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Connect XI with Sterling GIS Using SOAP HTTP Adapters

Applies To:

SAP Exchange Infrastructure v 3.0, SP15, Integration Repository and Directory. Sterling Gentran Integration Broker 3.0.

Summary

It's not uncommon for SAP XI to be integrated with Sterling's Gentran Integration Server in SAP EDI implementations. More often than not, this connection is enabled with File System Adapters. But SOAP HTTP is a viable and relatively simple alternative and provides good performance. The purpose here is to provide practical details for configuring both systems for SOAP communication with each other via HTTP.

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Date: November 14, 2005

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SOAP: A Clean Connection

It's not unusual in an SAP EDI implementation for XI to be paired with Gentran Integration Suite (GIS), with XI providing integration and routing into and out of backend SAP systems and GIS performing all the traditional functions of an EDI subsystem.

These traditional EDI functions include mapping and translation between X12 messages and IDocs, Enveloping and De-enveloping, trading partner management and security, and EDI communications through a VAN, AS2, FTP or other protocols.

Quite often this scenario uses a File System Adapter to send IDocs between XI and GIS. But we'll look at a different approach here: the use of SOAP HTTP Adapters in both GIS and XI to exchange XML IDocs between the two systems.

We'll look at inbound and outbound processes in both systems and describe how they need to be configured to enable communications between them.

Inbound in this document is always inbound from GIS into XI. Outbound is always outbound from XI into GIS. Design and configuration of the XI interfaces are not covered here. This document assumes GIS 4.0 and SAP XI 3.0 SP 14.

Inbound

GIS Inbound Configuration

EDI (and other interface) processing in GIS is handled by Business Process Models that generate BPML code. Within these BP, objects representing Services and Adapters are strung together in a processing chain. Processes can be modularized to handle a specific task (HTTP transfer, translation processing, etc.) and they can call, and be called by, other BP's.

Process Data, which as its name implies is the data produced during a BP's execution, can be passed on to the next BP called in the processing chain. Process Data is in XML format and can be read and manipulated with XPath statements.

The beauty of this is that you can pass values into Process Data at any point in the processing chain, from a variety of sources that can then be used as variables at any other point down the chain. These sources can include, but are not restricted to, configuration files, system information, lookup tables, X12 or IDoc documents, hard-coded or logically derived values, and so on.

An inbound EDI transmission is typically managed by a series of discreet BP's performing the following steps:

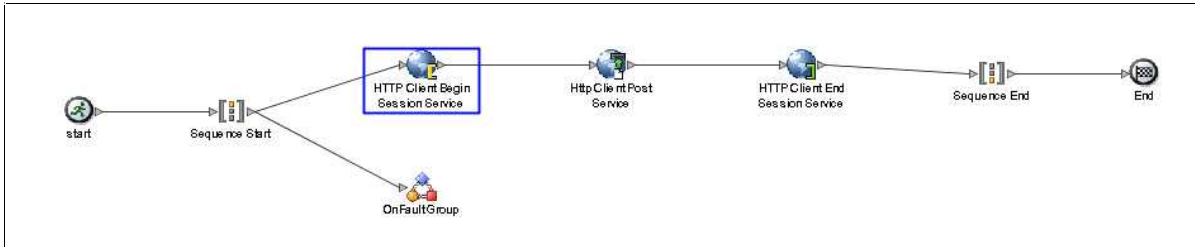
1. Receive or collect a transmission from an AS2 Server or VAN Mailbox, or other data collection point.
2. Trigger De-enveloping. This strips the ISA, GS and ST Envelopes from the transmission, and splits it into individual transactions for delivery to the mapping and translation BP. When it hits the ST Envelope, the X12 transaction set is identified and, by reading the Inbound Envelopes defined within GIS, identifies the BP used to map and translate the X12 transactions.
3. Archive, map and translate from X12 to XML IDoc.
4. Call the SOAP HTTP Adapters that handle the transmission of the XML IDoc into XI.

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Each BP is a modular processing function that performs its task and then calls the next BP in the chain. Each called BP inherits Process Data and Primary Documents used or generated by the previous BP, although this data inheritance can be controlled. The SOAP call into XI completes the EDI processing chain within GIS.

Figure 1 illustrates an inbound BP with the minimum services required for a SOAP HTTP call into XI. This BP is called from the mapping and translation BP.

Figure 1: Basic inbound SOAP Business Process in GIS can be called from other BPs.



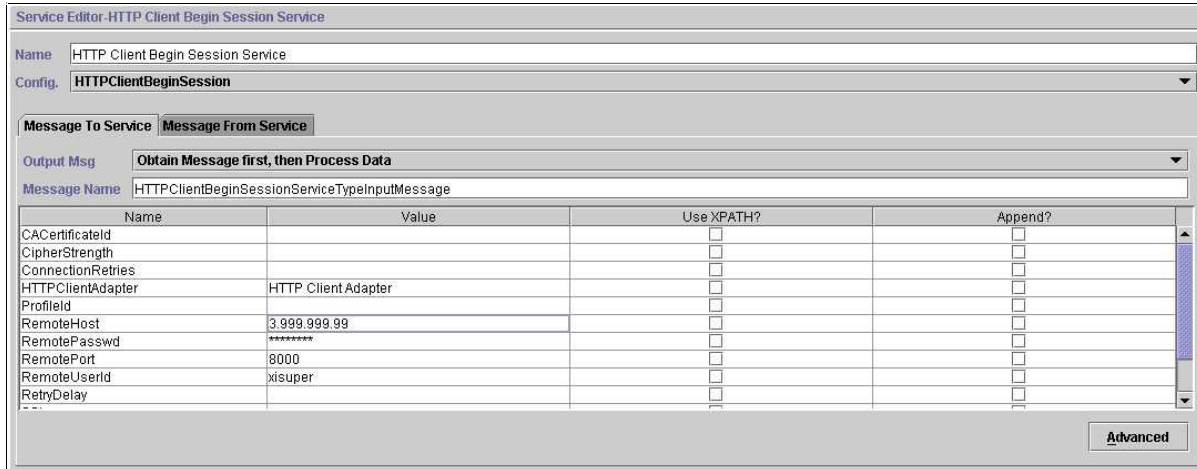
The following services are used:

1. **HTTP Client Begin.** This initiates the HTTP session with XI. Configuration options are illustrated in Figure 2. These include:
 - HTTPClientAdapter: HTTP ClientAdapter. Identifies the Adapter configuration instance.
 - RemoteHost: IP Address or Server name of the remote XI application server host.
 - RemotePassword: Password of the remote host.
 - RemotePort: Port number for XI application server.
 - RemoteUserID: User name required to access XI application server.

These options can also be stored in an XML configuration file, read into Process Data and passed to the service with an XPath statement.

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Figure 2: Configuration options for the HTTP Client Begin service.



2. **HTTP Client Post:** This builds the URL used to post the XML IDoc to the XI SOAP HTTP Sender (Inbound) Adapter. Configuration options are illustrated in Figure 3. These include:

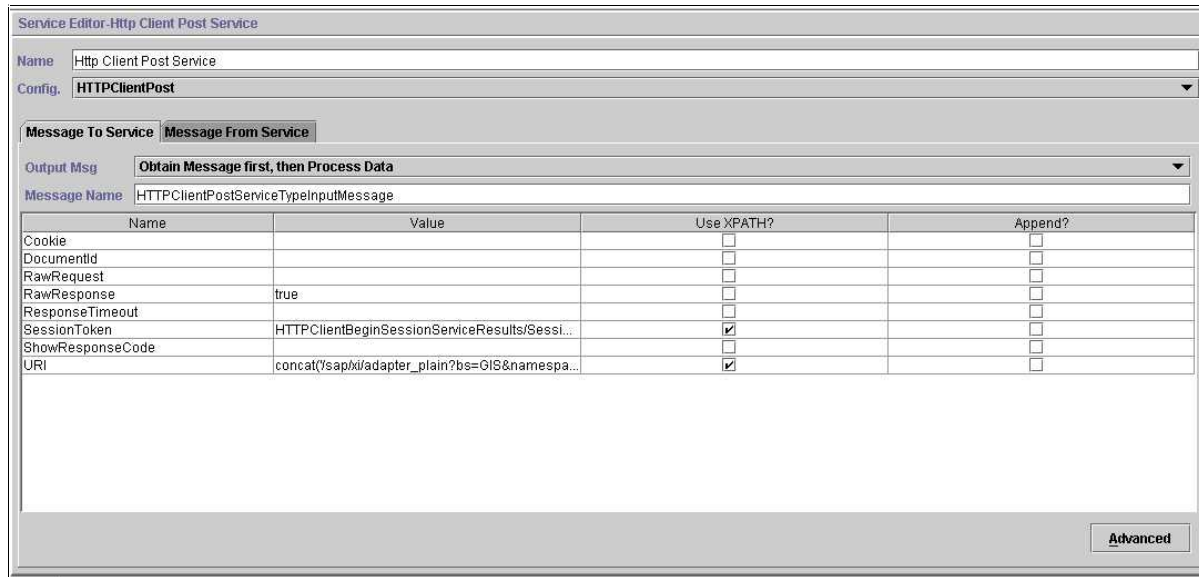
- SessionToken: An XPath statement that pulls the session token from Process Data, ie: HTTPClientBeginSessionServiceResults/SessionToken/text()
- URI: The URL that posts the XML IDoc to the XI SOAP Adapter including specific identifying information for the XI Adapter.
- Assuming that you're on XI SP14 and that Party is not being used in XI, the URI must match three parameters defined in the receiving XI SOAP Adapter:
- Default Interface Namespace.
- Default Interface Name.
- Quality of Service.

The goal is to make this as generic as possible, so that the same URI is used for all XI interfaces. The URI should be constructed dynamically, with XPath, concatenating specific XI interface data from Process Data for the current IDoc, for example:

```
concat('/sap/xi/adapter_plain?bs=GIS&namespace=',/ProcessData/ROOT/ROW/XI_INTERFACE_NAMESPACE/text(),'&interface=',/ProcessData/ROOT/ROW/XI_INTERFACE_NAME/text(),'&qos=EO')
```

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Figure 3: The HTTP Client Post service dynamically builds a URL to call the XI SOAP Adapter.



This follows documented XI requirements for the URL Post. The XPath concat function is being used to concatenate the following pieces into the URL:

```
/sap/xi/adapter_plain?bs=GIS&namespace=
```

Identifies the Adapter Command and the XI interface namespace parameter.

```
/ProcessData/ROOT/ROW/XI_INTERFACE_NAMESPACE/text()
```

Pulls the XI Interface namespace from the XI_INTERFACE_NAMESPACE element in Process Data using the XPath text() function. This value was put into Process Data in an earlier BP by reading a lookup table linking each Business Partner with key information.

```
&interface=
```

Identifies the XI interface name parameter.

```
/ProcessData/ROOT/ROW/XI_INTERFACE_NAME/text()
```

Pulls the XI Interface name from the XI_INTERFACE_NAME element in Process Data using the XPath text() function.

```
&qos=EO
```

This identifies the XI SOAP Adapter Quality of Service parameter as Exactly Once and matches a parameter set in the XI SOAP Adapter.

3. **HTTP Client End:** Reads the same Session Token as the HTTP Post service to break off the SOAP HTTP call.

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SAP XI Inbound Configuration

The basic assumption is that GIS is set up in the System Landscape Directory as a Third Party Technical and Business System and that is associated with the software products and product versions used to build your interfaces.

GIS is set up in the Integration Directory as a Business System, a Service without Party. This allows us to build generic inbound interfaces that can handle IDocs for all Trading Partners, rather than repeat configuration of each interface for each Party.

This is possible because the IDoc Adapter in SP14 can identify the Sender and Receiver from the Payload, specifically, from the Control Segment of the inbound IDoc.

The GIS Sender (Inbound) Communication Channel drives receipt of the XML IDoc from the GIS BP described above. It matches up information from the URL called by the GIS BP to configuration information in the Sender Agreement and Receiver and Interface Determination to route the XML IDoc through the XI Pipeline.

The incoming XML IDoc is mapped to itself in the XI Mapper, producing another XML IDoc that is handed off to the IDoc Adapter for translation into a standard positional IDoc and routing into SAP.

Configuration values for the GIS Sender SOAP Communication Channel are illustrated in Figure 4. The following parameters are required:

1. **Adapter Type:** SOAP, with Sender selected.
2. **Transport Protocol:** HTTP
3. **Message Protocol:** SOAP 1.1
4. **Adapter Engine:** XI Application Server, selected from a drop-down list populated by the SLD.
5. **Conversion Parameters:** Optional.
6. **Default Interface Namespace:** A critical parameter. This is the namespace defined in the Integration Repository for your Interface, and must correspond to the Interface Namespace parameter in the URL called by the GIS HTTP Adapter, for example:

urn:invoic02_to_invoic02:in

7. **Default Interface Name:** Another critical parameter. This identifies the interface defined in the XI Integration Repository that will be called and must correspond to the Interface Name parameter in the URL called by the GIS HTTP Adapter.

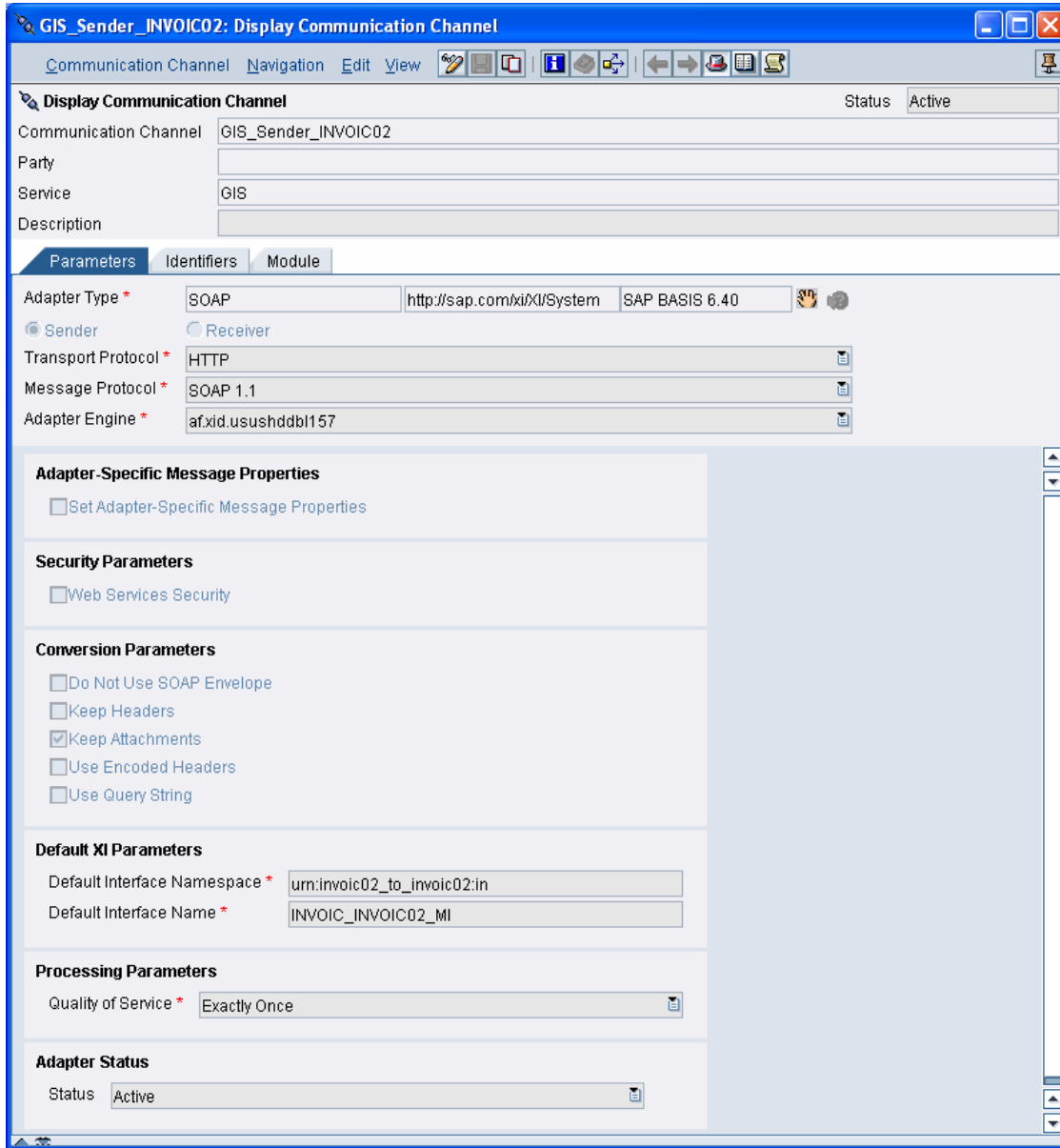
The practical consequence of the Interface parameters is that one Communication Channel is required for each separate Interface Namespace-Name designed in the XI Integration Repository and configured in the Integration Directory.

The number of Communication Channels you need to create is determined by your interface design approach. Our current model entails one namespace and interface for each IDoc being processed.

8. **Quality of Service:** Exactly Once. Other options include Best Effort and Exactly Once in Order. Whichever option is chosen, it must be specified in the qos parameter in the URL used to post the XML IDoc from the GIS BP.

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Figure 4: Configuration options for the SAP XI GIS Sender (Inbound) Communications Channel.



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Outbound

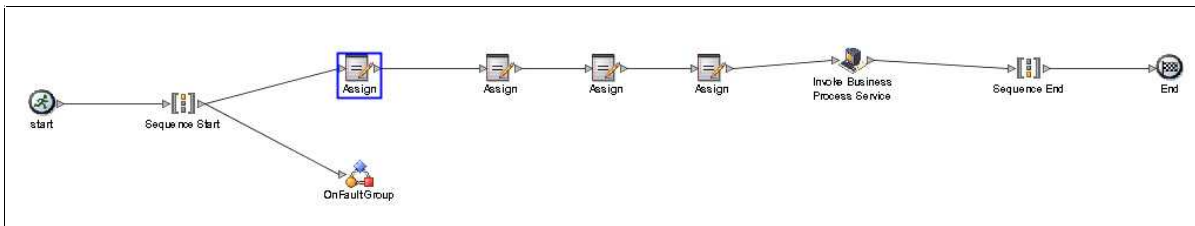
GIS Outbound Configuration

To enable outbound processing in GIS (from SAP) the HTTP Server Adapter Service is configured with a URL and a receiving BP for XI to post to.

A receiving BP is illustrated in Figure 5. Following best practices, which segregate BP's by function, it is limited to assigning variables to Process Data that are provide data to subsequent BP's to support mapping and translation, enveloping and routing services that take it all the way through to the communications servers and the Trading Partners beyond.

After assigning its variables to Process Data, the receiving process calls the main mapping and translation BP. The only purpose of this BP is to be triggered by the HTTP call from XI and to receive its incoming XML IDoc and to initiate the outbound EDI processing chain.

Figure 5: An outbound BP is required in GIS to receive the XML IDoc from XI.



To get to the HTTP Server Adapter configuration in GIS, select Deployment > Services > Configuration and enter its name in the selection screen.

Base configuration options such as the HTTP Listen Port and Perimeter Server Name were set up at installation and initial configuration (see Figure 6). The key here is to define the XI URI and to name the Receiving BP that it will call. This is illustrated in Figure 7.

The base URI is the IP address or Server Name of the GIS Target Server with its listening port. An XI subdirectory is added. This URI is used to configure the XI outbound Communication Channel.

GIS is now set up to receive XML IDocs from SAP XI.

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Figure 6: GIS outbound HTTP Server Adapter base Connection Properties.

▶ Http Server Adapter	
Service Settings	
Service Type	HTTP Server Adapter
Description	An HTTPServerAdapter instance operating in local mode
System Name	HttpServerAdapter
Group	None
HTTP Listen Port	60033
Perimeter Server Name	node1 & local
Document Storage	Database
User Authentication Required	No
Use SSL (Note: User Authentication without SSL will result in a weak security configuration)	None

Figure 7: XI configuration.

URI	URI: /SAP/OUTBOUND Business Process: NBCU_SAP_OUTBOUND_HTTP_XI Send Raw Messages: No
-----	---

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SAP XI Outbound Configuration

The GIS Receiver (outbound from XI) Communication Channel is assigned to a GIS Business System set up in the Integration Directory as a Service without Party. Unlike the Sender Channel, it is not interface-specific so only one is required for all outbound interfaces.

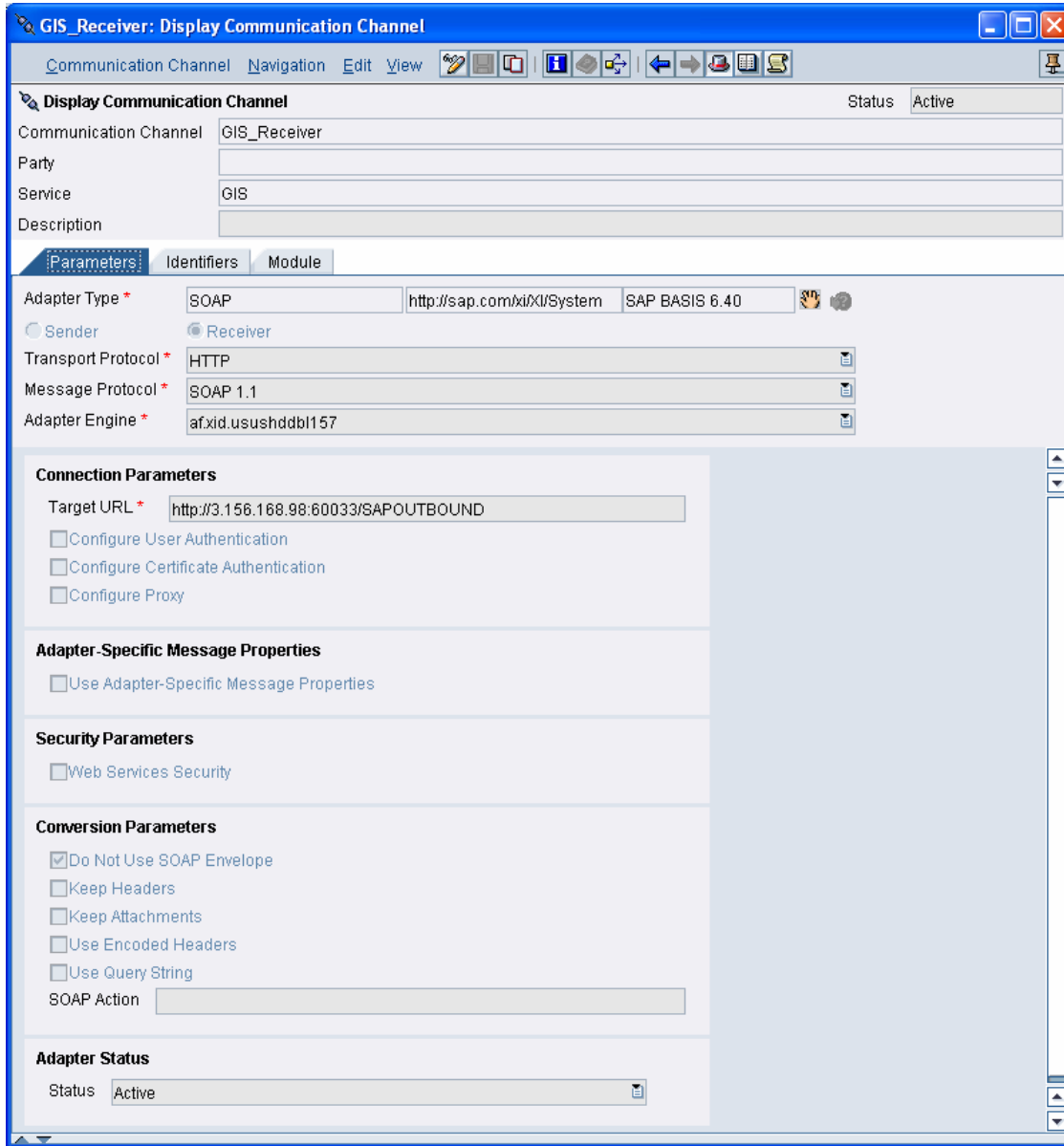
The GIS Receiver Communication Channel is associated with the Receiver Agreement for all outbound interfaces. Configuration values are illustrated in Figure 8. The following parameters are required:

1. **Adapter Type:** SOAP, with Receiver selected.
2. **Transport Protocol:** HTTP
3. **Message Protocol:** SOAP 1.1
4. **Adapter Engine:** XI application server. Selected from a drop-down list populated by the SLD.
5. **Target URL:** Provides connection parameters to GIS through the URL set up in the GIS HTTP Server Service. The URL structure is:
`http://<IP or Server Name>:<Listening Port>/<SAP XI subdirectory>`
6. **Conversion Parameters:** Optional.

This configuration does not require authentication on the GIS side. Assuming you can get inside the firewall, any browser that calls this URL can trigger the receiving BP in GIS.

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Figure 8: Configuration options for the SAP XI GIS Receiver (Outbound) Communications Channel.



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Author Bio



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Emmanuel Hadzipetros has been an SAP contractor and consultant for more than 11 years, since R3 version 2.2. He has intimate and detailed knowledge of the IDoc interface and other standard SAP and external integration tools and technologies and has used this knowledge in more than 10 SAP implementations representing a wide variety of industries in four countries and three continents.

For the last four years Emmanuel has gone Hollywood as a key fixture on two major Studio implementations where he helped lead the SAP development effort in building complex VMI-based EDI transactional processing systems supporting billions of dollars a year in Video and DVD sales.

Emmanuel currently lives with his son Johnny in Westlake Village, California. He is SAP EDI Development Lead at NBC Universal Home Entertainment, where he is actively involved in all phases of designing and implementing a dynamic EDI architecture that includes Gentran Integration Suite for EDI services, Contivo Analyst for mapping, XI for integration logic, and SAP R3 as the enterprise system of record.