International Postal System

Import/Export Guide

version 2015 and later

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About this document

Intended audience

This document is for advanced IPS users wanting to interface IPS with external systems.

How to use this manual

This document explains how to import and export event data for IPS mail objects using asynchronous interfaces. IPS import/export is very flexible and can be customized, however, you can only set up default import and export interfaces using this manual. We recommend that you contact the PTC to discuss more complex customization needs.

Introduction

Overview of IPS import/export

IPS import/export provides a scheduled way of importing data into the IPS database from external systems, and of exporting data from the IPS database to external systems. Examples of external systems are: Track&Trace, counter systems, sampling/statistics systems, operational dashboards, mechanical/conveyor belts, enterprise service buses, data brokers, etc.

Import/export data is based on mail objects and the events associated with them. In addition to operational data, EDI data, such as delivery information, can be exported to the client application. You define an import or export interface for each schedule and mail object type you want to transfer (see "Creating new import/export interfaces" on page 15). Each import/export interface has the following characteristics:

- Uses XML or custom assemblies
- Can be run on demand or on different frequency schedules
- Is limited to a specific set of mail objects (see "Mail objects you can import" on page 6 and "Mail objects you can export" on page 8 for more information)

Data is transferred using XML files. IPS includes schemas for validation of the XML structure, and transformation templates to change the XML structure. See "XML files, schemas and transformations" on page 21 for more information.

Note: At this time, XML transformations are only possible when *exporting* data.

Except when explicitly stated otherwise, the following sections describe default import and export in IPS. To achieve greater flexibility, it is possible to implement a custom assembly. If your needs cannot be met by default import or export, please contact the PTC to discuss creating a custom assembly.

IPS Interfaces Service

The IPS Interfaces Service is implemented as a Microsoft Windows Service. It can be found in the IPS \Bin directory and is called IPS.Interfaces.Service.exe.

The service runs continuously and executes the import and export interfaces according to their schedules. It also listens for requests to run interfaces on demand.

Mail objects you can import

You can import all events into the IPS database relating to the following mail object types:

- mail items
- receptacles
- sampling
- accounting dispatch
- accounting transport lines
- sampling rules
- terminal dues rates
- floating receptacles

Sampling rules

Sampling rule import always creates new records, so it is possible to create duplicates. Duplicates can be removed using IPS if required.

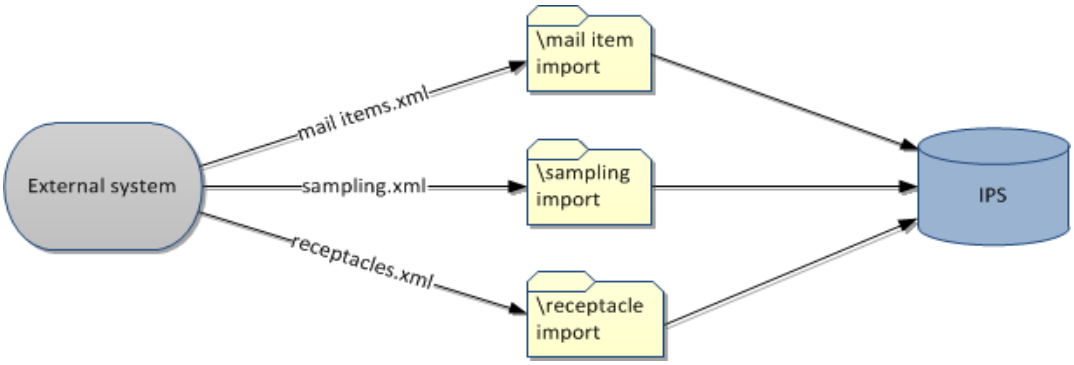
Terminal dues rates

Duplicate terminal dues rates are rejected during import.

Import procedure

IPS imports events either on demand, or according to a pre-defined schedule. You define one interface for each mail object type you wish to import, including details such as the import schedule and the location of the import folder. You cannot filter the events to import for the mail object type.

The following diagram shows three import interfaces for three different mail object types.



IPS imports the data as follows:

Step	Action
1	The external system creates XML files and writes them to the import folder specified in IPS for the interface of that mail object type.

Step	Action
2	When IPS runs import interfaces on demand, or according to their schedule, it: • Checks for import files containing the mail object type of the interface • Validates corresponding files against the XML schema relating to the mail object type • Imports valid data into the database
3	When IPS imports data into the database: • If the mail object does not exist in the database, it is created • If the mail object exists in the database, its attributes are updated with the attributes of the import data at event level[1] • The mail object event is created and linked to the mail object

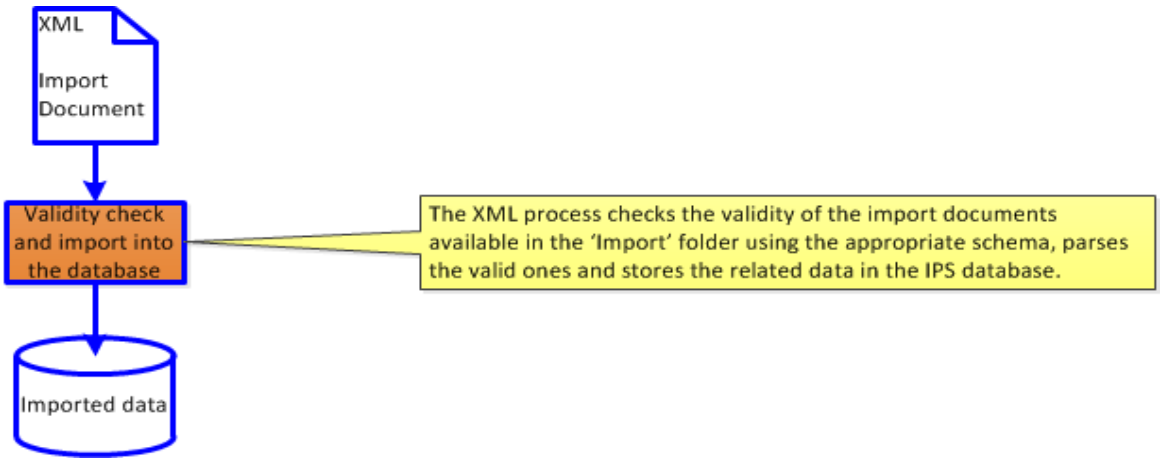
[1]You can override this default behavior by setting the option **Do not update mail item attributes on event import** in **National management > Reference data > Event types**.

See:

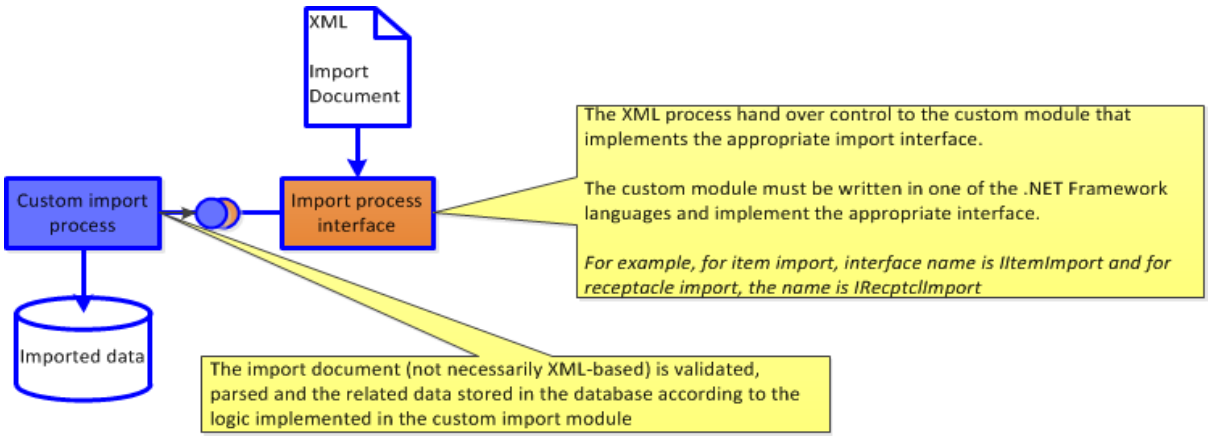
- "Creating new import/export interfaces" on page 15 for more details on creating the interface
- "XML files, schemas and transformations" on page 21 for more details on import XML

The following diagrams show how both default and custom assembly imports are performed. However, the remainder of the import sections of this document are limited to explaining default imports only.

Default



Custom



Mail objects you can export

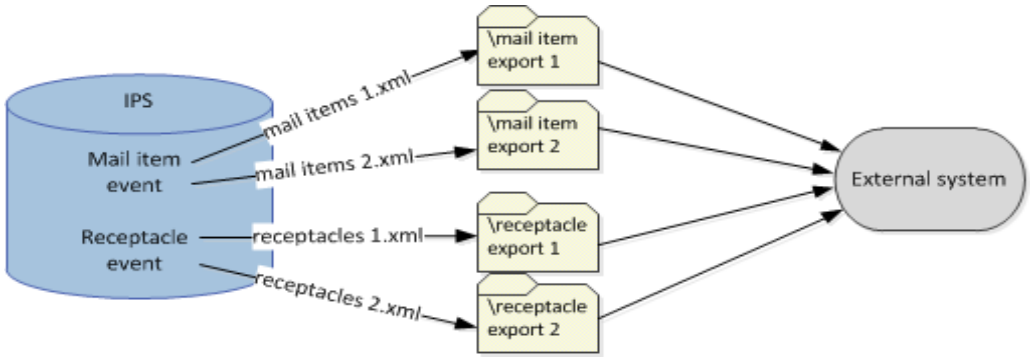
You can export all events from the IPS database relating to the following mail object types:

- mail items
- receptacles

Export procedure

Events are exported either on demand, or according to a pre-defined schedule. You can define one or more interfaces for each mail object type you wish to import, including details such as the export schedule, the location of the export folder, and which XSLT transformation to apply to the file. You can also filter the events to export for the mail object type.

The following diagram shows four different export interfaces, two for mail items and two for receptacles. In this scenario, both interfaces for each mail object type are exporting the same event.



IPS exports the data as follows:

Step	Action
1	When IPS runs export interfaces on demand, or according to their schedule, it:

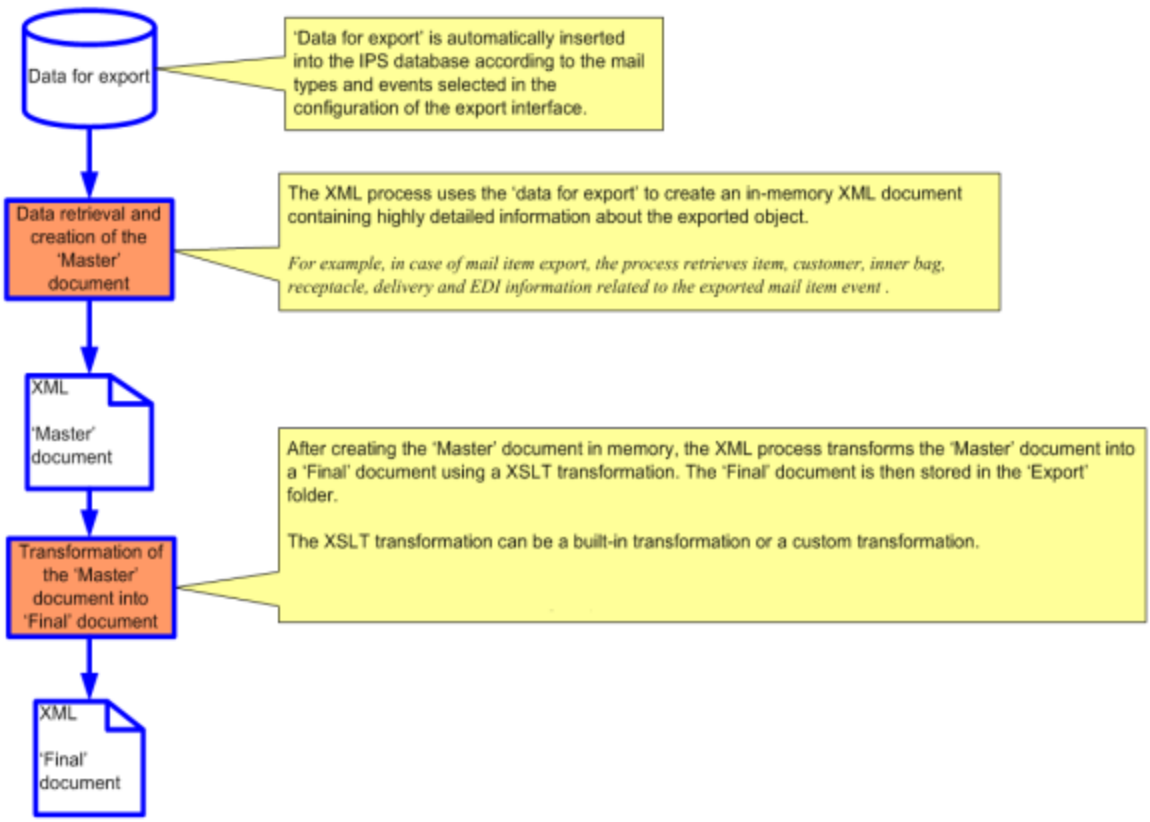
Step	Action
	• Checks the database for mail object type events specified for the interface • Creates XML files from the relevant data • Transforms the XML files using the XSLT specified for the interface • Places the transformed XML files in the export folder specified for the interface

See:

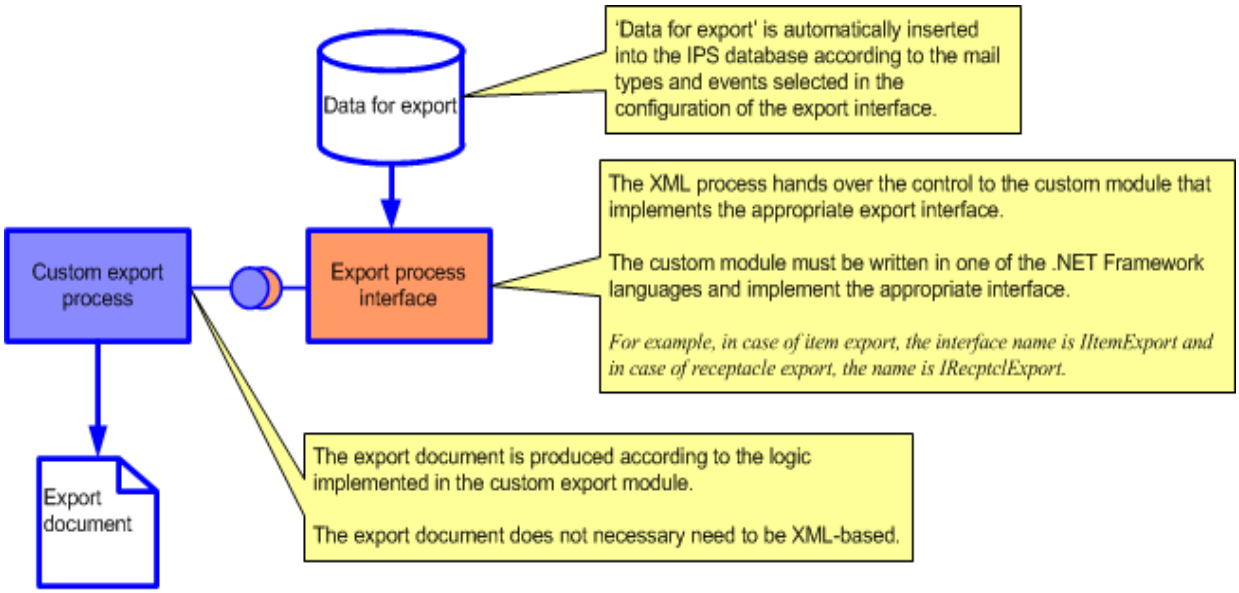
- "Creating new import/export interfaces" on page 15 for more details on creating the interface
- "XML files, schemas and transformations" on page 21 for more details on export XML

Note: The following diagrams show how both default and custom assembly exports are performed. However, the remainder of the export sections of this document are limited to explaining default exports only.

Default



Custom



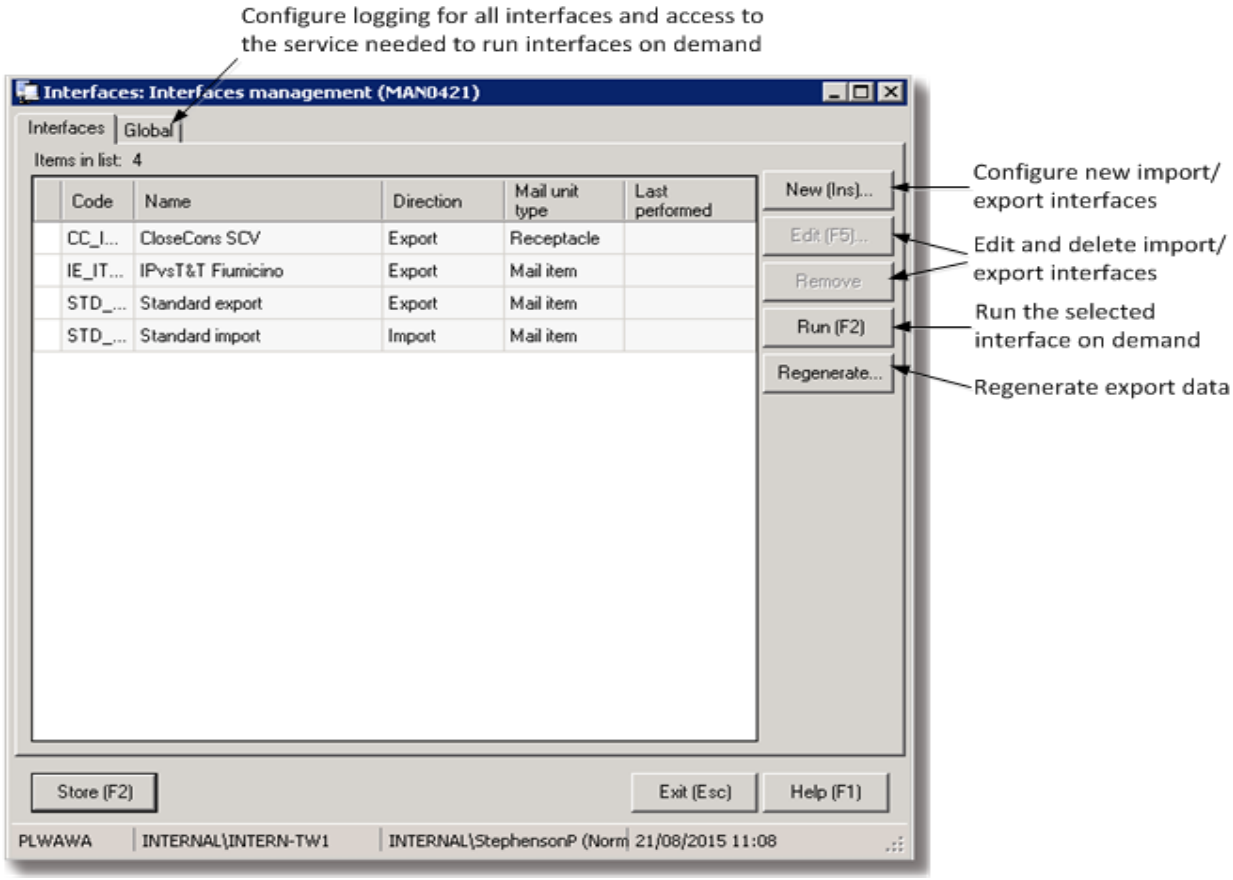
GMT vs local time in IPS import/export

XML exports events with the time in Greenwich Mean Time (GMT), not local time. In the default export schema, the Event->Date element has a GMT value. Local time adjustments to GMT can be made using the EVENT_LOCAL_OFFSET element of the master XML export schemas in an XSLT export template (see "XML files, schemas and transformations" on page 21 for more information).

XML import also expects events with the time in GMT, not local time.

Configuring import and export

Interface management

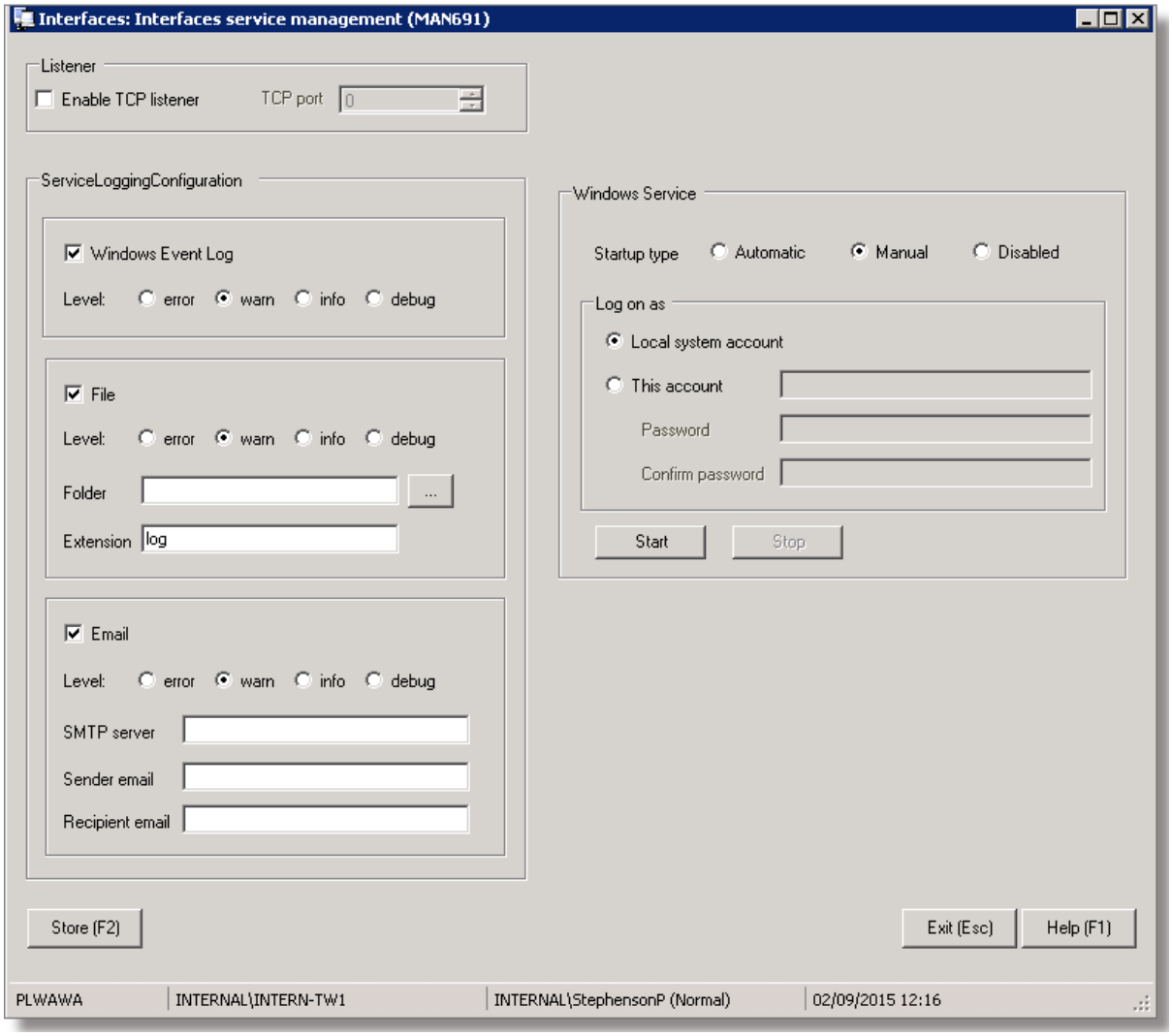


IPS provides an interface management dialog that allows you to:

- configure import and export interfaces (see "Creating new import/export interfaces" on page 15)
- view, edit and delete previously created interfaces
- configure global settings for IPS import and export interfaces, including logging and access to the IPS Interfaces Service needed to run interfaces on demand

It also provides two additional functions: regenerating export data for a given time period, and running import and export interfaces on demand. See "Additional import/export functions" on page 12 for more information.

Interface service management



IPS additionally provides a dialog for managing the IPS Interfaces Service. The Interfaces service management dialog allows you to:

- configure the Listener
- configure service logging
- configure the IPS Interfaces Service for Microsoft Windows (see "Configuring the IPS Interfaces Service" on page 14)
- manually start and stop the IPS Interfaces Service (see "Configuring the IPS Interfaces Service" on page 14)

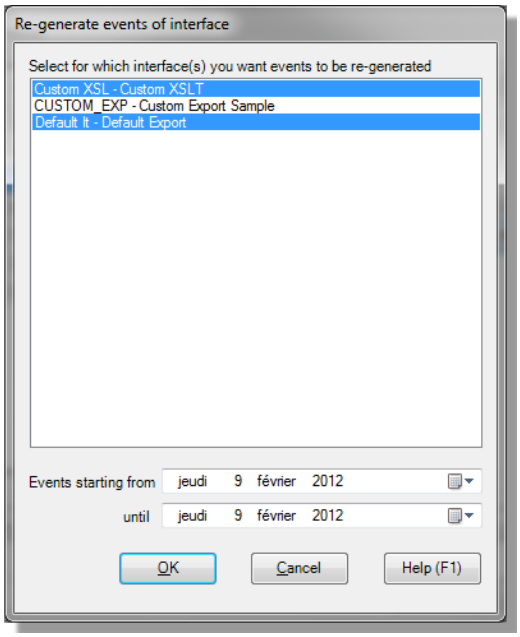
Additional import/export functions

In addition to the configuration functions described in more detail later in this chapter, the Interfaces management dialog provides two other import/export functions.

Regenerating export data

If you accidentally lose or corrupt exported data in your external application, you can regenerate events relating to a specific period in time from the relevant table in the database, as follows:

1. Open **National management** > **Interfaces management**.
2. From the **Interfaces** tab, click **Regenerate**. A new dialog box opens.



3. Select the export interface you want to regenerate from the list.
4. Select the date range in the **Events starting from** and **until** fields.
5. Click **OK**. IPS recreates the export data in the folder defined for the interface.

Running an import/export interface on demand

Important: Before you can run an interface on demand, you must:

- Enable the Listener (see "Configure the Listener" on page 14)
- Specify the IP address of the server where the IPS Interfaces Service is running (see "Enable access to the IPS Interfaces Service" on page 15)

Note: This function is not available to IPS.POST users.

To run an import/export interface on demand:

1. Open **National management** > **Interfaces management**.
2. From the **Interfaces** tab, select the interface from the list in the Interfaces management dialog. If the interface does not yet exist, create it (see "Creating new import/export interfaces" on page 15).
3. Click the **Run** button.

Configuring the IPS Interfaces Service

Before you can start using IPS import and export, you must first configure the IPS Interfaces Service.

Navigation

The procedures below use window  **National management** > **Interfaces** > **Interfaces service management**.

Configure the Listener

IPS uses the Listener for running interfaces on demand.

1. Check **Enable TCP Listener**.
2. Specify the **TCP port** the Listener will run on.
3. Click **Store** to save your changes.

Configure service logging

1. Choose to write logging messages to the **Windows Event Log**, to a **File**, or both.
2. For the logging type(s) chosen, choose the logging level: **error**, **warn**, **info** or **debug**. Each of the four levels includes its own messages, plus those of the levels beneath it, with **error** including only error messages, and **debug** including all four types.
3. If you checked **File** in step 1., specify the location of the logging file in **Folder**, and a file extension in **Extension**, if required.
4. If you wish to send the logs to an email address, check **Email**, then specify the level of messages to email, the **Recipient email** address where you want the error log to be sent, and the outgoing **SMTP Server** name. You can also specify the **Sender email** address if required.
5. Click **Store** to save your changes.

Specify the Microsoft Windows configuration for the service

1. Specify the type of startup in the **Startup type** section:
   - **Automatic** - the service starts up automatically when you start Windows
   - **Manual** - the user must start up the service manually
   - **Disabled** - this account has service startup disabled
2. In the **Log on as** section, select the user account under which the Windows service will run:
   - **Local system account** - the account you are currently using
   - **This account** - select a different user from the drop-down list, then type the user's password in the **Password** and **Confirm password** fields
3. Click **Store** to save your changes.
4. Click the **Start** button to start the service, if required. If you have selected **Manual** as the startup type, you must remember to start it manually either here or in the Windows Control Panel

before any data can be imported or exported.

Tip: You can stop the service by clicking **Stop**.

Configuring the interfaces

You can configure logging details for the interfaces and the IP address and port for the IPS Interfaces Service in the **Global** tab of the Interfaces management dialog.

Navigation

The procedures below use window **National management** > **Interfaces** > **Interfaces service management**.

Configure interface logging

1. From the **Global** tab, in the **File** section, choose whether to log **Errors and information**, or **Errors only**.
2. In the **Folder** field, specify where the log file is to be stored. In IPS.POST, the specified location will be added as a subfolder after *<IPS installation directory>*\Import for import interfaces, and *<IPS installation directory>*\Export for export interfaces.
3. In the **Extension** field, specify the extension for the log file.
4. If you wish to email the log files, in the **Email** section, choose whether to send **Errors and information** or **Errors only**.
5. Choose the **Recipient email** address.
6. If required, choose the **SMTP Server** and **Sender email** address (not available in IPS.POST).
7. Click **Store**.

Enable access to the IPS Interfaces Service

You must first complete these fields before you can run interfaces on demand.

1. From the **Global** tab, in the **Service** section, enter the IP address of the server where the IPS Interfaces Service is running.
2. Enter the **TCP port** where the service is running.
3. Click **Store**.

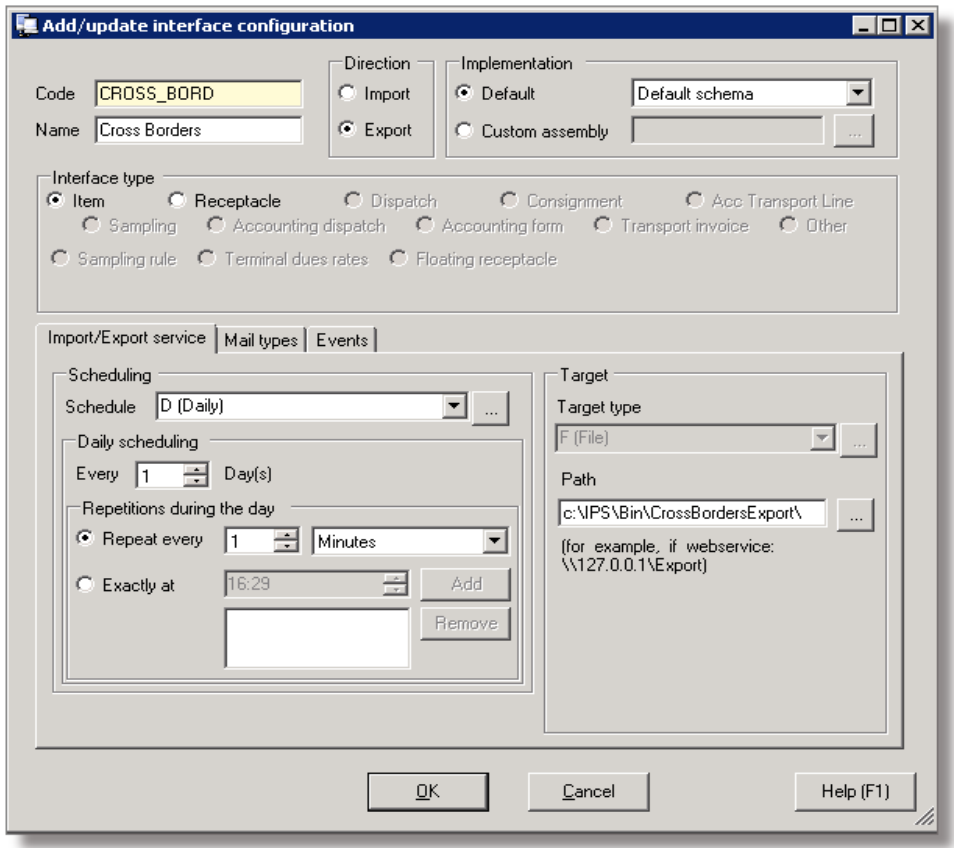
Creating new import/export interfaces

You can define one or more import/export interfaces using the IPS Interfaces management screen. When each interface has been stored, it appears as a line on the main Interface management dialog.

Important: The following instructions are for creating a **Default** interface. Setting up a custom assembly is a complex task outside the scope of this document. For more information on custom assemblies, please contact the PTC.

1. Open **National management** > **Interfaces** > **Interfaces management**.
2. From the **Interfaces** tab, click **New**.

   You can also update an existing interface, by selecting a line and clicking **Edit** to edit an existing interface, or **Remove** to delete it.



3. Choose a short **Code** and a **Name** to describe the interface.
4. Click the **Import** or **Export** radio button in the **Direction** section.
5. In **Implementation**, click the **Default** radio button.
6. (Export only) Choose the schema from the drop-down list. If you choose:
   - **Default schema**, IPS transforms the XML file using the default export transformation template for the mail object type
   - **Old schema**, IPS transforms the XML file using the old export transformation template for the mail object type
   - **Import schema**, IPS transforms the XML file using the bi-directional export transformation template for the mail object type

   You can also choose a custom schema from the drop-down list above if you have created your own transformation template (see "Creating custom export XSLT templates" on page 23 for more details).

For more information on the schemas and transformations included with IPS, see "XML files, schemas and transformations" on page 21.

7. Choose the type of object you want to import or export in **Interface type**. Not all import/export objects are available in a default implementation, and different object types are available for import and export.

   If you cannot select the object type required, you need to discuss creating a custom assembly with the PTC.

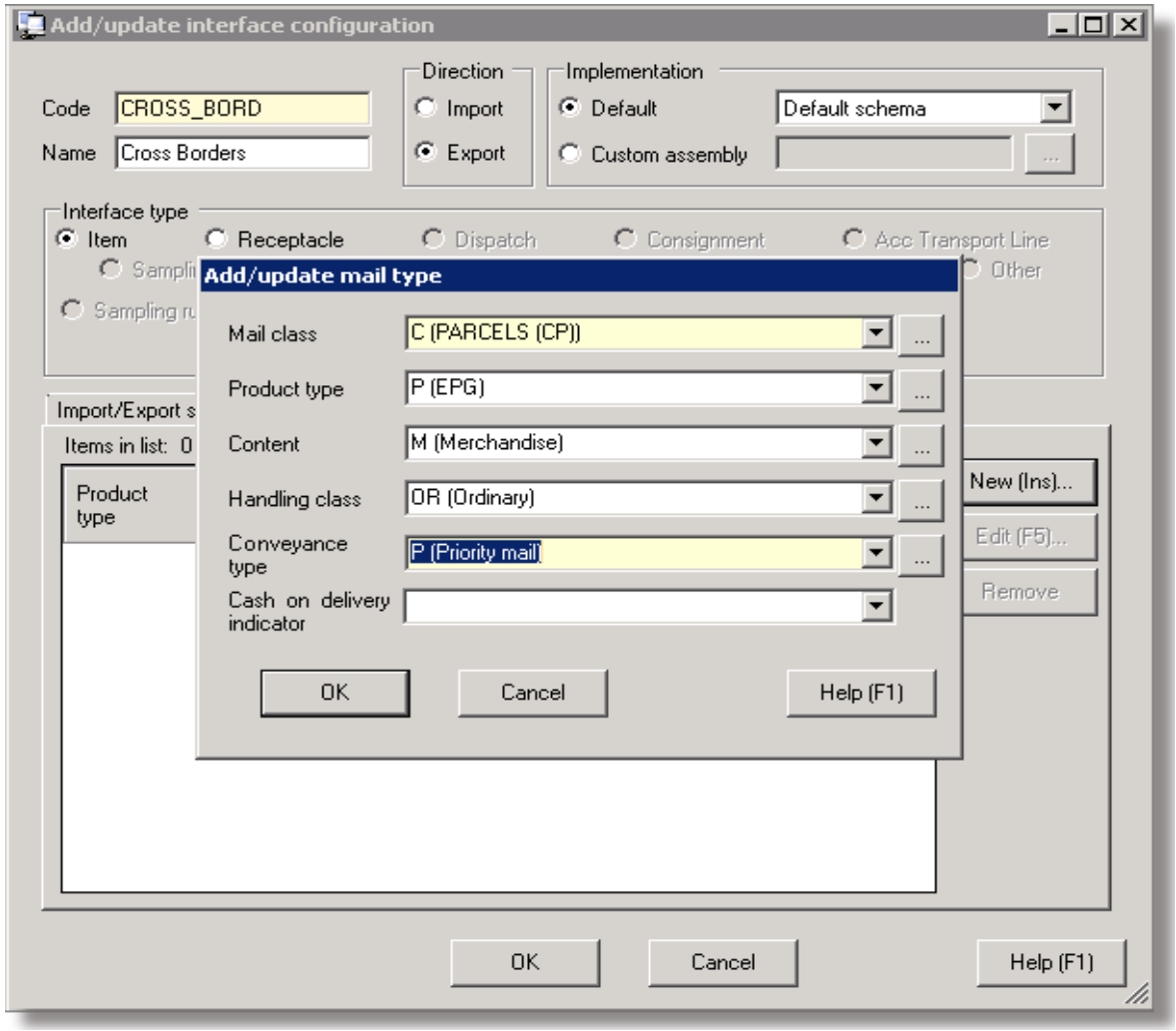
8. From the **Interfaces** tab, in **Scheduling**, define the schedule for running the interface. If you choose:

   - **Not scheduled**, you can only run the interface on demand (see "Running an import/-export interface on demand" on page 13).
   - **Daily**, choose how many days apart the scheduler should run in **Daily scheduling**. If you choose to run it daily (**Every 1 Day(s)**), you must also choose between: running the scheduler at defined intervals (in **Repeat everyxMinutes** or **Hours**), and running the scheduler at specific times (in **Exactly at**, by entering each time required, followed by **Add**).
   - **Monthly**, choose on which days of which months the scheduler should run.
   - **Weekly**, choose how many weeks apart the scheduler should run in **Weekly scheduling**. If you choose weekly, choose the days of the week.

   Note: The schedule defines when the interface runs. The actual creation of import and export items depends on other factors, so items are only imported and exported according to this schedule if they have first been created.

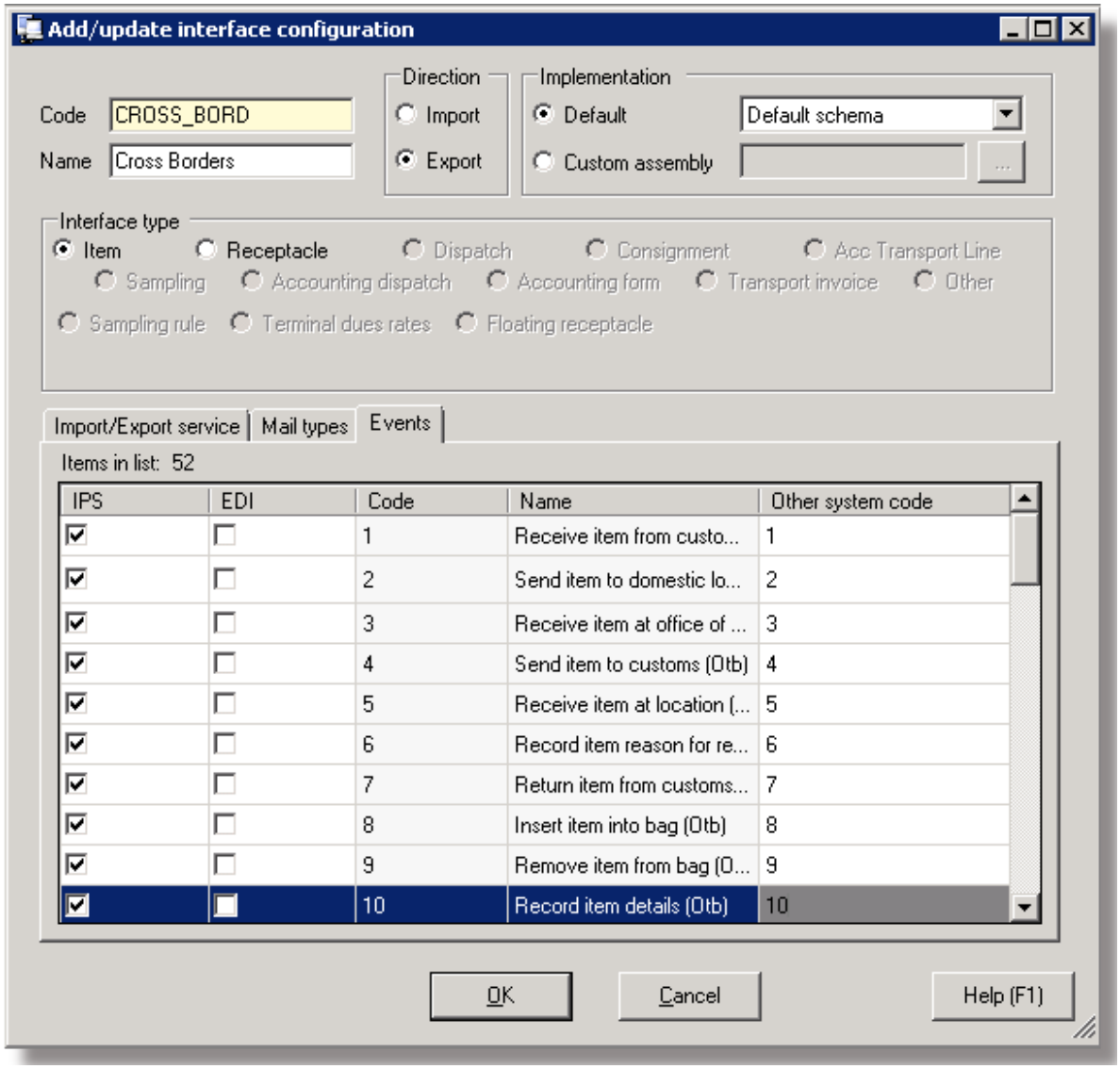
9. Set **Target type** to **F (File)**.
10. Set the **Path** to which to write the import file, or from which to pick up the export file for IPS. For IPS.Post, set the subfolder.
11. For export interfaces, click the **Mail types** tab to view, create or change the mail types set up for this interface. Mail types allow you to create one or more specific definitions of the mail object, filtered by its attributes (see the diagram below for details). If no mail types are defined, the generic definition is applied.

    You can set up more than one mail type per export interface by clicking **New**. You can also change the mail attributes that trigger the creation of an export item, by double-clicking on a line and selecting the relevant mail attributes.



12. Click the **Events** tab. If you are creating an export interface, check the check box next to the IPS and EDI events to be exported. If you are creating an import interface, all events are imported. You can also add an alias for the code relating to each event in **Other system code**.

    If you are defining an export interface for receptacle-level events, you can also filter the events by workstation group, by selecting it from the **Workstation group** drop-down list (note that the list is not visible if this is not an export interface for receptacles). Only events recorded by workstations belonging to the selected group will be exported by the interface.



Tip: You can define new events in IPS using **National management** > **Reference data** > **Event types**. Note that if the option **Do not update mail item attributes on event import** is selected in the event definition, the mail item's attributes will not be updated when IPS imports the event data.

13. Click **OK**. The dialog closes.
14. Click **Store** on the Interfaces management dialog to save the interface to the database. Once the interface is stored, you can edit or delete it, as explained in step 2.

Examples: Export

An example of an export scenario is as follows:

Example 1	Export IPS outbound B (receive item at office of exchange) and C (insert into receptacle) events for mail class U (letters)

For guidance on the structure of the XML produced, see the mail item export schema as listed in "XML schemas" on page 21. You can also contact the PTC for example XML files.

Examples: Import

Some examples of import scenarios are as follows:

Example 1	Import into IPS the following data recorded within a domestic system: reception of a mail item at a point of delivery (event G) and delivery (event I)
Example 2	Import into IPS the following data recorded within a domestic system: reception of a receptacle from another country (Receive receptacle from abroad (Inb) event) and forwarding of the receptacle to the office of exchange (Receive receptacle at domestic location (Inb) event)
Example 3	Import into IPS sampling data for two inbound receptacles
Example 4	Import accounting dispatch
Example 5	Import accounting transport line

For guidance on the structure of the XML expected, see the appropriate import schema as listed in "XML files, schemas and transformations" on page 21. You can also contact the PTC for example XML files.

XML files, schemas and transformations

Export XML

When an IPS export interface is executed, files are first transformed, then written to the export folder specified for the interface, as follows:

1. The *Master*XML document is first created in memory.
2. The *Master* XML document is transformed to a *Final* XML document using the XSLT transformation template associated with the current schema.
3. The *Final* XML document is stored in the folder specified during configuration of the interface.

IPS has three default XSLT templates you can choose from, or you can create your own template, within the limits of the master schemas (see "XML files, schemas and transformations" on page 21). If you need to transform files to a different format or an XML format not covered by the master schema, you must use a custom assembly. Please contact the PTC to discuss your needs.

Import XML

When an IPS import interface is executed, files are first read from the import path, then validated using import XML schemas, before being written to the IPS database. There is one schema for each mail object type. If import is successful, the import file is moved to a subfolder of the import folder specified for the interface, called `\Backup`. If it fails, the import file is moved to a subfolder called `\Error` (both folders are created automatically).

Note: No XSLT transformation is currently possible for XML import files.

XML schemas

The schemas are located in <*IPS_installation_folder*>\Bin\XML\Schemas. Below is a list of the XML schemas included with IPS, along with a description of their purpose.Note: The list below may not include all IPS schemas. For the most up-to-date list of schemas included with IPS, check the relevant folder in your own IPS installation.

Schema	Description
Export schemas	
IPS.ApplicationLayer.ImportExport.Item.Export.xsd	Default mail item

Schema	Description
	export
IPS.ApplicationLayer.ImportExport.Item.Export.Old.xsd	Old mail item export (backward compatibility)
IPS.ApplicationLayer.ImportExport.Item.Import.xsd	Used for exporting mail items to another IPS database, the same schema as used for import
IPS.ApplicationLayer.ImportExport.Item.Export.Internal.xsd	Master mail item export
IPS.ApplicationLayer.ImportExport.Receptacle.Export.xsd	Default receptacle export
IPS.ApplicationLayer.ImportExport.Receptacle.Export.Old.xsd	Old receptacle export (backward compatibility)
IPS.ApplicationLayer.ImportExport.Receptacle.Import.xsd	Used for exporting receptacle data to another IPS database, the same schema as used for import
IPS.ApplicationLayer.ImportExport.Receptacle.Export.Internal.xsd	Master receptacle export
Import schemas	
IPS.ApplicationLayer.ImportExport.Item.Import.xsd	Mail item import
IPS.ApplicationLayer.ImportExport.Receptacle.Import.xsd	Receptacle import
IPS.ApplicationLayer.ImportExport.Sampling.Import.xsd	Sampling import
IPS.ApplicationLayer.ImportExport.AccDispatch.Import.xsd	Accounting dispatch import
IPS.ApplicationLayer.ImportExport.Conveyance.Import.xsd	Accounting transport line import
IPS.ApplicationLayer.ImportExport.TerminalDue.Import.xsd	Terminal dues rates

Schema	Description
	import
IPS.ApplicationLayer.ImportExport.SamplingRule.Import.xsd	Sampling rules import

XML transformation templates

IPS provides a number of transformation templates, located in *<IPS_installation_folder>*\Bin\XML\Transformations. Transformation templates are only used during export. The transformation template applied depends on the schema chosen when the interface is defined.The list below may not include all IPS transformation templates. For the most up-to-date list of transformation templates included with IPS, check the relevant folder in your own IPS installation.

Transformation	Description
IPS.ApplicationLayer.ImportExport.Item.Export.Default.xslt	Default mail item export, used with IPS.ApplicationLayer.ImportExport.Item.Export.xsd schema.
IPS.ApplicationLayer.ImportExport.Item.Export.Import.xslt	Bi-directional mail item export, used with IPS.ApplicationLayer.ImportExport.Item.Import.xsd schema.
IPS.ApplicationLayer.ImportExport.Item.Export.Old.xslt	Old mail item export, applied with IPS.ApplicationLayer.ImportExport.Item.Export.Old.xsd schema.
IPS.ApplicationLayer.ImportExport.Receptacle.Export.Default.xslt	Default receptacle export, applied with IPS.ApplicationLayer.ImportExport.Receptacle.Export.xsd schema.
IPS.ApplicationLayer.ImportExport.Receptacle.Export.Import.xslt	Bi-directional receptacle export, applied with IPS.ApplicationLayer.ImportExport.Receptacle.Import.xsd schema.
IPS.ApplicationLayer.ImportExport.Receptacle.Export.Old.xslt	Old receptacle export, applied withIPS.ApplicationLayer.ImportExport.Receptacle.Export.Old.xsd schema.

Creating custom export XSLT templates

If the XML output from the standard transformation templates supplied with IPS is not suitable, you can create your own template. The template must comply with the master export schemas, which

define the limits of XML data export in IPS (see "Mail item master export schema" and "Receptacle master export schema" on page 30). To create a custom transformation template you need to:

- create a new XSLT file based on the default template for the mail object type, as listed in the above table
- place it in *<IPS_installation_folder>*\Bin\XML\Transformations.
- update the IPS database with details of the new template

Please contact the PTC for more information.

Once the new template is added to the IPS database, it creates a new entry in the **Default** drop-down list when you create a new interface for exporting the mail object type. If you select it, the XSLT file specified is applied during export.

Note: You can only create templates that transform one XML structure into another. If you want to create output in another format, you must invoke an external process or create a custom assembly. Please contact the PTC for more information.