BOX Messaging Hub – MERVA Replacement

Intended Audience

The document is intended to be read by business managers, system architects, and system administrators who are considering or working on a MERVA replacement project. It describes how MERVA specific functions can be implemented in BOX Messaging Hub (BOX) – the financial messaging solution from INTERCOPE.

For general information about BOX please refer to the document "BOX – Solution Overview"

The Challenge

One unique solution for SWIFT FIN

IBM's MERVA (Message Entry and Routing with Interfaces to Various Applications), originally developed in the 1980s, evolved into a de facto standard for SWIFT FIN. MERVA covered all relevant aspects of SWIFT message handling in one unique solution including the network layer via X.25, the security layer via bilateral key exchange (BKE), and the application layer via a large set of functions and customization options.

However, MERVA does not support the current IP based SWIFT network, the required Relationship Management Application (RMA), XML based MT messages, and the SWIFT services InterAct and FileAct. Nevertheless, MERVA is still in use in large financial organizations together with complementary software components providing the missing protocols and functions.

Fragmented set of technologies

This has typically led to a situation where MERVA users had to introduce a fragmented set of technologies to address their business needs with significant implications from an operation, business risk and cost perspective. Additional complexity and costs arose in many cases due to the prerequisites of these solutions requiring several additional middleware components.

BOX Messaging Hub

Intercope's BOX Messaging Hub (BOX) was explicitly designed to address all MERVA functionality, such as back office integration, a user interface, manual message processing functions, and routing and printing services.

A single integrated product

This allows MERVA customers to migrate to a single integrated product storing all relevant data objects in one unique database and providing high availability based on cluster configurations. This solution addresses all current and future SWIFT requirements whilst at the same time streamlining operations and significantly reducing hardware and software costs based on the factors summarized below:

- Technology with the capability to replace and optimize the business logic implemented in MERVA.
- Technology capable of keeping or migrating existing applications interacting with MERVA without necessarily requiring changes in those applications.
- A supplier with deep MERVA knowledge and experience and a product strategy focused on depicting MERVA objects, processing logic, security and confidentiality mechanisms within a single integrated product environment.

Minimizing migration risks

The remainder of this document describes how and why the challenges faced by organizations wanting to move their MERVA installations to a new strategic platform can be met using Intercope's BOX software components and services. By using Intercope's technology and resources, organizations can minimize MERVA migration risks and cost, and at the same time retain the rich MERVA functionality whilst exploiting state of the art technology.

Routing

Performance optimized workflow engine

The BOX routing component has been designed by a team of MERVA experts following a thorough study of MERVA routing facilities and their use in live customer installations. The result is a performance optimized workflow engine capable of handling all the routing options found in MERVA systems. All fields of a message can be analyzed including header information, user defined fields and information generated by BOX.
As a result of this analysis multiple routing destinations can be assigned including specific back office applications, printers, and queues for manual intervention.

Saving hundreds of MERVA queues

In addition, the BOX User Profile Management (UPM) provides a very powerful tool for SWIFT messaging authorization, and especially for any MERVA migration. Analysis of actual customer MERVA installations revealed that very often hundreds of MERVA queues were used with the only objective being to control message access. As part of the migration to BOX this highly complex queue structure can be replaced by a simple, coherent and transparent definition of organizational units and message ownership.

A browser-based user interface is provided to help define the routing rules. and the UPM.

Printing

All printing options of MERVA

MERVA users make extensive use of the automatic and manual printing functions and Intercope's studies revealed this to be a high priority requirement for any replacement solution. As a result, all the printing options of MERVA have been taken into consideration during BOX development. In particular network printers can be defined as one of the various routing destinations and manual printing functions are available for most functions supported by the graphical user interfaces.

Message Entry and Repair

User friendly web-based GUI

MERVA users who have migrated to BOX have been delighted to find all the functionality previously available via the 3270 green screens, but now provided through a modern, user friendly, web-based GUI. Several levels of context sensitive online help are provided together with error checking including field related access to SWIFT user handbooks.

Queues

All functions of MERVA queues

Like MERVA BOX includes a queue concept to handle messages which require some form of manual intervention such as an authorization or correction, or they are waiting for a system event such as the receipt of a SWIFT ACK or NAK. The messages in these queues can be accessed via the BOX GUI under various selection criteria and a predefined set of actions can be performed by authorized users. In addition, these application queues can incorporate certain specific attributes of MERVA queues such as being started and stopped or launching external applications.

User Profile Management

Queues in MERVA are also used extensively to restrict message access to specific user groups. In BOX message access is controlled by the User Profile Management settings. This leads to a major simplification in the definition of routing rules as well as to performance enhancements because no routing or copying of messages has to be executed for this purpose. In addition, the significant administration task of designing, defining and maintaining these queues is eliminated.

In summary BOX includes all relevant options and functions of MERVA queues and more, based on a powerful User Profile Management, a universal concept of application queues and views on the message database.

Message Enrichment

User Data processing

User Data is a feature of MERVA allowing external applications or processing steps in MERVA itself to include user or application specific data in a message. This data is not only stored in the MERVA message but can also be used for routing purposes in MERVA.

This requirement has been considered in the BOX design and BOX provides similar functionality. The information can be provided through application interfaces such as MQ or via the MERVA API emulation. User data can be displayed in BOX Journals and Application Queues. The data can be filtered and searched for by standard BOX search and filter functions and can be analysed for routing decisions.

In addition to the configuration options of the graphical user interface it is also possible to customize screens using X-HTML syntax. This is particularly helpful for visualizing customer specific user data and offers a high degree of flexibility for implementing customer specific requirements such as those previously available with MERVA MCBs.

Financial Message Transfer

No cost message transfer

With MERVA it is possible to transfer SWIFT messages directly between MERVA systems thus avoiding the cost which would otherwise be incurred if the messages were sent through the SWIFT network. BOX fully supports this type of Financial Message Transfer (FMT) so that no transmission cost occurs when messages are transferred between several BOX systems, or BOX and any other application supporting the FMT format.

Message validation and RMA permission check

Web Services

Best operations practice demands the detection of any potential problem with a message as early as possible to enable corrective action at an early stage in the message life cycle. For this purpose, BOX offers two specific functions implemented as Web Services:

- The Validation Service allows an application to send a message to the service and to receive a reply indicating whether the message passed validation, or if not, which syntactical or semantic errors occurred
- The Authorization Service checks if an RMA authorization exists for a specific correspondent and specific message type and returns the result to the calling application.

With these Web Services BOX provides the same functions as the former MERVA BKE lookup and the MERVA message validation API call, but through a modern, future-oriented interface fitting into the strategy of a Service Oriented Architecture (SOA).

SDI / SDO

Batch Input and Output

BOX offers features enabling a customer to continue using MERVA- specific batch input and output functions. This feature eases a migration from MERVA to BOX and provides an emulation of the MERVA sequential dataset (SDS) programs DSLSDI and DSLSDO.

The functions provided in MERVA to import SWIFT FIN messages from a sequential MVS dataset and to export FIN messages into a sequential MVS dataset are supported. The format of the FIN messages should be SWIFT 2 wire format. Given this format no changes are required in the structure of these datasets or in the syntax required to load the MERVA programs DSLSDI and DSLSDO. Recovery and restart functions are provided, and the tool has been designed and tested for high volume data throughput.

Although the modules emulating DSLSDI and DSLSDO must be installed and run on the mainframe, BOX software itself can run on any other supported operating system as the communication between the emulation and BOX is based on MQ interfaces.

MERVA API

Emulation of DSLAPI

To further ease migration from MERVA, BOX includes an emulation of the most important services provided by the IBM program DSLAPI including Queue Management Services, TOF (Tokenized Form) Services, and Message Format Services. This feature enables customers to keep existing applications that exploit the MERVA API without necessarily requiring changes and is offered following analysis of a customer's specific requirements.

As with the SDI/SDO feature the modules emulating DSLAPI must be installed and running on the mainframe, but the BOX software itself can run on any other supported operating system as the communication between the emulation and BOX is again based on MQ interfaces.

Implementation

Analysis of complex environments

MERVA replacement projects require a detailed analysis of the existing MERVA environment which typically has grown over many years and can be highly complex and include:

- Hundreds of even thousands of MERVA queues
- Complex message analysis and routing algorithms to determine the recipient(s) of specific messages
- Specific attributes of MERVA queues such as start-stop functions and message enrichment by external applications
- Batch functions to load and unload messages from MERVA queue to sequential datasets
- Interaction with customer transactions through the MERVA API
- Usage of MERVA Reconciliation for statistics, reports and end of the day processing

Step by step migration strategy

INTERCOPE has helped several large customers with this complex exercise, defined together with those customers a step-by step migration approach minimizing operational risks and successfully implemented this strategy without any interruption of the production environment. Examples for these projects can be found here:

- *Finanz Informatik* - one of the first migrations from MERVA to BOX in 2010 for Berliner Landesbank
- *s IT Solutions* - a MERVA replacement for Erste Group which has been realized in close cooperation with IBM

Summary

Streamlined processing and simplified configuration

Intercope designed BOX for SWIFTNet with the explicit objective of enabling customers to make a smooth migration from MERVA to new state- of–the-art technology while at the same time simplifying and reducing the administrative requirements for SWIFT messaging. Intercope's detailed investigation and analysis of complex MERVA installations formed the basis of the functional requirements for the BOX solution. Several new innovative concepts have been introduced, such as virtual queues, and a powerful User Profile Management capability. These innovations allow streamlined processing and simplified configuration, operation and maintenance. This design allows the user to eliminate hundreds of formerly required MERVA queues, whilst keeping and extending the rich functionality provided by MERVA.

Successful MERVA replacement project

Based on the flexibility of the BOX solution and the outstanding competence of Intercope staff in the areas of SWIFT and MERVA implementations, several complex MERVA replacement projects have been successfully terminated - typically using a step-by-step approach to provide a phased migration. Intercope is actively involved in these migration projects providing expert on-site consultancy through experienced MERVA and BOX consultants to define the optimal BOX configuration options to meet each customer's specific requirements.

INTERCOPE