cannot deploy the changes. If this is selected, the following occurs:

- The Details screen will display this highlighted text: Conflicting LockID – Deploy Action is disabled.
- The conflicting attributes with the Expected Old Values will be displayed.
- The Deploy action will be disabled until all conflicts are resolved.

> **Note:** LockID validation is not available for the audit records created before the Sterling Multi-Channel Fulfillment Solution Release 8.0.

- Validate Record Exists Before Delete: When enabled, the system will validate the record exists in the target database before it attempts to delete it. If the record is not there, the operation will be marked as a conflict.

8.3 Using the Configuration Data Versioning Tool

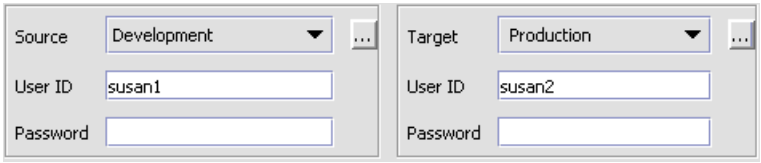
This section contains instructions for using the Configuration Data Versioning Tool.

To start the Configuration Data Versioning Tool:

1. Start the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench. On Microsoft Windows, run the `ydk.cmd` script for Windows (`ydk.sh` for UNIX/Linux) from the `<INSTALL_DIR>\bin` directory.

> **Note:** The Windows console displays WorkBench startup information. Do not close the console while the WorkBench is running. Closing the console closes the tool, and your work is lost.

2. From the Sterling Multi-Channel Fulfillment Solution Development and Deployment WorkBench menu, choose Tools > Deployment > Configuration Data Version Deployment. This opens the Configuration Data Version Tool Logon dialog box.



3. Choose the Source button and enter the values appropriate for the source database. Then choose the Target button and enter the values appropriate for the target database.

   When you are finished, close the dialog box. The values you specified are saved automatically and persist from one session to the next.

> **Note:** If you change the name of either source or target database, the transformation settings are lost. To get back your old transformation settings, revert to the old source and target database name.

In the Source database and Target database windows, specify the applicable values as described in Table 8–2.

Table 8–2 Configuration Deployment Tool Logon Dialog Box

Field	Detail
Name	Specify a logical database identifier. For the source, specify the database you want to copy data from. For the target, specify the database to write the data to.
className	Specify the class name of your database driver as follows: • If using Oracle, set to: `oracle.jdbc.OracleDriver` • If using Microsoft SQL Server 2000, set to: `com.microsoft.jdbc.sqlserver.SQLServerDriver` • If using Microsoft SQL Server 2005, set to: `com.microsoft.sqlserver.jdbc.SQLServerDriver` • If using DB2, set to: `com.ibm.db2.jcc.DB2Driver`

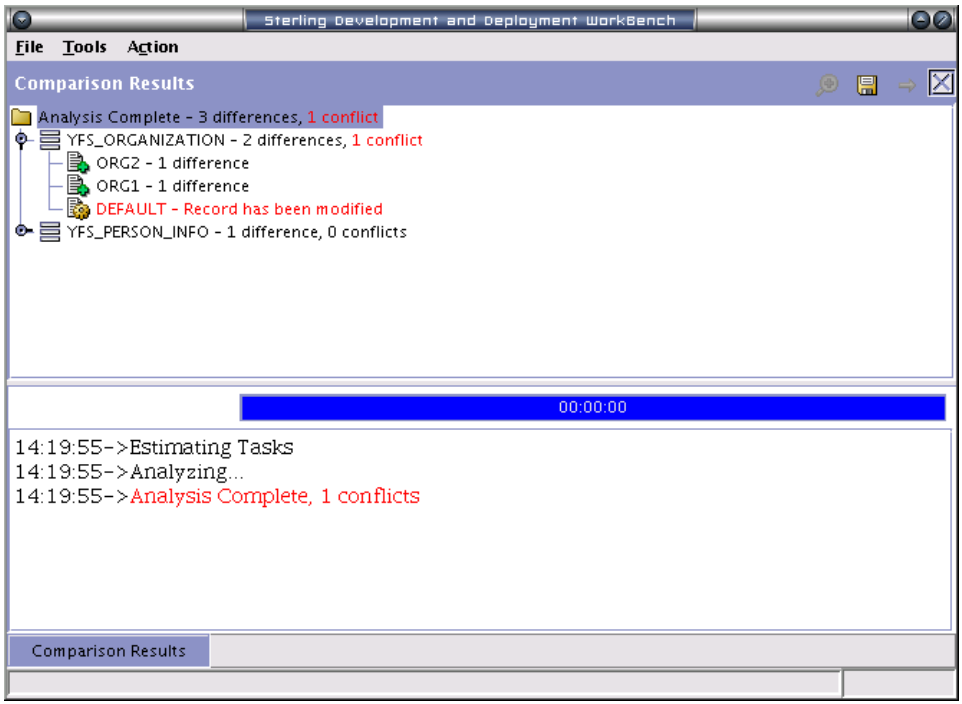
Table 8–2 Configuration Deployment Tool Logon Dialog Box

Field	Detail
jdbcURL	Specify the URL to connect to the database: • If using Oracle, set to: `jdbc:oracle:thin:@<DatabaseServerHostname/IP address><TNSListenerPortNumber>:<DatabaseSID>.` • If using MS SQL Server 2000 or MS SQL Server 2005, set to: `jdbc:sqlserver://<Database Server Hostname>:<Port Number>;DatabaseName=<Database name>.` • If using DB2, set to: `jdbc:db2://<Database Server Hostname>:<Port Number>/<Database name>.`
dbType	Specify the type of database you are running. Enter it in all lower case, as shown: • For Oracle, specify `oracle` • For SQL Server, specify `sqlserver` • For DB2, specify `db2` • For an XML datasource, specify `xml`
folder	If using an XML datasource, specify the complete path of the folder location for the XML files.
httpurl	Only applicable for the target database. Specify a URL for the application server whose data cache is to be refreshed after data is deployed into the target database. Use the syntax: `http://<hostname/ip-address>:<port-number>/[Application]/interop/InteropHttpServlet`, where hostname, IP-address and port-number are the parameters used to connect to the application server.
schema	Specify the schema owner as follows: • If you are using Oracle or DB2 database, and the user you specify is different from the Sterling Multi-Channel Fulfillment Solution schema owner, specify the owner of the Sterling Multi-Channel Fulfillment Solution schema. • If you are using SQL Server, leave this blank.
user	Specify the user name associated with the database.

4. In the Logon dialog box, enter the passwords associated with the user names and Click **OK**.
5. The Compare screen displays. Select a **From Version Label** and a **To Version Label** and click **OK**.

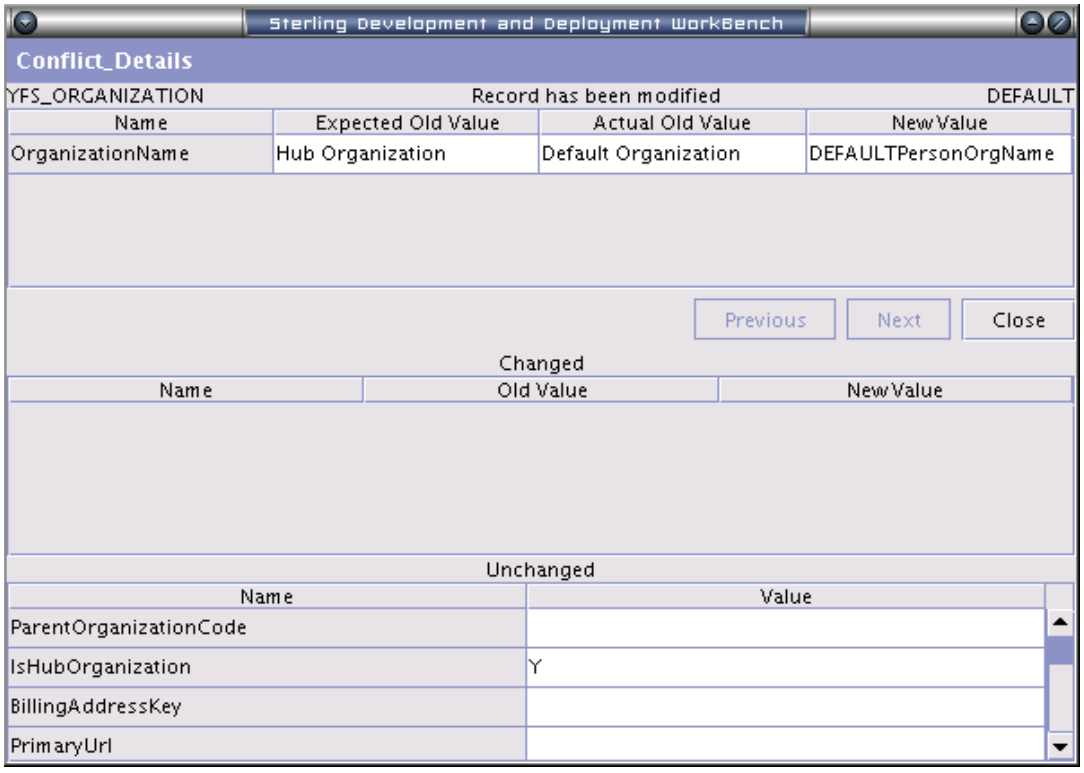
> **Note:** Use the Configurator to create Version Labels. For more information on how to create Version Labels, see the *Sterling Multi-Channel Fulfillment Solution Platform Configuration Guide*.

The system compares the two database versions. Once the comparison is complete, the system displays the Comparison Results screen:



Note that the results are grouped by table name onscreen.

6. To see the details for any record included in the results, right-click and select **Details**.



There are three types of changes that can be displayed:

- Modifications: The Record Details screen displays with a list of changed and unchanged attributes. For changed attributes, the old value and the new value will be displayed. (The old value is the existing value on the target database; new value is the value of the obtained change from the source database.)
- Insertions: The Record Details screen displays with a list of attributes and their values to be inserted.
- Deletions: The Record Details screen displays with a list of attributes of the entity.

You can scroll through the records by using the Previous and Next buttons. When you are done reviewing the details for a record, click Close.

8.3.1 Exporting Results

Before resolving conflicts in the database, you must export the changes to a file so that they can be later deployed on another environment by using the Export Results option. Exporting results for research is only a "must" when conflicts do exist. If there are no conflicts, exporting results is not required.

To export the results to a file:

1. Start the Sterling Development and Deployment WorkBench.
2. Select Tools > Configuration Data Version Deployment.
3. The Logon screen displays. Select the names of the desired source and target databases, and enter the password for each. Click **OK**.
4. The Compare screen displays. Select a **From Version Label** and a **To Version Label** and click **OK**.
5. From the Comparison Results action bar, choose the *Deploy* icon.

This option does the following:

- Creates a new folder under the Reports Directory configured in the Preferences with the naming convention as “export_<FromVersionLabelID>_<ToVersionLabelID>_<CurrentTS>”
- Creates a version audit file named as `ydkversionexport.xml` file.

8.3.2 Resolving Conflicts

The database conflicts can only be resolved by editing the version audit file `ydkversionexport.xml`. The `ydkversionexport.xml` file contains all the changes that are applied to the system. Any detected conflict is described within a <Conflict> element. The <Conflict> element contains the information such as conflict type and conflict description.

To resolve conflicts:

1. Export the results to the `ydkversionexport.xml` file (if not already done). For more information about exporting results, see Section 8.3.1, "Exporting Results".
2. Open the `ydkversionexport.xml` file and search for the <Conflict> element to find out the type of conflict. The CDV Tool supports following types of conflict:

- RECORD_ALREADY_EXISTS
- RECORD_DOES_NOT_EXIST
- RECORD_CHANGED

Below is a sample <Conflict> element entry from the ydkversionexport.xml file:

```
<Conflict ConflictDescription="Record does not exist"
          ConflictType="RECORD_DOES_NOT_EXIST"/>
```

3. Search for the <AuditDetail> element to find out the old and new values for a particular entity. In the <AuditDetail> element, change the old value to match the new value in the target database. If you want to update the new values, change the old value mentioned in the OldValue attribute to match the new value mentioned in the NewValue attribute. If you do not want to update the new values, delete the <AuditDetail> elements from the ydkversionexport.xml file.

   Below is a sample <AuditDetail> element entry from the ydkversionexport.xml file:

```
<AuditDetail AuditType="User">
   <IDs>
      <ID DataType="class java.lang.String" Name="Loginid" Value="User1"/>
   </IDs>
   <Attributes>
      <Attribute DataType="class java.lang.String"
                 Name="Modifyuserid" NewValue="si" OldValue="consoleadmin"/>
      <Attribute DataType="class java.lang.Long" Name="Lockid"
                 NewValue="0" OldValue="5"/>
      <Attribute DataType="class java.lang.String"
                 Name="Modifyprogid" NewValue="YDKConfigDeploy"
                 OldValue=".YEntityServlet"/>
   </Attributes>
</AuditDetail>
```

8.3.3 Importing Version Audit File

After resolving the conflicts, you can import the version audit file (ydkversionexport.xml).

To import the Version Audit File:

1. Start the Sterling Development and Deployment WorkBench.
2. Select Tools > Deployment > Import Version Audits.
3. The Logon screen displays. Select the name of the target database, and enter the password for the target database. Browse to the version audit file (`ydkversionexport.xml`), and click **OK**.

8.3.4 Deploying Database Changes

Before you can deploy changes from one database to another, you must first verify whether there are conflicts. If there are conflicts, you must export the results to a file in order to research and resolve conflicts. Once the conflicts have been resolved, you can re-import the version audit file (`ydkversionexport.xml`) and then deploy the changes to the target database. For more information about resolving conflicts, see Section 8.3.2, "Resolving Conflicts".

To deploy the database changes:

1. Start the Sterling Development and Deployment WorkBench.
2. Select Tools > Configuration Data Version Deployment. The Logon screen displays.
3. Select the names of the source and target databases, and enter the password for each. Click **OK**. The Compare screen displays.
4. Select a **From Version Label** and a **To Version Label**, and click **OK**.
5. From the Comparison Results action bar, choose the ⇨ *Deploy* icon. The Input window displays.
6. In Enter a label for this deployment field, enter the label number from which you want to deploy the configuration data.
   - If the deployment succeeds, the Status panel displays a success message. The data is committed to your target database, and the cache is updated as specified in the `httpurl` field described in Table 5–1.
   - If the deployment fails, the Status panel specifies the errors to resolve, and data is not committed to the target database.

8.3.5 Rolling Back Changes

You can rollback changes to a given version label. The CDV Tool audits all the records from a label to the current timestamp, figures out the changes, reverses those changes, and applies it back to the database.

To rollback changes to a particular label:

1. Start the Sterling Development and Deployment WorkBench.
2. Select Tools > Deployment > Rollback Data To Version Label.
3. Select the name of the database and enter the password. Click **OK**.
4. Select a **To Version Label**, and click **OK**. The Compare screen displays.
5. From the Comparison Results action bar, choose the ⇨ *Deploy* icon. The Input window displays.
6. In Enter a label for this deployment field, enter the label number from which you want to deploy the configuration data.
   - If the deployment succeeds, the Status panel displays a success message. The data is committed to your target database, and the cache is updated as specified in the `httpurl` field described in Table 5–1.
   - If the deployment fails, the Status panel specifies the errors to resolve, and data is not committed to the target database.

9

Deploying Your Configuration Data

Before deploying configuration data, ensure that you are deploying the correct data by comparing the data and examining any differences.

In addition, ensure that you have addressed rollback issues. The Sterling Multi-Channel Fulfillment Solution supplies sample backup and rollback scripts. For information on these scripts, see Section 10.4, "Data Rollback Scripts".

9.1 Deploying Configuration Data

To deploy your configuration data:

1. Compare the two databases (by choosing the *Compare* icon). For this detailed procedure, see Section 7.1, "Comparing Data".
2. From the Comparison Results tree, select the entities you want to deploy.

   Tip: When you deploy data for the first time, deploy the entire database. Deploy smaller increments only after you are certain that your source and target databases have relatively few differences.

   The available options are as follows:

   - For the entire database, choose the *Sterling Multi-Channel Fulfillment Solution Configuration* icon.
   - For a specific configuration group, choose the *Configuration Group* icon.

- For a specific driver entity, choose the *Driver Entity* icon.

3. From the Comparison Results action bar, choose the *Deploy* icon.
   - If the deployment succeeds, the Status panel displays a success message, the data is committed to your target database, and the cache is updated as specified in the `httpurl` field described in Table 5–1.
   - If the deployment fails, the Status panel indicates the errors to resolve and no data is committed to the target database.
4. If you have deployed data from the YFS_RESOURCE table, restart your application servers in the target environment in order to refresh the cache.

Auditing

During the deployment of the configuration data, the audits are generated in the target database. These audits can be used for tracking changes and rolling back the data. These audits are not deployed from the source database, they are generated based on the entity definitions located in the `<INSTALL_DIR>/repository/entity` directory. For more information about Generating Audit References for Entities, see the *Sterling Multi-Channel Fulfillment Solution Customization Guide*

Config-db.xml File

The config-db.xml file is the configuration file used by the CDT to display the logical or functional grouping of tables into which data is to be deployed. This file organizes the tables in a hierarchical manner based upon the functional dependencies among them. The actual data deployment is carried out in accordance with this configuration or hierarchy. The config-db.xml file is located in the `<INSTALL_DIR>/database/cdt/` directory.

9.1.1 Deploying Your Configuration Data in Command-Line Mode

There may be circumstances under which you want to run or schedule deployment of configuration data without user interface interaction or without viewing the source and target comparison results.

To accomplish this you can deploy your configuration data in command-line mode. When you deploy your data in command-line mode, CDT automatically compares the source and target environments and then deploys the configuration data.

To deploy configuration data in command-line mode:

1. Run CDT.
2. Set the properties in the <INSTALL_DIR>/bin/cdtshell.cmd file for windows (cdtshell.sh for UNIX/Linux) as described in Table 9–1.

Table 9–1 Configuration Deployment Tool Properties

Property	Description
SOURCE_DB	Specify the name of the data source as defined in the Configuration Deployment Tool Logon dialog box.
SOURCE_PASSWORD	Optional. If using a database as the source destination for data, specify the password for the database instance.
TARGET_DB	Specify the name of the data target destination for the data. For example, TARGET_DB=xxx (if using a database) or TARGET_DB=xxx (if using an XML file).
TARGET_PASSWORD	Optional. If using a database for the target destination, specify the password for the database instance.

3. Run the <INSTALL_DIR>/bin/cdtshell.cmd script for windows (cdtshell.sh for UNIX/Linux).

You can also schedule this script to run at any appropriate time.

You can use the command line arguments with CDT:

- MODE Deploy—To deploy changes from source to target database. The various other options available with the MODE argument are:
  - ExportDir <directory>—The specified <directory> will be created, and the results of the comparison are stored in that <directory>.
  - ImportDir <directory>—The specified <directory> should contain the exported results. Instead of comparing the source and target databases, this export will be loaded. When you pass this argument, the source database properties are not used.

- DoNotSynchronize <Y|N>—If you pass Y, only the comparison the is done; nothing is deployed. By default, exported results are automatically deployed.

For example, if you want to perform comparison and export the comparison results to specific directory. But you do not want to deploy those changes, pass the following arguments:

```
-MODE Deploy -ExportDir C:\CDT\Reports -DoNotSynchronize Y
```

Note: By default, the changes are automatically deployed from source to target database.

10

Troubleshooting

During operations, the Configuration Deployment Tool displays messages in the Status panel that enable you to understand the status of each operation. These messages can be classified as:

- Status
- Warnings
- Unexpected errors

The following section describes various messages that you may encounter and any relevant corrective actions you should take.

10.1 Messages

While using the Configuration Deployment Tool, you may encounter either informational messages or warning messages. These message types are described below.

10.1.1 Informational Messages

Informational messages represent the status of the operation being performed. These messages are displayed in the default color (typically black) in the Status panel. Examples of informational messages include:

- Refreshing database cache
- Deployment operation started
- Reading table YFS_ORGANIZATION

10.1.2 Warning Messages

Warning messages typically require corrective action. They are displayed in red on the Status panel. CDT may produce the warning messages described in this section.

WARNING - FK check failed for table <name> to <name2>

This warning message typically indicates that the configuration data that you are trying to deploy causes inconsistent data in the target database.

To analyze and correct this problem:

1. Determine the size of the data set you are deploying. This error typically occurs when trying to deploy a very small set of data, such as only a driver entity or a configuration group. For example, when deploying a pipeline, this error results if the document type to which the pipeline belongs has not been picked for deployment.

   Try resolving this error by selecting a larger set to deploy. For example, instead of deploying a record, deploy the entire group, if possible.

2. If you still encounter this error for a group or you must only deploy a particular record, try synchronizing the foreign table before deploying the data.

3. Occasionally, inconsistent data in the source database causes this error. If this is the case, you must correct the source of the inconsistency before you proceed.

WARNING - Cache Refresh Failed

This error indicates that CDT was unable to inform the application server cluster on the target environment about the newly deployed configuration changes. The reason the cache refresh failed is displayed on the Status panel.

To analyze and correct this problem:

1. Verify the URL specified in the `httpurl` field for the target database. The `httpurl` is accessible from the Logon dialog box. Ensure that the `httpurl` points to a running instance of the application server and has the following format:

http://<hostname/ip-address>:<port-number>/yantra/interop/InteropHttpServlet where hostname, ip-address and port-number are the parameters used to connect to the application server.

2. If your target environment is not running, no action is required. Sterling Multi-Channel Fulfillment Solution automatically reads the latest configuration data when it is started.

3. If the target environment is running, you must manually drop the stale database cache using the Sterling Multi-Channel Fulfillment Solution System Administration Console. Not performing this step may result in Sterling Multi-Channel Fulfillment Solution not recognizing the changed configuration.

WARNING - The program detected a few abandoned records in the target database.

In most cases, the abandoned records are harmless and do not lead to incorrect operation of Sterling Multi-Channel Fulfillment Solution. By default, the CDT leaves them untouched.

This warning typically occurs as a result of the following circumstances which are described in detail in Section 2.3, "Externally Maintained Configuration Data".

- When the CDT determines that records do not belong to a valid driver entity (for example, a pipeline for a process type that no longer exists).
- When the CDT has been configured to ignore certain tables without ignoring all dependent tables.

To analyze and correct this problem:

1. Add the `-DShowAbandoned=Y` Java parameter to the `ydk.cmd` script.
2. Run the `ydk.cmd` script. If the CDT finds abandoned records, it dynamically creates a group called "Abandoned Records" and displays them in the Comparison Results window.
3. Examine these records, and then either ignore them or delete them from the target.

10.2 Unexpected Errors

Depending on the severity, messages about unexpected errors are displayed in either of the following places:

- In the CDT Status panel (in red)
- In the Microsoft Windows console used to launch the Configuration Deployment Tool

To analyze and correct these errors:

- If the error indicates an out-of-memory condition, try your previous operation with a smaller set of data.
- Verify that your system specifications comply with the recommendations described in Chapter 2, "System Requirements"System Requirements.
- You can edit the `-mx` Java parameter in the `ydk.cmd` script to increase the memory available for the Configuration Deployment Tool.

For example, if you were comparing the complete configuration, try comparing one group at a time. The same is true for the deployment operation.

In other cases, the underlying error and detailed trace are displayed. This may point to an incomplete or faulty installation or incorrectly specified runtime parameters.

10.3 Exceptions While Exporting With cdtshell.cmd/sh Scripts

The cdtshell.cmd (or .sh) scripts throw a java.lang.StringIndexOutOfBoundsException when exporting configuration data using the CDT with the database as SOURCE_DB and the XML file as TARGET_DB.

To analyze and correct this exception:

Verify that the ExportDir and the folder location of the XML files are not the same location.

10.4 Data Rollback Scripts

Before deploying data from a staging to a production environment, it is recommended to take a snapshot of your production configuration data. This snapshot enables you to perform a rollback of the deployment operation in case of failure. Sterling Multi-Channel Fulfillment Solution provides the following rollback scripts:

- Backup script - Creates multiple files containing data from the Sterling Multi-Channel Fulfillment Solution configuration data.
- Restore script - Uses the files created by the backup scripts to restore the Sterling Multi-Channel Fulfillment Solution configuration to a previously known good state.

To generate the backup and restore scripts, run the `backupScriptGen.xml` script located in the `<INSTALL_DIR>/bin` directory using `ant -f backupScriptGen.xml`. This script generates sample backup and restore scripts in the `<INSTALL_DIR>/bin/sample` directory.

> **Note:** The backup files do not represent the entire configuration snapshot (for example, it does not capture the YFS_PERSON_INFO table), so do not use the scripts for deploying data to a different database. Instead, use the CDT to deploy configuration data.
>
> These scripts are only for performing a rollback of configuration data onto the database from which the snapshot was taken.

10.4.1 Customizing the Scripts

You can generate the backup and restore scripts by running the `backupScriptGen.xml` script provided by the Sterling Multi-Channel Fulfillment Solution. This file is located in the `<INSTALL_DIR>/bin` directory. You can rename and customize the scripts to suit your business needs. For example, you can modify the script to add your custom configuration tables and modify the path where the data files are stored. These scripts depend on utilities provided by the database vendors.

The backupScriptGen.xml script accepts the following arguments:

Table 10–1 backupScripGen.xml Arguments

Argument	Purpose	Accepted Values
-Dos=	This argument is used to determine what kind of script is generated. If "windows" is selected, a .cmd file is created. If "linux" or "unix" is selected, a .sh file is created. If "all" is selected, both .cmd and .sh files are created.	• windows • unix • linux • all •
-Ddbtype=	This argument is used to determine which database(s) the scripts will be generated for.	• oracle • db2 • sqlserver • db2iseries • all
Dtabletype=	This argument determines which entities scripts to generate scripts for. Shared entities refer to tables that contain both transaction and configuration data.	• configuration • transaction • shared • all

Note: Running the backupScriptGen.xml script creates both backup and restore scripts for the selected operating systems and databases.

- Oracle scripts depend on export, import, or sqlplus utilities. You can modify and use the following scripts:
  - backup_config_oracle.cmd
  - restore_config_oracle.cmd

- SQL server scripts depend on bcp or osql utilities. You can modify and use the following scripts:
  - backup_config_sqlserver.cmd
  - restore_config_sqlserver.cmd
- DB2 scripts depend on export or load utilities. You can modify and use the following scripts:
  - backup_config_db2.cmd
  - restore_config_db2.cmd

10.4.2 Running the Scripts

Before you deploy any data using the Sterling Multi-Channel Fulfillment Solution Configuration Deployment Tool, use the backup script to back up your data. These backup data files can then be version controlled.

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