Active Integrator (MQ Series – TUXEDO)

NAME:	AI	**STATUS:**	Delivered
PURPOSE:	Interfacing TUXEDO applications to MQSI	**CATEGORY:**	e-Engineering

Product Description

The Active Integrator (MQ Series-TUXEDO) gateway provides an interface between TUXEDO and MQ Series allowing applications in either environment to initiate communications via the gateway. The gateway comprises two components.

The first component is an MQ server operating as a TUXEDO client that receives MQ messages in eXtensible Markup Language (XML) format and translates these messages into Field Manipulation Language (FML) buffers. This then invokes a TUXEDO service defined within the inbound XML messages passing the FML buffer. If requested within the message, the application will wait for a response from the server, translate the response FML buffer into XML and then return that message via the ReplyToQueue identified by the inbound MQ message.

By this mechanism existing TUXEDO services are exposed and an external application can invoke those TUXEDO services by dispatching an MQ message in either TUXEDO Synchronous mode with a reply returned immediately or in Asynchronous mode with no reply specifically returned by the TUXEDO service.

The second component is a TUXEDO server that dynamically advertises a series of services defined within an XML document contained in an MQ configuration queue. The TUXEDO applications may invoke the services passing an FML buffer to the service and optionally receiving an FML buffer from the service as a reply. Each service is linked to an output queue, and if a reply is required, to an input queue. The contents of the FML buffer are translated into XML and then placed onto the output queue. If a reply is required, the service then waits for a timeout interval on the input queue for a reply. If a reply is received, the contents are translated back to FML and returned to the calling service. This mechanism enables programmers to invoke services destined for external applications via MQ. It also provides a migration path for client applications to operate unchanged when the service has been migrated out of TUXEDO to another environment accessible by MQ.

Our customers have found this a particularly effective mechanism for connection between MQSI and Clarify running in three tier mode using TUXEDO 6.4. A key benefit of our approach is the ability act as a gateway between these two products without any requirement to configure the gateway for each message or to modify existing message formats, once the queue structure and service definitions of the gateway have been determined.

We have a program of enhancements to the product underway which we can provide. We are able to incorporate new requirements from customers into the product where they are consistent with the overall product approach.

The Original Requirement

Vodafone had approached other suppliers but were concerned that the solutions offered required new code to be written and maintained for every configuration change that might be required to the gateway. Every new message and probably every new queue would require changes to the solution with the associated testing and software lifecycle maintenance costs. In addition these solutions offered involved the purchase of a number of expensive software products that would also require to be managed and maintained. This solution was required to support an interface between Clarify running on TUXEDO 6.4 and MQSI 2.0 running initially on NT.

Strategic Thought identified that a straightforward solution was possible relying on TUXEDO features and XML messaging parsing that could be controlled by a configuration file and did not require programming for every new message. Because of this third party products are not required.

The Second Requirement

As a consequence of the successful delivery to Vodafone, CGEY asked us to work with them to extend the capabilities to support a number of new features for their customer Energis. These included:

1. The introduction of an XML 'pass-through' mechanism that enable the creation of XML messages within the TUXEDO application and the passage through the TUXEDO FML buffer mechanism to MQ Series.
2. The introduction of additional defaults to remove mandatory control information from messages. These provide system wide defaults, overridden by optional queue or service defaults but still enable individual messages to contain control information that overrides the queue or system defaults (in XML or FML as appropriate).
3. Use of a GUI for remote configuration and control of all facilities within the gateway.
4. Introduction of the MQ client application as a trigger application with full logging back to the GUI so that the GUI can control the applications remotely.
5. Introduction of control features to allow the application to enqueue messages using MQPUT1 onto queues specified at run time, overriding the configuration data for the service used.
6. Implementation of a number of additional performance features.

Solution Delivery

The primary development environment is NT using C and C++. Each version is then ported to UNIX. There is a single code line for all platforms. Active Integrator is currently available on NT and Solaris, has been tested on AIX and can be provided on other platforms running TUXEDO, MQ and the XERCES-C XML parser from XML.APACHE.ORG.

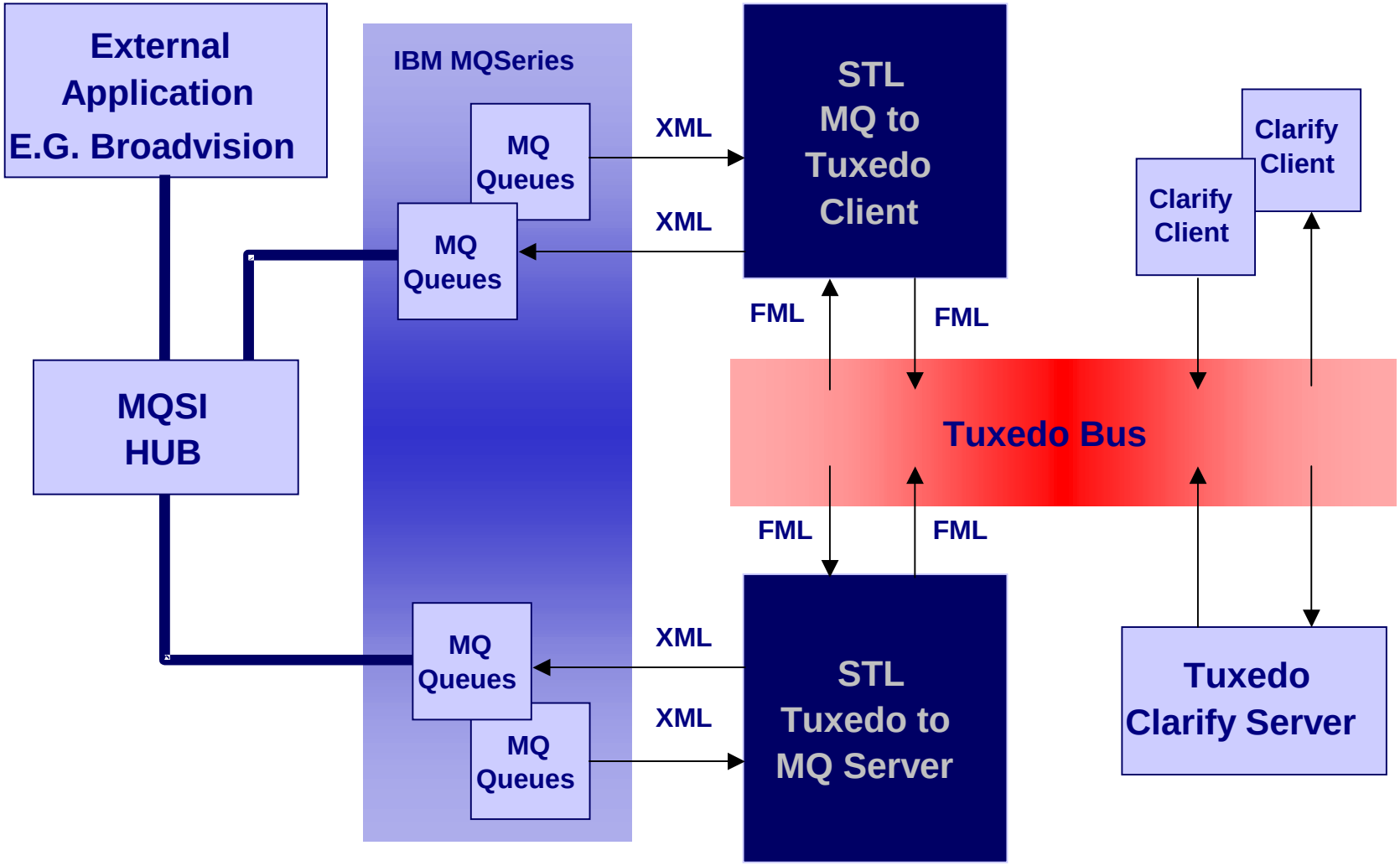
Initial indications show excellent performance exceeding 20 messages per second with a single client process and single TUXEDO server, for small messages. The architecture is highly scalable and can support multiple instances across multiple machines to achieve very high throughput of messages when required.

The Technology

The product was developed using our proven E-engineering skills. The architecture is represented on the following page:

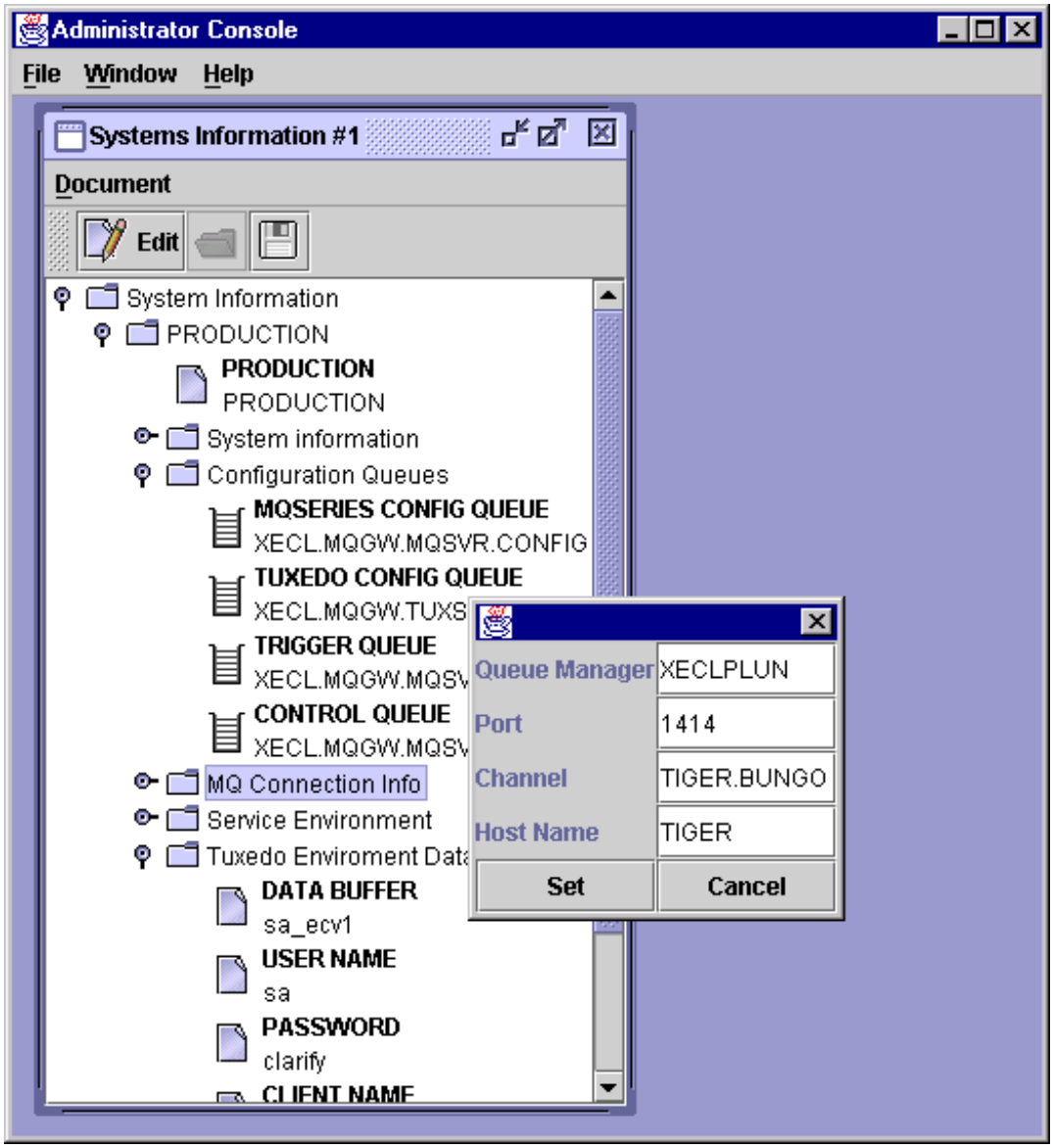
Active Integrator - Deployment Example

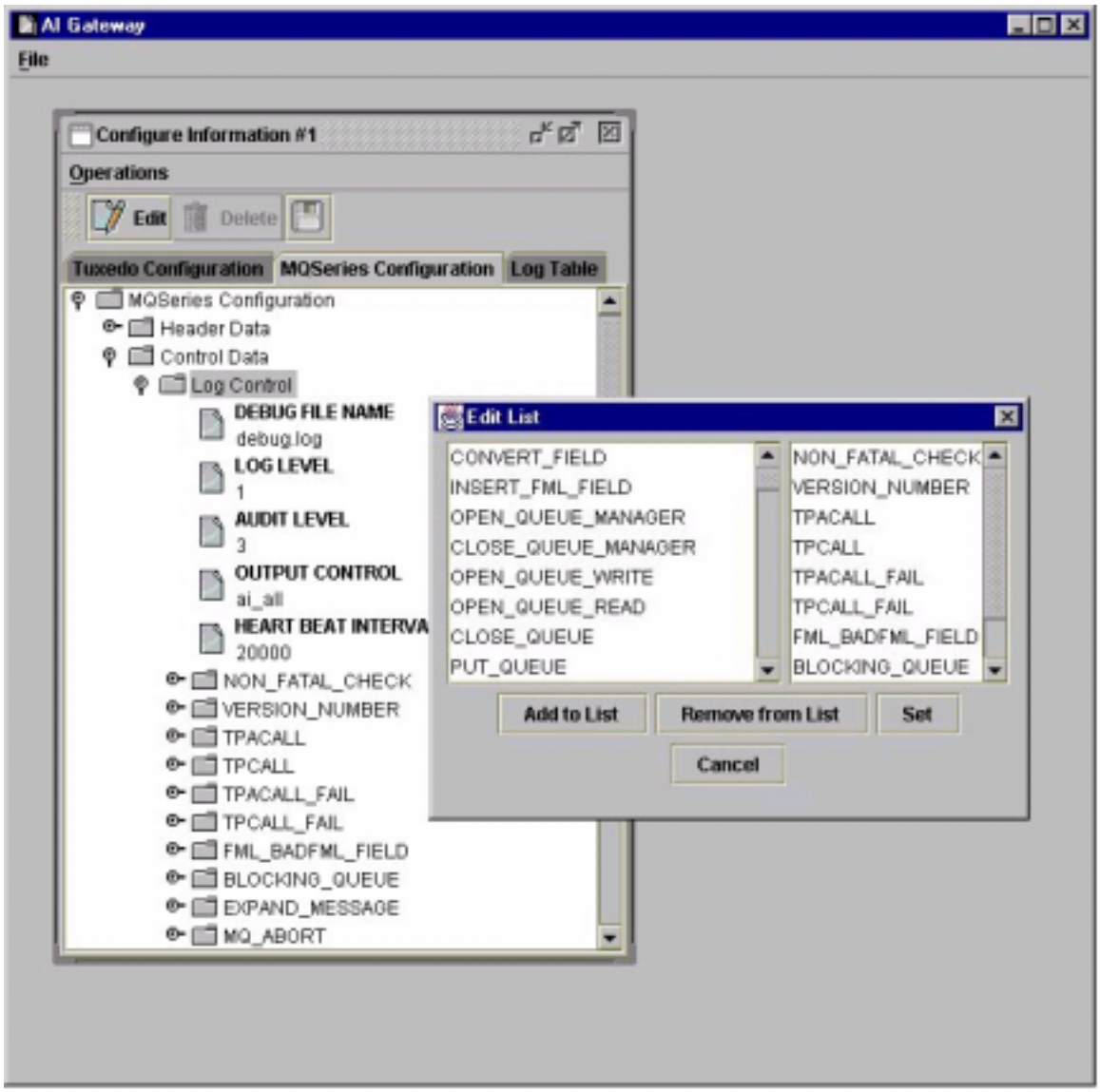
Clarify CRM System Integration to IBM MQSI HUB



Examples of GUI Screens

The following screen shots give an indication of the GUI that is used to build the configuration data on an NT workstation, transmit that data to the configuration queues on any of the target systems and then startup, monitor, control and shutdown the active integrator applications.





Note that TUXEDO server configuration is controlled by the GUI, but the application server is under control of the TUXEDO system administrator using the TMBOOT command.

This interface means that:

- There is no coding required to add new messages.
- Multiple instances of the client application can be defined, started up, monitored, controlled and shutdown from this console on any of the defined environments.
- Log messages are provided back to the administrator from each server via a log queue in XML format.
- The administrator does not need to log on to any of the target machines.

However currently:

- The TUXEDO environment must be set up by the TUXEDO system administrator.
- Each MQ environment must be set up by the MQ administrator.
- The AI software must be installed on each machine manually.

Market Knowledge

The ability of Strategic Thought to implement this program of work to tight timescales relied on the high level of in depth expertise and experience of Strategic Thought staff in all the related middleware products. Previously our company had been responsible for the middleware architecture of major TUXEDO projects, of particular note being the Irish Government re-architecture of the Revenue Commissioners systems from the BULL GCOS8 mainframe to a TUXEDO architecture on UNIX supporting 6000 users. Strategic Thought ran the BEA TUXEDO European support centre for 1 year until the purchase of USL France by BEA resulted in the transfer of the support centre to Paris.

Strategic Thought was awarded one of four IBM UK platinum awards for innovation and influence. To be selected out of a partner community of 280 companies in this manner is recognition of the continuing excellence Strategic Thought demonstrates in the Portal to Legacy system world.

Strategic Thought has undertaken many projects requiring the design and delivery of high performance applications supporting hundreds or thousands of users based on middleware products such as IBM ENCINA, IBM MQ Series and TUXEDO, usually in conjunction with RDBMS's such as DB2, Oracle, Ingres, Sybase or SQL Server. Much of this work is within the Telecoms and Finance sector, but includes work for many large corporations deploying these technologies. A hallmark of our work is the effective and innovative use of enterprise strength technologies.

About Strategic Thought

Strategic Thought Limited was founded in 1987 as a software development company specialising in enterprise applications. The company has achieved sustained growth in turnover and profits and is still privately owned with its shareholders directly employed in the business.

The company has grown significantly in the last two years, over 100% in the last year, as it's e-Engineering and .com development business practices have flourished.

Strategic Thought is now in the final stages of launching it's Active Risk Manager (ARM), risk system, which has been developed over the last 18 months and presents a very significant growth opportunity to the company.

For more information on Strategic Thought please visit www.strategicthought.co.uk and for ARM visit www.arm-risk.com

or contact:

Richard Higgs
Strategic Thought ltd
email: richardh@strategicthought.co.uk

Mary Phillips/Andreina Porter
PR Artistry Limited
email: mary@pra-ltd.co.uk