Using MQSeries Link for Lotus Notes with IBM′s FlowMark for MVS Application Integration Feature

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Preface

This document is addressed to those who are considering using IBM's MQSeries link for Lotus Notes to access MVS resources from Lotus Notes environments or to invoke Lotus Notes from MVS applications. The document outlines how IBM's Application Integration Feature (AIF) of FlowMark for MVS enhances the use of the MQSeries link for Lotus Notes in integrating MVS data and applications with Lotus Notes environments. It will be of particular interest to companies that have made strong business commitments to Lotus Notes and MQSeries throughout their enterprises.

Introducing AIF

AIF is a new MVS/ESA environment for message-driven processing applications built on MQSeries for MVS/ESA. Because new and existing MVS applications can be ″threaded″ together with AIF messages, new forms of controlling business processing can be achieved. AIF can support new technology front-ends, (e.g. web requests, or Lotus Notes requests), and manage the flow of information and work between new client applications and existing MVS transactions. For example, a single request can be used to aggregate all customer account information from multiple and perhaps different data base implementations to supply a complete response to a client request.

AIF supplies new programming and administrative services that lets you:

- Develop and manage ″message-driven″ applications more easily than using native MQSeries facilities. The AIF environment provides facilities that setup and automate such areas as: queue creates, queue manager connections, triggering, application version control, message correlation management, and recovery level support. These services are provided through new APIs for the programmer, and new panel driven facilities for the administrator.
- Use AIF messaging APIs to integrate and re-use existing transactions without change. This is accomplished through agents or ″spokes″ that will be defined below.
- Support complex request management where a single input request can spawn further requests. This capability can be used to integrate different back-end environments and data bases to provide a single result to a client. For example, customer information can be retrieved from all accounts (e.g. banking, insurance, etc.) and returned to a workstation as a single response.
- Configure and change elements of the environment such as adding new applications, queues, address spaces, on a dynamic 24x7 basis. Based upon customer policies, AIF automates threshold management for high volumes of message traffic to assure responsiveness, scalability, and performance. AIF agents can be designed to handle thousands of concurrent requests with recovery and performance. Currently available with AIF, are agents for FlowMark and Lotus Notes Link messages, with others under development.
- Develop mission-critical messaging applications through AIF′s exploitation of MVS/ESA, CICS/ESA and MQSeries industrial strength facilities

Building on MQSeries (TM) for MVS/ESA, AIF message-driven applications are used to control business request processing with messaging services that manage the flow of information and work between client and server applications. AIF implements a ″hub and spoke″ approach to application integration. Airlines have adopted this approach to provide simpler passenger connectivity options and to reduce scheduling and traffic costs. Rather than have a myriad of direct connections between cities, it is advantageous to have routes connected to a hub or a switch location. In our analogy, MQSeries messages are the arriving and departing ″aircraft″.

The spokes, or agents, are the various customized client applications with their network connections and data and format transformations that enable communication between AIF and client and server applications. The agent portion of the spoke transforms network and data protocols from clients or servers into an internal MQ message format that AIF uses. Conversely, other agents map AIF/MQ messages into the protocols that clients and servers expect. Using spokes, AIF can support any kind of request using any network protocol that is supported on MVS.

An example of a spoke is the AIF support for interoperability with the MQSeries link for Lotus Notes. AIF also currently provides spokes to IMS, CICS, and FlowMark applications and processes, with more planned. Using the high-level interfaces that AIF provides, you can develop your own spokes for connecting to AIF virtually any client and server in the enterprise.

AIF serves as the integration hub. Upon receiving a client′s business request from a front-end spoke application, AIF invokes appropriate server applications to execute the request, aggregate the results, and return a response to the client. To perform the business logic of an AIF server, AIF uses scripts, which are CICS programs. These CICS programs use new APIs to send and receive messages for processing the sequence of transactions required to satisfy that request. A script may also be written to communicate MVS events to Lotus Notes users. AIF provides APIs that enable any MVS application in any MVS environment to schedule and execute an AIF script.

An MQSeries Link for Lotus Notes Refresher

The IBM MQSeries link for Lotus Notes, referred to as the Notes MQ link in this paper, enables Lotus Notes users to connect to all IBM and non-IBM platforms that support MQSeries. The Notes MQ link executes on the Lotus Notes server. Included in the product are services to:

- Support a Lotus Notes database that holds information to be sent to and received from the host.
- Setup a Lotus Notes mapping database, which maps the information from a Notes format into an MQSeries format, and vice-versa.
- Establish the MQSeries environment.

Basically, the Notes MQ link supports the two-way exchange of data between Lotus Notes and MQSeries. The Notes MQ link executes on many LAN Lotus Notes servers such as OS2, AIX, HP, NT, (and others to come), and generates MQSeries messages in response to requests from Lotus Notes clients. The Notes MQ link sends MQSeries messages to target applications on other platforms, including AIF on MVS.

MQSeries can also be used by applications on other platforms to communicate with Lotus Notes clients. Mapping support in the Lotus MQSeries link can perform data mappings in both directions, from Lotus Notes to MQSeries messages and vice-versa. Inbound MQSeries messages can be directed to an appropriate Lotus Note client. Initially, this inbound MQSeries support to a Lotus Notes server will be provided by an MQSeries SupportPac.

Why AIF ?

While the MQSeries Link supports ″outbound″ LAN connections, AIF support delivers a ″message catcher″ on MVS that can handle large volumes of requests and do new kinds of processing with those requests. What follows is the synergy possible by using Lotus Notes as the ″trigger″ for new kinds of processing.

AIF provides the following benefits to Notes MQ link users:

- Lotus Notes can use the facilities of AIF to start or access applications across multiple platforms connected to MVS/ESA more easily than using MQSeries only. In fact, AIF will enable you to connect to platforms that don′t run MQ today.
- Lotus Notes can be used to trigger complex requests on AIF. These in turn can re-use existing MVS transactions, or consult multiple data bases to provide single views to support for example, customer relationship management.
- AIF facilitates new data location and management options for Lotus data.
- By connecting to AIF, new enterprise wide relationships between FlowMark and Lotus Notes across all LAN sites are made possible.

In summary, the opportunity for using Lotus Notes as a strategic client in an enterprise is greatly expanded because of the new capabilities MQ brings to the table, and the ability of AIF requests to exploit these capabilities.

AIF Benefits

Integrate Applications with Lotus Notes: AIF′s hub and spoke approach greatly simplifies enterprise-wide connectivity for Lotus Notes. Agents support connectivity to applications on any platform connected to MVS. Lotus Notes users will not only be able to access MVS applications and data, but will have access to other functions and data previously linked to AIF. AIF′s value increases significantly as customers connect more clients and server applications.

MVS applications, in turn, can initiate processing in Lotus Notes environments. Using AIF APIs, MVS applications can be written or modified to communicate with a Lotus Notes server or individual Lotus Notes users. AIF MQSeries messages can be used for example, to initiate Lotus Notes e-mail for Notes MQ link users.

Protect Investments: AIF can integrate new and existing applications, which enables businesses to use, re-use, and build on existing IT investments. AIF also ensures continued access to MVS data and applications from anywhere in the enterprise. For example, funds transfer logic implemented with scripts, may be called for by any number of different front-end spokes, such as an ATM, a teller, a Lotus Notes or web user. Thus AIF supports the inclusion of new front-end hardware or client application technology without impact on prior investments.

With AIF, a Lotus Notes laptop user can access existing MVS applications and data from a hotel phone connection. Notes requests can execute existing CICS or IMS transactions or any MVS application. This allows remote workers to enter new orders or receive work requests for the following day. It should be noted that through the use of AIF agents, existing CICS or IMS transactions are re-used without change.

Opens new data location and management options: Additional data placement options are available for the Lotus Notes users beyond that of the local Lotus Notes server. Many companies have multiple LAN sites and need to keep key data at these sites in a consistent state. Because Lotus Notes users can easily access MVS, you can keep this data on MVS. This approach can simplify systems management and can address LAN storage capacity issues should they become a problem.

AIF′s hub and spoke approach enables access to all host data, e.g. CICS VSAM, MVS files, DL/I files and DB2. Any data residing on the host is deliverable to the LAN, and use of IBM′s storage management facilities can be automated (with AIF scripts) to handle not only MVS data, but to archive and manage LAN data as well.

For example, all Lotus Notes users can gain access to the most current price list for their companies products, wherever they operate in their enterprise. The price list would be available from an AIF script application on the host that would access and return the appropriate data to the Lotus Notes user.

Expanded FlowMark/LAN processing: While Lotus Notes has existing linkage to FlowMark, this linkage applies to LAN environments. Shipped with AIF, are building blocks that connect FlowMark LAN servers to AIF on MVS. By handling messages directly from a Lotus Notes user, AIF can be utilized as a FlowMark request broker, reaching other sites in the enterprise that perhaps are not connected to the originating LAN. Because AIF also contains FlowMark process control APIs, AIF can start multiple FlowMark processes at any remote LAN location. Because of this capability, a Lotus Note can be used as the trigger to start work at any FlowMark site connected to MVS. Further, a FlowMark LAN process can invoke one or more AIF scripts, which in turn, can generate Lotus Notes mail requests to sites not connected to the originating FlowMark LAN server.

Respond Quickly to Change: The APIs provided by AIF are easier to code than MQSeries commands, and using messages to schedule and execute other scripts or programs, the programmer can shift his focus to business logic issues. Using scripts to separate business logic from application logic makes it easier and faster to deploy changes to business processes or to incorporate new technology. This partitioning improves speed to market for new services.

AIF simplifies application development by handling both business logic and communication with the applications it invokes. Programmers no longer need to provide those functions, which makes applications less complex and the programmers more productive. The installation process of AIF defines the configuration of queues along with work policies to deal with MQ message traffic. Based on the definitions at setup, the programmer has an environment that greatly simplifies the use of messaging and makes the writing of messaging applications easier.

AIF automates the management of concurrent complex requests, assuring that responses are directed to the correct originating application. Without AIF, considerable programming would be required to perform this response matching, as well as handling the secondary requests to prevent deadlocks from occurring.

Improve Customer Service: Using AIF to manage complex business requests can improve end-user productivity, customer service, and use of I/S resources. For example, to maximize speed and efficiency of claims processing, an insurance company might replace multiple inquiries to a back-end application with an AIF script that automates the processing and returns a simple reply. Other application examples where a single request can be used to deliver useful customer results include:

- a loan origination request, where multiple accounts or systems are queried, responses evaluated, and the loan approved or disapproved
- a travel request, where multiple bookings are made, e.g. air, car, hotel, etc., and a travel itinerary generated
- a service representative′s inquiry, where all customer account information is collected from multiple sources and returned
- a single status view of an order which may have been dispersed across multiple manufacturing locations

Lotus Notes users can invoke these services with an e-mail request that is mapped and directed to AIF. This approach of using a single request with Lotus Notes to perform complex request processing, brings new power to Lotus Notes for developing new business applications.

Ease of administration: AIF is a completely packaged environment with both administrative and programmer facilities to simplify messaging management and development while delivering all the benefits MQSeries also provides. The facilities included in AIF address the message-driven application paradigm in a comprehensive fashion, and this saves valuable time for both systems and application programmers, enabling applications to be produced faster.

Installation is fast and programmers can quickly learn the new APIs in a matter of few days. The end result can mean running production applications in a few short months.

Summary

AIF interoperability with MQSeries link for Lotus Notes brings the full resources of MQSeries, CICS, and MVS/ESA in partnership to provide complete enterprise wide solutions to business problems. A single Lotus Notes request can be used to trigger a sequence of other service activity, providing significant processing power while preserving the simplicity of the end-user interface. AIF automates messaging facilities, and provides new services to ease the development of applications that can now integrate transactions and data in new client/server relationships to deliver new business applications. All spoke connections that exist on the customer′s AIF hub are resources that Lotus Notes user′s can exploit. Lotus Notes users can bring MVS data to client desktops, and the Lotus Notes e-mail facilities can be used to broadcast key information using MVS AIF as a coordination backbone for the enterprise.

AIF delivers flexibility that helps businesses manage growth and change while taking advantage of the industrial strength that MVS/ESA delivers. The infra-structure provided leverages existing System/390 investments and enables the quick adaptation of new technology to move a business forward.

If you have made a commitment to messaging as an approach for your future, then AIF can provide you with real value now.