

# IMS and Ivory: A Perfect Combination for Mainframe SOA

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A GT Software White Paper

Ivory®

*The Ivory® mainframe SOA solution instantly turns mainframe developers into service developers for rapid mainframe SOA development leveraging IMS and other mainframe assets. With Ivory Service Architect and Ivory Data Access, developers can quickly and easily assemble and orchestrate right-sized composite business services from existing IMS transactions and data, and publish them as Web services – with little or no training, and no consulting required.*



# Table of Contents

Don't Lower Your Goals – Raise Your Expectations.....	1
It's All About Orchestration.....	2
Service Orchestration Diagram .....	2
Maximize Your Assets.....	2
Right-sizing Business Services .....	3
Support for “Top-down” or “Bottom-up” Design.....	3
Ivory Studio .....	4
Graphical Web Service Modeling Screen.....	4
Ivory Server.....	5
Ivory Data Access .....	5
Configuring Data Sources Diagram.....	5
Comprehensive Mainframe Support .....	6
Supported Systems (Table).....	6
Highest Level of Service Integration .....	6
Flexible Architecture.....	7
Ivory Service Architect Deployment Diagram.....	7
Fastest Time to Value .....	8
Customer Examples .....	8
GT Software – Experience, Focus, Character .....	9

# IMS and Ivory<sup>®</sup>: A Perfect Combination for Mainframe SOA

When it comes to integrating IMS assets into today's SOA applications, many organizations have proceeded with very low expectations, having found themselves hostage to other integration options. As a result, many companies have settled for minimal results, even though IMS is inherently well suited for SOA; like Web services, IMS applications can be "non-conversational," or stateless, or conversational requiring multiple transaction to be run to accomplish a task and IMS already integrates both the transaction system and the database that are incorporated into business services in an SOA.

## **Don't Lower Your Goals – Raise Your Expectations**

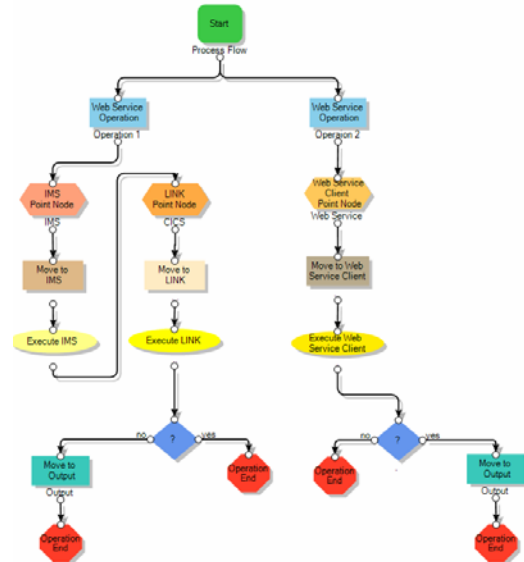
The Ivory solution from GT Software completely changes the picture of mainframe SOA, raising the bar when it comes to fully leveraging IMS assets, both transactions and data, in today's service-oriented applications and infrastructures. The centerpiece of the Ivory solution, Ivory Service Architect, instantly transforms your most knowledgeable mainframe programmers into service developers, giving them an intuitive and automated development environment designed specifically for their needs. Fully automated service orchestration enables the right-sizing and high-performance deployment of multi-step, multi-operation business services based on IMS transactions, while Ivory Data Access provides real-time SQL-based access to IMS data. Comprehensive platform support ensures that all mainframe assets are fully leveraged in the SOA, incorporating all types of mainframe data and applications – including both IMS and CICS. And because Ivory Service Architect doesn't rely on code generation to create services, deployment is faster and easier, maintenance is streamlined, and portability and governance are ensured.

In this paper, we will look at all of these components of IMS service integration in detail, and reveal why Ivory is enabling companies to raise their expectations of IMS participation in strategic SOA initiatives.

# IMS and Ivory®: A Perfect Combination for Mainframe SOA

## It's All About Orchestration

The automated service orchestration offered by Ivory Service Architect is the cornerstone of success for mainframe-based service development. Not only does the Ivory Studio component enable mainframe developers to quickly and easily assemble multi-step, multi-operation composite business services from existing IMS assets, the Ivory Server component provides a high-performance runtime engine for executing the deployed business services. This is becoming a very common approach to development using flow modeling or “wiring” diagrams that allow you to drag, drop and wire together various building blocks – the steps of a process – to compose a service. And Ivory Service Architect handles IMS application utilizing both the non-conversational (stateless) IMS transactions and IMS conversational transaction, for a truly integrated architecture. Ivory Studio provides the orchestration tool to compose these complex business services, and Ivory Server provides the runtime to execute the orchestration.



The benefits of this approach are obvious in terms of who can participate in the development process, what they are able to accomplish, and the types of design patterns they can employ.

## Maximize Your Assets

In addition to integrating the functionality, data and performance assets of IMS into the SOA, it is equally important to leverage the IMS developer’s comprehensive knowledge of those resources. In not doing so, many companies leave much of the mainframe’s value on the sidelines. Some fear that the skills required for service implementation (typically associated with distributed platform developers), and the in-depth knowledge of mainframe applications and technologies required to create composite business services, are islands that can’t be bridged within the organization. While it is unrealistic to expect service development experts to quickly come up to speed on decades of knowledge about mainframe applications and data, a reverse of the process is actually quite practical.

Mainframe developers already have an in-depth knowledge of IMS mainframe applications – as well as mainframe CICS, various data sources, and their interactions. With Ivory Service Architect – service development tools designed specifically for their use – mainframe developers are quickly able to assemble and deploy services comprising these components and interactions. All

## **IMS and Ivory®: A Perfect Combination for Mainframe SOA**

that remains is to provide a methodology for defining the right level of granularity to create IMS-based business services to fuel the SOA.

### **Right-sizing Business Services**

The business services that make up SOA perform a more complex role than simply enabling the invocation of a function in a standard way. In addition to being readily recognizable and understandable by the business user, they typically contain orchestrated multi-step, multi-operation functionality, with transparent communications and data transformation. Critical to successful SOA is the ability to understand and deliver such business services at the optimal level of granularity to facilitate reuse and to insulate the user from downstream maintenance. Otherwise, everything that is developed in support of the SOA simply becomes an elementary building block that will have to be assembled into a usable structure elsewhere, with all the attendant development, testing and maintenance ramifications that implies.

So how do you identify and scope a business service that will be the right kind of building block for your SOA? Start your service definition at the end point – the employment of the completed service by the user: For example, the Customer Service Representative (CSR) performing the job function “Get Customer Information.” This is just one step in the process of signing up a customer for a new service or product, but it is a discrete job function within the process that the CSR will recognize and know how to use.

While the user sees a recognizable business task, under the hood, “Get Customer Information” is a multi-function, multi-operation service, which is a further indication that you are approaching the right level of granularity. It is composed of information such as financial transactions, address information, credit rating, purchase history, etc. Retrieving this information may invoke multiple applications or systems with different interfaces, and even external Web services such as an outside credit bureau. It might even perform specific operations on the data returned in order to fulfill the requirements of the service interface. At the same time, all of this must be transparent to the user of the service; the alternative is a bunch of standalone services, each of which must be invoked in turn by the user. Further, at the right level of granularity, the use of the service itself must be insulated from downstream changes to its underlying components. For example, if the company switches credit bureaus, the necessary changes can be made within the service without affecting the way it is invoked by the CSR’s customer upgrade application. This combination of granularity and transparency ensures the highest level of service understanding, acceptance, and reuse, the ultimate goal of the SOA.

### **Support for “Top-down” or “Bottom-up” Design**

This kind of top-down service design, where business processes drive the development of the Web service, has been shown to be a best practice for mainframe SOA. As described above, with

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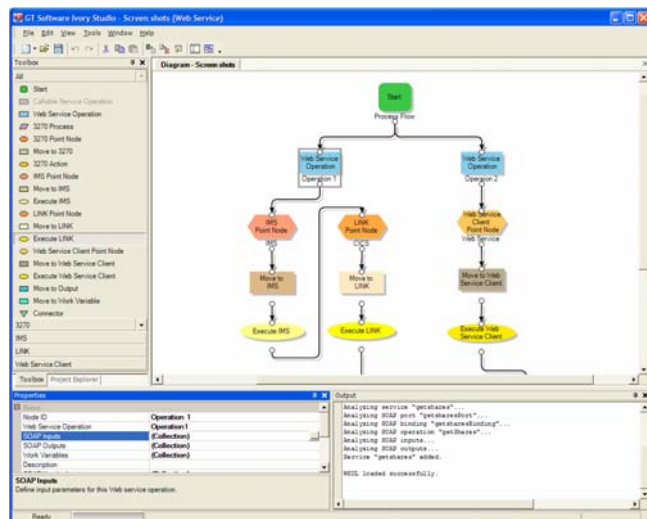
this approach the mainframe developer works in advance with the user who needs the service, identifying the consumer's functional and data requirements, then mapping the mainframe components to the service requirements. From this design map, the developer builds an integrated business service that automates all the steps and operations required to fulfill those requirements, which ensures that the components of the architecture are optimally designed and sized to promote maximum reuse and efficiency. It is this service optimization that leads to the fastest returns on your SOA investments, in terms of cost savings, operational efficiencies, reduced overhead and strategic advantage. And it is the built-in service orchestration capabilities of Ivory Service Architect that enable mainframe developers to achieve this level of optimization, without coding.

By contrast, a bottom-up approach simply wraps discrete pieces of mainframe functionality as isolated Web services to be accessed by various end-user applications and systems as “building blocks” which then have to be assembled and managed by the consumer of the service. Such an approach may have some usefulness as a mainframe SOA “jumpstart” tactic.

In either case, whether you are using the strategic top-down approach or the tactical bottom-up method – or a combination of the two – Ivory Service Architect, consisting of Ivory Studio and Ivory Server, provides the development and deployment tools you need to be successful.

**Ivory Studio** is an intuitive development tool that enables mainframe developers to leverage any mainframe transaction, application or data, as well as Web services, to create a single- or multi-function composite service. Simple to learn and operate, Ivory Studio features a graphical environment that enables the easy

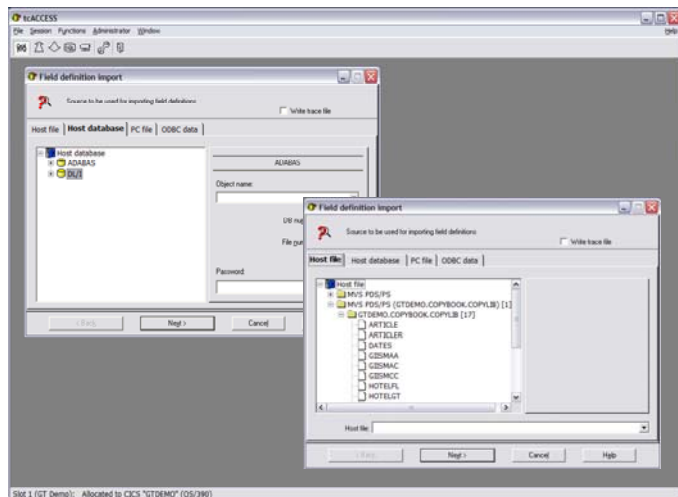
orchestration of building-block functions into business services. This drag-and-drop environment enables developers to define Web service inputs and outputs, and then graphically model the multi-step process to implement the service. With its powerful visualization and orchestration features, Ivory Studio makes it possible to build business services with the right level of granularity, removing technical limitations from consideration in packaging services for maximum reuse.



## IMS and Ivory®: A Perfect Combination for Mainframe SOA

**Ivory Server** consists of a high-performance SOAP processor, a business service flow processor, and a central repository for WSDL discovery. Ivory Server exploits IMS, CICS, and native data access capabilities, eliminating the need for middle-tier servers, and providing the flexibility to fully leverage mainframe processing power as appropriate within the SOA. The server receives SOAP requests, invokes the business service flow previously defined in Ivory Studio to satisfy the request, and formats the SOAP response.

**Ivory Data Access** already contains the connection parameters and data definitions needed to automate access to IMS and other mainframe data sources. The Ivory Data Access SQL engine provides direct access to IMS databases from a variety of open system environments or mainframe platforms using standard SQL syntax. Ivory Data Access supports the join of information from IMS tables with information from other, non-relational mainframe data sources (i.e. VSAM, DB2, ADABAS, CA-Datcom, CA-IDMS, PDS/PS), presenting the end user with relevant data in familiar relational data views. Ivory Data Access provides fast, efficient data access that is flexible and



### Configuring data sources with Ivory Data Access

transparent. Neither special adapters nor user coding is required or generated. With Ivory, access to target databases is established at the server level, using a simple wizard-based configuration approach.

Ivory Data Access features include:

- Dynamic, efficient IMS data access through automatic use of key information
- Support for SELECT (GU), INSERT (ISRT), UPDATE(CHNG) and DELETE (DLET) commands
- Transaction support with 2-phase commit
- Relational processing of IMS hierarchies through SQL commands or IMS path calls
- Automatic detection and presentation of key information to simplify creation of relations and joins with other data sources
- Support for standard security systems (RACF, ACF2, etc.)

# IMS and Ivory®: A Perfect Combination for Mainframe SOA

## Comprehensive Mainframe Support

Ivory Service Architect facilitates the integration of all mainframe assets within a single service, regardless of underlying platforms, languages and data formats. For example, with the “Get Customer Detail” service described above, the financial information might be in an IMS database, customer address in a 3270 screen, the purchase history in an IMS Transaction, credit bureau data in an external Web service – all of which are assembled and orchestrated in Ivory. With Ivory, IMS shops have access to the full range of SOA integration options, not the limited subset of options available from other vendors.

## Highest Level of Service Integration

In providing the highest level of Web service integration, Ivory Service Architect provides comprehensive support of XML, enabling the incorporation of WSDL definitions created in almost any tool, application, or environment, further enhancing support for proven top-down SOA design methodologies. The ability to import and leverage XSD schemas enables developers to leverage centrally defined XML schemas to comply with corporate and industry standards such as ACORD, IFX, and HR-XML.

In addition, Ivory Service Architect enables the development of outbound callable Web services, providing a mainframe-based interface for anything you can build in Ivory. It is this powerful outbound service support that provides the foundation for Ivory’s robust batch integration capabilities.

### Supported Systems

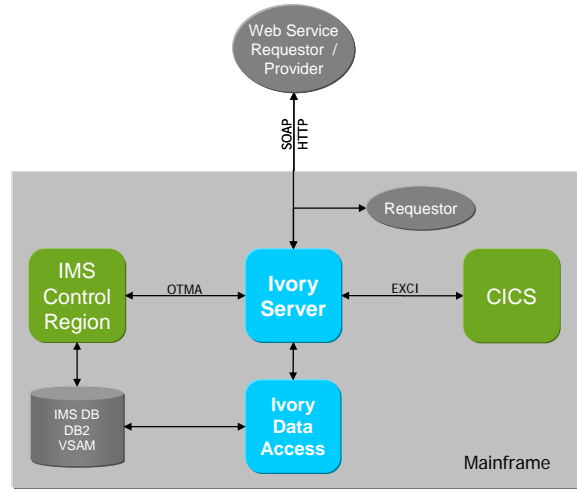
- IMS
  - Conversational and non-conversational
  - 3270
  - OTMA
  - IMS Connect
- CICS
  - COMMAREA (including Channels and Containers)
  - 3270 linkable bridge
  - MQ Series
- TN3270
- Outbound Web services
- Batch applications
- Data integration with Ivory Data Access, including:
  - IMS, VSAM, DB2, CA-IDMS, Adabas, CA-Datacom
- Languages, including:
  - COBOL, PL/1, CA-ADS, CA-Ideal,

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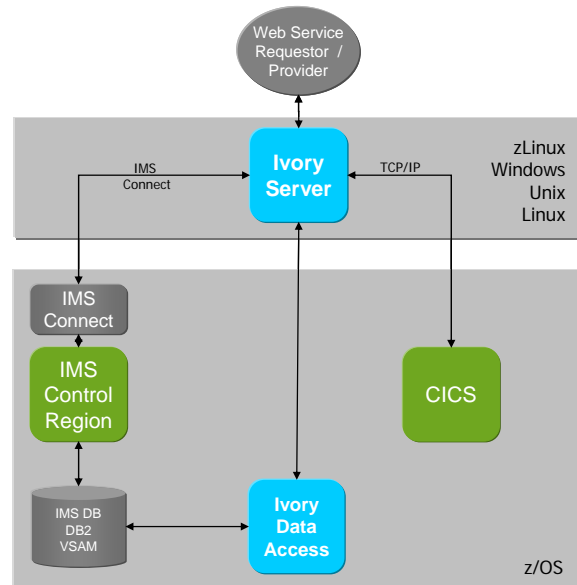
## Flexible Architecture

The flexible architecture of Ivory Service Architect provides for dynamic cross-platform deployment, a key performance factor. Because Ivory doesn't rely on generating code to build services, you have the option of running the work where it makes sense – on the mainframe under IMS or CICS, or off the mainframe – wherever there will be the least impact on productivity and the highest performance levels. And because that can be a moving target in today's complex, high-volume enterprise information infrastructures, Ivory Service Architect enables you to offload the work when and if required. This kind of operational flexibility and service portability is not possible with service development approaches that rely on fixed code generation. In addition to making the services easier to build and deploy, Ivory's no-code-generation approach streamlines maintenance, avoiding the hefty cycles required by most companies to rebuild and redeploy source-code-based applications.

Ivory Service Architect also enables effective service governance, providing the ability to interrogate the registry to identify available services and easily register newly created services. Ivory Service Architect also automates the process of providing the information necessary for the SOA service management component to understand new services and their orchestration, a key feature of Ivory's integration into the broader SOA-enabling "ecosystem."



Ivory z/OS Architecture



Ivory "Distributed" Architecture

# IMS and Ivory®: A Perfect Combination for Mainframe SOA

## Fastest Time-to-Value

In spite of its power and flexibility, Ivory Service Architect incorporates ease-of-use features that set the standard for mainframe service development and establish the industry benchmark for the fastest time-to-value. To begin with, installation of the Ivory Studio is accomplished in about five minutes, with minimal pre-requisites. Once Ivory Studio is installed, the mainframe developer is ready to start building services, with no learning curve. That's because Ivory Service Architect has been designed from the ground up to put advanced service development capabilities in the hands of mainframe developers – the subject area experts when it comes to mainframe data and functionality. Other vendors' tools are complicated and difficult to master, requiring extensive knowledge typically outside of the traditional mainframe developer's experience, such as Java or XML. And the intuitive interface and plug-and-play approach of Ivory Service Architect mean that its entire range of powerful functionality is immediately available and usable.

## Customer Examples

This value proposition is borne out in case after case of GT Software's customer implementations, as Ivory users report high success rates and productivity gains. For example, LBBW, one of Germany's largest banks, has leveraged Ivory Service Architect to service-enable their IMS-based brokerage systems enabling bank employees and customers to execute stock trades on any exchange in the world. Most interesting is the fact that ***LBBW's Ivory developers had no formal training***, and experienced about ***80% reuse of their IMS-based services***.

Similarly, a leading health plan company reports that Ivory Service Architect enables them to ***build mainframe-based services up to ten times faster*** than with alternative tools. Ivory enabled them to optimize their use of resources by providing the ability to aggregate services and optimize granularity on the mainframe itself fully utilizing their mainframe development force.

Additionally, one of the largest mutual company insurers of property and liability insurance in the United States uses Ivory Service Architect to make legacy services available to new composite applications. With Ivory, their mainframe developers ***reduced overhead for calling and exposing services from more than 50% to less than 5% of their time***. And Ivory supported a more efficient use of development resources, enabling the same people who built the underlying CICS COBOL application to deliver a business service in an easy-to-use browser-based front-end. As a result, they were able to ***reduce the construction phase of their project by 30%***. Measured in terms of improved productivity and greater reuse of services, the company reports that Ivory paid for itself with their first two projects.

# IMS and Ivory®: A Perfect Combination for Mainframe SOA

## GT Software – Experience, Focus, Character

For more than 20 years, GT Software has been in the business of helping organizations derive the greatest business benefit from their mainframe investments. No company is better positioned to help you bring the value of mainframe-based business services to emerging architectures and applications across your organization.

As a leading provider of rapid SOA development solutions, GT Software's products enable a company's mainframe developers to quickly and easily model, automate, and extend mainframe processes for deployment as key components of an enterprise SOA, making the mainframe an active participant in SOA initiatives. With more than 2,000 installations worldwide, GT Software provides high-quality, innovative and cost-effective solutions for many Fortune 1000 companies. Founded in 1982 and headquartered in Atlanta, Georgia, GT Software is a privately held company represented in the US, Canada, Asia, Europe, Australia, Africa and South America. GT Software's product strategy is to continue to provide unparalleled capability to leverage the mainframe's proven functionality, power, stability, and performance to its fullest potential. In keeping with that strategy, products are consistently engineered to be powerful yet extremely intuitive, designed to be used by mainframe developers with *minimal training* and *no consulting* - without giving up one bit of sophistication. Our customers have our commitment that they will never find themselves looking back and wondering how they got stuck buying so much consulting to get the job done.

A key element of our commitment to providing the best customer experience possible is to work closely with our customers and prospective customers to help us refine and develop tools you can use to overcome your most critical business challenges. The customer benefits of this collaborative approach have most recently resulted in the production of Ivory Server for Batch, a product that was developed and delivered specifically in response to customer requests, and with customer involvement throughout the process. The result – the timely release of this crucial enabling technology, achieved in record time, and with immediate benefit to users – is indicative of the overriding commitment to service and excellence that exemplifies GT Software.

In addition to providing the best tools for leveraging mainframe value across the enterprise, GT Software actively seeks out and partners with other leading companies worldwide whose offerings complement ours, and whose commitment to your success matches ours. Together, GT Software and its partners provide the most comprehensive and practical mainframe value solutions available.

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