TECHniques
TECHNICAL TIPS AND TRICKS FOR THE SOFTWARE AG COMMUNITY

April 2008

Technology **SPOTLIGHT**

Modernize Your Core COBOL Applications with webMethods EntireX

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In order to quickly offer new products and services to clients, businesses today need a great deal of flexibility. For a long time they could rely on their core COBOL applications to meet their business needs. However, these applications, with their lengthy change cycles, are not flexible enough; they cannot support the rapidly changing business models driven by increasing competitive pressures. Yet replacing these core systems does not make sense—the ROI is just not there, and they still contain a wealth of information central to the business. With globalization, the business need is stronger than ever to effectively leverage the information and intelligence these systems contain. A classic example is the airline reservation system that now needs to also support a comprehensive range of travel services today – a far different business requirement than when these systems were originally designed and implemented.

We need a way to easily leverage the investments in these applications in order to gain new business and increase the business competitiveness. With webMethods EntireX you can quickly transform the flexibility of your core COBOL applications—allowing you to deliver new business services in just a few days or weeks. The latest EntireX release provides even more enhanced COBOL support for maximum business readiness. Based on webMethods EntireX RPC technology, EntireX is both reliable and modern, providing state-of-the-art mainframe integration with over 10 years proven performance and robustness in many mission critical environments.

Using EntireX you can integrate your core COBOL applications with webMethods ESB, Web services, Java, .NET and other environments to reach a broad range of COBOL transactions. The bi-directional integration allows you, for example, to use a Web service to call a COBOL transaction and (vice versa) have a COBOL program call a Web service. In addition, your developer's productivity is greatly enhanced with the EntireX Workbench, the 100% Eclipse-based development environment. EntireX Workbench is user-friendly and provides wizards, views and an optimized user interface for increased efficiency. You are

able to quickly deliver new business services because webMethods EntireX integrates useful tools with its comprehensive COBOL support, so you can:

- Use local or remote mainframe PDS source files.
- Extract server interfaces directly from COBOL sources and copybooks.
- Perform user-driven mapping.
- Automatically deploy server mapping.
- Automatically generate client and server code.
- Directly test your server connection or implementation.

This article provides an overview of the webMethods EntireX COBOL mainframe solution, touching on the comprehensive COBOL support it provides. We also note the tools and features of highest interest.

webMethods EntireX COBOL Technical Overview

The webMethods EntireX COBOL mainframe solution uses the Software AG IDL Extractor for COBOL and the EntireX COBOL Wrapper. The Software AG IDL Extractor for COBOL inspects the COBOL sources and copybooks, extracts IDL from the server sources and generates the desired client interface. The EntireX COBOL Wrapper encapsulates functionality to provide bi-directional RPC connectivity between the mainframe and other sources. With EntireX you can reach many types of mainframe transactions, e.g. CICS, Batch, IMS; z/OS, z/VSE. EntireX provides enhanced support for COBOL Interface Types (Figure 1) and COBOL syntax, user-driven mapping, as well as asynchronous and reliable message wrapping.

EntireX supports these COBOL Interface Types:

- CICS with DFHCOMMAREA Calling Convention (for DPL enabled)
- CICS with DFHCOMMAREA and Different IN / OUT Structures
- CICS with DFHCOMMAREA Large Buffer Interface** / ***
- CICS with DFHCOMMAREA Large Buffer and Different IN / OUT Structures
- CICS with Channel Container Calling Convention**
- Batch with Standard Linkage Calling Convention
- IMS BMP with Standard Linkage Calling Convention (with PCB pointers)
- Other interface types can be supported by means of a custom wrapper

**This allows us to exceed the 32K limit.
***This interface is the same as the webMethods WMTLSRVR interface of webMethods Mainframe (MIS).

Figure 1: EntireX-supported COBOL Interface Types

Software AG IDL Extractor for COBOL

The Software AG IDL Extractor for COBOL has wizards, tools, editors and generators (Figure 2) that allow you to easily extract and map the Software AG Interface Definition Language (IDL), and deploy, validate and test the results. The Software AG IDL can be extracted from either local or remote mainframe PDS sources; the extractor wizard inspects COBOL sources and related copybooks for data items to be extracted. You can specify the COBOL data items that form the COBOL INOUT parameters of your server program (Figure 3). The process generates two related files, referred to as IDL and SVM:

- The IDL file is the Software AG IDL (interface definition language) file containing the modeled interface of the COBOL server. This file will be the starting point for the RPC client-side wrapping generation tools that generate the client interface objects.
- The SVM file is the Software AG server mapping file that completes the mapping and it is required by the RPC server during runtime to call the COBOL server. With the EntireX Workbench deployment wizard you can deploy the server mapping to the RPC server.

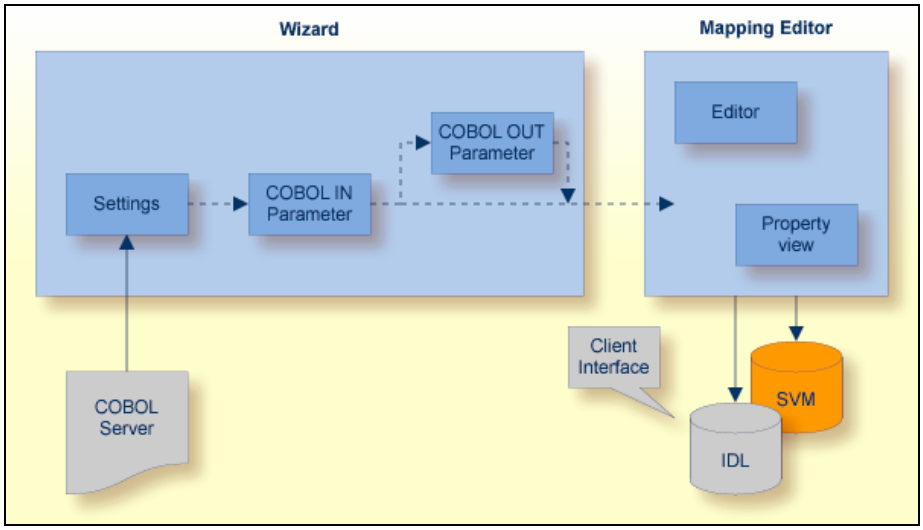

Figure 2: The Software AG IDL Extractor for COBOL Wizard and Mapping Editor

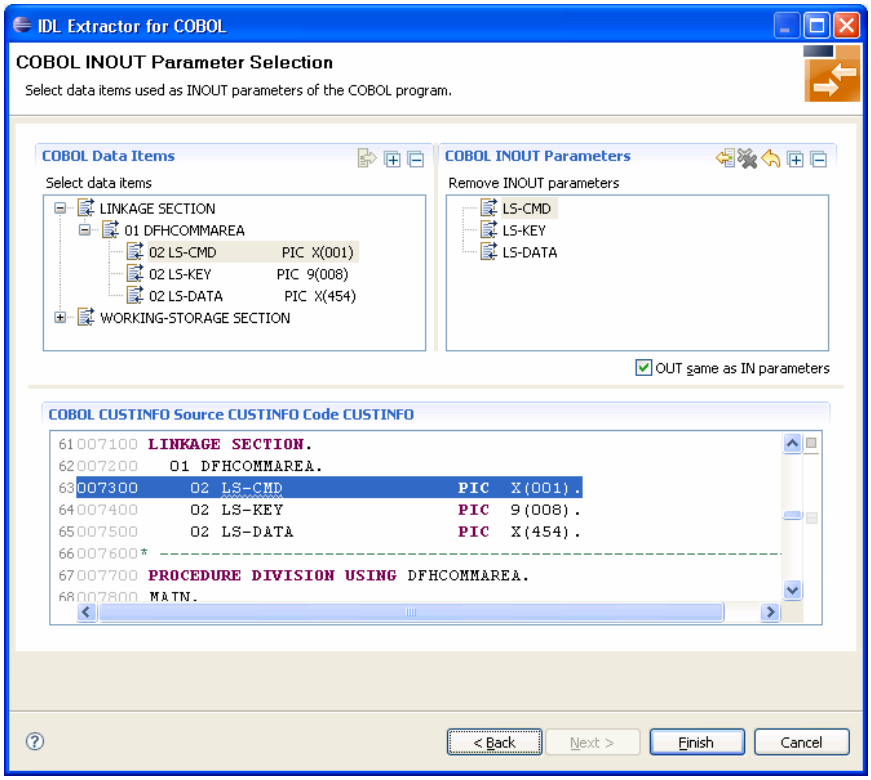

Figure 3: Select COBOL Parameters

The Software AG IDL Extractor for COBOL wizard allows you to:

- Access COBOL source files from either local or remote mainframe PDS members; to aid your source file/member selection, you can browse your directories (locally) or the mainframe PDS sources (remotely). In addition, you have the option to save remote COBOL sources to your local environment.
- Resolve COBOL copybooks and copybooks with the REPLACE option.
- Manually select and map the COBOL server interface (using the Mapping Editor); this allows extraction when the interface definition has not been completely given making automatic parameter detection impossible.
- Define default mapping for pseudo-parameter FILLER fields and alphanumeric fields.

The Software AG IDL Extractor for COBOL can map most COBOL data types, including:

- Condition Names – LEVEL 88 Data Items (supports user-defined mapping for constants, map to operation).

- SIGN LEADING and TRAILING SEPARATE Clause.
- Tables with Variable Size - DEPENDING ON Clause ("unbounded arrays").
- Unstructured Data Types - LEVEL 77 Data Items.
- REDEFINE (supports user-defined mapping).

Mapping Editor

The IDL Extractor for COBOL Mapping Editor (Figure 4) is the tool to map the COBOL server interface to the Software AG IDL. The Mapping Editor GUI supports the user-driven mapping process and allows users to define mappings that fit their business needs right from the start. In addition, sometimes COBOL source programs do not contain all the information needed for IDL mapping, so you can also use the Mapping Editor to manually enter any missing data. The Mapping Editor has user-friendly features that help speed up the process of mapping using visual guides, such as specific icons for COBOL parameter wrapping and Level-88 data items, as well as decision markers that alert you where a choice is needed. In the mapping editor you can define:

- Which COBOL server parameters are mapped to Software AG IDL (select REDEFINE paths, suppress or hide unneeded server side fields).
- How COBOL server parameters are mapped to Software AG IDL (Map to IN, OUT, INOUT).
- How COBOL server parameters are provided to the COBOL server (Map to Constants, Map to Operations).

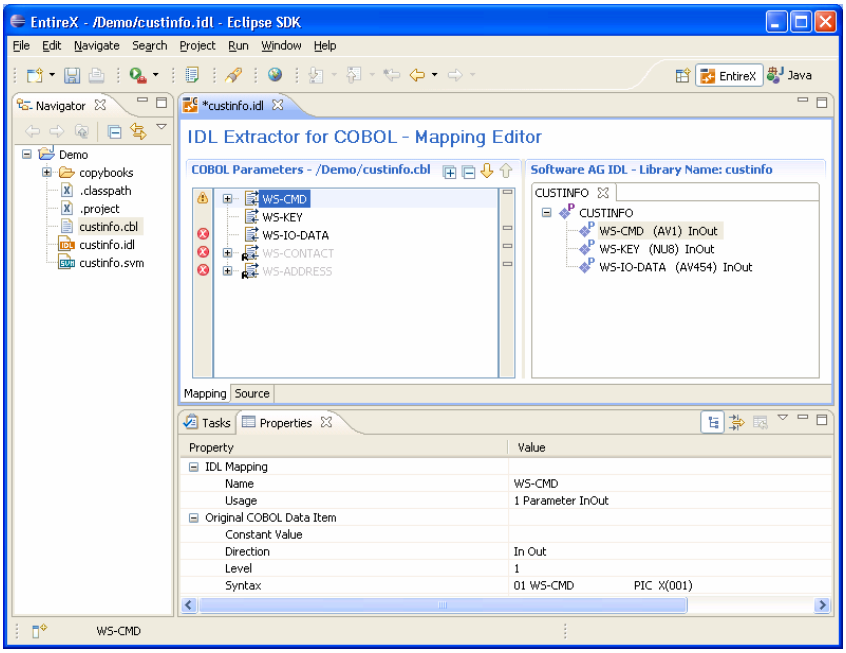

Figure 4: Software AG IDL Extractor for COBOL Mapping Editor

You use the "Map to Operation" for multiple business functions controlled by an operation or function code field. If the Software AG IDL is processed further with a workbench wrapper, then business functions can be provided as Web service operations (if exposed as a Web service) or methods (if wrapped with the Java or .NET wrappers).

Software AG Server Mapping Deployment

Deployment of Software AG server mapping files is supported by a wizard; this requires an active RPC server and an RPC server deployment service. Manual deployment is also possible with FTP and IDCAMS.

EntireX COBOL Wrapper

The EntireX COBOL Wrapper enables development of both clients and servers to access RPC-based components from COBOL applications, i.e. RPC servers for COBOL client applications and COBOL servers for any RPC client. The COBOL Wrapper uses the COBOL interface (Figure 1) when generating the server skeleton.

EntireX Workbench COBOL Wrapper tools generate the COBOL sources that implement the interface objects, i.e. the functions and data types of the interface. The generated functions can be compiled and linked with the COBOL compiler of the target platform. The Software AG IDL file describes the RPC interface and is used as input to generate the COBOL code. By using application error codes in a standardized way, the RPC server is able to return customer-defined errors to the RPC client without needing to define IDL error code fields.

Developers use the generated client interface object(s) and copybooks to write COBOL client applications that access RPC servers. For COBOL server applications, developers use the generated server skeleton to write their own server code for each program in the IDL.

Introduction to Reliable RPC

Reliable RPC was a customer-requested enhancement developed to provide support for asynchronous and reliable service calls on an RPC level. With Reliable RPC, your processes can span multiple systems or applications without a loss of performance. It is used to send messages to a persisted EntireX Broker service; messages described by an IDL program that contains only IN parameters. The client and server COBOL interface objects are generated from the IDL file using the EntireX COBOL Wrapper. Reliable RPC is enabled at runtime; and the 8.0 RPC Server is implemented and configured in the same way as for normal RPC. The 8.0 RPC Server and applications within will only need regeneration if you wish to enable Reliable RPC. Now with Reliable RPC you have the same level of user-friendly, Eclipsed-based GUI support for both asynchronous and synchronous service calls.

Summary

The webMethods EntireX COBOL integration is state-of-the-art and provides comprehensive COBOL support, performance and reliability. Its user-friendly tools help increase productivity with point-and-click generation to rapidly modernize your core COBOL applications. EntireX effectively bridges the gap between your mainframe core systems and newer technologies such as BPM and SOA, to bring the organization to new levels of business flexibility and competitiveness. With EntireX you can fully capitalize on your mainframe investments to quickly realize highly-competitive business products and services today.

Glossary of Terms

BPM: Business Process Management
DPL: CICS Distributed Program Link
ESB: Enterprise Service Bus
FTP: File Transfer Protocol
GUI: Graphical User Interface
IDCAMS: An IBM program that is used to process access method services commands
IDL: Software AG Interface Definition Language
MIS: Mainframe Integration Server; same as webMethods Mainframe
PCB: Program Communication Block - a control block that contains pointers to Information Management System (IMS) databases.
PDS: Mainframe Partitioned Data Set
RPC: Remote Procedure Call
SOA: Service-oriented Architecture
SVM: Software AG Server Mapping file
webMethods WMTLSRVR interface: Large Buffer based CICS Server interface for large message sizes; used by webMethods Mainframe (MIS)