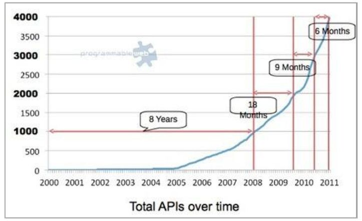
FROM LEGACY TO LEADING EDGE

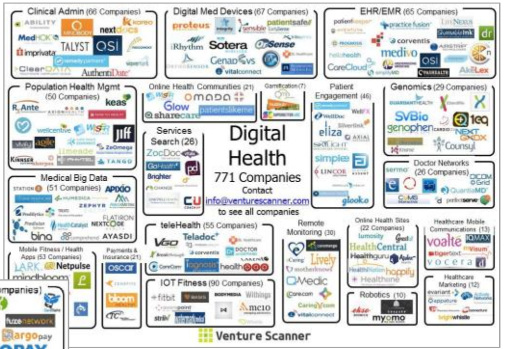
Creating CICS APIs Without Coding

Glenn Schneck, Principal Technical Architect

API Evolution & Revolution

Retail Technology
753 Companies
Contact info@venturescanner.com to see all companies
Venture Scanner



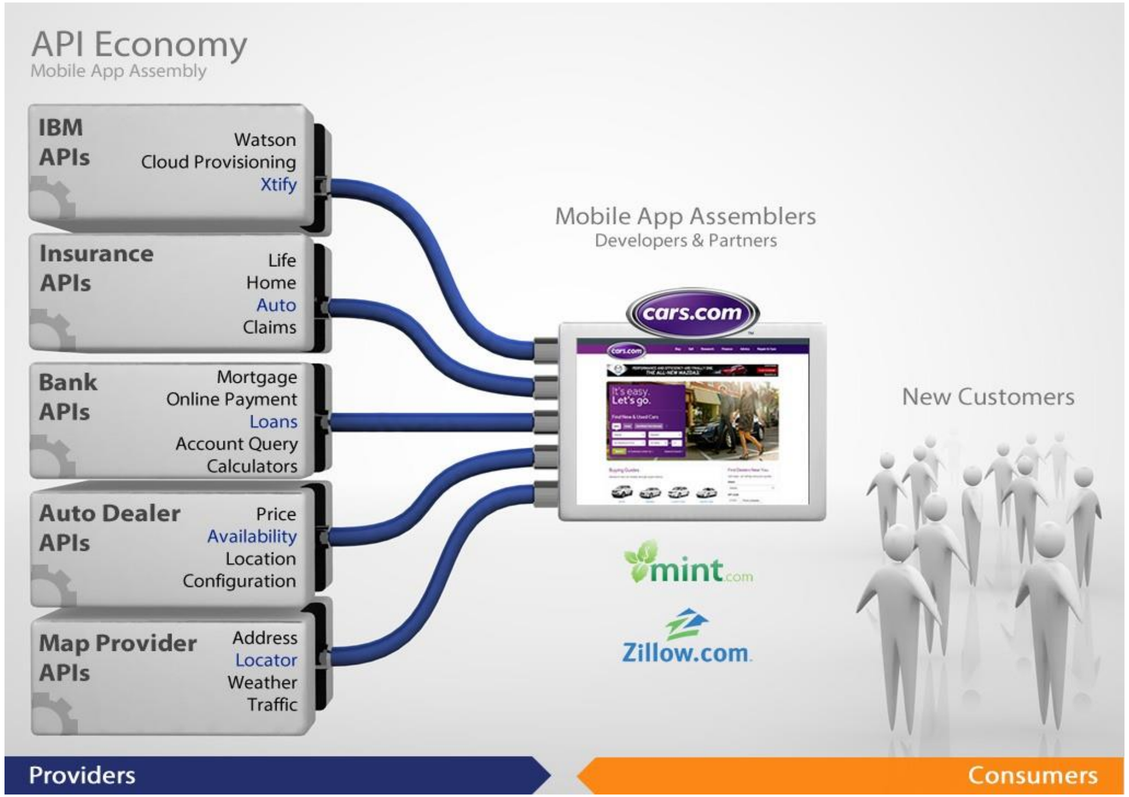


FinTech
1094 Companies
Contact info@venturescanner.com to see all companies
Venture Scanner

sources: programmableweb.com, venturescanner.com

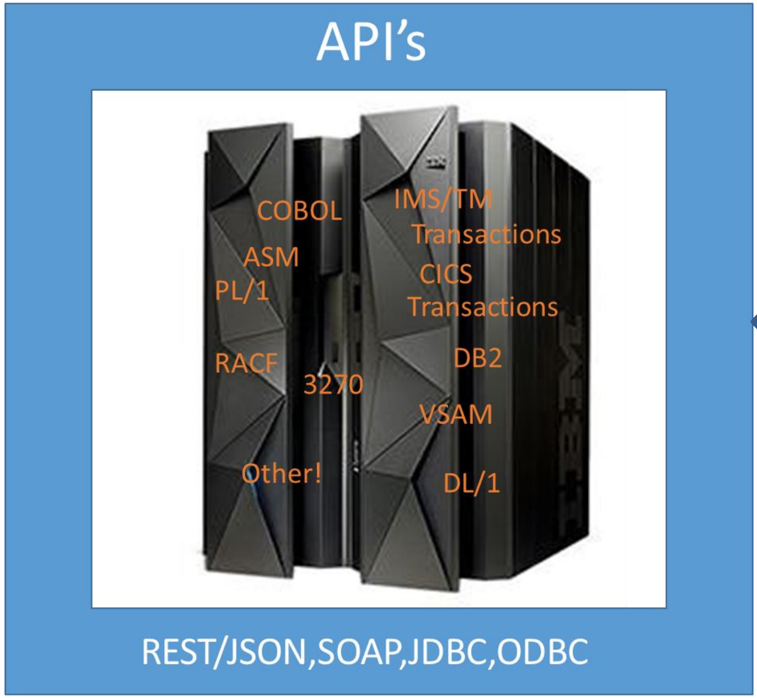
Application Programming Interface (API) is a set of subroutine definitions, protocols, and tools for building application software. It is a set of clearly defined methods of communication between various software components. ~ *Wikipedia*

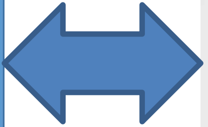
API Economy for Digital Enterprises

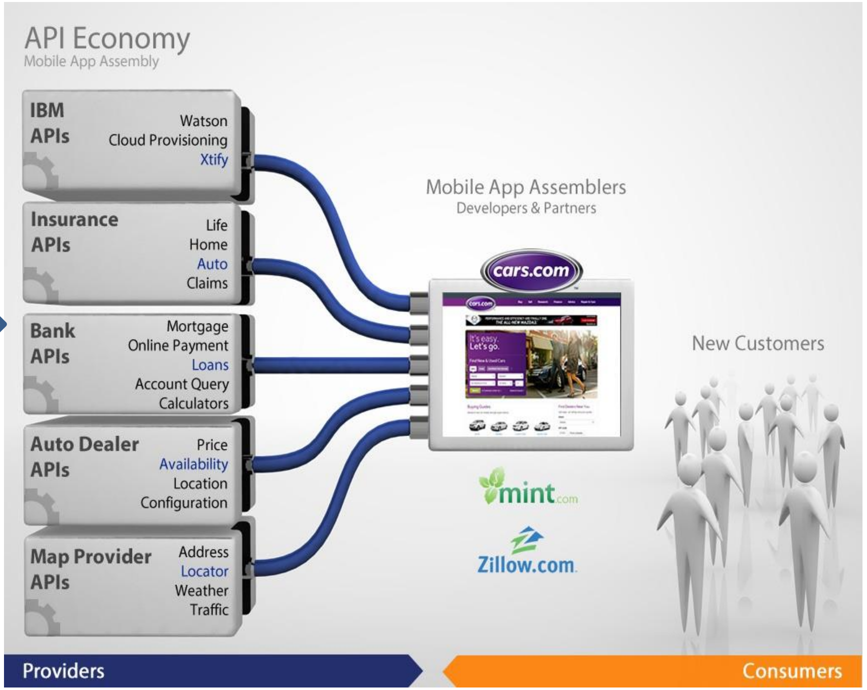


Source: IBM

The "Connected" Mainframe







Types of Mainframe "Connectors"

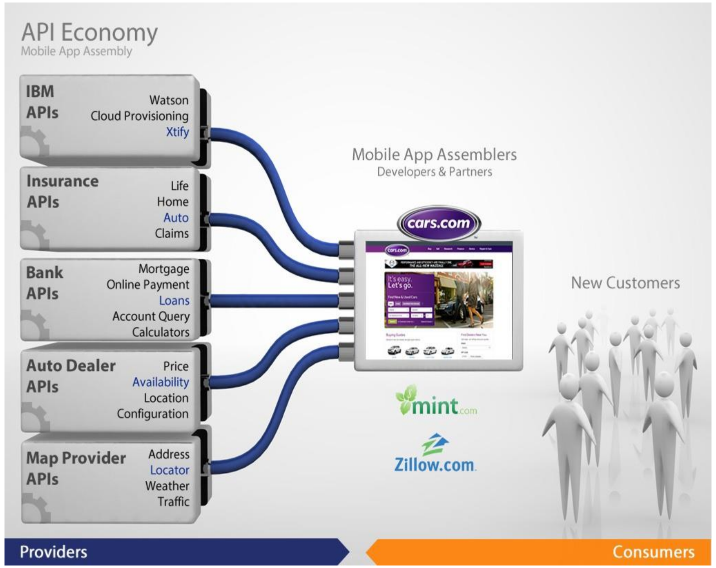
API's

REST/JSON,SOAP,JDBC,ODBC

Mainframe Connectors ⟷ Business Services

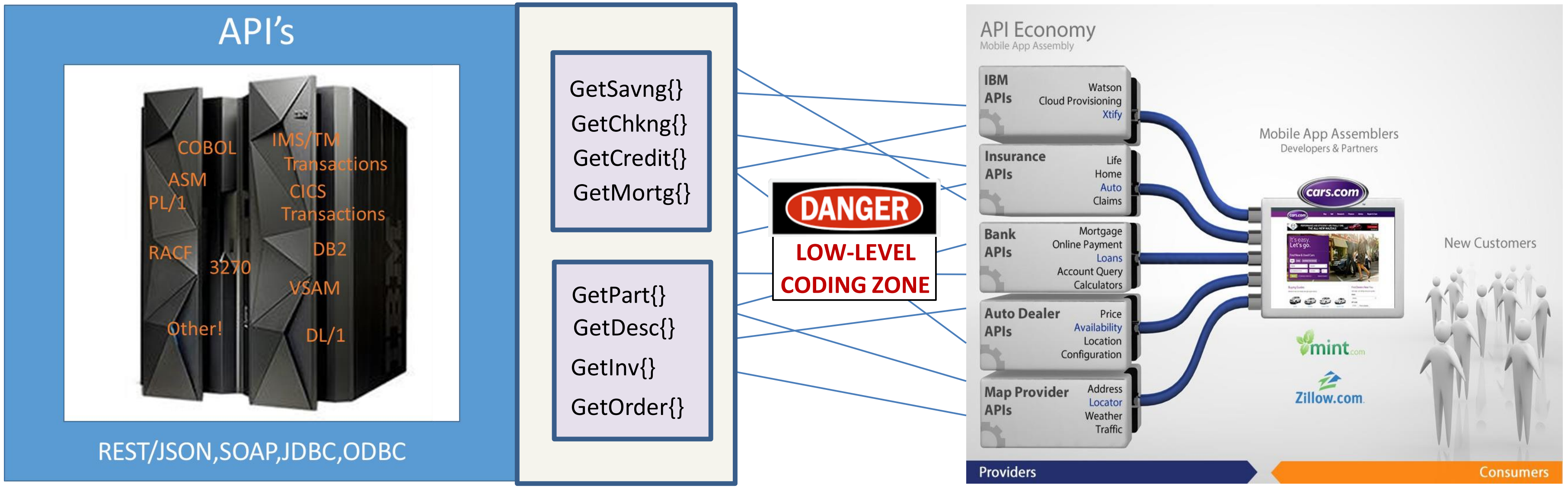
- z/OS Connect Enterprise Edition
- CICS Transaction Gateway (CTG)
- CICS Web Services (CWS)
- HOSTBRIDGE
- IMS CONNECT
- TN3270
- SQL to Data

?



Transaction APIs

Single Transaction APIs



Composite APIs

API’s

REST/JSON,SOAP,JDBC,ODBC

Transaction APIs

GetSavng{}
GetChkng{}
GetCredit{}
GetMortg{}

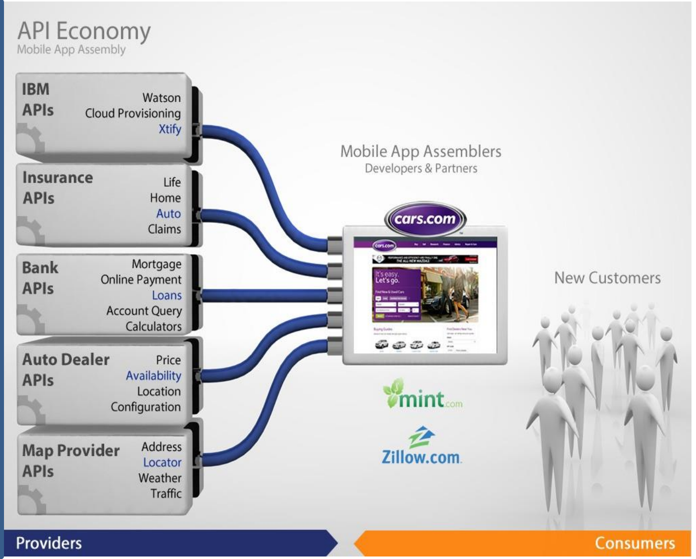
GetPart{}
GetDesc{}
GetInv{}
GetOrder{}

Composite APIs

GetCust{}

GetStatus{}

ListCust{}



Mainframe API Challenges

REALITY / NEED	THE BAD	THE UGLY
All data structures supported	Some structures don’t map well	Comp-3, binary , OCCURS DEPENDING ON, REDEFINES
Copybook fields exposed as service inputs/outputs	Names in COBOL may be cryptic and need to be renamed	Blank When Zero, Program control fields with no external value
Expose existing programs without changes	BMS map macros that set input message field values	

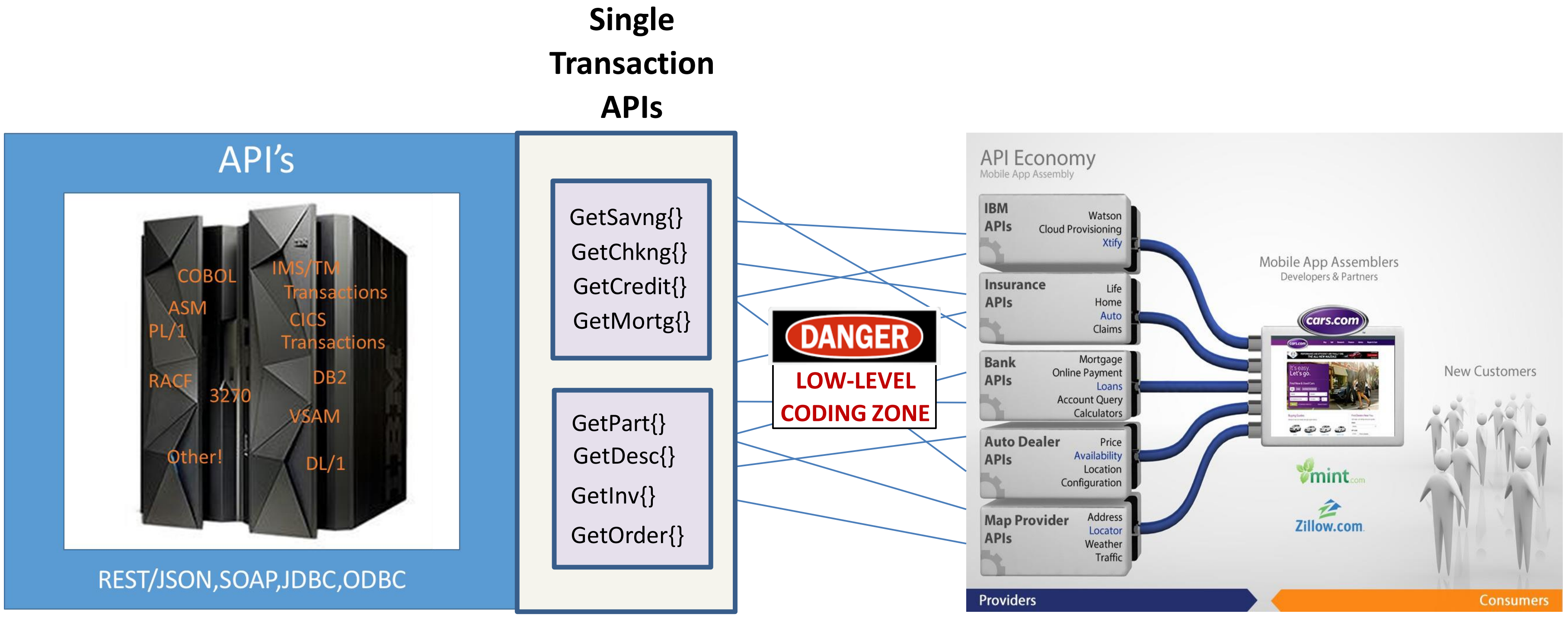
Mainframe API Challenges

REALITY / NEED	THE BAD	THE UGLY
Existing transactions exposed as REST or SOAP	A transaction may be too fine grained	Multiple transaction dependencies
Programs that return multiple output formats designed for terminals	Data may be too convoluted to use in a service	Volume of data may be too large to return to a distributed client
PFKEY = TRANCODE	Maybe need multiple transactions in sequence	

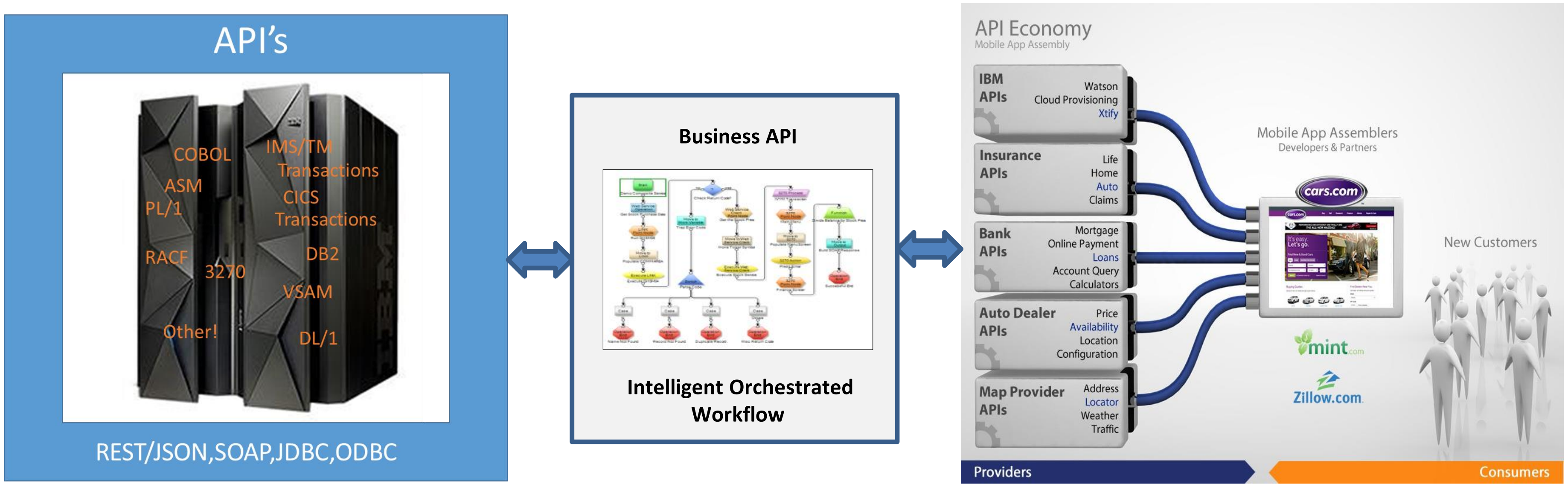
Mainframe API Challenges

REALITY / NEED	THE BAD	THE UGLY
Combine transactions in one service	May not work well with others	API’s that run for minutes
Conversational transactions	Long running conversations may be long running API’s	No understanding of conversational impact, rollback

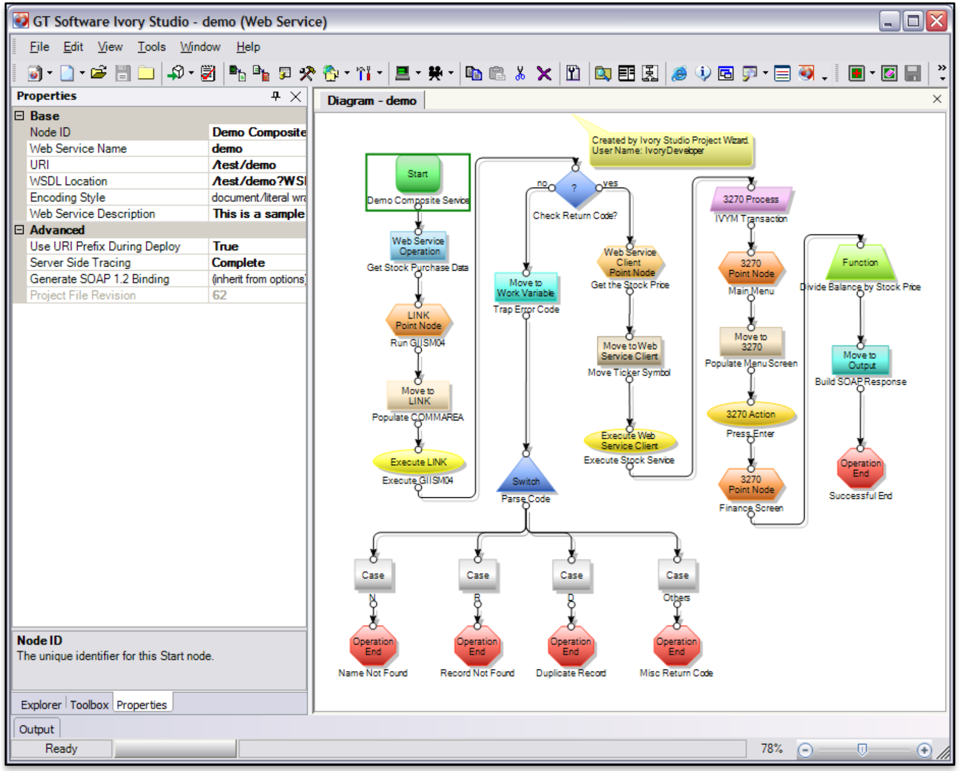
Transaction APIs



API Orchestration for Mainframe Integration



GT Ivory® API Orchestration



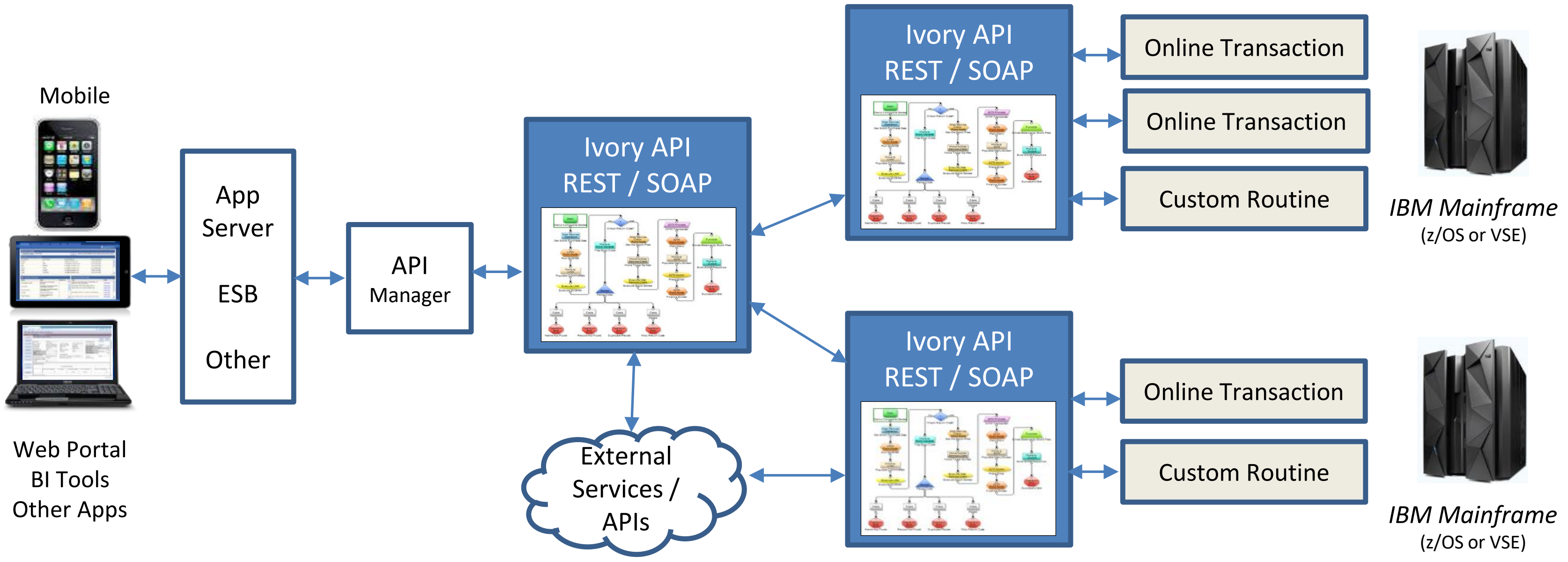
Base	
Node ID	Demo Composite
Web Service Name	demo
URI	/test/demo
WSDL Location	/test/demo?WSI
Encoding Style	document/literal wra
Web Service Description	This is a sample
Advanced	
Use URI Prefix During Deploy	True
Server Side Tracing	Complete
Generate SOAP 1.2 Binding	(inherit from options)
Project File Revision	62

Node ID
The unique identifier for this Start node.

Intelligent Composite API:

- Multiple transactions
- Multiple data sources
- External web services and APIs
- Conditional Logic
- Error handling
- Governance and security
- Drag-and-drop (**no coding**) SDK
- Shared 'business' APIs across consumers
- No 'low level' coding and management of mainframe connectors
- Easy, fast, and agile development

GT Ivory - Atomic & Composite APIs



Ivory APIs can be designed as a single transaction execution or as a composite workflow that invokes multiple online transactions, external services and other APIs, and custom routines.

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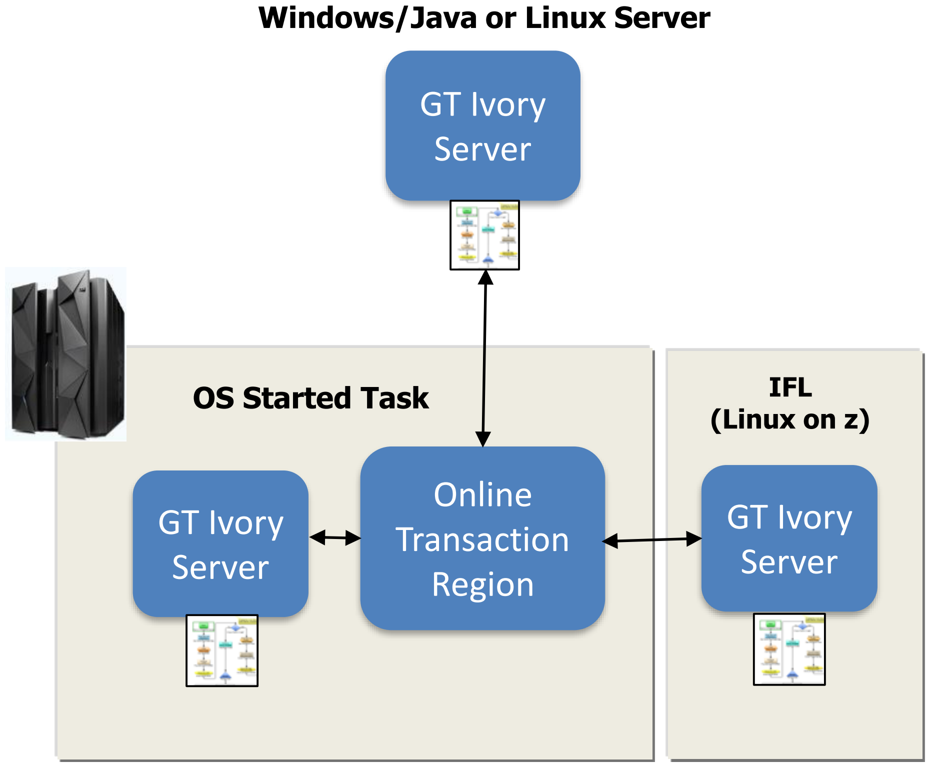
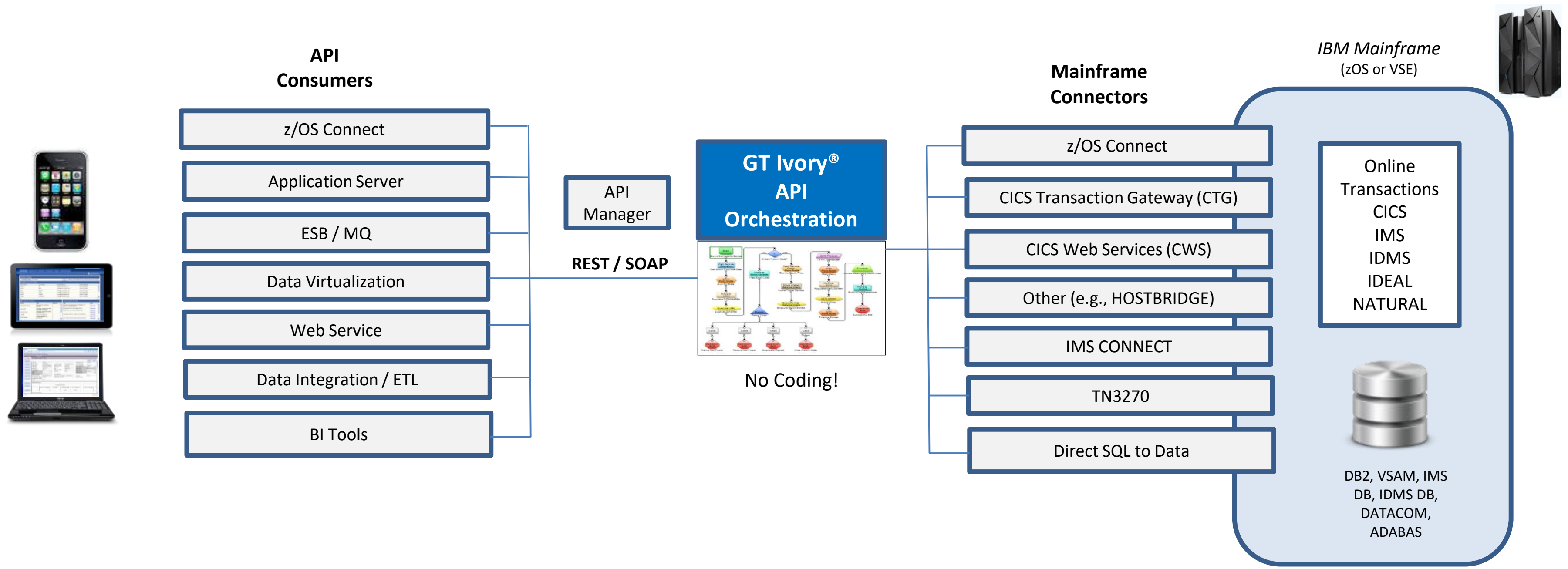
GT Ivory Examples & Demonstration

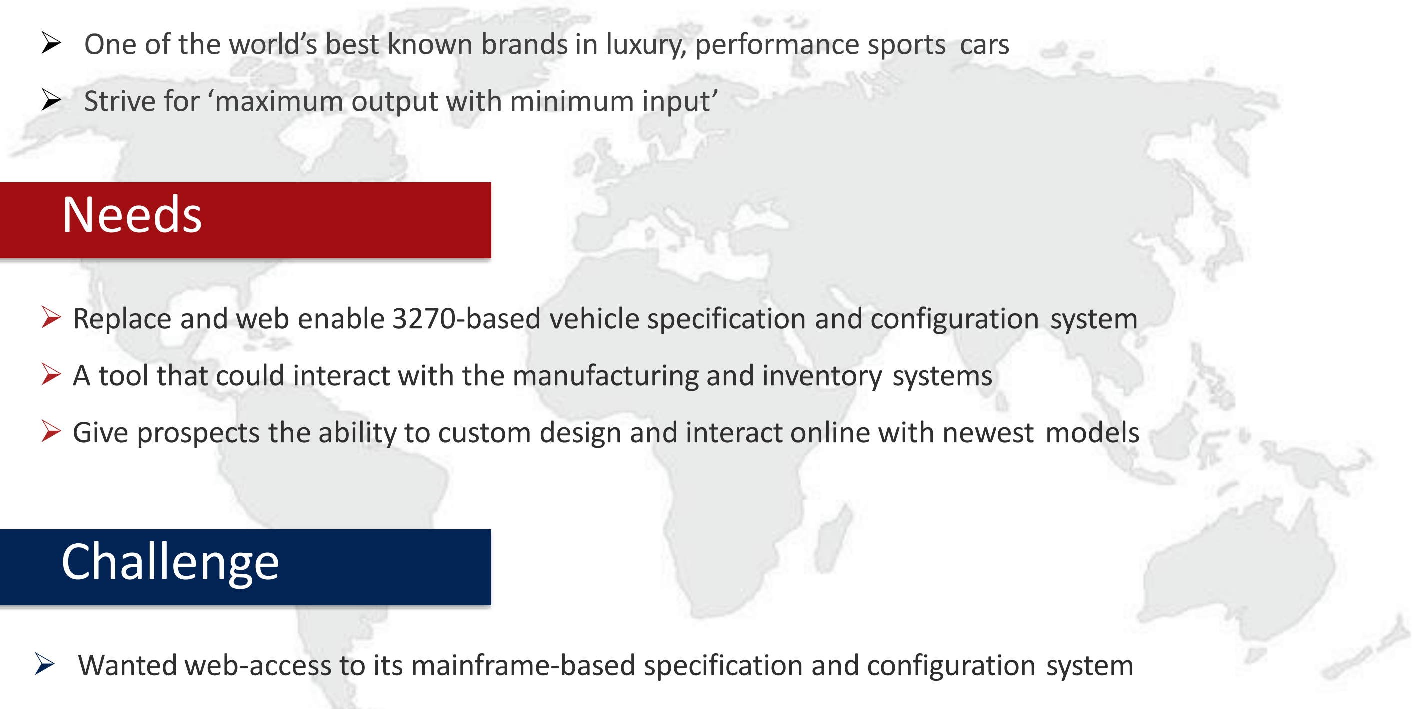
GT Ivory On and Off Mainframe Deployment Options



Making Everything Work Together



Leading Luxury Sports Car Manufacturer



- One of the world’s best known brands in luxury, performance sports cars
- Strive for ‘maximum output with minimum input’

Needs

- Replace and web enable 3270-based vehicle specification and configuration system
- A tool that could interact with the manufacturing and inventory systems
- Give prospects the ability to custom design and interact online with newest models

Challenge

- Wanted web-access to its mainframe-based specification and configuration system
- Current interface was based on IBM OS/2 operating system with 3270 ‘green-screens’

Results

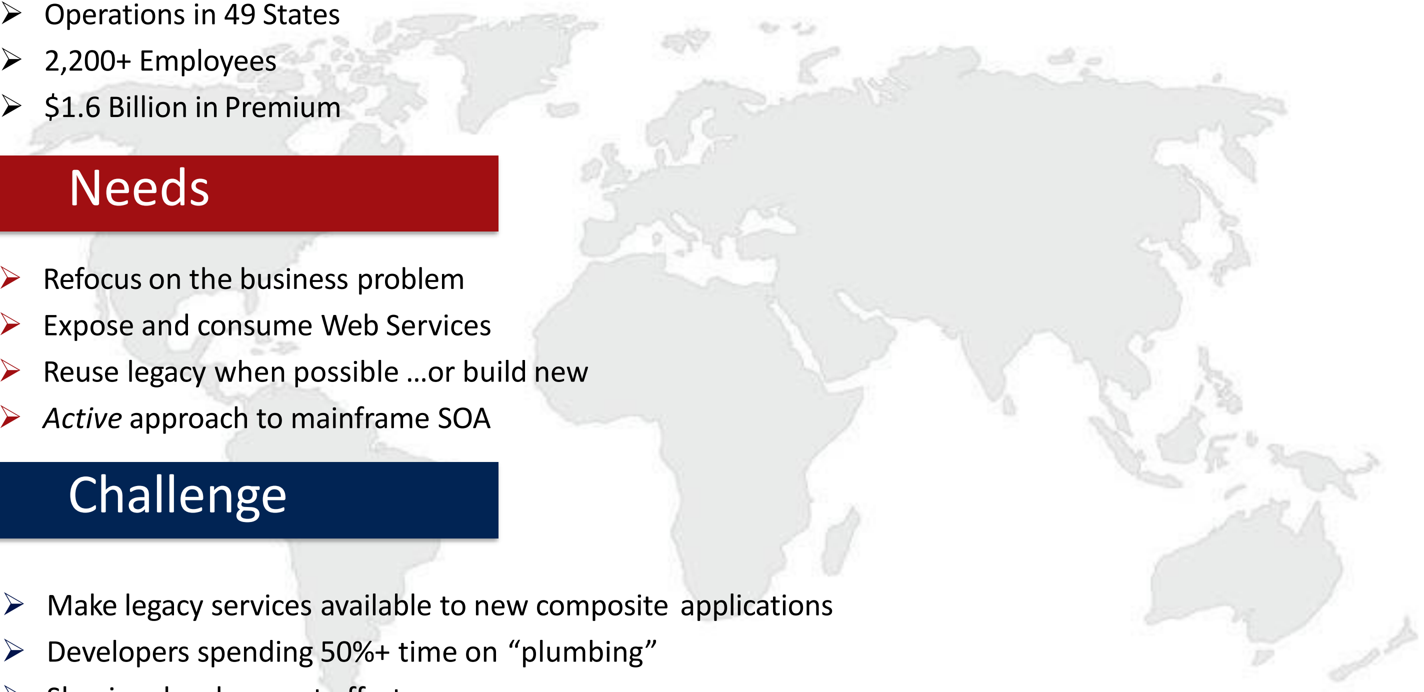
No Additional MIPS Required For Processing

Less than 1 Day to Develop, Publish and Use Web Services

No Programming or Additional Personal Required

Secure Transfer of Information Readily Available

Multi-lines Mutual Insurance Company



- Operations in 49 States
- 2,200+ Employees
- $1.6 Billion in Premium

Needs

- Refocus on the business problem
- Expose and consume Web Services
- Reuse legacy when possible …or build new
- *Active* approach to mainframe SOA

Challenge

- Make legacy services available to new composite applications
- Developers spending 50%+ time on "plumbing"
- Slowing development efforts
- Reuse opportunities lost

Results

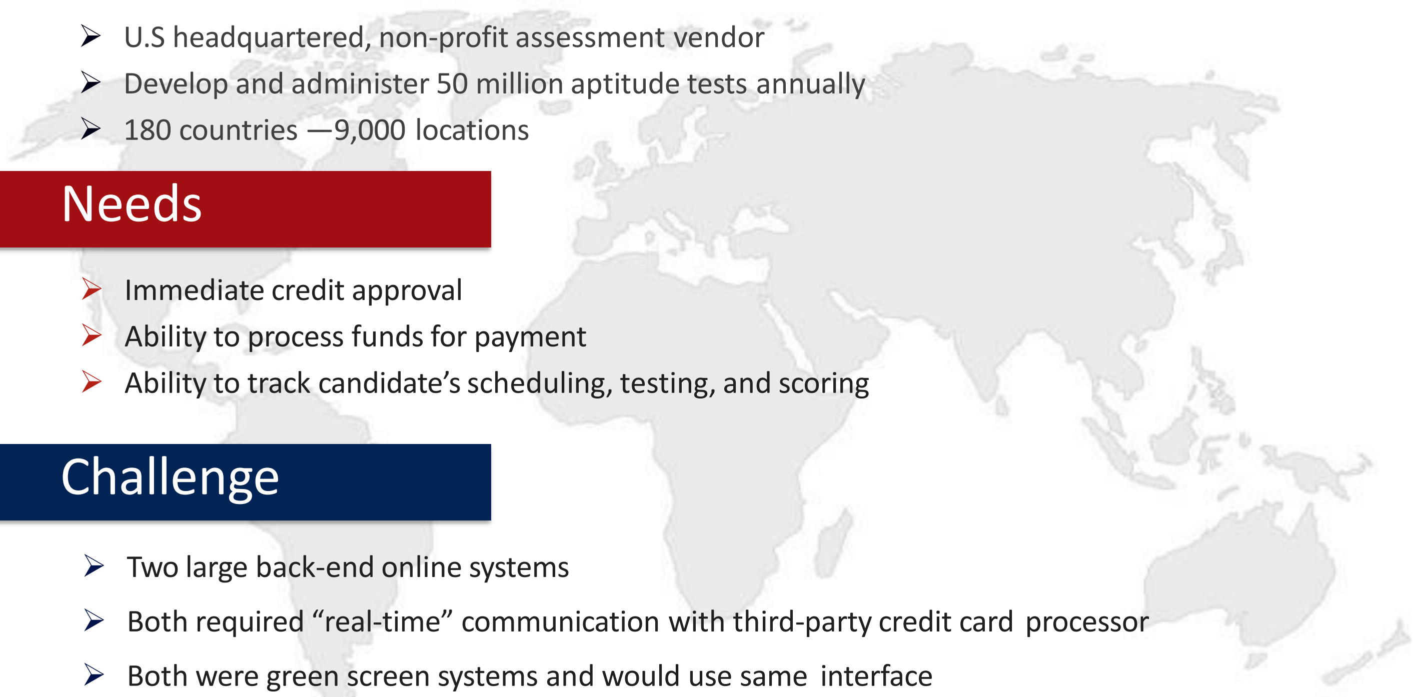
Strong ROI Within 1 Year

Only 2 Hours of Training Per User

Serving 10 Applications Across 7 Business Areas

Processes over 400K Ivory-based Web Service Requests / day

Leading Aptitude Testing Company



- U.S headquartered, non-profit assessment vendor
- Develop and administer 50 million aptitude tests annually
- 180 countries —9,000 locations

Needs

- Immediate credit approval
- Ability to process funds for payment
- Ability to track candidate’s scheduling, testing, and scoring

Challenge

- Two large back-end online systems
- Both required “real-time” communication with third-party credit card processor
- Both were green screen systems and would use same interface
- Neither coded to support encryption, SSL security and WS security tokens — a requirement for credit card processing

Results

Created "common" interface

Met aggressive timeline

Added encryption, WS security (per PCI Compliance)

Strong ROI

80% Reuse

West Coast County Government

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- Mainframe-based Criminal Justice Information System (CJIS) developed in early 1980’s
- Support for Sheriff, Police, Prosecutor, District Attorney, Courts, and other law enforcement
- Over 100,000 transactions per day

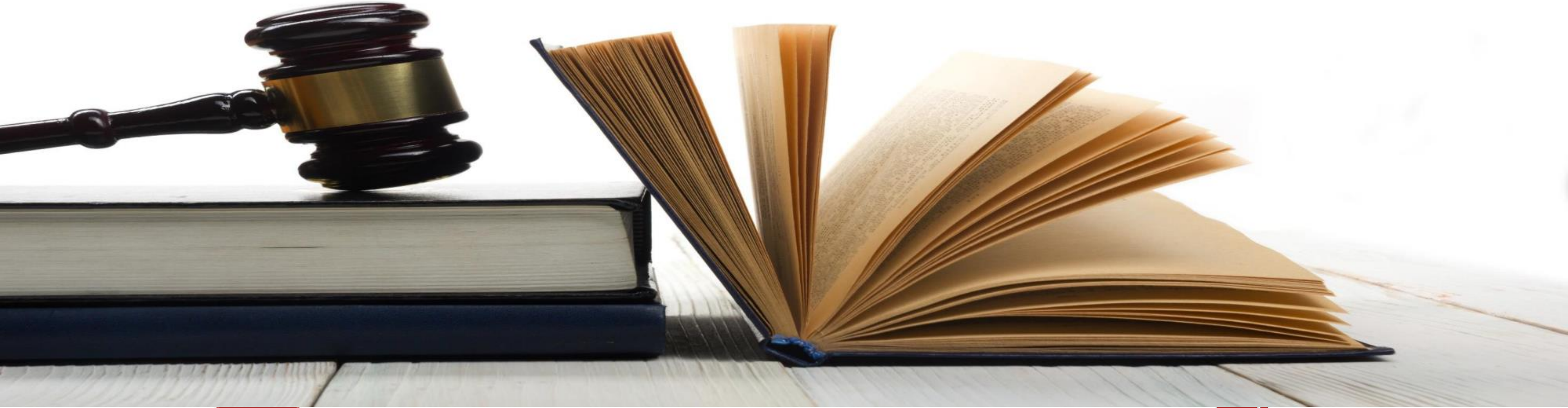
Challenge

- Multiple law enforcement systems across County
- CJIS and Jail Management System, other systems off-mainframe
- Migration of CJIS to new COTS system

Needs

- Consistant exchange of information regarding bookings and other data across systems
- Pull data generated on 3270 screens from the legacy system

Results



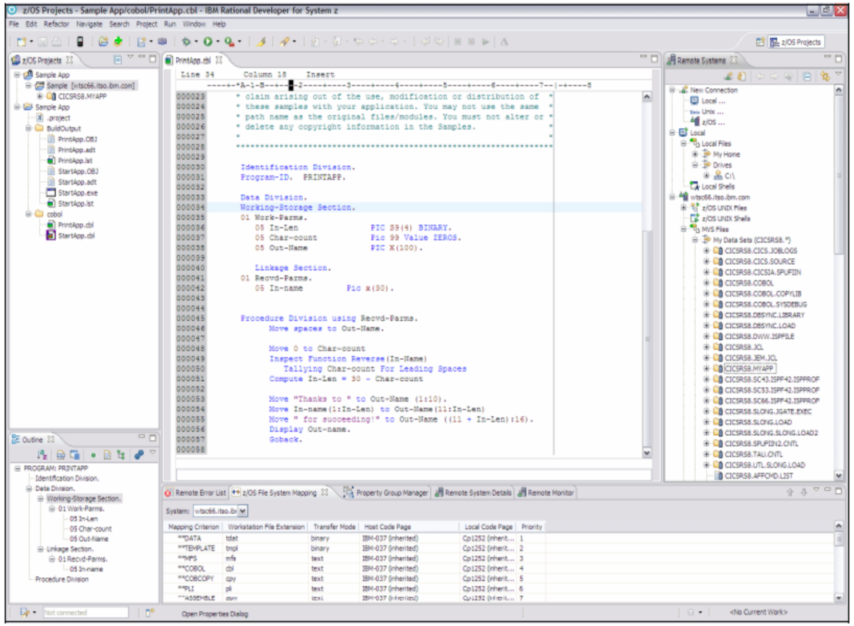
Seamless integration of systems

Access to data from CJIS transaction screens and directly from databases

Greater efficiency across law enforcement entities

Mainframe APIs – The Easy or The Hard Way?

Lots of Low-level Coding

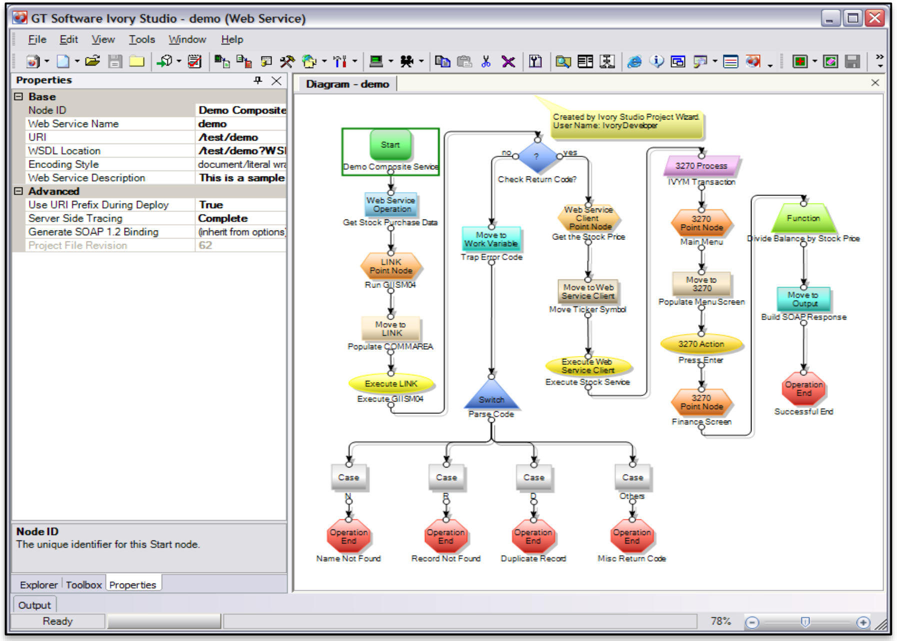

z/OS Projects - Sample App/cobol/PrintApp.cbl - IBM Rational Developer for System z
File Edit Refactor Navigate Search Project Run Window Help
z/OS Projects
PrintApp.cbl
Remote Systems
Outline
Open Properties Dialog

```
Line 34      Column 18    Insert
      * claim arising out of the use, modification or distribution of *
      * these samples with your application. You may not use the same *
      * path name as the original files/modules. You must not alter or *
      * delete any copyright information in the Samples.               *
      *                                                                *
      ******************************************************************

       Identification Division.
       Program-ID.  PRINTAPP.

       Data Division.
       Working-Storage Section.
       01 Work-Parms.
          05 In-Len               PIC S9(4) BINARY.
          05 Char-count           Pic 99 Value ZEROS.
          05 Out-Name             PIC X(100).

          Linkage Section.
       01 Recvd-Parms.
          05 In-name         Pic x(30).


       Procedure Division using Recvd-Parms.
             Move spaces to Out-Name.

             Move 0 to Char-count
             Inspect Function Reverse(In-Name)
                Tallying Char-count For Leading Spaces
             Compute In-Len = 30 - Char-count

             Move "Thanks to " to Out-Name (1:10).
             Move In-name(1:In-Len) to Out-Name(11:In-Len)
             Move " for succeeding!" to Out-Name ((11 + In-Len):16).
             Display Out-name.
             Goback.
```

System: wtsc66.itso.ib

Mapping Criterion	Workstation File Extension	Transfer Mode	Host Code Page	Local Code Page	Priority
**DATA	tdat	binary	IBM-037 (inherited)	Cp1252 (inherit...	1
**TEMPLATE	tmpl	binary	IBM-037 (inherited)	Cp1252 (inherit...	2
**MFS	mfs	text	IBM-037 (inherited)	Cp1252 (inherit...	3
**COBOL	cbl	text	IBM-037 (inherited)	Cp1252 (inherit...	4
**COBCOPY	cpy	text	IBM-037 (inherited)	Cp1252 (inherit...	5
**PLI	pli	text	IBM-037 (inherited)	Cp1252 (inherit...	6
**ASSEMBLE	asm	text	IBM-037 (inherited)	Cp1252 (inherit...	7

No Coding



Properties

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WSDL Location	/test/demo?WSI
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Web Service Description	This is a sample
Advanced	
Use URI Prefix During Deploy	True
Server Side Tracing	Complete
Generate SOAP 1.2 Binding	(inherit from options)
Project File Revision	62

Node ID
The unique identifier for this Start node.

A web service in several days…

Or in just a few hours or even minutes!

Questions?

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