SUN SEEBEYOND

SWIFT OTD LIBRARY USER'S GUIDE

Release 5.1.2

Sun microsystems

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Contents

Chapter 1

Introducing the SWIFT OTD Library

This guide explains how to install and operate the Sun Java Composite Application Platform Suite's SWIFT OTD Library.

This chapter provides a brief overview of operations, components, and general features of the Object Type Definition (OTD) Library.

What's in This Chapter

1.1 Overview

The Society for Worldwide Interbank Financial Telecommunication (SWIFT) OTD Library contains template OTDs for use with the Sun Java Composite Application Platform Suite. These OTDs correspond to the SWIFT user-to-user message types employed by its SWIFT network. The library provides an individual OTD for each SWIFT message type, as defined in the SWIFT standards documentation.

Each OTD in the SWIFT OTD Library represents a corresponding SWIFT message type. See **"Using the SWIFT OTD Library" on page 14** for a complete list of these OTDs. You can use these OTDs to transport SWIFT message data with the Sun Java Composite Application Platform Suite.

This user's guide explains how to use these OTDs with the Sun Java Composite Application Platform Suite, as well as the features available with them.

1.2 2005/2006 Library Features

The new SWIFT OTD Libraries (2005 and 2006 versions) allow you to use the following features:

- **SWIFT OTD Library Funds Features** on page 60
- **Message Format Validation Rules (MFVR)** on page 34
- **MPR Validation Methods** on page 36
- **In Collaboration Validation Methods** on page 37

1.3 Library Versions and Access

SWIFT periodically revises their message types, adding to or subtracting from the total set of Message Types, and modifying the definitions of individual message types. New sets are identified with the year they are issued, such as 2001, 2002, 2003, 2005, or 2006.

Sun releases a new SWIFT OTD Library corresponding to each revised set of SWIFT message types. The current release includes templates supporting the 2001 through 2006 message type sets.

You must install each year's version via a separate .**sar** file (see **Chapter 2**). However, the MT Funds, Validation, and BICDirService (see **Chapter 4**) features can only be used with the 2003, 2005, and 2006 OTDs.

1.4 What's New in This Release

The Sun SeeBeyond SWIFT OTD Library includes the following changes and new features:

New for Version 5.1.2

- Includes the 2006 SWIFT OTD Library.

New for Version 5.1.1

- The SWIFT OTD Library SAR file has been repackaged to decrease size and upload time.
- Additional methods are now available that allow you to validate an OTD directly from the Collaboration.

New for Version 5.1.0

- Improved performance for Validation Collaborations.

1.5 What's in This Document

The SWIFT OTD Library User's Guide includes the following chapters:

- **Chapter 1 "Introducing the SWIFT OTD Library"** provides an overview of the SWIFT OTD Library and the SWIFT OTD Library User's Guide.
- **Chapter 2 "Installing the SWIFT OTD Library"** provides the supported operating systems and system requirements for the SWIFT OTD Library. It also includes directions for installing the SWIFT OTD Library and accessing the accompanying documentation and sample projects.
- **Chapter 3 "Using the SWIFT OTD Library"** lists and describes the SWIFT Message Types.
- **Chapter 4 "Using Message Validation Features"** explains how to use the SWIFT message validation features that are a part of the SWIFT OTD Library product.
- **Chapter 5 "Using SWIFT FIN Based Funds OTDs"** explains how to use specialized MT Funds features available with the SWIFT OTD Library.
- **Chapter 6 "Using OTD Library Java Classes"** lists the SWIFT OTD Library Java classes and provides directions for accessing the SWIFT OTD Library Javadoc.

1.5.1 Scope of the Document

This user's guide provides a description of the SWIFT OTD Library. It describes how to install the library, how to use it with eGate Integrator, and how to implement the sample projects included with the library. For detailed information about eGate-specific procedures, refer to the *eGate Integrator User's Guide*. If you are using the OTD library with eXchange, refer to the *eXchange Integrator User's Guide* for eXchange-specific procedures.

1.5.2 Intended Audience

This guide is intended for experienced computer users who have the responsibility of helping to set up and maintain a fully functioning Java Composite Application Platform Suite system. This person must also understand any operating systems on which the Java Composite Application Platform Suite will be installed (Windows and UNIX), and must be thoroughly familiar with Windows-style GUI operations.

1.5.3 Text Conventions

The following conventions are observed throughout this document.

Table 1 Text Conventions

Text Convention	Used For	Examples
Bold	Names of buttons, files, icons, parameters, variables, methods, menus, and objects	▪ Click **OK**. ▪ On the **File** menu, click **Exit**. ▪ Select the **eGate.sar** file.
`Monospaced`	Command line arguments, code samples; variables are shown in ***bold italic***	`java -jar ***filename***.jar`
Blue bold	Hypertext links within document	See **Text Conventions** on page 8
Blue underlined	Hypertext links for Web addresses (URLs) or email addresses	http://www.sun.com

1.6 Sun Microsystems, Inc. Web Site

The Sun Microsystems web site is your best source for up-to-the-minute product news and technical support information. The site's URL is:

http://www.sun.com

1.7 Documentation Feedback

We appreciate your feedback. Please send any comments or suggestions regarding this document to:

CAPS_docsfeedback@sun.com

Chapter 2

Installing the SWIFT OTD Library

This chapter lists supported operating systems and system requirements, and explains how to install the SWIFT OTD Library.

What's in This Chapter

Note: *See the Sun Java Composite Application Platform Suite Installation Guide for complete eGate installation instructions.*

2.1 SWIFT OTD Library System Requirements

The SWIFT OTD Library Readme contains the latest information on:

- Supported Operating Systems
- System Requirements
- External System Requirements

The SWIFT OTD Library Readme is uploaded with the eWay's documentation file (SwiftOTDLibraryDocs.sar) and can be accessed from the Documentation tab of the Sun Java Composite Application Platform Suite Installer. Refer to the SWIFT OTD Library Readme for the latest requirements before installing the SWIFT OTD Library.

2.2 Installing the SWIFT OTD Libraries

The Sun Java Composite Application Platform Suite Installer, a web-based application, is used to select and upload eWays and add-on files during the installation process. The following section describes how to install the SWIFT OTD Libraries.

Note: *When the Repository is running on a UNIX operating system, the eWays are loaded from the Suite Installer, running on a Windows platform, connected to the Repository server using Internet Explorer.*

2.2.1 Installing the eWay on a JavaCAPS Supported System

Follow the directions for installing the Sun Java Composite Application Platform Suite in the *Sun Java Composite Application Platform Suite Installation Guide. After you have installed eGate™ or eInsight™, do the following:*

1. From the Sun Java Composite Application Platform Suite Installer's **Select Sun Java Composite Application Platform Suite Products to Install** table (Administration tab), expand the **eWay** and **OTD** options.
2. Select the products you require for your Sun Java Composite Application Platform Suite and include the following:
   - **FileeWay** (the File eWay is used by most sample Projects)
   - **SwiftOTDLibrary:** Common file used by all of the SWIFT OTD Libraries. Always install this file. Each of the OTD Libraries is dependent on this file.
   - **SwiftOTDLibrary2006**: Installs the 2006 SWIFT OTD Library.
   - **SwiftOTDLibrary2005**: Installs the 2005 SWIFT OTD Library.
   - **SwiftOTDLibrary2003**: Install the 2003 SWIFT OTD Library.
   - **SwiftOTDLibrary2002**: Install the 2002 SWIFT OTD Library.
   - **SwiftOTDLibrary2001**: Install the 2001 SWIFT OTD Library.
3. To upload the SWIFT OTD Library User's Guide, Help file, Javadoc, Readme, and sample Projects, select the following:
   - **SwiftOTDLibraryDocs**
4. From the **Selecting Files to Install** box, locate and select your first product's SAR file. Once you have selected the SAR file, click **Next**. Your next selected product appears. Follow this procedure for each of your selected products. The **Installation Status** window appears and installation begins after the last SAR file has been selected.
5. Once your product's installation is finished, continue installing the Sun Java Composite Application Platform Suite as instructed in the *Sun Java Composite Application Platform Suite Installation Guide.*

Note: *The MT Funds and Validation features can only be used with the 2003 and 2005 OTD libraries (see* **"Using Message Validation Features" on page 30***).*

Adding a Product to an Existing Suite Installation

If you are adding a library to an existing Sun Java Composite Application Platform Suite installation, do the following:

1. Complete steps 1 through 4 above.
2. Open the Enterprise Designer and select **Update Center** from the Tools menu. The Update Center Wizard appears.
3. For Step 1 of the wizard, simply click **Next**.

4 For Step 2 of the wizard, click the **Add All** button to move all installable files to the **Include in Install** field, then click **Next**.

5 For Step 3 of the wizard, wait for the modules to download, then click **Next**.

6 The wizard's Step 4 window displays the installed modules. Review the installed modules and click **Finish.**

7 When prompted, restart the IDE (Integrated Development Environment) to complete the installation.

After Installation

Once you install the eWay, it must then be incorporated into a Project before it can perform its intended functions. See the *eGate Integrator User's Guide* for more information on incorporating the eWay into an eGate Project.

2.3 Increasing the Enterprise Designer Heap Size

Because of the size of the SWIFT OTD Library, the Enterprise Designer **Heap Size** may need to be increased before using the library. If the heap size is not increased, you may receive an **OutOfMemoryError** message, when you try to activate a SWIFT OTD Project.

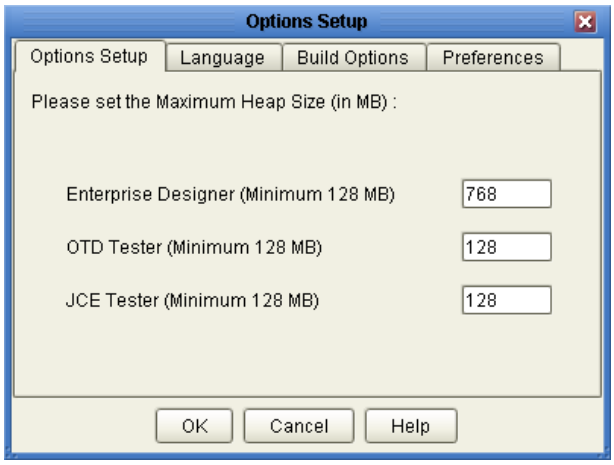
If you receive this message during Project activation, you must increase the heap size before you can activate any SWIFT OTD Projects. This action resets the Enterprise Designer's maximum memory size.

Increasing the heap size from the Enterprise Designer

1 From the Enterprise Designer's **Tools** menu select **Options**. The **Options Setup** dialog box appears (see **Figure 1 on page 12**).

2 Increase the configured heap size for the Enterprise Designer to 768 MB as displayed in Figure 1. Click **OK**.

Figure 1 Options Setup: Heap Size



3 Close and restart the Enterprise Designer to allow your changes to take effect.

Increasing the heap size from the heapSize.bat file

If an **OutOfMemoryError** message occurs while you are trying to open the Enterprise Designer, the heap size settings may be changed before starting the Enterprise Designer. You can increase the heap size values found in the **heapSize.bat** file.

1 Go to the following directory and file:

<*eGate Install Directory***>/edesigner/bin/heapSize.bat**

2 From the BAT file code, change the following heap size value to read as follows:

- **set eDesigner_heap_size=768**

3 Save the file and start the Enterprise Designer.

Chapter 3

Using the SWIFT OTD Library

This chapter explains, lists, and provides a cross-reference for, the SWIFT OTD Library message types.

What's in This Chapter

3.1 SWIFT Message Type OTDs

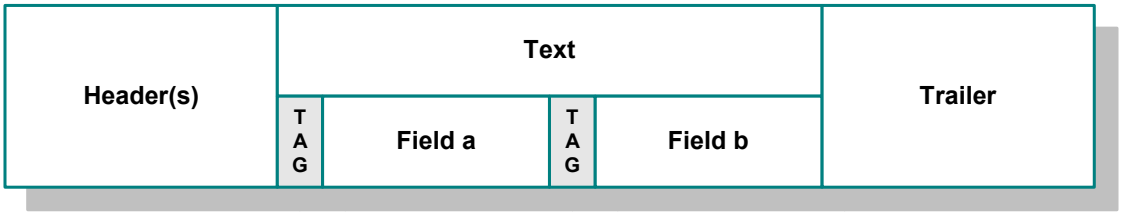
This section provides a general overview of the SWIFT message types and their OTDs.

3.1.1 SWIFT Message Structure

Messages used by the SWIFT network have a maximum of five components (see Figure 2), as follows:

- Basic header block
- Application header block
- User header block (optional)
- Text block
- Trailer block

Figure 2 SWIFT Message Structure



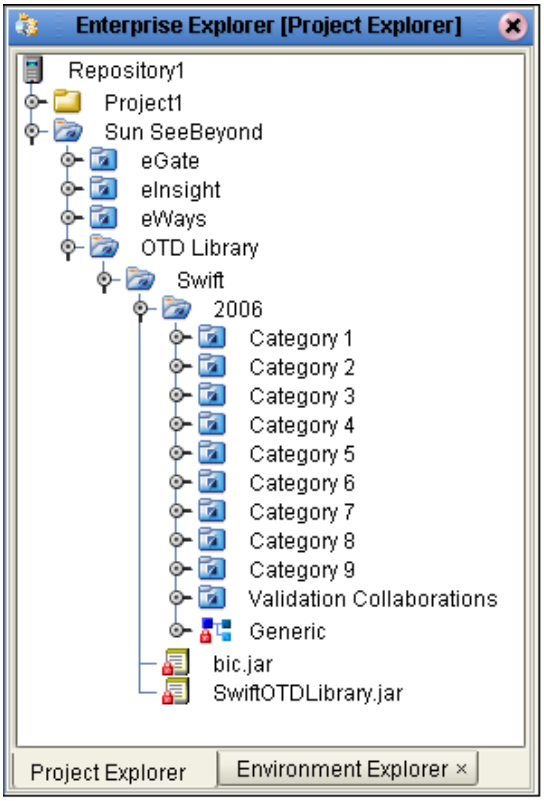
Each field component in the text block is preceded by a field tag. There are no field tags in the header and trailer blocks. The one exception to this format is **MT 121, EDIFACT FINPAY**, which has a single text field with no field tag identifier.

Information about a field common to all message types in which that field is used is found in the *Standards - General Field Definitions* volume of the *SWIFT User Handbook*. Information about a field specific to its use with a particular message type is found in the field specifications section of the *Standards* volume of the *SWIFT User Handbook* for that message type.

3.1.2 OTD and Collaboration Locations in Enterprise Designer

You can find the SWIFT OTDs, including the MT Fund OTDs and Generic OTD, in the Enterprise Designer's Project Explorer tree, as shown in Figure 3. This figure also shows the location of the Java-based Validation Collaboration Definitions.

Figure 3 SWIFT OTD Locations



The **Validation Collaborations** directory contains the Collaboration Definitions that enable the validation features of the SWIFT OTD Library. See **Chapter 4** for details.

The **Category 5** directory contains the SWIFT MT Funds message template OTDs in the library. See **Chapter 5** for details.

The **bic.jar** file allows you to update the BICDirService feature. See **Chapter 4** for details.

3.2 SWIFT Message Type Reference

SWIFT groups message types into the following categories:

Customer Payments and Cheques

- See **"Category 1 Messages" on page 16**.

Financial Institution Transfers

- See **"Category 2 Messages" on page 18**.

Treasury Markets: Foreign Exchange and Derivatives

- See **"Category 3 Messages" on page 19**.

Collections and Cash Letters

- See **"Category 4 Messages" on page 20**.

Securities Markets

- See **"Category 5 Messages" on page 21**.

Treasury Markets: Precious Metals and Syndications

- See **"Category 6 Messages" on page 24**.

Documentary Credits and Guarantees

- See **"Category 7 Messages" on page 25**.

Travellers Cheques

- See **"Category 8 Messages" on page 26**.

Cash Management and Customer Status

- See **"Category 9 Messages" on page 27**.

The remainder of this chapter explains these categories and the message types within each category.

The 2001, 2002, 2003, 2005, and 2006 versions of the SWIFT OTD Library are provided with the SWIFT OTD Library. You must install each version via a separate **.sar** file (see **Chapter 2**). However, the MT Funds, Validation, and BICDirService features can only be used with 2003, 2005 and 2006 OTDs (see **Chapter 4**).

This chapter explains only the 2005/2006 SWIFT message types. For explanations of the 2001, 2002, and 2003 versions, see the SWIFT Web site at **http://www.swift.com**.

3.2.1 Category 1 Messages

Table 2 lists the Category 1 message types, Customer Payments and Cheques, with the type designation MT 1xx.

Table 2 Customer Payments and Cheques

SWIFT Message Type	Description
MT 101	Request for Transfer
MT 102	Multiple Customer Credit Transfer
MT 102+(STP)	Multiple Customer Credit Transfer (STP)
MT 103	Single Customer Credit Transfer
MT 103+ (REMIT)	Single Customer Credit Transfer (REMIT)
MT 103+ (STP)	Single Customer Credit Transfer (STP)
MT 104	Direct Debit and Request for Debit Transfer Message (STP)
MT 105	EDIFACT Envelope
MT 106	EDIFACT Envelope
MT 107	General Direct Debit Message
MT 110	Advice of Cheque(s)
MT 111	Request for Stop Payment of a Cheque
MT 112	Status of a Request for Stop Payment of a Cheque
MT 121	Multiple Interbank Funds Transfer (EDIFACT FINPAY Message)
MT 190	Advice of Charges, Interest and Other Adjustments
MT 191	Request for Payment of Charges, Interest and Other Expenses
MT 192	Request for Cancellation
MT 195	Queries
MT 196	Answers
MT 198	Proprietary Message
MT 199	Free Format Message

3.2.2 Category 2 Messages

Table 3 lists the Category 2 message types, Financial Institution Transfers, with the type designation MT 2xx.

Table 3 Financial Institution Transfers

SWIFT Message Type	Description
MT 200	Financial Institution Transfer for its Own Account
MT 201	Multiple Financial Institution Transfer for its Own Account
MT 202	General Financial Institution Transfer
MT 203	Multiple General Financial Institution Transfer
MT 204	Financial Markets Direct Debit Message
MT 205	Financial Institution Transfer Execution
MT 206	Cheque Truncation Message
MT 207	Request for Financial Institution Transfer
MT 210	Notice to Receive
MT 256	Advice of Non-Payment of Cheques
MT 290	Advice of Charges, Interest and Other Adjustments
MT 291	Request for Payment of Charges, Interest and Other Expenses
MT 292	Request for Cancellation
MT 295	Queries
MT 296	Answers
MT 298	Proprietary Message
MT 299	Free Format Message

3.2.3 Category 3 Messages

Table 4 lists the Category 3 message types, Treasury Markets, Foreign Exchange, Money Markets, and Derivatives, with the type designation MT 3xx.

Table 4 Treasury Markets, Foreign Exchange, Money Markets, and Derivatives

SWIFT Message Type	Description
MT 300	Foreign Exchange Confirmation
MT 303	Forex/Currency Option Allocation Instruction
MT 304	Advice/Instruction of a Third Party Deal
MT 305	Foreign Currency Option Confirmation
MT 306	Foreign Currency Option Confirmation
MT 307	Advice/Instruction of a Third Party FX Deal
MT 308	Instruction for Gross/Net Settlement of Third Party FX Deals
MT 320	Fixed Loan/Deposit Confirmation
MT 321	Instruction to Settle a Third Party Loan/Deposit
MT 330	Call/Notice Loan/Deposit Confirmation
MT 340	Forward Rate Agreement Confirmation
MT 341	Forward Rate Agreement Settlement Confirmation
MT 350	Advice of Loan/Deposit Interest Payment
MT 360	Single Currency Interest Rate Derivative Confirmation
MT 361	Cross Currency Interest Rate Swap Confirmation
MT 362	Interest Rate Reset/Advice of Payment
MT 364	Single Currency Interest Rate Derivative Termination/Recouponing Confirmation
MT 365	Single Currency Interest Rate Swap Termination/Recouponing Confirmation
MT 380	Foreign Exchange Order
MT 381	Foreign Exchange Order Confirmation
MT 390	Advice of Charges, Interest and Other Adjustments
MT 391	Request for Payment of Charges, Interest and Other Expenses
MT 392	Request for Cancellation
MT 395	Queries
MT 396	Answers
MT 398	Proprietary Message
MT 399	Free Format Message

3.2.4 Category 4 Messages

Table 5 lists the Category 4 message types, Collections and Cash Letters, with the type designation MT 4xx.

Table 5 Collections and Cash Letters

SWIFT Message Type	Description
MT 400	Advice of Payment
MT 405	Clean Collection
MT 410	Acknowledgment
MT 412	Advice of Acceptance
MT 416	Advice of Non-Payment/Non-Acceptance
MT 420	Tracer
MT 422	Advice of Fate and Request for Instructions
MT 430	Amendment of Instructions
MT 450	Cash Letter Credit Advice
MT 455	Cash Letter Credit Adjustment Advice
MT 456	Advice of Dishonor
MT 490	Advice of Charges, Interest and Other Adjustments
MT 491	Request for Payment of Charges, Interest and Other Expenses
MT 492	Request for Cancellation
MT 495	Queries
MT 496	Answers
MT 498	Proprietary Message
MT 499	Free Format Message

3.2.5 Category 5 Messages

Table 6 lists the Category 5 message types, Securities Markets, with the type designation MT 5xx.

Table 6 Securities Markets

SWIFT Message Type	Description
MT 500	Instruction to Register
MT 501	Confirmation of Registration or Modification
MT 502	Order to Buy or Sell
MT 502 (FUNDS)	Order to Buy or Sell (FUNDS)
MT 503	Collateral Claim
MT 504	Collateral Proposal
MT 505	Collateral Substitution
MT 506	Collateral and Exposure Statement
MT 507	Collateral Status and Processing Advice
MT 508	Intra-Position Advice
MT 509	Trade Status Message
MT 509 (FUNDS)	Trade Status Message (FUNDS)
MT 510	Registration Status and Processing Advice
MT 513	Client Advice of Execution
MT 514	Trade Allocation Instruction
MT 515	Client Confirmation of Purchase or Sale
MT 515 (FUNDS)	Client Confirmation of Purchase or Sale (FUNDS)
MT 516	Securities Loan Confirmation
MT 517	Trade Confirmation Affirmation
MT 518	Market-Side Securities Trade Confirmation
MT 519	Modification of Client Details
MT 524	Intra-Position Instruction
MT 526	General Securities Lending/Borrowing Message
MT 527	Triparty Collateral Instruction
MT 528	ETC Client-Side Settlement Instruction
MT 529	ETC Market-Side Settlement Instruction
MT 535	Statement of Holdings
MT 535 (FUNDS)	Statement of Holdings (FUNDS)
MT 536	Statement of Transactions
MT 537	Statement of Pending Transactions
MT 538	Statement of Intra-Position Advice

Table 6 Securities Markets (Continued)

SWIFT Message Type	Description
MT 540	Receive Free
MT 541	Receive Against Payment
MT 542	Deliver Free
MT 543	Deliver Against Payment
MT 544	Receive Free Confirmation
MT 545	Receive Against Payment Confirmation
MT 546	Deliver Free Confirmation
MT 547	Deliver Against Payment Confirmation
MT 548	Settlement Status and Processing Advice
MT 549	Request for Statement/Status Advice
mt 558	Triparty Collateral Status and Processing Advice
MT 559	Paying Agent's Claim
MT 564	Corporate Action Notification
MT 565	Corporate Action Instruction
MT 566	Corporate Action Confirmation
MT 567	Corporate Action Status and Processing Advice
MT 568	Corporate Action Narrative
MT 569	Triparty Collateral and Exposure Statement
MT 574 (IRSLST)	IRS 1441 NRA (Beneficial Owners' List)
MT 574 (W8BENO)	IRS 1441 NRA (Beneficial Owner Withholding Statement)
MT 575	Report of Combined Activity
MT 576	Statement of Open Orders
MT 577	Statement of Numbers
MT 578	Statement of Allegement
MT 579	Certificate Numbers
MT 581	Collateral Adjustment Message
MT 582	Reimbursement Claim or Advice
MT 584	Statement of ETC Pending Trades
MT 586	Statement of Settlement Allegements
MT 587	Depositary Receipt Instruction
MT 588	Depositary Receipt Confirmation
MT 589	Depositary Receipt Status and Processing Advice
MT 590	Advice of Charges, Interest and Other Adjustments
MT 591	Request for Payment of Charges, Interest and Other Expenses
MT 592	Request for Cancellation

Table 6 Securities Markets (Continued)

SWIFT Message Type	Description
MT 595	Queries
MT 596	Answers
MT 598	Proprietary Message
MT 599	Free Format Message

3.2.6 Category 6 Messages

Table 7 lists the Category 6 message types, Treasury Markets, Precious Metals, with the type designation MT 6xx.

Table 7 Treasury Markets, Precious Metals

SWIFT Message Type	Description
MT 600	Precious Metal Trade Confirmation
MT 601	Precious Metal Option Confirmation
MT 604	Precious Metal Transfer/Delivery Order
MT 605	Precious Metal Notice to Receive
MT 606	Precious Metal Debit Advice
MT 607	Precious Metal Credit Advice
MT 608	Statement of a Metal Account
MT 609	Statement of Metal Contracts
MT 643	Notice of Drawdown/Renewal
MT 644	Advice of Rate and Amount Fixing
MT 645	Notice of Fee Due
MT 646	Payment of Principal and/or Interest
MT 649	General Syndicated Facility Message
MT 690	Advice of Charges, Interest and Other Adjustments
MT 691	Request for Payment of Charges, Interest and Other Expenses
MT 692	Request for Cancellation
MT 695	Queries
MT 696	Answers
MT 698	Proprietary Message
MT 699	Free Format Message

3.2.7 Category 7 Messages

Table 8 lists the Category 7 message types, Treasury Markets, Syndication, with the type designation MT 7xx.

Table 8 Treasury Markets, Syndication

SWIFT Message Type	Description
MT 700	Issue of a Documentary Credit
MT 701	Issue of a Documentary Credit
MT 705	Pre-Advice of a Documentary Credit
MT 707	Amendment to a Documentary Credit
MT 710	Advice of a Third Bank's Documentary Credit
MT 711	Advice of a Third Bank's Documentary Credit
MT 720	Transfer of a Documentary Credit
MT 721	Transfer of a Documentary Credit
MT 730	Acknowledgment
MT 732	Advice of Discharge
MT 734	Advice of Refusal
MT 740	Authorization to Reimburse
MT 742	Reimbursement Claim
MT 747	Amendment to an Authorization to Reimburse
MT 750	Advice of Discrepancy
MT 752	Authorization to Pay, Accept or Negotiate
MT 754	Advice of Payment/Acceptance/Negotiation
MT 756	Advice of Reimbursement or Payment
MT 760	Guarantee
MT 767	Guarantee Amendment
MT 768	Acknowledgment of a Guarantee Message
MT 769	Advice of Reduction or Release
MT 790	Advice of Charges, Interest and Other Adjustments
MT 791	Request for Payment of Charges, Interest and Other Expenses
MT 792	Request for Cancellation
MT 795	Queries
MT 796	Answers
MT 798	Proprietary Message
MT 799	Free Format Message

3.2.8 Category 8 Messages

Table 9 lists the Category 8 message types, Travellers Cheques, with the type designation MT 8xx.

Table 9 Travellers Cheques

SWIFT Message Type	Description
MT 800	T/C Sales and Settlement Advice [Single]
MT 801	T/C Multiple Sales Advice
MT 802	T/C Settlement Advice
MT 810	T/C Refund Request
MT 812	T/C Refund Authorization
MT 813	T/C Refund Confirmation
MT 820	Request for T/C Stock
MT 821	T/C Inventory Addition
MT 822	Trust Receipt Acknowledgment
MT 823	T/C Inventory Transfer
MT 824	T/C Inventory Destruction/Cancellation Notice
MT 890	Advice of Charges, Interest and Other Adjustments
MT 891	Request for Payment of Charges, Interest and Other Expenses
MT 892	Request for Cancellation
MT 895	Queries
MT 896	Answers
MT 898	Proprietary Message
MT 899	Free Format Message

3.2.9 Category 9 Messages

Table 10 lists the Category 9 message types, Cash Management and Customer Status, with the type designation MT 9xx.

Table 10 Cash Management and Customer Status

SWIFT Message Type	Description
MT 900	Confirmation of Debit
MT 910	Confirmation of Credit
MT 920	Request Message
MT 935	Rate Change Advice
MT 940	Customer Statement Message
MT 941	Balance Report
MT 942	Interim Transaction Report
MT 950	Statement Message
MT 970	Netting Statement
MT 971	Netting Balance Report
MT 972	Netting Interim Statement
MT 973	Netting Request Message
MT 985	Status Inquiry
MT 986	Status Report
MT 990	Advice of Charges, Interest and Other Adjustments
MT 991	Request for Payment of Charges, Interest and Other Expenses
MT 992	Request for Cancellation
MT 995	Queries
MT 996	Answers
MT 998	Proprietary Message
MT 999	Free Format Message

3.2.10 Validation Collaborations

Table 11 lists the Validation Collaboration. Validation Collaboration Definitions are provided for many key SWIFT message types.

Table 11 Common Group Messages

Validation Collaborations	Validates OTD/Message Type
ValidateMt_101	MT_101 - Request for Transfer
ValidateMt_103_STP	MT_103_STP - Single Customer Credit Transfer
ValidateMt_202	MT_202 - General Financial Institution Transfer
ValidateMt_300	MT_300 - Foreign Exchange Confirmation
ValidateMt_502_FUNDS	MT_502_FUNDS - Order to Buy or Sell (FUNDS)
ValidateMt_515_FUNDS	MT_515_FUNDS - Client Confirmation of Purchase or Sale (FUNDS)
ValidateMt_535	MT_535 - Statement of Holdings
ValidateMt_536	MT_536 - Statement of Transactions
ValidateMt_537	MT_537 - Statement of Pending Transactions
ValidateMt_540	MT_540 - Receive Free
ValidateMt_541	MT_541 - Receive Against Payment
ValidateMt_542	MT_542 - Deliver Free
ValidateMt_543	MT_543 - Deliver Against Payment
ValidateMt_544	MT_544 - Receive Free Confirmation
ValidateMt_545	MT_545 - Receive Against Payment Confirmation
ValidateMt_546	MT_546 - Deliver Free Confirmation
ValidateMt_547	MT_547 - Deliver Against Payment Confirmation
ValidateMt_548	MT_548 - Statement Status and Processing Advice
ValidateMt_900	MT_900 - Confirmation of Debit
ValidateMt_910	MT_910 - Confirmation of Credit
ValidateMt_940	MT_940 - Customer Statement Message
ValidateMt_950	MT_950 - Statement Message

For information about the Validation Collaborations, see **"Using Message Validation Features" on page 30**

3.2.11 SWIFT Generic OTD

The SWIFT OTD Libraries for 2005 and 2006 include a Generic OTD used to route SWIFT messages. The Generic OTD can be used to parse any valid SWIFT message, allowing you to unmarshal and read the message headers to determine the message type, while leaving the message data as a String. Messages can then be routed to the appropriate OTD for that message type.

3.2.12 SWIFT OTD Library JAR Files

The SWIFT OTD Library include two JAR files, **bic.jar**, and **SwiftOTDLibrary.jar**, that are visible from the Project Explorer's Swift directory. These JAR files provide the classes and methods that support the Validation Collaborations.

Chapter 4

Using Message Validation Features

This chapter explains how to use specialized message validation features and Projects available with the SWIFT OTD Library.

What's in This Chapter

4.1 Library Validation Features: Overview

This section generally explains the validation features available with the SWIFT OTD Library and how they operate.

4.1.1 Basic Validation Features

The SWIFT OTD Library accomplishes validation operations via Java-based Collaboration Definitions packaged with the library. These Collaboration Definitions have the following validation features provided to enhance their use:

- **Message Format Validation Rules (MFVRs)**: Set of functions that accurately test the semantic validity of a given subset of the SWIFT messages.
- **Market Practice Rules (MPRs)**: Set of functions that accurately test the semantic and syntactical validity of a particular subset of the SWIFT messages called the 500 series.
- **BICDirService (Bank Identifier Code Directory Service) Lookup**: A set of methods that provide search and validation functionality for SWIFT's BIC codes and ISO currency and country codes. The information used to look up and validate is provided by SWIFT.

These validation features share the following use characteristics:

- Each available method and function is fully incorporated into and used by the appropriate SWIFT message OTD.
- You can modify the validation rules for your system if desired. Customize the Collaboration's validation rules by checking the Collaboration out (from Version Control) and modify the Validation Collaboration code. The sample implementation and instructions are provided in the Validation Collaboration as Java comments.
- Validation methods and functions have no dependencies outside SWIFT data files and the individual OTD.

Installing the OTD library allows eGate and any eWay you use with the library to provide full support for these features. The rest of this chapter provides a summary of how these features operate with the SWIFT OTD Library.

Validation Components

In addition to components described under **"Basic Validation Features" on page 30**, the SWIFT OTD Library also contains the following basic components:

- **SWIFT OTDs (2001, 2002, 2003, 2005, and 2006)**: OTDs in the SWIFT OTD Library that represent standard SWIFT message types. See **Chapter 3** for details. The validation features are only available with the 2003, 2005, and 2006 OTD libraries.
- **MT Funds OTDs**: Specialized OTDs that allow you to automate the specialized funds operations. This category contains FIN-based OTDs.
- **Validation Collaboration Definitions**: Validation eGate components provided for each SWIFT message type. See **"Validation Collaboration Definitions" on page 31** for details.
- **Sample Projects**: Sample Projects have been provided as examples of validation implementation. See **"SWIFT OTD Sample Projects" on page 40** for details.

Validation Methods

The SWIFT OTD Library now provides three additional OTD API methods, **validate()**, **validateMFVR()**, and **validateMRP()**, that can be invoked by a Collaboration to validate SWIFT 2003, 2005 and 2006 OTDs directly in the Collaboration. (see **"In Collaboration Validation Methods" on page 37**). This is an alternative to using the Validation Collaboration Definitions.

Validation Collaboration Definitions

Validation Collaboration Definitions are provided for many key SWIFT message types. These Collaboration Definitions, when combined with eGate Services, become Java-based Collaborations that verify the syntax of the SWIFT messages.

This verification is done by parsing the data into a structure that conforms to the SWIFT standard specifications. The validation functions use these Collaborations to access specific data that is then verified according the algorithms of the MFVR or MPR specifications.

For lists of these Collaboration Definitions, see **"Message Validation Rules" on page 33**.

Validation Operation

You can combine the library's validation features in any way desired, to meet your specific needs. The SWIFT OTD Library packages a prebuilt implementation that takes SWIFT messages from a JMS Queue or Topic and validates them individually, then writes the results to a specified JMS Queue or Topic. One set contains valid messages, and the other contains the invalid ones, along with messages indicating the errors generated.

Validation Project examples

The validation Collaboration Definitions are part of the OTD Library and packaged with validation Project examples you can import into eGate.

Basic validation steps

Each validation Collaboration Definition has only the applicable tests for a specific OTD/message type, but they all operate according to the same general format, as follows:

- The Service first tests a message to make sure it is syntactically correct, by parsing it into the OTD.
- If the message fails, the message and its parser error are sent to an error Queue. If the message is valid, all applicable MFVR or MPR functions are applied to the message.
- Any and all errors produced from these tests are accumulated, and the combined errors, as well as the message, are written to an error Queue for later processing. As long as no error is fatal, all applicable tests are applied.
- Again any and all errors produced from these tests are accumulated, and the combined errors and message are written to the error Queue for later processing.
- If no errors are found in a message, it is sent to a Queue for valid messages.

For an explanation of using these Collaboration Definitions and the validation Project examples, see **"SWIFT OTD Sample Projects" on page 40**.

4.1.2 Library Methods

The SWIFT OTD Library provides a set of run-time methods that allow you to manipulate OTD data in a variety of ways. The following methods are the most frequently used with validation operations:

- **set()**: Allows you to set data on a parent node using a byte array or a string as a parameter.
- **value()**: Lets you get the string value of data in a node at any tree level.
- **getLastSuccessInfo()**: Returns a string that represents information about the last node in the tree that was successfully parsed.

- **command()**: Allows you to pass flags as parameters, which set levels that determine the quantity of debug information you receive (see **"Setting the Debug Level" on page 57** for details).
- **marshalToString()** and **unmarshalFromString()**: Returns string data from or accepts string data to a desired node.

In addition, the library has methods that allow you to perform basic but necessary operations with the OTDs. See Table 12.

Table 12 Basic OTD Methods

Method	Description
add()	Adds a repetition to a given child node.
append()	Adds given data at the end of existing data.
copy()	Copies given data at a specified point.
count()	Gives the count of node repetitions.
delete()	Erases data at a specified point.
get()	Retrieves data from a node.
has()	Checks whether a specified child node is present.
insert()	Inserts given data at a specified point.
length()	Returns the length of data contained in an object.
marshal()	Serializes internal data into an output stream.
remove()	Removes a given child node repetition.
reset()	Clears out any data held by an OTD.
size()	Returns the current number of repetitions for the current child node.
unmarshal()	Parses given input data into an internal data tree.

To help in your use of the SWIFT OTD Library and its features, the library includes a **Javadoc**. You can see this document for complete details on all of these methods. See **Chapter 6** for more information on this document and how to use it.

4.2 Message Validation Rules

Validation Collaborations are provided for the following SWIFT Message types and their corresponding OTDs in the library:

MFVR

- MT 101: Request for Transfer
- MT 103+ (STP): Single Customer Credit Transfer
- MT 202: General Financial Institution Transfer
- MT 300: Foreign Exchange Confirmation

- MT 502 (FUNDS): Order to Buy or Sell
- MT 515 (FUNDS): Client Confirmation of Purchase or Sale
- MT 535: Statement of Holdings *
- MT 536: Statement of Transactions *
- MT 537: Statement of Pending Transactions *
- MT 540: Receive Free *
- MT 541: Receive Against Payment Instruction *
- MT 543: Deliver Against Payment Instruction *
- MT 545: Receive Against Payment Confirmation *
- MT 547: Deliver Against Payment Confirmation *
- MT 548: Settlement Status and Processing Advice *
- MT 900: Confirmation of Debit
- MT 910: Confirmation of Credit
- MT 940: Customer Statement Message
- MT 950: Statement Message

  * Validation Collaborations for these Messages also contain the necessary MPR rules. In addition, the following messages support MPR, but not MFVR:

  - MT 542: Deliver Free
  - MT 544: Receive Free Confirmation
  - MT 546: Deliver Free Confirmation

  The Validation Collaborations contain MFVRs and MPRs wherever applicable.

4.2.1 Message Format Validation Rules (MFVR)

The MFVR support for the SWIFT OTD Library is a set of functions collectively known as the message format validation rules methods. These functions accurately test the semantic validity of a given subset of the SWIFT messages. Validation is performed according to standards provided in SWIFT's publication, the *Message Format Validation Rules Guide* (current version).

There is one validation method for each MFVR message type and its corresponding OTD. Each method is called on a particular OTD and is used to validate the data of a given instance of that message type. Because business practices vary greatly between organizations, these functions can be modified as needed.

For examples of how the MFVR validation process works, you can import the sample validation Projects. For details, see **"SWIFT OTD Sample Projects" on page 40**.

SWIFT's MFVR validation rules are known as semantic verification rules (SVRs) or semantic rules, as opposed to the syntactic rules, which verify the syntax of the fields only. Syntactic verification is built into each OTD.

SWIFT defines a total of 299 SVRs that are validated by the FIN network engine. SWIFT Alliance Access or IBM's Merva products do not implement these rules, mainly because there is no functional model, and the implementation work is mostly manual. Each message type has to be validated against a subset of these rules.

In addition this set of 299 SVRs, SWIFT has defined a new series of rules to help enable straight-through processing (STP) in the securities industry. The OTD methods that validate for MFVR compliance also validate for compliance with STP rules.

4.2.2 MFVR Validation Methods

The MFVR methods adhere to SWIFT's current *Message Format Validation Rules Guide*, including those in any updates section in the back of the manual. The methods implement all of the "special functions" as defined in the guide, which are required by the validation rules.

The SVR methods also implement the semantic validation "rules" or functionality used in the validation functions, as defined by the current *Message Format Validation Rules Guide*.

Using this semantic validation, eGate can verify the contents of each message before it is sent into the FIN network, saving time and usage fees.

4.2.3 MFVR Errors

These errors result from the application of the Semantic Validation Rules. Multiple errors are possible, and they are given in the order in which they occurred and with the sequences, fields, or subfields used to determine them.

For example, an MFVR failure on a 535 Collaboration OTD appears as follows:

```
MFVR MT535 Error
SVR Rule 103 - Error code: D031001 = Since field :94a:: is present
in Sequence B, then   fields :93B::AGGR and :94a::SAFE are not
allowed in any occurrence of Subsequence B1a.mt_535.Mt_535.Data[1].
SubSafekeepingAccount mt_535.Mt_535.Data[1].SubSafekeepingAccount[0].
SubSeqB1[0].SubSeqB1a.Balance

SVR Rule 104 - Error code: D04-
1001 = Since field :93B::AGGR is present in Subsequence B1a,then
:field 94a::SAFE must be present in the same Subsequence B1a.
mt_535.Mt_535.Data[1].SubSafekeepingAccount[0].SubSeqB1[0].
SubSeqB1a.Balance
```

For more information on error messages, see **"Error Message Information" on page 56**.

4.2.4 Market Practice Rules (MPR)

The MPR support for the SWIFT OTD Library is a set of functions collectively known as the MPR methods. These methods accurately test the semantic and syntactical validity of the SWIFT messages' 500 series (according to SWIFT's current publication of the ISO 15022 *Market Practice Rules – Description and Pseudo Code, v1.1*).

The validations done by SWIFT are not sufficient for certain scenarios. The MPRs represent *best practices* to avoid creating messages that are invalid at the semantic level, as defined by the Securities Market Practice Group. This group is an organization of SWIFT members seeking to create best practices to enable straight-through processing, that is, the automatic handling of requests without human intervention.

An MPR-invalid message is *not* invalid on the network. This type of invalidation only means that the subject message does not adhere to these best practices for specifying information. Also, MPR-invalid messages may not be assimilated into the receiving system because certain information is not supplied and/or may not be in a machine-usable form. Members of the Securities Market Practice Group or anyone following its practices would reject messages that failed to meet these standards.

For an example of how the MPR validation process works, you can import the sample validation Projects. For details, see **"SWIFT OTD Sample Projects" on page 40**.

4.2.5 MPR Validation Methods

The SWIFT OTD Library's MPR methods and their validations are optional and can be taken out. However, these validations can help you to achieve STP with your trading partners and reduce excess labor and processing time, because you have fewer messages rejected.

The following MPRs are created as methods:

- S101, Specify Trade Date: Abbreviated as **S101-SpecifyTradeDate**.
- S103, Specify the Identification of the Financial Instruments with a valid ISIN and valid country code: Abbreviated as **S103-SpecifyFinanicalInstrumentWithISINAndCountryCode**.
- S106, Specify the delivering or receiving agent with a BIC: Abbreviated as **S106-SpecifyDeliveringReceivingAgentWithBIC**.
- S108, Specify the client of the delivering agent (except if place of settlement is US or DK): Abbreviated as **S108-SpecifyClientOfDeliveringAgent**.
- S109, Specify the client of the receiving agent (except if place of settlement is US or DK): Abbreviated as **S109-SpecifyClientOfReceivingAgent**.
- S111, Specify place of settlement with a BIC: Abbreviated as **S111-SpecifyPlaceOfSettlementWithBIC**.
- S114, Do not specify any Financial Instrument Attributes if the ISIN is already specified: Abbreviated as **S114-DoNotSpecifyAnyFinancialInstrumentAttributesWithISIN**.
- S117, Specify related reference: Abbreviated as **S117-SpecifyRelatedReference**.
- S120, Specify correct Safekeeping Account: Abbreviated as **S120-SpecifySafekeepingAccount**.
- S124, Specify DEAG's safekeeping Account at the place of settlement: Abbreviated as **S124-SpecifyDEAGSafekeepingAccountAtSettlementPlace**.
- S128, Specify REAG safekeeping Account at the place of settlement: Abbreviated as **S128-SpecifyREAGSafekeepingAccountSettlementPlace**.

- S132: When the place of settlement is Italy, specify the deal price: Abbreviated as **S132-WhenSettlementInItalySpecifyDealPrice**.
- S134, Specify the safekeeping account of the beneficiary agent with Receiving agent: Abbreviated as **S134-SpecifySafekeepingAccountOfBeneficiaryAgentWithReceivingAgent**.

4.2.6 MPR Errors

MPR errors are the result of the application of specific MPRs. As with the MFVRs, these rules are cumulative and are accompanied by the paths to the data used in the rule.

The following examples show possible error messages resulting from the MPR rules for a 541 Collaboration OTD:

```
MPR S101 - Error code: 1002 = The receive against payment message
(MT-541) should specify trade date(field :98A).
    mt_541.Mt_541.Data.TradeDetails
    mt_541.Mt_541.Data.TradeDetails[0].DateTime

MPR S108 - Error code: 1005 = The receive against payment message
(MT-541) should specify the client of the delivering agent with Option
P,not with Option Q, if the place of settlement is not US or DK.
    mt_541.Mt_541.Data.SettlementDetails[0].SubSeqE1
    mt_541.Mt_541.Data.SettlementDetails[0].SubSeqE1[0].Party
    mt_541.Mt_541.Data.SettlementDetails[1].SubSeqE1
    mt_541.Mt_541.Data.SettlementDetails[1].SubSeqE1[0].Party
    mt_541.Mt_541.Data.SettlementDetails[1].SubSeqE1[0].Party.PartyP
    mt_541.Mt_541.Data.SettlementDetails[2].SubSeqE1
    mt_541.Mt_541.Data.SettlementDetails[2].SubSeqE1[0].Party
    mt_541.Mt_541.Data.SettlementDetails[3].SubSeqE1
    mt_541.Mt_541.Data.SettlementDetails[3].SubSeqE1[0].Party
    mt_541.Mt_541.Data.SettlementDetails[3].SubSeqE1[0].Party.PartyP
    mt_541.Mt_541.Data.SettlementDetails[0].SubSeqE1
    mt_541.Mt_541.Data.SettlementDetails[0].SubSeqE1[0].Party
    mt_541.Mt_541.Data.SettlementDetails[0].SubSeqE1[0].Party.PartyQ
```

For more information on error messages, see **"Error Message Information" on page 56**.

4.3 In Collaboration Validation Methods

As an alternative to using the Validation Collaborations, the 5.1 version of the SWIFT OTD Library offers three validation methods, **validate()**, **validateMFVR()**, and **validateMRP()**, that can be invoked by a Collaboration to validate SWIFT 2003, 2005, and 2006 OTDs directly in the Collaboration.

For example, if you have an OTD for message MT 541, you can call the OTD's validateMFVR() method from the Collaboration, and the Collaboration validates the message's MFVRs.

The validation methods are available for the same SWIFT message OTDs listed under **"Message Validation Rules" on page 33**. You can see (or select) these validation methods by right-clicking the SWIFT message OTD from the Collaboration Editor's Business Rules Designer and clicking **Select method to call** on the shortcut menu.

These methods are described in detail as follows:

validate()

Description

Validates applicable MFVR and/or MPR rules against the OTD instance. Throws a **MessageValidationException** if the OTD is invalid in regard to applicable MFVR rules or applicable MPR rules. Error message detail can be obtained by calling **MessageValidationException.getErrorMessage()**.

If the OTD does not have applicable MFVR or MPR rules, the method call returns without throwing a MessageValidationException.

Syntax

```
public void validate()
```

Parameters

None.

Return Values

None.

Throws

`com.stc.swift.validation.MessageValidationException: A` MessageValidationException is thrown when the OTD is invalid in regard to applicable MFVR rules or applicable MPR rules.

validateMFVR()

Description

Validate applicable MFVR rules against the OTD instance. Throws **MFVRException** if the OTD is invalid in regard to applicable MFVR rules. Error message detail can be obtained by calling **MFVRException.getErrorMessage()**.

If the OTD does not have applicable MFVR rules the method call always returns without throwing an MFVRException.

Syntax

```
public void validateMFVR()
```

Parameters

`None.`

Return Values

None.

Throws

`com.stc.swift.validation.MFVRException`: The **MFVRException** is thrown when the OTD is invalid in regard to applicable MFVR rules.

validateMPR()

Description

Validate applicable MPR rules against the OTD instance. Throws **MPRException** if the OTD is invalid in regard to applicable MPR rules. Error message detail can be obtained by calling **MPRException.getErrorMessage()**.

If the OTD does not have applicable MPR rules the method call returns without throwing an MPRException.

Syntax

```
public void validateMPR()
```

Parameters

None.

Return Values

None.

Throws

`com.stc.swift.validation.MPRException`: The **MPRException** is thrown when the OTD is invalid in regard to applicable MPR rules.

Calling the Validation Methods in your Collaboration

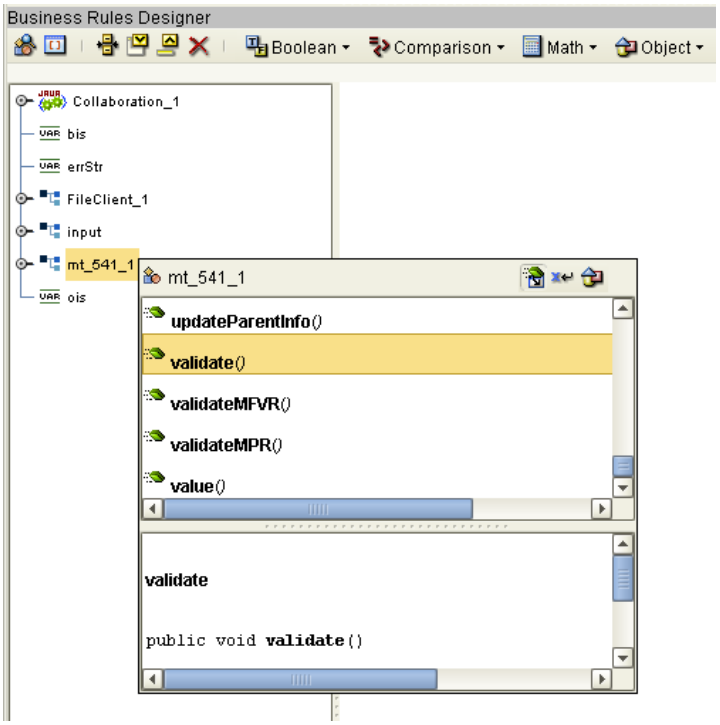
The validation methods are available at the OTD level, and can be called after the OTD is populated with it's values. This usually occurs after a message is unmarshaled in the OTD.

The following fragment of code demonstrates the use of the **validate** method within a Collaboration. In this example, **validate()** is called and either "message OK' or the exception error String is written to the log.

```
{
       java.io.ByteArrayInputStream bis = new java.io.ByteArrayInputStream( input.getByteArray() );
        com.stc.otd.runtime.OtdInputStream ois = new
com.stc.otd.runtime.provider.SimpleOtdInputStreamImpl( bis );
        String errStr = "";
        try {
            mt_541_1.unmarshal( ois );
            logger.error( "UNMARSHAL MT 541 SUCCESS!!!!!!!!!!!!!!!!!!!!!!!!" );
        } catch ( Exception e ) {
            errStr += e.getMessage();
            logger.error( "Exception when unmarshal MT 541 message ================, e=" + e );
        }
        if (errStr.length() == 0) {
            try {
                mt_541_1.validate();
                logger.error( "VALIDATION MT 541 message OK ::::::::::::::::::::" );
            } catch ( com.stc.swift.validation.MessageValidationException mve ) {
                errStr += mve.getErrorMessage();
            }
```

To select a validation method from the Collaboration Editor's Business Rules Designer, right-click the SWIFT message OTD and select Select method to call from the shortcut menu. Three methods are available as displayed in **Figure 4 on page 40**

Figure 4 Selecting the validation methods from the Business Rules Designer



4.4 SWIFT OTD Sample Projects

Two sample Projects are packaged with the SWIFT OTD Library:

- **prjSwift_JCD_Sample**: Demonstrates how to use the SWIFT OTDs using a Java-based Collaboration for the business logic.
- **prjSwift_BP_Sample**: Demonstrates how to use the SWIFT OTDs with an eInsight Business Process for the business logic.

These sample Projects are uploaded with the SWIFT OTD Library documentation SAR file, and downloaded from the Sun Composite Application Platform Suite Installer. They demonstrate both the MFVR and MPR validation operations.

In addition to the sample Projects, the sample Project file also includes sample data files for both the JCD and eInsight™ sample Projects.

4.5 Importing a Sample Project

The SWIFT sample Projects are bundled into a single zip file named **SWIFT_OTD_Library_Sample.zip**. This file is uploaded with the eWay's documentation SAR file, **SwiftOTDLibraryDocs.sar,** and is available for download from the Sun Java Composite Application Platform Suite Installer's Documentation tab.

See **"Installing the SWIFT OTD Libraries" on page 10** for directions on uploading the **SwiftOTDLibraryDocs.sar file.**

To import a sample eWay Project to the Enterprise Designer do the following:

1. The sample files are uploaded with the eWay's documentation SAR file and downloaded from the Sun Java Composite Application Platform Suite Installer's Documentation tab. The **SWIFT_OTD_Library_Sample.zip** file contains the various sample Project ZIP files. Extract the samples to a local file.
2. Save all unsaved work before importing a Project.
3. From the Enterprise Designer's Project Explorer pane, right-click the Repository and select **Import** from the shortcut menu. The **Import Manager** appears.
4. Browse to the directory that contains the sample Project zip file. Select the sample file and click **Import**. After the sample Project is successfully imported, click **Close**.
5. Before an imported sample Project can be run you must do the following:
   - Create an **Environment** (see **"Creating an Environment" on page 50**)
   - Create a **Deployment Profile** (see **"Creating the Deployment Profile" on page 52**)
   - Create and start a domain (see **"Creating and Starting the Domain" on page 52**)
   - Build and deploy the Project (see **"Building and Deploying the Project" on page 53**)

4.6 SWIFT Projects and the Enterprise Designer

A Project contains all of the eGate components that you designate to perform one or more desired processes in eGate.

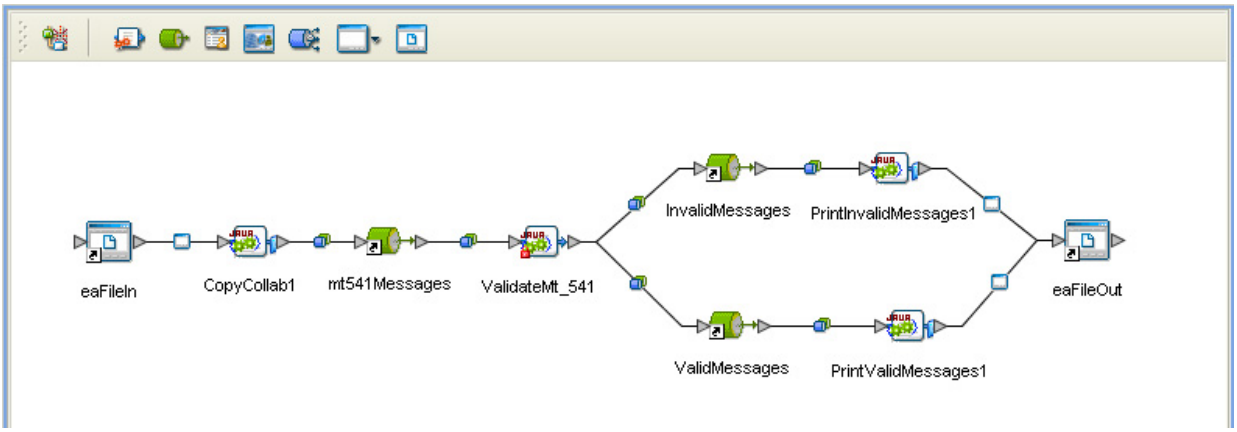
- **Connectivity Map Editor**: contains the eGate business logic components, such as Collaborations, Topics, Queues, and eWays, that you include in the structure of the Project.
- **OTD Editor**: contains the source files used to create Object Type Definitions (OTDs) to use with a Project.
- **Business Process Designer and Editor**: allows you to create and/or modify Business Rules to implement the business logic of your Project's eInsight Business Processes.
- **Java Collaboration Editor**: allows you to create and/or modify Business Rules to implement the business logic of your Project's Java Collaboration Definitions.

4.6.1 SWIFT Sample JCD Project

The SWIFT Sample JCD Project (**prjSwift_JCD_Sample**) demonstrates the validation features of the SWIFT OTD Library. Specifically, this Project employs the Java-based Validation Collaborations and their definitions.

The Project uses a common process infrastructure to identify and isolate invalid messages. The process keeps these messages readily available for further use. It also passes valid messages on to their destinations. See Figure 5.

Figure 5 prjSwift_JCD_Sample Project - Connectivity Map



Project Walkthrough

Figure 5 displays the Project's Connectivity Map, which represents the flow of the Project as follows:

- The inbound File eWay subscribes to an external "input" directory. The eWay accepts an MT_541 message and publishes it to the Service1 Collaboration.
- The CopyCollab1 service (CopyCollaboration) unmarshals the message, copies all of the data fields (to demonstrate how to copy the data fields), marshals the message to a String and publishes the message to a JMS Queue.
- The ValidateMT_541 Collaboration accepts the message from the JMS Queue, validates the message, and publishes it to the ValidMessage Queue if the message is valid, or to the InvalidMessages if the message is not valid.
- The PrintValidMessages Collaboration accepts the valid messages, prints out the message and sends the message to the outbound File eWay.
- The PrintInvalidMessages Collaboration accepts the invalid messages, prints that the message is invalid and lists any errors. It then sends that message to the outbound File eWay.
- The outbound File eWay publishes the messages to an external folder as either **Valid_Swift_JCD_output1.dat** or **Invalid_Swift_JCD_output1.dat**.

You must name the source (input) and destination (output) file directories in the setting property settings for the Project's File eWays. See the *File eWay Intelligent Adapter User's Guide* for details.

SWIFT JCD Sample Project Data

Sample valid and invalid input messages are provided with the downloaded sample, as well as examples of valid and invalid output messages. These are located in the **Swift_JCD_Sample_Data** folder as:

- **input_JCD_Valid541.~in:** sample valid message input file
- **input_JCD_Invalid541.~in:** sample invalid message input file
- **Valid_Swift_JCD_output1.dat:** example of sample valid message output
- **Invalid_Swift_JCD_output1.dat:** example of sample invalid message output

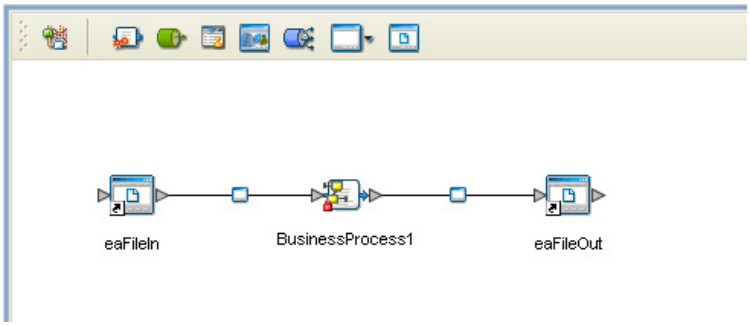
Also, see **"Validation Operation" on page 32** for a more detailed explanation of the validation operation.

4.6.2 SWIFT Sample eInsight™ Project

The SWIFT eInsight Sample Project (**prjSwift_BP_Sample**), an eInsight Project, uses an eInsight Business Process Service instead of the Java-based Collaborations used in the JCD sample. Before using this Project, you must first import it into eGate. See **"Importing a Sample Project" on page 40** for details on how to import a Project.

The SWIFT eInsight Sample project demonstrates the use of SWIFT OTDs in a Business Process, and provides an example of how to use the **marshal()** and **unmarshal()** operations included as part of every SWIFT OTD. This Project contains one Business Process.

Figure 6 SWIFT eInsight Sample Project - Connectivity Map



Project Walkthrough

Figure 6 displays the Project's Connectivity Map, which represents the flow of the Project as follows:

- The Business Process (see **Figure 8 on page 46**) begins with a **File.read()** operation. This operation subscribes to an external "input" directory and picks up a file that contains a valid SWIFT MT 541 message.
- The **File.read()** operation publishes the message to the input of the **mt_541.unmarshal()** operation. This operation basically unmarshals the MT 541 message into a Java data structure that represents the message. This structure is the output of the mt_541.unmarshal() operation.

- The Business Process continues by publishing this output to the input of the **mt_541.marshal()** operation. The **mt_541.marshal()** operation transforms the OTD data structure back into a String.
- Finally, this String is published as input to the **File.write()** operation, which writes out the String to an external directory.

The Business Process itself is relatively simple, but it identifies how the operations of the SWIFT OTDs can be used in a Business Process.

Configuration of the Connectivity Map is simply the configuration of the Inbound and Outbound File eWay (see **Figure 6 on page 43**). The configuration of the Inbound File eWay determines where the SWIFT MT 541 message is located. The configuration of the Outbound File eWay states where the output of the Business Process goes.

Note: *You must have the* **eInsight.sar** *file installed to use the features available with this Project. See the* **Sun Java Composite Application Platform Suite Installation Guide** *for complete installation procedures.*

SWIFT eInsight Sample Project Data

A sample messages, as well as an example of a valid output message are located in the **Swift_eInsight_Sample_Data** folder (downloaded with the sample) as:

- **input_BP_Validmt541.txt.~in**: sample valid message input file
- **Swift_Valid_BP_Output1.dat:** example of sample valid message output

4.6.3 Using eGate With eInsight

You can set up and deploy eGate components using eInsight. Once you have associated the desired component (for example, a Service in this Project) with a Business Process, the eInsight engine can automatically invoke that component during run time, using a Business Process Execution Language (BPEL) interface.

The following eGate components are able to interface with eInsight:

- Java Messaging Service (JMS)
- Object Type Definitions (OTDs)
- eWays
- eGate Services

Using the eGate Enterprise Designer and its eInsight Editor, you can add an operation to a Business Process, then associate that process with an eGate component, for example, a Service. In the Enterprise Designer, associate the Business Process and the Service icons using drag-and-drop procedures.

See the *eInsight Business Process Manager User's Guide* for details.

SWIFT OTD Library With eInsight

You can add SWIFT OTD Library objects to an eInsight Business Process during the system design phase. To create this association, select the desired operation, for example **marshal** or **unmarshal,** under the OTD in the Project Explorer, and drag it onto the eInsight Business Process Editor.

At run time, the eInsight Engine is able to invoke each of the steps in order of set up in the Business Process. Using the engine's BPEL interface, eInsight in turn invokes the SWIFT OTD Library operations, as well as any eWays in the Business Process.

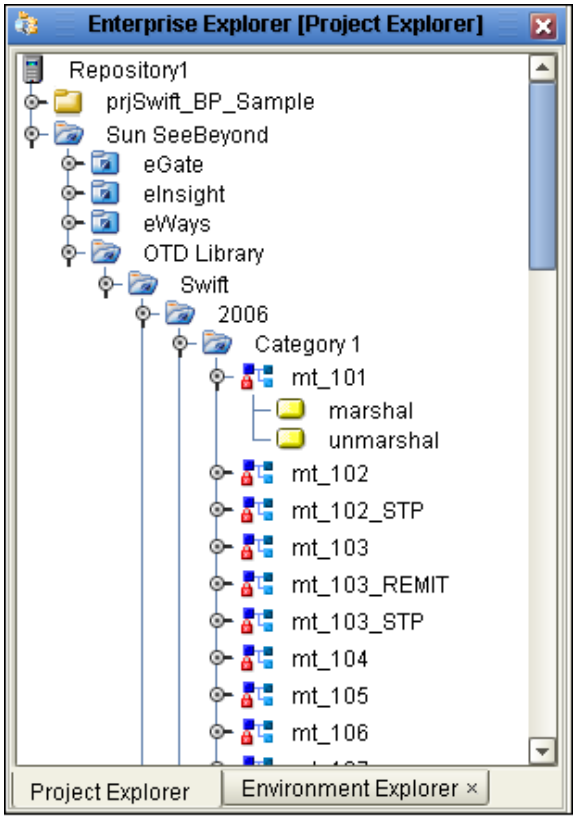
Table 13 shows the eInsight Business Process operations available to the SWIFT OTD Library, as well as a description of these operations.

Table 13 Available eInsight SWIFT OTD Business Process Operations

eInsight Business Process Operation	Description
unmarshal	Parses the SWIFT message/OTD for validation.
marshal	Readies the SWIFT message for writing, along with any errors.

Figure 7 on page 45 shows the Enterprise Designer's **Project Explorer** with the SWIFT OTD Library Business Process operations exposed under the OTD icon.

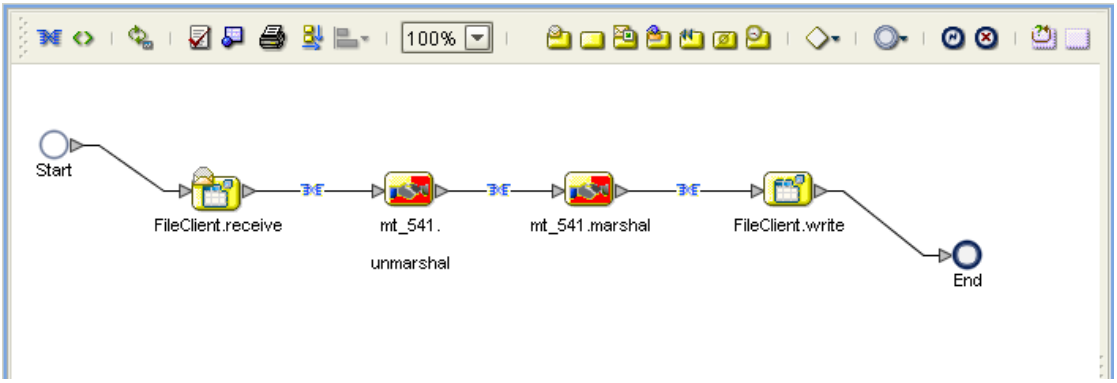
Figure 7 Project Explorer With Business Process Operations



4.6.4 Using a Business Process

Once you have designed your Business Process for this sample, you can use the eInsight Business Process Designer and Editor to create it. Figure 8 displays the Business Process operations as created by the Business Process Editor.

Figure 8 Sample Project Business Process



4.6.5 Configuring the Modeling Elements

Business Rules are defined and configured between the Business Process Activities located on the modeling canvas. The sample Project contains the Business Rules that govern each of the Activities listed in a Business Process flow.

Each of the icons located on the links between Activities represent a Business Rule. The Business Rules found in the sample Project include:

- **Copying the Output File** on page 46
- **Unmarshaling and Marshaling the Data** on page 47
- **Returning the Value** on page 47

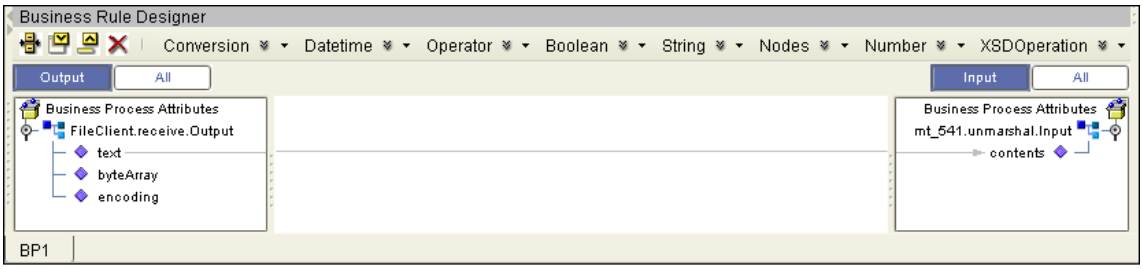
Double-click one of the icons to open the Business Rule Designer pane.

Note: *A detailed description of the steps required to configure modeling elements is found in the Sun SeeBeyond eInsight Business Process Manager User's Guide.*

Copying the Output File

The **FileClient.receive.Output** container copies the output file containing the message to be used. The Business Process copies the message content to the **input container, mt_541.unmarshal.Input, to be unmarshaled. See** Figure 9.

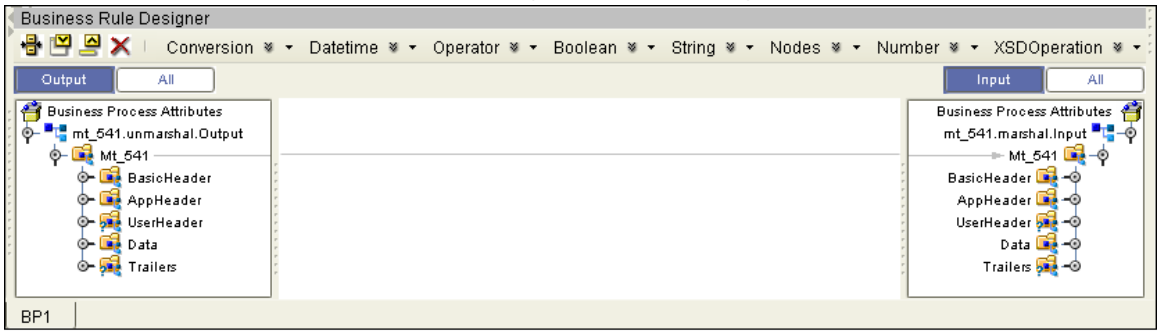
Figure 9 Copying the Output File



Unmarshaling and Marshaling the Data

The Business Process unmarshals the data and marshals the data, using the **mt_541.unmarshal** and **mt_541.marshal** operations. The Business Process then writes the results to the **FileClient.write.Output** container. See Figure 10.

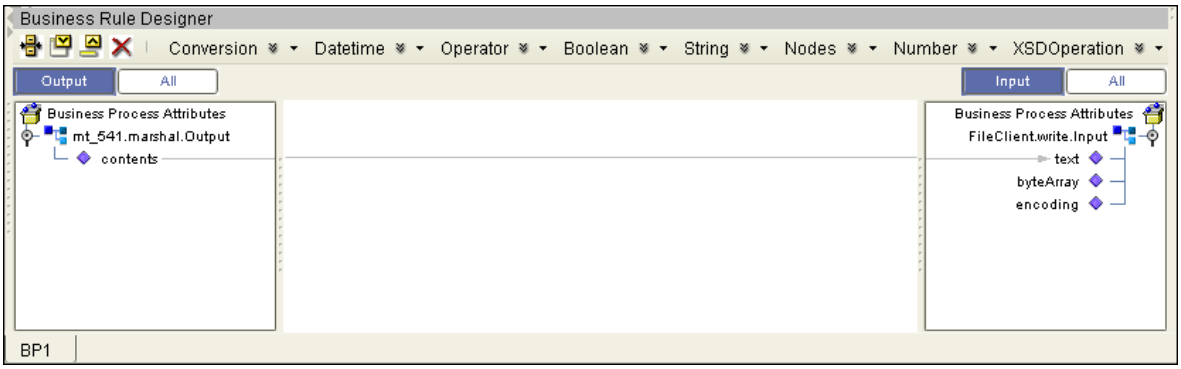
Figure 10 Unmarshaling and Marshaling the Data



Returning the Value

The OTD output container writes the resulting value to a text file using the **FileClient.write.Input** container. See Figure 11.

Figure 11 Returning the Requested Value



4.6.6 Creating a Connectivity Map

The Enterprise Designer's Connectivity Map Editor provides a canvas for assembling and configuring a Project's components. Connectivity Maps are used with both Java

Collaboration (JCD) and eInsight (BP) Project implementations. The following sample demonstrates how the prjSwift_BP_Sample is created.

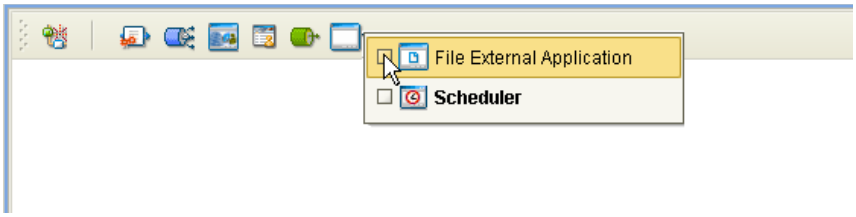
1 From the Enterprise Designer's Project Explorer, right-click the **prjSwift_BP_Sample** Project and select **New > Connectivity Map** from the shortcut menu.

2 The New Connectivity Map appears and a node for the Connectivity Map is added under the Project on the Project Explorer tree labeled **CMap1**. Rename the Connectivity Map **cmSwift_BP**.

Selecting the External Applications

In the Connectivity Map, the eWays are associated with External Systems. For example, to establish a connection to an external file, you must first select File as an External System to use in your Connectivity Map (see Figure 12).

Figure 12 Connectivity Map - External Applications



1 Click the **External Application** icon on the Connectivity Map toolbar,

2 Select the external systems necessary to create your Project (for this sample, **File**. Icons representing the selected external systems are added to the Connectivity Map toolbar.

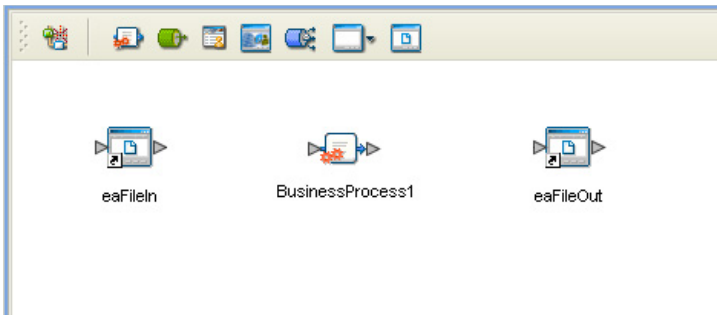
Populating the Connectivity Map

The icons in the toolbar represent the available components used to populate the Connectivity Map canvas. Add the Project components to the Connectivity Map by dragging the icons from the toolbar to the canvas.

1 For this sample, drag the following components onto the Connectivity Map canvas as displayed in Figure 13:

- **File External System** (2)
- **Service** (A service is a container for Collaborations, Business Processes, eTL processes, and so forth)

Figure 13 Connectivity Map with Components



2 Rename the **File1** External Application to **eaFileIn** by right-clicking the object, selecting **Rename** from the shortcut menu, and typing in the new name. In the same way, rename the other Connectivity Map components as follows:

- **File2** to **eaFileOut**
- **cm_Swift_BP_Service1** to **BusinessProcess1**.

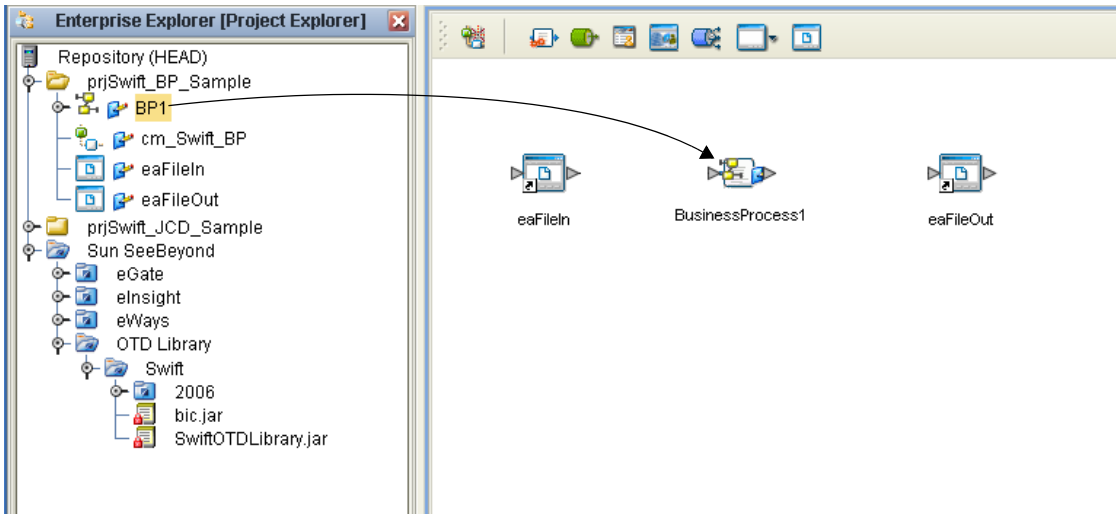
3 Save your current changes to the Repository.

4.6.7 Binding the eWay Components

Once the Connectivity Map has been populated, components are associated and bindings are created in the Connectivity Map.

1 Drag and drop the **BP1** Business Process, under prjSwift_BP_Sample, from the Project Explorer tree to the Service (**BusinessProcess1**). If the Business Process was successfully associated, the Service's icon changes to a Business Process icon (see **Figure 14 on page 49**).

Figure 14 Populating the Service



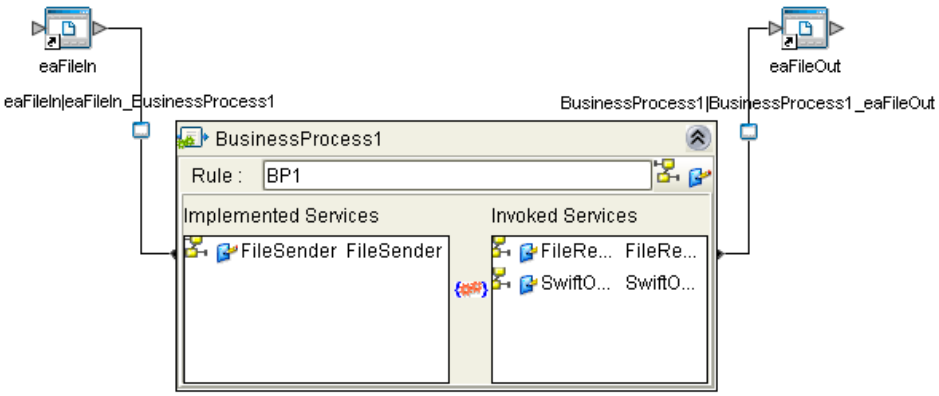
2 Double-click the **BusinessProcess1 Service**. The **BusinessProcess1** binding dialog box appears using the **BP1** Rule.

3 From the **BusinessProcess1** binding dialog box, map **FileSender** (under Implemented Services) to the **eaFileIn** (File) External Application. To do this, click

on **FileSender** in the **BusinessProcess1** binding dialog box, and drag the cursor to the output node of the **eaFileIn** External Application in the Connectivity Map. A link named **eaFileIn|eaFileIn_BusinessProcess1** is now visible.

4 From the **BusinessProcess1** binding dialog box, map **FileReceiver** (under Invoked Services) to the input node of the **eaFileOut** External Application (see Figure 15).

Figure 15 Connectivity Map - Associating (Binding) the Project's Components



5 Minimize the **BusinessProcess1** binding dialog box and save your current changes to the Repository.

4.6.8 Creating an Environment

Environments include the external systems, Logical Hosts, integration servers and message servers used by a Project and contain the configuration information for these components. Environments are created using the Enterprise Designer's Environment Editor. The following example uses the **prjSwift_BP_Sample** Project.

1 From the Enterprise Designer's Enterprise Explorer, click the **Environment Explorer** tab.

2 Right-click the Repository and select **New Environment**. A new Environment is added to the Environment Explorer tree.

3 Rename the new Environment to **envSwift_BP_Sample**.

4 Right-click **envSwift_BP_Sample** and select **New File External System**. Name the External System **esFile**. Click **OK**. **esFile** is added to the Environment Editor.

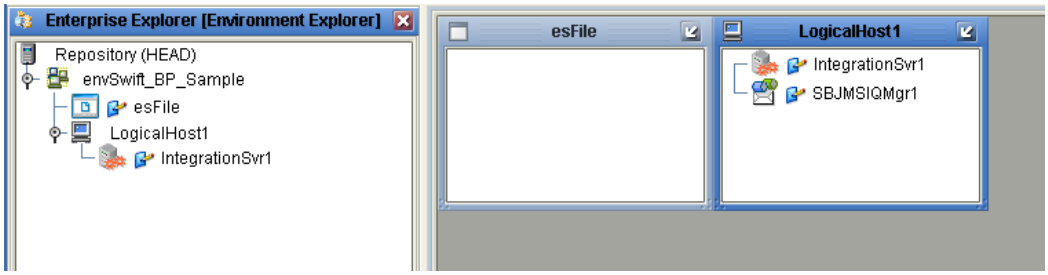
5 Right-click **envSwift_BP_Sample** and select **New Logical Host**. The **LogicalHost1** box is added to the Environment and **LogicalHost1** is added to the Environment Editor tree.

6 Right-click **LogicalHost1** and select **New > Sun SeeBeyond Integration Server**. A new Integration Server (**IntegrationSvr1**) is added to the Environment Explorer tree under **LogicalHost**1 (see *Figure 16*).

7 For the **prjSwift_JCD_Sample** only, the Environment must also include a JMS IQManager. To add an IQ Manager, right-click **LogicalHost1** and select **New >**

SeeBeyond JMS IQManager. A new JMS IQ Manager (**SBJmsIQMgr1**) is added to the Environment Explorer tree under LogicalHost1.

Figure 16 Environment Editor - envSwift_BP_Sample



8 Save your current changes to the Repository.

4.6.9 Configuring the eWays

The sample Projects contains two component File eWays (inbound and outbound) represented in the Connectivity Map as a node between an File External Application and a Collaboration. The existing Connectivity Map property settings are sufficient for the sample, but the Environment property settings must be configured for your system as follows:

1 From the **Environment Explorer** tree, right-click the **File** External System (**esFile** in this sample), and select **Properties**. The Properties Editor opens to the File eWay Environment configuration.

2 From the Properties Editor, modify the **Directory** settings (Parameter Settings > Directory) for both the Inbound and Outbound File eWays, to correspond with inbound and outbound directories you created on your system. Click **OK** to accept the settings.

For more information on configuring the File eWay properties for your system, see the *Sun SeeBeyond eWay™ File Adapter User's Guide*.

4.6.10 Configuring the Integration Server

You must set your Sun SeeBeyond Integration Server Password property before deploying your Project.

1 From the Environment Explorer, right-click **IntegrationSvr1** under your **Logical Host**, and select **Properties** from the shortcut menu. The Integration Server Properties Editor appears.

2 Click the **Password** property field under **Sun SeeBeyond Integration Server Configuration**. An ellipsis appears in the property field.

3 Click the ellipsis. The **Password Settings** dialog box appears. Enter **STC** as the **Specific Value** and as the **Confirm Password**, and click **OK**.

4 Click **OK** to accept the new property and close the Properties Editor.

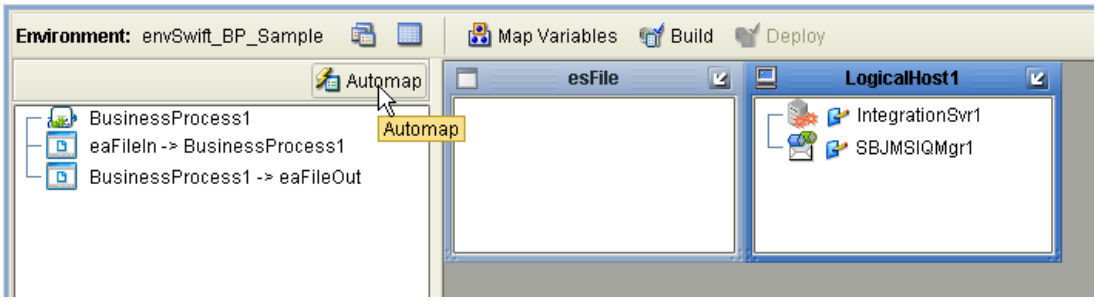
For more information on deploying a Project see the *Sun SeeBeyond Java™ Composite Application Platform Suite Deployment Guide*.

4.6.11 Creating the Deployment Profile

A Deployment Profile is used to assign Business Processes, Collaborations, and message destinations to the integration server and message server. Deployment Profiles are created using the Deployment Editor.

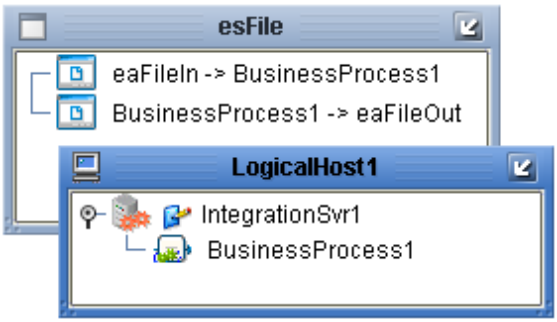
1. From the Project Explorer, right-click the Project (**prjSwift_BP_Sample**) and select **New** > **Deployment Profile**.
2. Enter a name for the Deployment Profile (for example, **dpSwift_BP_Sample**). Make sure that the selected Environment is **envSwift_BP_Sample**. Click **OK**.
3. Click the **Automap** icon as displayed in Figure 17.

Figure 17 Deployment Profile - Automap



The Project's components are automatically mapped to their system window as seen in Figure 18.

Figure 18 Deployment Profile



4. Save your changes to the Repository.

4.6.12 Creating and Starting the Domain

To deploy your Project, you must first create a domain. A domain is an instance of a Logical Host.

Create and Start the Domain

1. Navigate to your **<*JavaCAPS51*>\logicalhost** directory (where <*JavaCAPS51*> is the location of your Sun Java Composite Application Platform Suite installation.
2. Double-click the **domainmgr.bat** file. The **Domain Manager** appears.

3 If you have already created a domain, select your domain in the Domain Manager and click the **Start an Existing Domain** button. Once your domain is started, a green check mark indicates that the domain is running.

4 If there are no existing domains, a dialog box indicates that you can create a domain now. Click **Yes**. The **Create Domain** dialog box appears.

5 Make any necessary changes to the **Create Domain** dialog box and click **Create**. The new domain is added to the Domain Manager. Select the domain and click the **Start an Existing Domain** button. Once your domain is started, a green check mark indicates that the domain is running.

6 For more information about creating and managing domains see the *Sun SeeBeyond eGate Integrator System Administration Guide*.

4.6.13 Building and Deploying the Project

The Build process compiles and validates the Project's Java files and creates the Project EAR file.

Build the Project

1 From the Deployment Editor toolbar, click the **Build** icon.

2 If there are any validation errors, a **Validation Errors** pane will appear at the bottom of the Deployment Editor and displays information regarding the errors. Make any necessary corrections and click **Build** again.

3 After the Build has succeeded you are ready to deploy your Project.

Deploy the Project

1 From the Deployment Editor toolbar, click the **Deploy** icon. Click **Yes** when the **Deploy** prompt appears.

2 A message appears when the project is successfully deployed.

Note: *Projects can also be deployed from the Enterprise Manager. For more information about using the Enterprise Manager to deploy, monitor, and manage your projects, see the Sun SeeBeyond eGate™ Integrator System Administration Guide.*

4.6.14 Running the Sample

To run your deployed sample Project do the following

1 From your configured input directory, paste (or rename) the sample input file to trigger the eWay.

2 From your output directory, verify the output data.

4.7 Updating BICDirService

The BICDirService feature is a database service. The data files used to populate BICDirService must be updated periodically from SWIFT's source CD-ROM issued once every four months.

Source of Information

The Java constructor for the **BICDir** class loads the required data from the following SWIFT-supplied files:

- **FI.dat**
- **CU.dat**

The constructor takes an argument from the directory that contains these two files. It then opens each file and loads the appropriate fields into a searchable structure. For more details on these files, see the current SWIFT *BIC Database Plus Technical Specifications* document for actual file layout and positioning information.

The data used to look up and validate comes from SWIFT's own BIC bank files containing its BIC codes and its currency and country codes. When necessary, SWIFT updates these files with a new version of its lookup tables, to keep them current. You can upload these files to eGate and control when updates to the system occur and access these files via SWIFT's update CD-ROM.

Update Operation

The BICDirService feature allows multiple simultaneous objects to access its methods with near-local object response times.

The SWIFT standards are not always sufficiently complete to enable STP. Currently a message can pass network validation but fail at the receiving end because of incompatible definitions or codes, or missing data. The result is expense to manually repair or follow up on these messages and possible retransmission of the message.

The SWIFT OTD Library's BICDirService ensures that valid, up-to-date BIC, country, and currency codes are present in eGate-processed messages. This feature increases the likelihood that a given message can flow "straight through".

You must update the BICDirService information before running components that utilize this feature.

To update BIC information

1. Go to the **bic.jar** file in the Enterprise Designer's **Project Explorer**. The file is located under **Sun SeeBeyond > OTD Library > Swift**.
2. Right-click the **bic.jar** icon (see **Figure 3 on page 15**).
3. Select the **Update BIC Files** option from the shortcut menu.
4. In the resulting **Open** dialog box, navigate to the location of the **CU.dat** file on the SWIFT update CD-ROM.

5 Select the file and upload it.

6 Select **Update BIC Files** again.

7 Navigate to the location of the **FI.dat** file.

8 Select the file and upload it.

This procedure updates the BICDirService feature.

4.7.1 BICDirService Method Operation

The BICDirService methods are static methods of a single Java class, the **BICDir** class. There is one method per each required lookup and validation. The **BICDir** methods are not dependent on any module other than SWIFT data files.

Lookup Method Definitions

The **BICDir** class has the following lookup methods:

- **Look up BIC by Institution Name:** Takes a string and returns a byte array of BICs (one element is possible). The signature is:

```
BIC[] getBIC(institutionName*);
```

- **Look up BIC by Institution Name, City and Country:** Takes three strings, an institution name, city, and country, and returns a byte array of BICs (one element is possible). The signature is:

```
BIC[] getBIC(institutionName*, city*, country*);
```

- **Look up Institution Name by BIC:** Takes a BIC string, either a BIC 8 or BIC11, and returns a byte array of institution names (one element is possible). The signature is:

```
institutionName[] getInstitutionName(BIC);
```

- **Look up Currency Code by Country Code:** Takes a string, a country code, and returns the currency code. The signature is:

```
currencyCode getCurrencyCode(countryCode);
```

- **Look up Country Code by Currency Code:** Takes a string, a currency code, and returns the country code. The signature is:

```
countryCode getCountryCode(currencyCode);
```

Validation Method Definitions

The **BICDir** class has the following validation methods:

- **Validate BIC:** Takes a string, either a BIC 8 or BIC11, and returns true or false. The signature is:

```
boolean validateBIC(BIC);
```

- **Validate Currency Code:** Takes a string, a currency code, and returns **true** or **false**. The signature is:

```
boolean validateCurrencyCode(currencyCode);
```

- **Validate Country Code:** Takes a string, a country code, and returns true or false. The signature is:

```
boolean validateCountryCode(countryCode);
```

BICDir Exceptions

The purpose of the exceptions is to give you some indication of what error has occurred and how to rectify it.

Error message framework

These error messages are implemented using the **log4j** framework. **STC.OTD.SWIFT.BICDirService** is used as the logging category.

Error message general form

The message of **BICDir** exception takes the following general form:

"BICDirService Error ["XX"] –" error-message

Where:

- **""**: Marks static text.
- **XX**: Stands for a unique number assigned to each error message.
- **error-message**: A descriptive narrative derived from the condition that caused the error, and a possible solution to rectify it.

4.8 Error Message Information

This section explains the SWIFT OTD Library validation error files and messages.

4.8.1 Error Messages

There are separate error messages and reporting mechanisms for each type of validation performed by a Service. You can control the amount of debugging information in the error messages you receive by using the debug flags as parameters when you call the **command()** method. The library's error parser provides the following debug levels:

- **Regular Information**: Gives general information, and if an error occurs, the path to the node or piece of data that caused the error.
- **Debug**: Gives all of the node information generated by the parse, that is, each field and subfield.

- **Parser Debug**: Combines the debug level with information regarding just what the parser is matching, and the data being used. In general, you only need to use this level for situations where the error cannot be determined using the other levels because of the quantity of data. This level gives the exact location and nature of the failure.

Error message file output appears at the end of any message that generates an error.

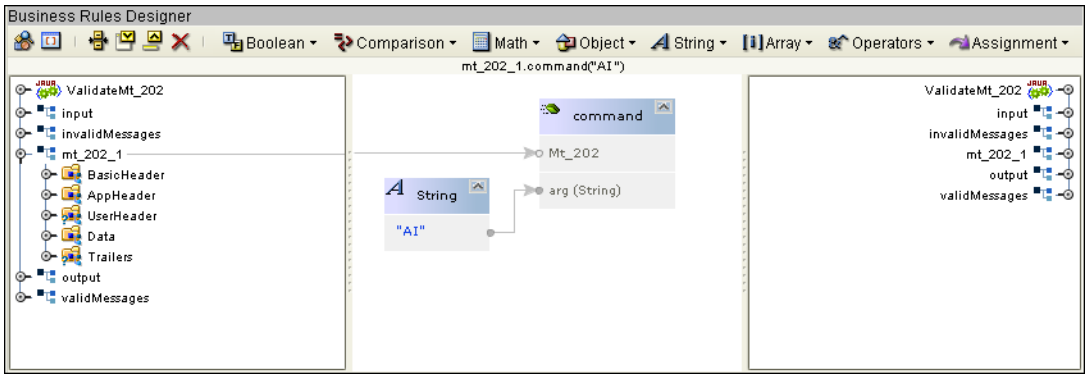
Setting the Debug Level

The available debug level flags are:

- **A** or **a**: Enables the **abbreviation of path names**. This reduces the path output when you are printing to a Regular Information set.
- **D** or **d**: Enables **Debug** (mid-level) debugging. If enabled, this generates more debug data than the Regular Information level, but less than the Parser Debug level.
- **I** or **i**: Enables **Regular Information** level debugging.
- **L** or **l**: Enables saving and display of the **last successfully parsed node**. When a parse has failed, this information is the last item printed by the current root node.
- **P** or **p**: Enables the **Parser Debug**-level information. If enabled, this generates the maximum information about what the internal parser is doing.

Using the Debug Level flags, you can configure the debugging information you receive by setting the appropriate debug parameter in the OTD's **command()** method. For example, to set the error message level to the Regular Information level (I flag), with abbreviations turned on (A flag), you would set **command()** with the parameters A and I. You can do this from the Collaboration Editor's Business Rules Designer as displayed in Figure 19.

Figure 19 Setting the debug level using the Business Rules Designer



This produces the following Java code (this example uses the mt_202 Validation Collaboration:

```
mt_202_1.command( "AI" );
```

Calling command() enables any of the debug functions presented as a parameter. For more information, see the SWIFT OTD Library Javadoc.

4.8.2 Message Examples

An example of a regular information-level parse error (cannot find a required field) is:

```
at 0: com.stc.swift.runtime.SwiftUnmarshalException: mt_103.Mt_103:
0: Failed to parse required child(Data).
```

An example of a parse error with the debug level enabled (cannot find a required field) is:

```
at 146: null: com.stc.swift.runtime.SwiftUnmarshalException:
mt_543.Mt_543.Data.GeneralInformation.FunctionOfTheMessage: 146:
Failed to parse required child(String2).
```

Given this path to the data, you can determine where in the message the parser failed by looking at:

- The *SWIFT User Handbook*
- Structure of the OTD in the Enterprise Designer's OTD Editor
- **Javadoc** for the OTD

See **"MFVR Errors" on page 35** and **"MPR Errors" on page 37** for MFVR- and MPR-specific error information. For more detailed error information, see **"Error Message Information" on page 56**.

Parse Debug Level Message Example

The following example shows error message output at the parse debug level:

```
[main] PARSE - Swift: matchDelimSkip("{1:") --> true.
[main] PARSE - Swift: getData("F|A|L") --> "F".
[main] DEBUG - Swift: mt_502.Mt_502.BasicHeader.AppIdentifier: 3:
Mapped data("F").
[main] DEBUG - Swift: mt_502.Mt_502.BasicHeader.AppIdentifier: 3:
Mapped rep[0].
[main] PARSE - Swift: getData(charSet, 2, 2) --> "01".
[main] DEBUG - Swift: mt_502.Mt_502.BasicHeader.ServiceIdentifier: 4:
The following is the last field successfully parsed the 4th 22a:
[main] PARSE - Swift: matchDelimSkip("22H::") --> true.
[main] PARSE - Swift: getData(charSet, 4, 4) --> "PAYM".
[main] DEBUG - Swift:
mt_502.Mt_502.Data.OrderDetails.Indicator.IndicatorH.String3: 218:
Mapped data("PAYM").
[main] PARSE - Swift: matchDelimSkip("//") --> true.
[main] DEBUG - Swift:
mt_502.Mt_502.Data.OrderDetails.Indicator.IndicatorH.String3: 218:
Mapped rep[0].
[main] PARSE - Swift: getData(charSet, 4, 4) --> "APMT".
[main] DEBUG - Swift:
mt_502.Mt_502.Data.OrderDetails.Indicator.IndicatorH.String5: 224:
Mapped data("APMT").
[main] DEBUG - Swift:
mt_502.Mt_502.Data.OrderDetails.Indicator.IndicatorH.String5: 224:
Mapped rep[0].
[main] PARSE - Swift: matchDelimSkip("
:") --> true.
[main] DEBUG - Swift:
mt_502.Mt_502.Data.OrderDetails.Indicator.IndicatorH: 213: Mapped
rep[0].
```

The message goes on for several more lines, not indicating any error. Then the parser is looking for any more 22a's, F or H, and does not find one. See the following example:

```
[main] DEBUG - Swift: mt_502.Mt_502.Data.OrderDetails.Indicator[3]:
159: Mapped rep[3].
[main] PARSE - Swift: matchDelimSkip("22F::") --> false.
[main] PARSE - Swift:
mt_502.Mt_502.Data.OrderDetails.Indicator.IndicatorF: 231: Failed to
find BeginDelimiter("22F::").
[main] PARSE - Swift: matchDelimSkip("22H::") --> false.
[main] PARSE - Swift:
mt_502.Mt_502.Data.OrderDetails.Indicator.IndicatorH: 231: Failed to
find BeginDelimiter("22H::").
```

The parser then looks for a 98a either option A | B | C as follows:

```
[main] PARSE - Swift: matchDelimSkip("98A::") --> false.
[main] PARSE - Swift:
mt_502.Mt_502.Data.OrderDetails.DateTime[0].DateTimeA: 231: Failed to
find BeginDelimiter("98A::").
[main] PARSE - Swift: matchDelimSkip("98B::") --> false.
[main] PARSE - Swift:
mt_502.Mt_502.Data.OrderDetails.DateTime[0].DateTimeB: 231: Failed to
find BeginDelimiter("98B::").
[main] PARSE - Swift: matchDelimSkip("98C::") --> false.
[main] PARSE - Swift:
mt_502.Mt_502.Data.OrderDetails.DateTime[0].DateTimeC: 231: Failed to
find BeginDelimiter("98C::").
```

The parser finds no repetitions, which does not fit in the required range of 1 to 3 as described in the following example, so at this point, the parser fails, because no expected repetitions were found:

```
[main] PARSE - Swift: mt_502.Mt_502.Data.OrderDetails: 231: Failed to
match minimum repititions[ 1 < 0 <= 3 ].

[main] PARSE - Swift: mt_502.Mt_502.Data.OrderDetails: 145: Failed to
parse required child(DateTime).
[main] PARSE - Swift: mt_502.Mt_502.Data: 145: Failed to match
minimum repititions[ 1 < 0 <= 1 ].
[main] PARSE - Swift: mt_502.Mt_502.Data: 73: Failed to parse
required child(OrderDetails).
[main] PARSE - Swift: mt_502.Mt_502: 67: Failed to match minimum
repititions[ 1 < 0 <= 1 ].
[main] PARSE - Swift: mt_502.Mt_502: 0: Failed to parse required
child(Data).
 [main] LAST  - Swift: Last match: mt_502.Mt_502.
Exception in thread "main" at 0: null:
com.stc.swift.runtime.SwiftUnmarshalException: mt_502.Mt_502: 0:
Failed to parse required child(Data).
    at
com.stc.swift.runtime.SwiftOtdRep.throwExcept(SwiftOtdRep.java:1977)
    at
com.stc.swift.runtime.SwiftOtdRep.parseChildren(SwiftOtdRep.java:1577
)
    at
com.stc.swift.runtime.SwiftOtdRep.parse(SwiftOtdRep.java:1486)
    at
com.stc.swift.runtime.SwiftOtdRep.unmarshal(SwiftOtdRep.java:1339)
```

Chapter 5

Using SWIFT FIN Based Funds OTDs

This chapter explains how to use specialized funds features available with the SWIFT OTD Library and eGate Integrator.

What's in This Chapter

5.1 SWIFT OTD Library Funds Features

Overview

The SWIFT OTD Library Object Type Definitions (OTDs) contain specialized OTDs that allow you to automate the following funds operations:

- Orders to buy and sell
- Client confirmations
- Checking order status
- Statement of holdings, for fund balances reconciliation

In the past, many funds industry players have asked SWIFT to help automate these operations by providing standards and connectivity between funds distributors, transfer agents, funds management companies, and other intermediaries like funds processing hubs. To meet these needs, SWIFT has developed standards and message templates based on these standards.

The SWIFT OTD Library contains the following FIN-based MT Fund OTDs (see Table 14) specialized for the associated SWIFT message types and fund operations:

Table 14 FIN-based Funds OTDs

OTD Name	Base	Description
mt_502_FUNDS	FIN	**Order to buy and sell**: for funds subscription, redemption, switch, and cancellation.
mt_509_FUNDS	FIN	**Order status**: for status update on orders (for example, a rejection or acknowledgement of a receipt).
mt_515_FUNDS	FIN	**Client confirmation**: for confirmation of the funds subscription, redemption, switch and cancellation.

Table 14 FIN-based Funds OTDs (Continued)

OTD Name	Base	Description
mt_535_FUNDS	FIN	**Statement of holdings**: for funds balance reconciliation.
mt_574_IRSLIST	FIN	**IRS 1441 NRA**: IRS Beneficial Owners' List
mt_574_W8BENO	FIN	**IRS 1441 NRA)**: Form W8-BEN

These MT Fund OTDs apply to the funds message types in the ISO 15022 FIN Standard. The Category 5 directory contains the SWIFT MT Funds message OTDs (see **Figure 3 on page 15**).

Chapter 6

Using OTD Library Java Classes

This chapter provides an overview of the Java classes/interfaces and methods contained in the SWIFT OTD Library. These methods are used to extend the functionality of the library.

What's in This Chapter

6.1 SWIFT OTD Library Classes: Overview

The SWIFT OTD Library exposes various Java classes to add extra functionality to the library and its Object Type Definitions (OTDs). Some of these classes contain methods that allow you to set data in the library OTDs, as well as get data from them.

6.1.1 Relation to OTD Message Types

The nature of this data transfer depends on the available nodes and features in each of the individual SWIFT OTD message types. For more information on the SWIFT OTD Library's messages and message types, see **Chapter 3**.

6.1.2 SWIFT OTD Library Javadoc

The SWIFT OTD Library Javadoc is an API document in HTML format that provides information on the various classes and methods available with the SWIFT OTD Library.

You can access the **Javadoc** by selecting and uploading the **SwiftOTDLibraryDocs.sar** from the **Documentation** tab of the Sun Java Composite Application Platform Suite Installer (see **"Installing the SWIFT OTD Libraries" on page 10**). The **Javadoc** can then be downloaded from the **Documentation** tab of the Suite Installer.

Two SWIFT OTD Library **Javadocs** are provided; one for the 2003 OTD Library and one for the 2005/2006 OTD Library. Both of these are bundled together in the initial .**zip** file uploaded to the Suite Installer.

To access the appropriate ZIP file, do the following operations:

1. Extract the **Javadoc.zip** file from the Suite Installer to a temporary folder. This extracts the following two files:

- **Swift2003Javadoc.zip**: Contains the SWIFT 2003 OTD Library Javadocs.
- **Swift2005/2006Javadoc.zip**: Contains the SWIFT 2005/2006 OTD Library Javadocs.

2. Delete the **Javadoc** that does not apply to your installation.
3. Extract the appropriate **Javadoc** files to an easily accessible folder.
4. After you extract the **SWIFT_OTD_Library_Javadoc.zip** file, double-click the **JavadocOverview.html** file to begin using the **Javadoc**. This file contains complete instructions on how to use this document, as well a link that takes you to the additional **Javadoc** files.

Note: *The Javadoc for the SWIFT OTD Library is very large and may operate slowly in your browser.*

6.2 OTD Library Java Classes

The **Javadoc** shows a Java class for each OTD in the SWIFT OTD Library. For example, the class **Mt_101** includes the OTD for the MT 101 SWIFT message type. See **Chapter 3** for a complete list of the SWIFT message types/OTDs in the library.

In addition to the classes for OTDs, there are the following Java classes with methods for run-time operation:

- **SwiftMarshalException**
- **SwiftOtdChild**
- **SwiftOtdInputStream**
- **SwiftOtdLocation**
- **SwiftOtdRep**
- **SwiftParseUtils**
- **SwiftUnmarshalException**

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