IBM System z Software
Premier Executive Briefing Event

Presenter – Guy Shevik

CICS Architecting for your future – *why CICS matters to you*

Date: 4Q 2012

Organizations must

- *Sell new product lines to grow revenue and profit*
- *Rapidly address new market opportunities and customer expectations – delivering **personalized services** with speed, flexibility and integrity*
- *Shift resources from "running IT" to transforming the business*

1. Leverage **best practices** and expertise from a broader range of sources
2. **Integrate** and optimize **merged** entities resulting from **acquisitions**
   - Constantly **innovate** and optimize **business processes**, adding both rigor and flexibility
   - Break down organizational and **application silos** to embrace rapid, proactive change
3. Tap into **information** and activity across the entire network – including sensors, mobile, cloud, and social media – to serve customers better, resolve problems and operate more efficiently
4. **Predict** problems and issues before they occur
5. Implement new **mobile** services to better serve customers

Agenda

- Issues facing Architects and Developers
- Key Architectural Principles
  - Best Practices
  - Integration
  - Connectivity
  - Predict problems
- Mobile services
- Summary
- References

Issues facing Architects and Developers

- Leverage Best practices
- Integration
- Tap in to Information across applications/systems
- Predict problems
- Implementing mobile solutions

Best Practices

- CICS Explorer
- OSGi
- Java 64 Bit
- Axis2
- Threadsafe
- CICS Developer Trial V4.2 and coming soon V
- CICS TS V5.1 open be

New

New

Some Key Architectural Principles

Architectural Principle	Relevant technology
Use industry standards	Web services, OSGi, JSPs and Servlets
Define clear interfaces	Web services, REST, Atom
Componentisation	OSGi, SCA
Reuse, not rewrite	Event Processing, WSRR, CICS IA
Loose coupling	Web services, Event Processing
Design for high availability	Parallel sysplex, CICSPlex SM workload management, no affinities
Code for performance	Threadsafe
Fit for purpose	Language choices e.g. Java Platform choices i.e. CICS TS Connectivity choices e.g. CICS TG

IBM CICS Explorer® V5.1

Enhanced!

Session and user views, Configuration, Broadcast, User and Admin commands

ISM

New!

Migrated file status

VT

Daemon & Connection Status & Test

TG

Threadsafe, File, CPU, Response & Wait analysis, Statistics, Alerts, Graphical and Sheet views

PA

Deployment, Discovery, Visualization, Cloning, Automation & Control

DA

Enhanced!

Execution Tree Dependencies Queries Command Flow

IA

CRUD, Install, History, Backout, Audit, Search, Compare, Packaging

CM

PD …

PD Tools Studio

Manage IMS …

IMS Explorer

Develop Test

RDz

Enhanced!

CRUD, Install, Control, Filter, Sort, Topology, Events, ATOM, Java, WLM, Txn Tracking, Copy/Paste

SM

z/OS Connections, z/OS Datsasets, zFS files, JES

z/OS Explorer

CICS TS, IMS, DB2, MQ, z/OS

Configuration Status Control, Test

MQ

Status Situations Topology

XE

Manipulate, browse z/OS data sets, z/FS, VSAM, MQ, CICS, DB2

FM

CICS, IMS, DB2, & z/OS Abend Reporting & Diagnosis

FA

CICS, IMS, DB2, & z/OS Application Debugging

DT

CICS, IMS, DB2, & z/OS Observation Requests & Reporting

APA

3270 application performance testing

WSIM

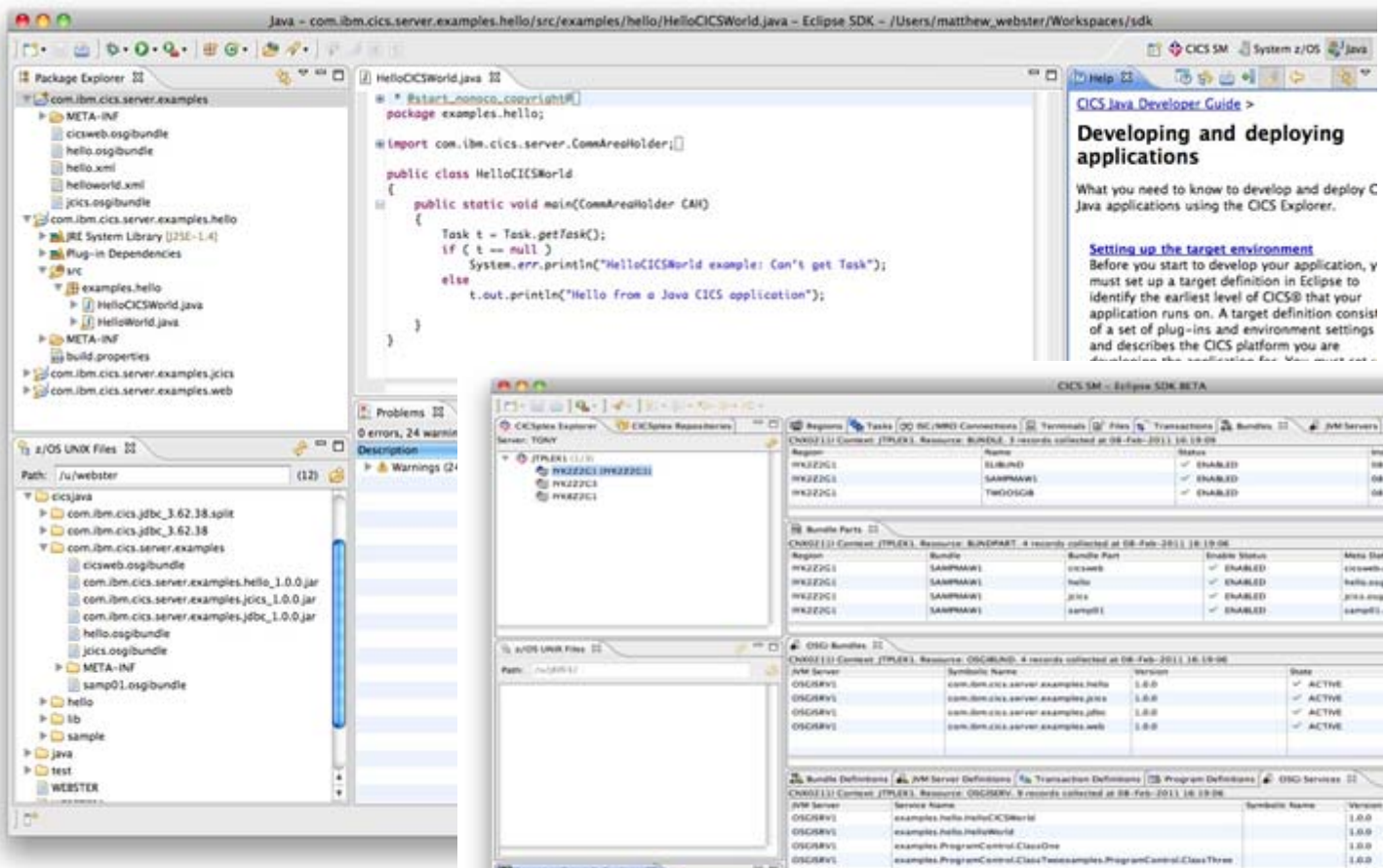
SM	CICS Transaction Server
IA	CICS Interdependency Analyzer
PA	CICS Performance Analyzer
CM	CICS Configuration Manager
DA	CICS Deployment Assistant
TG	CICS Transaction Gateway
ISM	IBM Session Manager
VT	CICS VSAM Transparency

APA	Application Performance Analyzer
FA	Fault Analyzer
DT	Debug Tool
FM	File Manager
WSIM	Workload Simulator
MQ	WebSphere MQ
XE	OMEGAMON XE for CICS
RDz	Rational Developer for System z

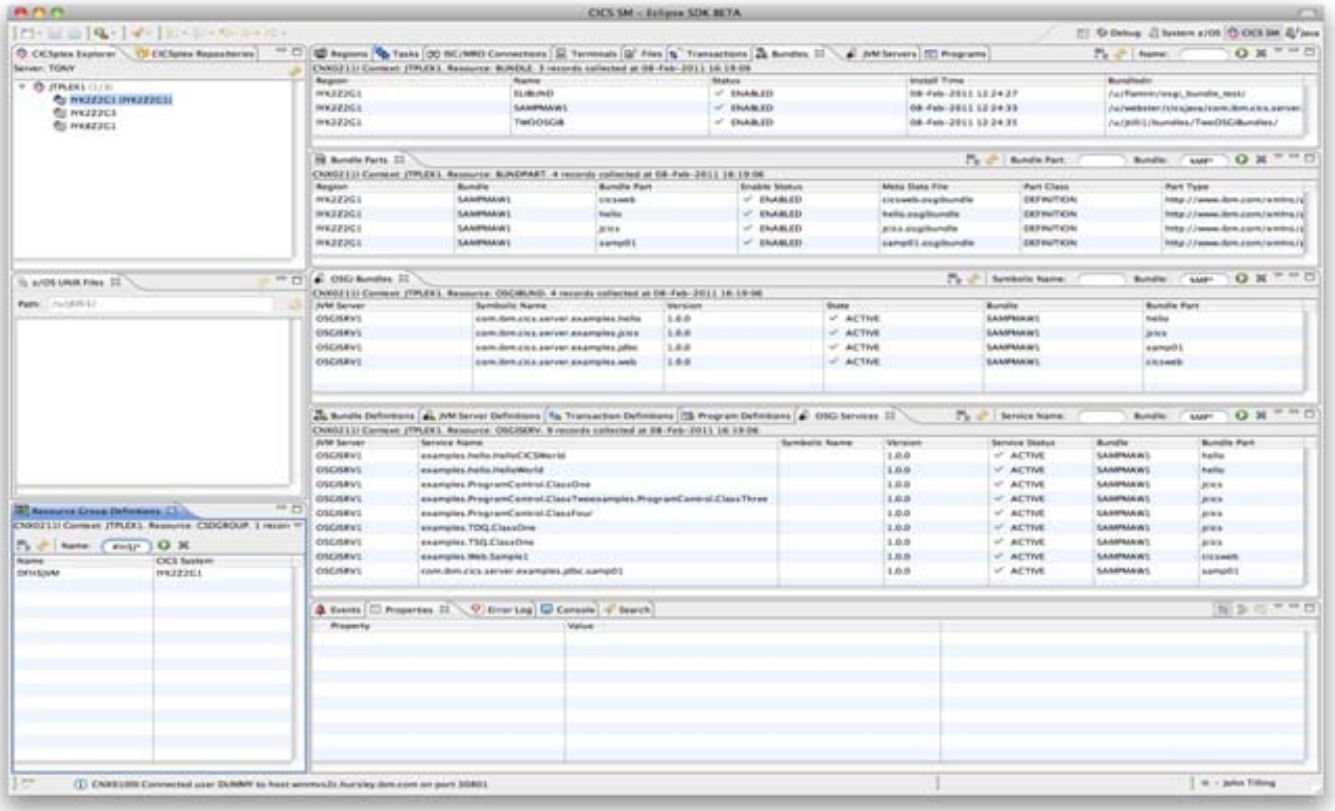
Support for Java 6 64-bit JVMs

- CICS TS supports Java 6.0.1, 64-bit, V5.1 Java 7
- Allows many more JVMs and larger heap sizes
- New OSGI runtime and tooling provides improves lifecycle and management support
- Rebuild any Native DLLs as AMODE(64)
- JVMServer provides modern scalable runtime for CICS together with Eclipse based tooling environment
  - OSGi,
  - Axis2,
  - Container for compute grid (CN11)
- WebSphere Application Server Liberty profile web container (V5.1)
  - Java servlets / Pages
  - Performance optimised with local access

OSGi support in CICS



CICS Explorer SDK

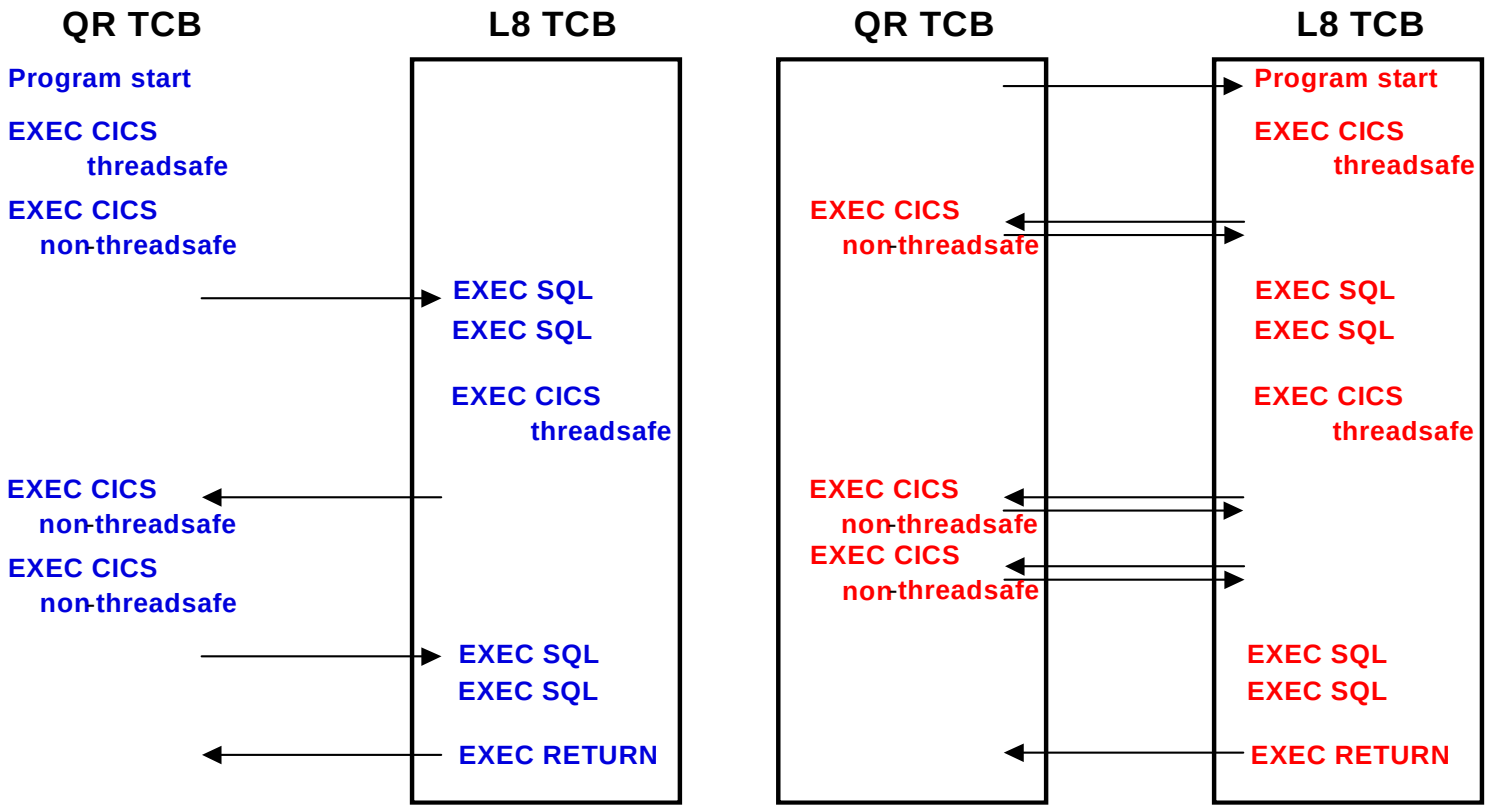


OSGi bundles and services in CICS Explorer

Axis2 Java Web services

- **Based on Axis2 technology**
  - Java SOAP pipeline
    - Alternative to the existing CICS Web Services pipeline
  - Similar support to existing CICS Web services pipeline
    - Provider (inbound) and requester (outbound) applications
    - WS-Addressing and MTOM/XOP
  - Runs within CICS JVM server environment
    - Can access existing CICS programs files etc. using JCICS class library
- **Advantages**
  - Complex XML parsing can off-loaded to zAAP
  - No need to use DFHWS2LS for top-down (WSDL to COBOL) mappings
  - Java components can use Java Web services interfaces such as JAX-WS
  - Ability to develop pure Java Web Services applications
  - **Note**: WS-Security not available for Axis2 WS provider applications

CICS TS Scalability enhancements



The program for this transaction is defined CONCURRENCY(THREADSAFE) API (CICSAPI),

EXECKEY(USER) or EXECKEY(CICS)

The program for this transaction is defined CONCURRENCY(REQUIRED) API (CICSAPI),

EXECKEY(USER) or EXECKEY(CICS)

CONCURRENCY(THREADSAFE) vs CONCURRENCENCY(REQUIRED)

Threadsafe considerations Redbook, A comparison of CICS QR and OTE Performance paper

CICS Developer Trial

Announced Jan 24th 2012, available from Jan 27th

- No charge trial, fixed expiry date
- Does not start SVC period
- For non-production environments
- Available through IBM ShopzSeries
- PID 5655-CIC

Based on CICS TS V4.2 (with restrictions)

- Performance
- Capacity
- License

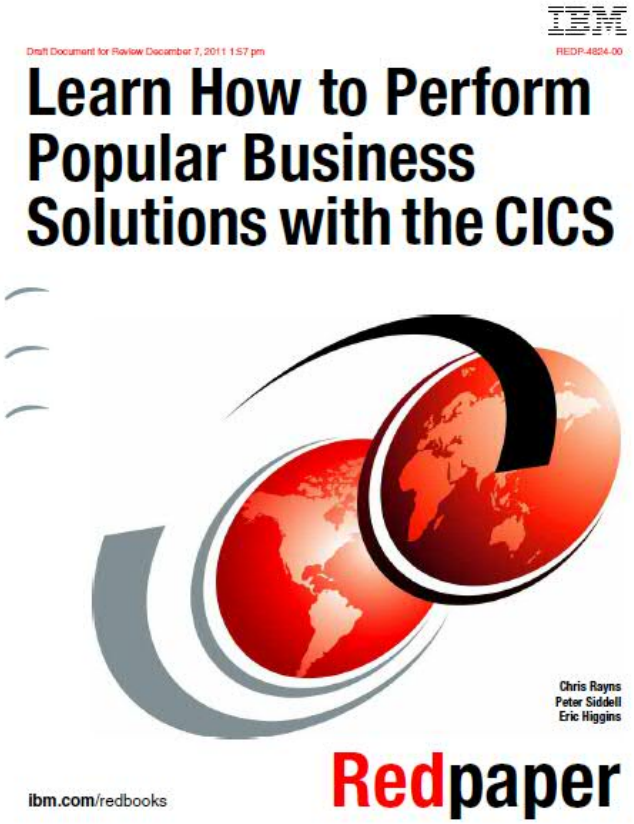
Based on CICS TS V5.1 coming Jan 2013

https://www.ibm.com/developerworks/connect/cicsdev

GENAPP – SupportPac and Redpaper

- **GENAPP is available to customers as SupportPac CB12, at no extra cost**
  - Download from http://www-01.ibm.com/support/docview.wss?rs=1085&uid=swg24031760
- **There is a paper based on GENAPP with scenarios in this new IBM Redpaper**
  - Download from http://www.redbooks.ibm.com/abstracts/redp4824.html?Open

New



GENAPP will be updated in December 2012 to exploit new CICS TS V5.1 features

Cloud-style CICS applications and infrastructure

CICS Transaction Server for z/OS V5.1 open beta

New!

- **Take a test flight** through cloud-style CICS development, deployment and operations
- **Try out the new** CICS web application capability, built on the WAS Liberty Profile

What's new in the 5.1 Beta?

- ***Platform as a Service (PaaS)*** capabilities that can be used to host Software as a Service (SaaS)-based CICS applications.
- ***Policy-based management*** to automatically modify the behaviour of tasks that exceed predefined thresholds, during runtime.
- ***Fast and lightweight Java web container*** combining Java Servlets and JSPs with fast local access to CICS applications.
- ***Capability and scalability advancements*** that allow CICS applications to do significantly more, with much greater ease.

Open Beta - everybody is invited

Announced on April 24, 2012

Available for download from July 13th, 2012

The new CICS Transaction Server V5.1 delivers…

Operational Efficiency

- *Greater capacity* - achieve cost savings through consolidation
- *Managed operations* - *reduce cost and risk through automation*
- *Increased availability* - reduce the need for planned downtime
- *Deeper insight* - *Improve decision making and audit readiness*

Service Agility

- *First-class applications* - create agile services from existing assets
- *First-class platforms* - create agile service delivery platforms
- *Modern interfaces* - build rich web experiences for critical applications
- *Foundational enhancements* - extend core capabilities

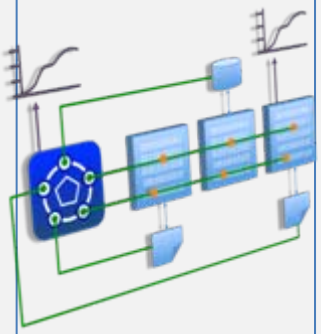
100+ requirements satisfied!

… with Cloud Enablement

consistent with the IBM Cloud Computing strategy
positions customers for the next transformational era in technology
moves towards a cloud oriented service delivery platform

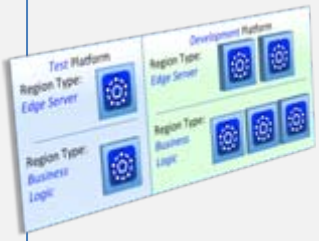
CICS TS V5.1 : Increasing Service Agility

First-class Applications



- Manage disparate resources as a single entity
- Rapidly move through the application lifecycle
- Automate dependency management
- Ensure rigorous yet flexible provisioning
- Measure entire application resource usage
- Dynamically manage applications with policies

First-class Platforms



- Group new and existing regions as platforms
- Decoupling applications from the region topology.
- Automatic resource deployment and validation
- De-provision resources when requested
- Deploy applications to regions within a platform
- Dynamically manage platforms with policies

Modern Interfaces

- A production-ready web container
- Deploy lightweight Java servlets and JSPs
- Local access to CICS applications and data
- Roll-out of interface updates through OSGi
- Integration with applications and platforms
- Built on WebSphere Application Server Liberty profile for compatibility

Foundational Enhancements

- CICS supports "one-to-many" event emission
- Greater-than-32KB across MQ (DPL) bridge
- Enhancements to IPIC add IMS support
- Reduced application storage needs with GET and PUT container
- Backup and restore entire CICSPlex System Manager (CICSPlex SM) systems
- Automatic adjustment of the CICS clock for daylight saving time changes

CICS TS V5.1 with cloud enablement

Moving towards a cloud oriented service delivery platform

3 simple steps to cloud enablement…

1. Define your platform encapsulating your existing regions
2. Define your applications, entry points, and dependencies from existing assets
3. Deploy your applications onto your platform

With cloud enablement you can…

- Bring the flexibility of cloud deployment to your existing CICS assets
- Easily measure resource usage of your CICS business applications
- Dynamically control your CICS applications and infrastructure at runtime

Application

Create agile services from existing assets

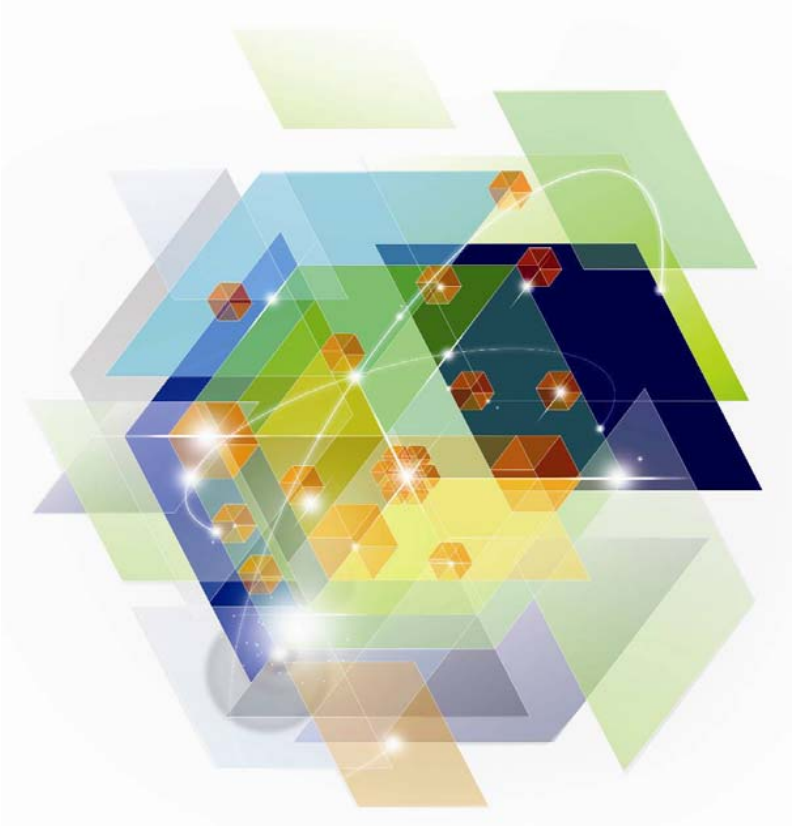
Platform

Create agile service delivery platforms

Policy

Control critical resource thresholds with policies

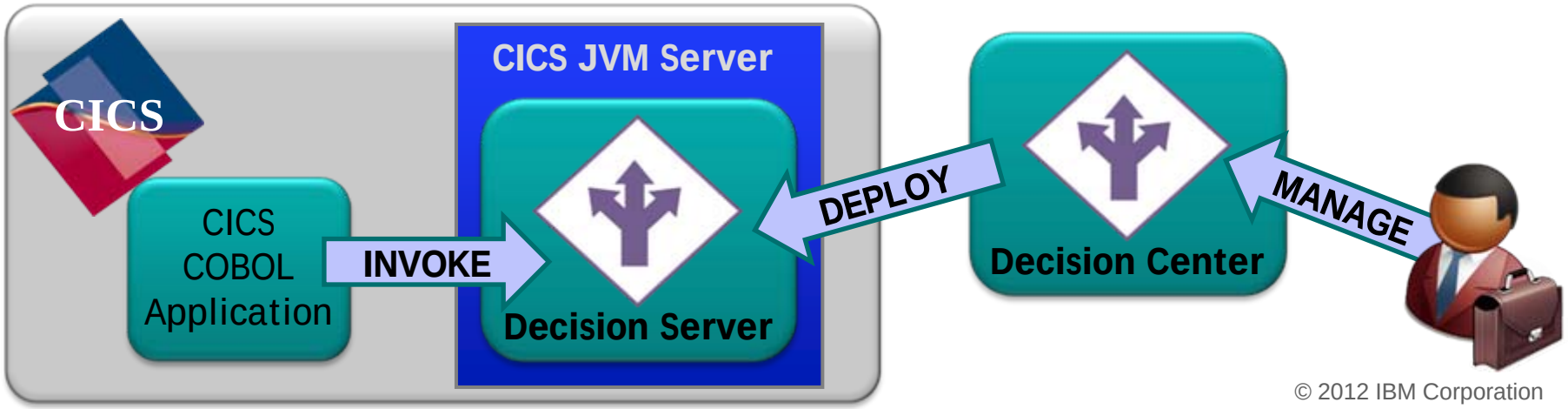
Integration



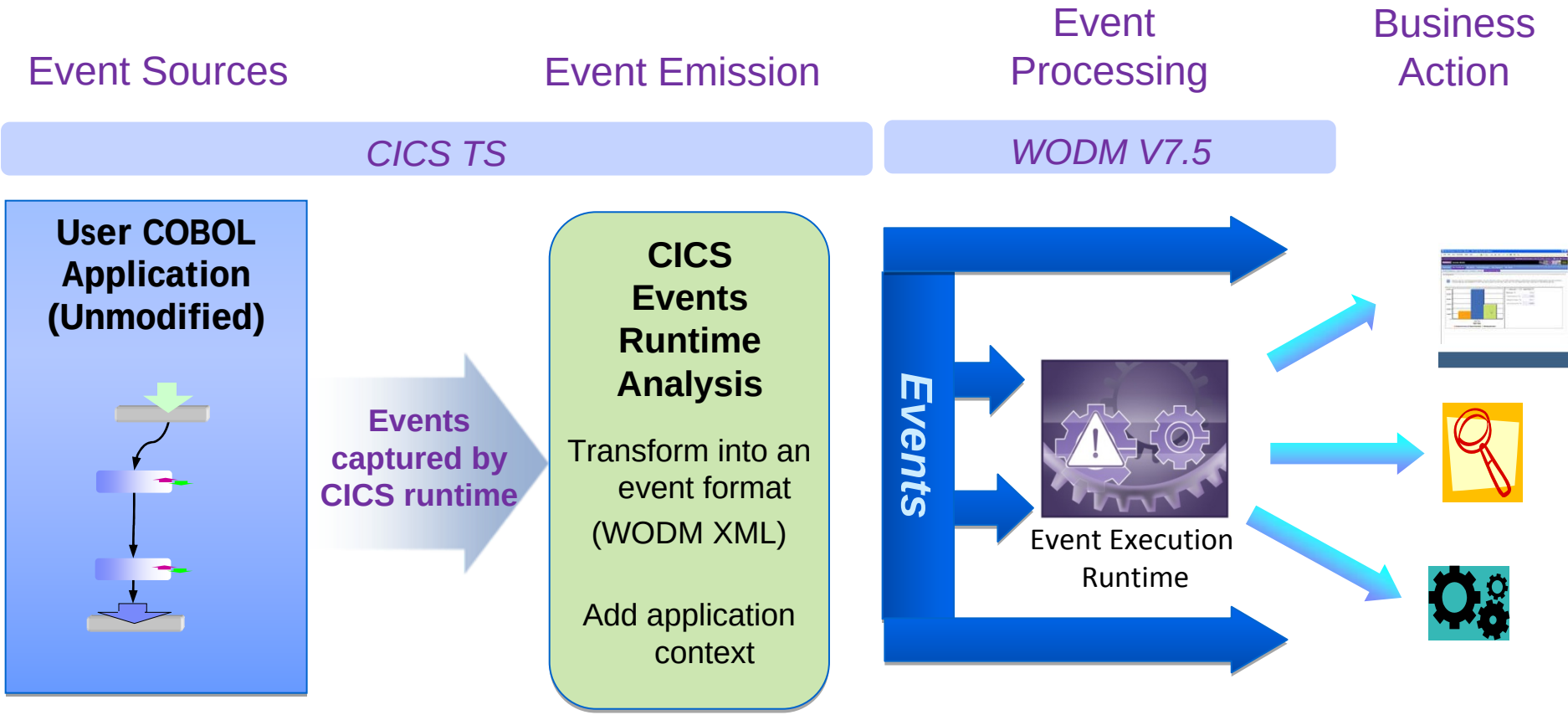
WebSphere Operational Decision Management & CICS

Externalize embedded business rule logic & execute within CICS

- *Gain business agility with existing and new CICS applications*
  - Manage decision logic on a separate lifecycle to application code
  - Ability to react to changes in a fast paced, competitive marketplace
- *Lower the cost of maintaining your business applications*
  - Improvement operational efficiency and total cost of ownership
- *Consistent Decision evaluation across the enterprise*
  - Author decision rules once and deploy to multiple systems on z/OS and distributed
- *Optimized decision execution*
  - Highly efficient rule execution engine
  - Local optimization of Decision Server within the CICS JVM Server environment



Events from CICS TS with WODM



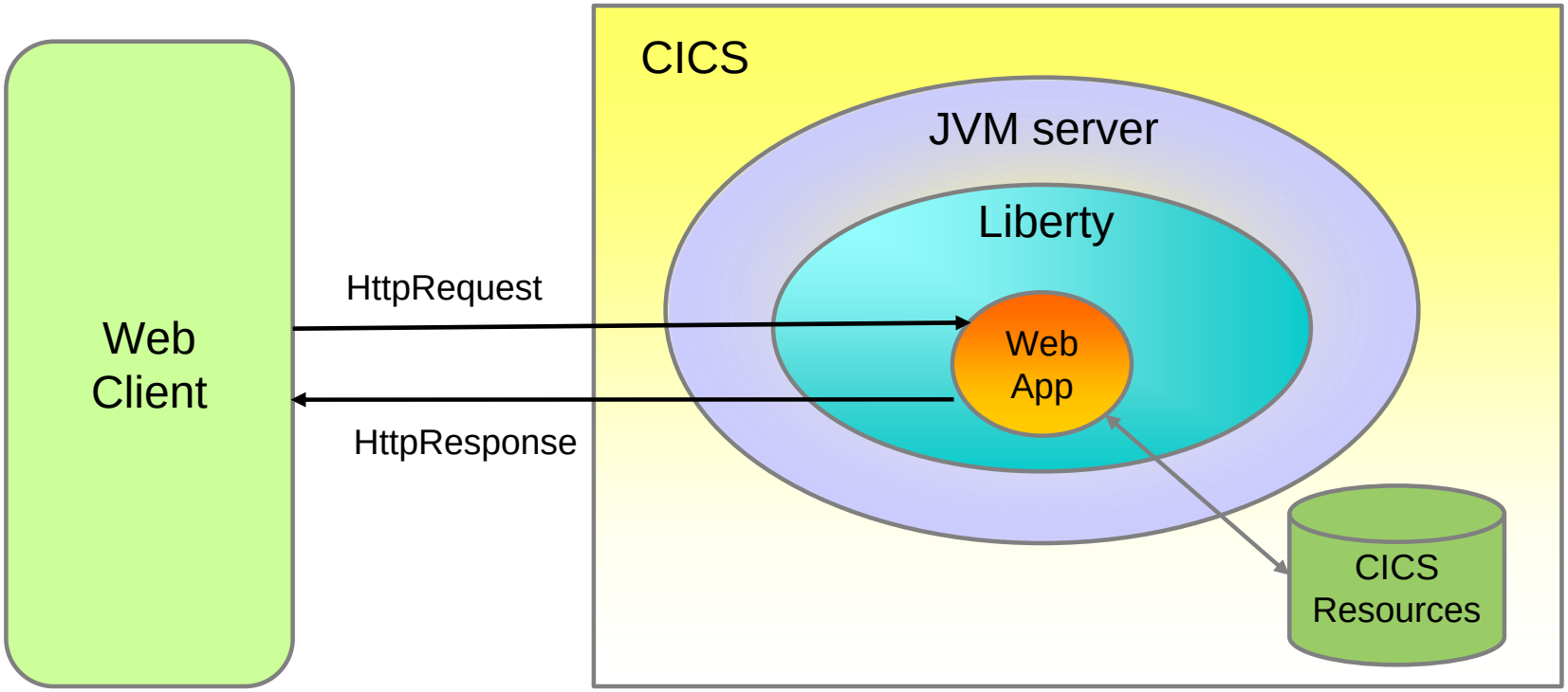
CICS Events help you to

- *Observe business processes*
- *Recognize suspicious activity*
- *Drive new processing*

Modern interfaces – Liberty Profile Web Container

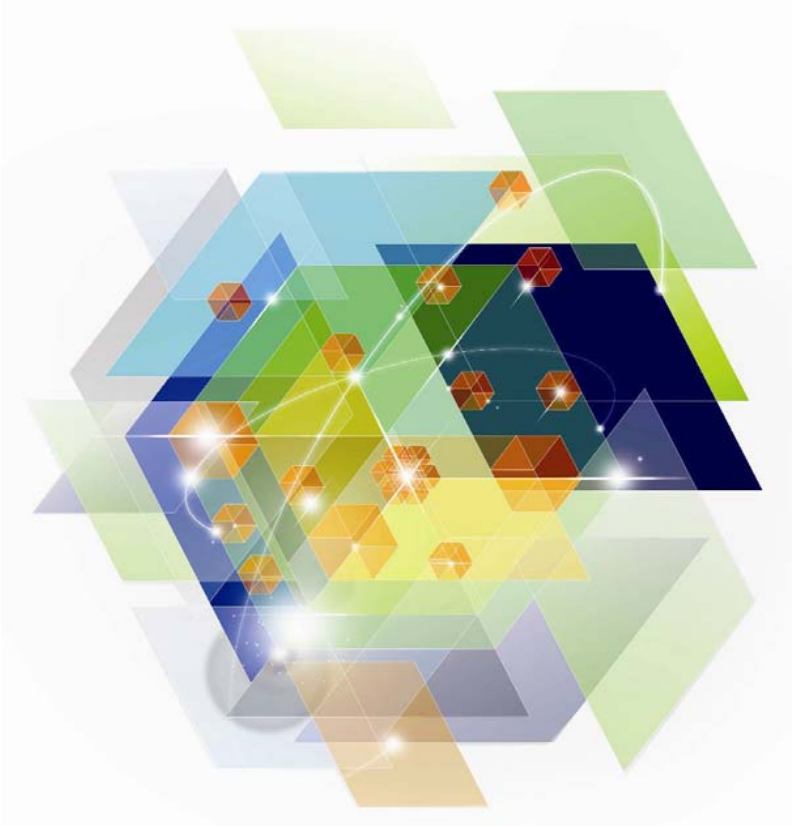
- **New Java web container is built on WebSphere Application Server Liberty profile technology:**
  - Liberty is a lightweight, composable, ‘profile’ of WebSphere Application Server
    - Provides a fast and lightweight Java web container
  - Provides “off the shelf” Web-server capabilities (JSPs and Servlets)
  - Provides potential to re-use even more WebSphere technology in CICS.
  - JSP and Web servlets have direct, local, access to CICS data and resources.
  - Servlets can take advantage of existing CICS OSGi applications to provide a Dynamic Web front end.

Modern interfaces – Liberty Profile WEB Container

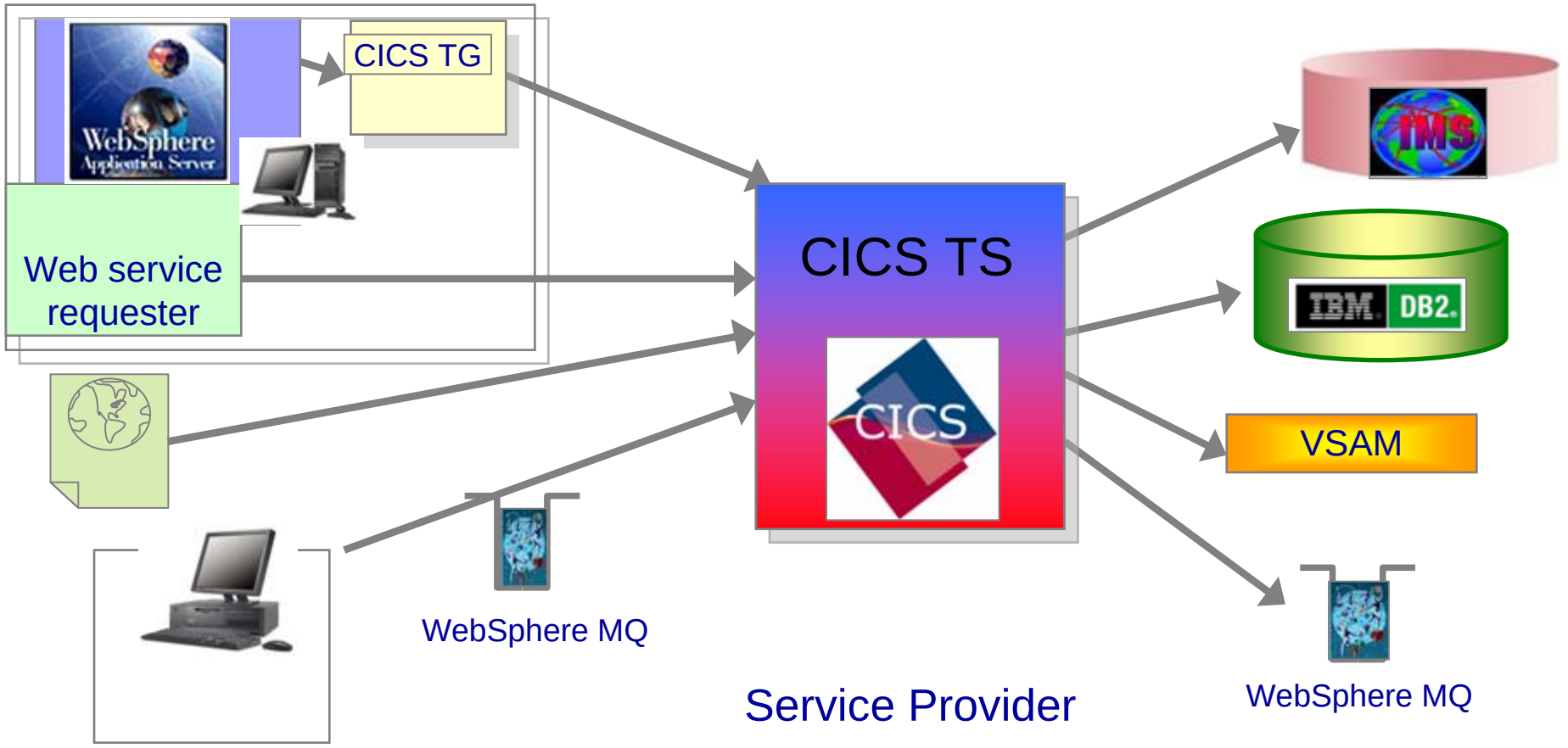


- Liberty Profile runs in a JVMSERVER
  - Use sample JVMSERVER profile DFHWLP
- Web App developed and deployed using Eclipse IDE & CICS Explorer SDK

Connectivity



CICS and connectivity



Service Consumers

Service Provider

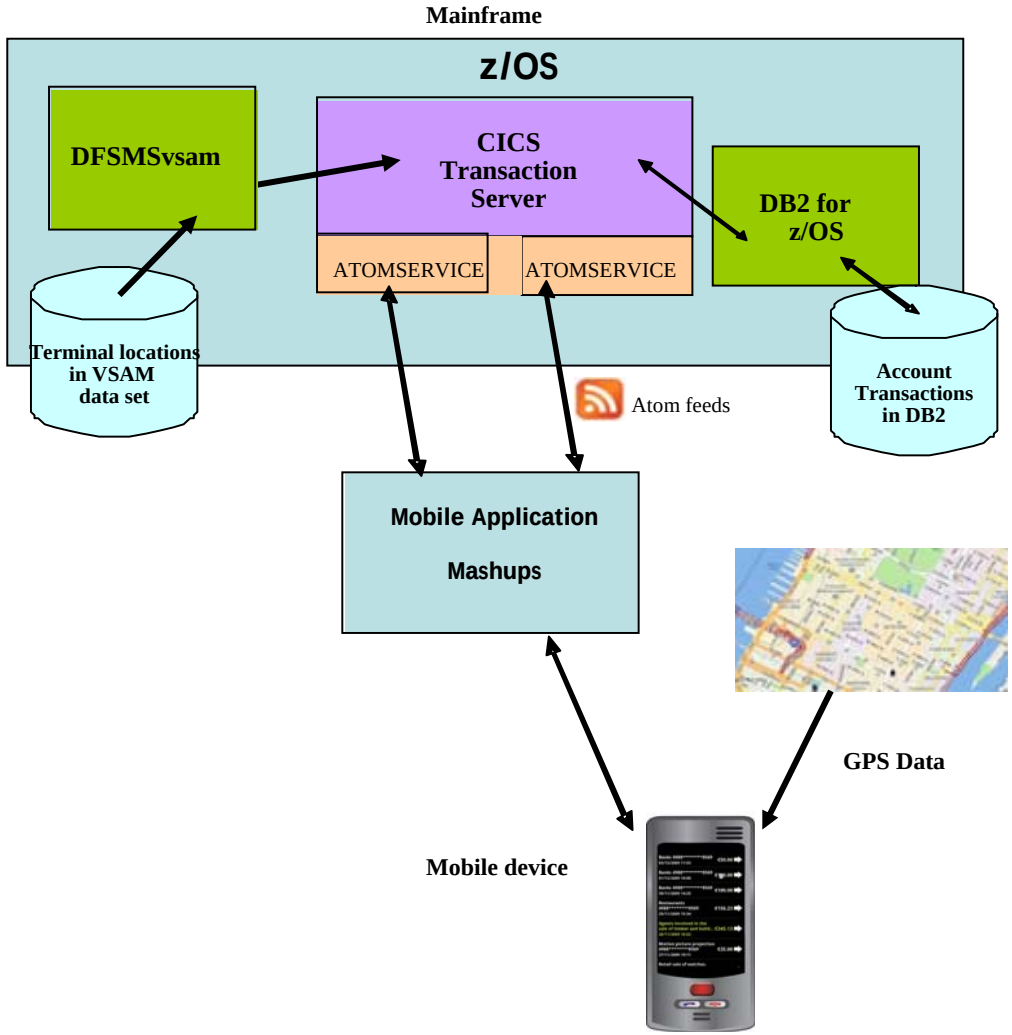
- delivering critical applications at the heart of your enterprise

Data

Consumable account information using Atom feeds from CICS

Mobile application which provides added value to customer

- View account data
- Flag unusually large transactions
- Find location of nearest ATM
- Mashup of where transactions took place together with location of mobile device at the time
- etc.



Define clean and clear interfaces

Motivation

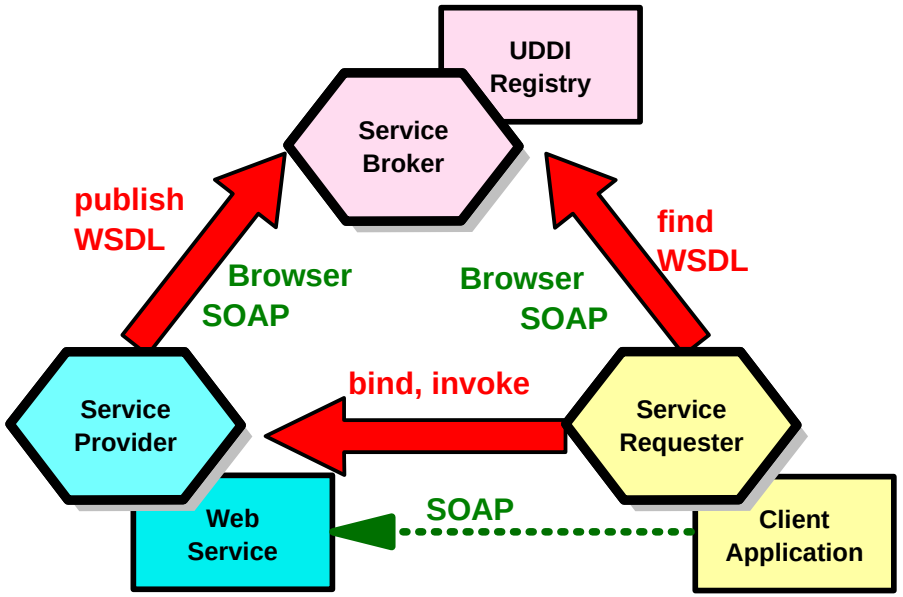
- Clarity of function provided
- Easy to invoke and use
- Easy and transparent to change underlying implementation
- Encourages a structured architecture

Supporting technologies

- Web services
- RESTful services
- Atom feeds

Web Services: Definitions

- **Architecture for**
  - Application to application
    - Communication
    - Interoperation
- **Definition:**
  - Web Services are software components described via **WSDL** that are capable of being accessed via standard network protocols such as **SOAP** over **HTTP**
- **WS-I.org (Web Services Interoperability Organization):**
  - An organization to ensure interoperability



The entire industry is agreeing on one set of standards !!

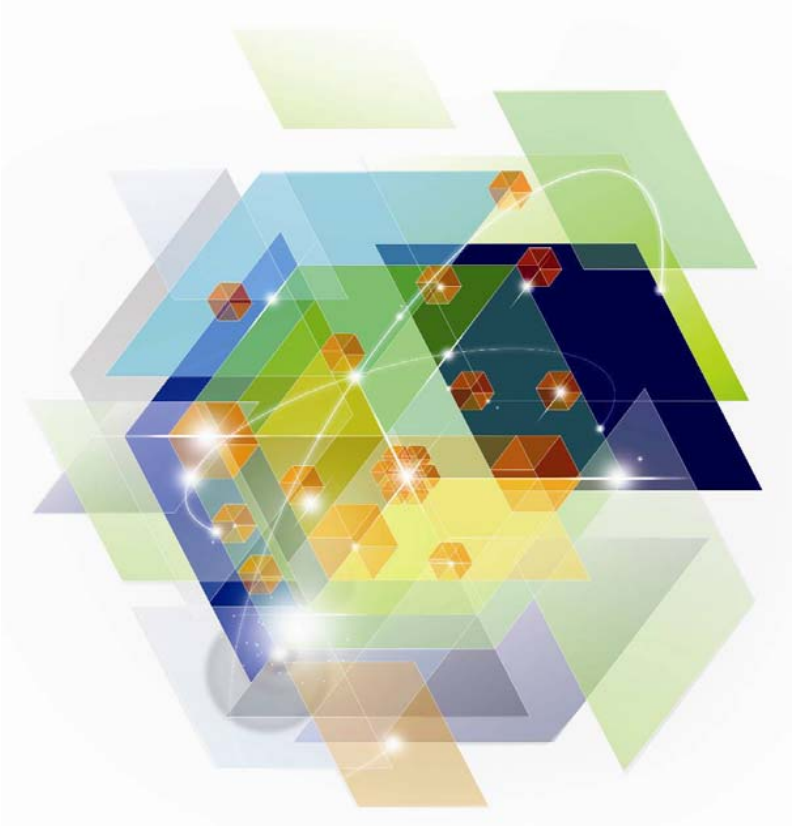
RESTful services

- **REST**
  - **RE**presentational **S**tate **T**ransfer
    - Architectural model on which the World Wide Web is (and always has been) based

- **Principles of REST**
  - Resource-centric approach
  - All relevant resources are addressable via URIs
  - Uniform access via HTTP – GET, POST, PUT, DELETE
    - ... all the verbs you'll ever need
  - Content type negotiation: retrieve alternative representations from same URI
  - Lightweight data transfer – from Web browser or any HTTP client or server

- **"Clean and meaningful URLs"**
  - For everything
  - e.g. a file, a database, a CICS TS queue....
    - or a single record within each resource
- **Light reading:** http://www.ics.uci.edu/~fielding/pubs/dissertation/top.htm

Predict Problems

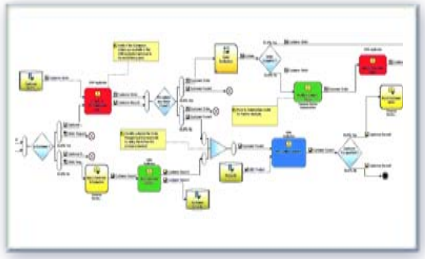


The Role-Based CICS Event Workflow

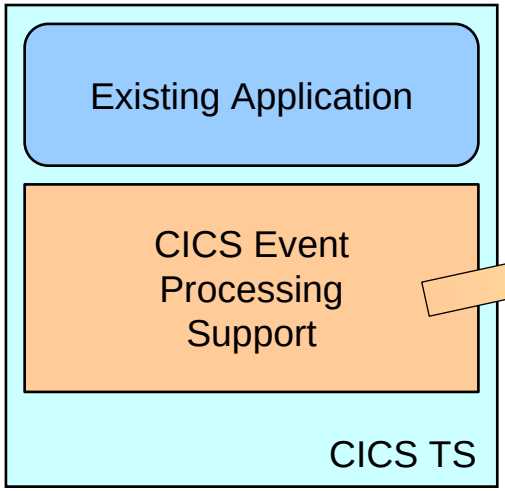
LoB Manager

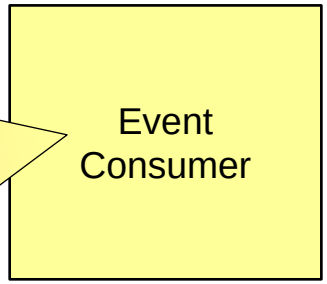
Application Analyst

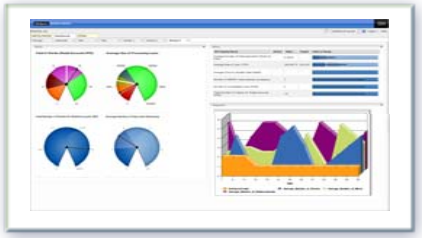
Systems Programmer



Business Modeler







Business Dashboard

LoB defines the business events

LoB Manager

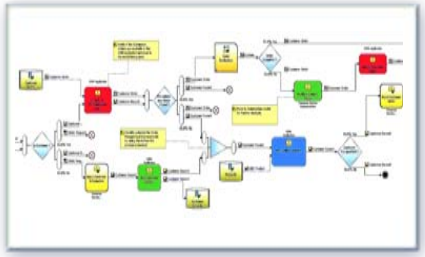
Identify Business Events

Application Analyst

Systems Programm

Studies existing business processing and identifies business events that occur and information to be collected.

May define patterns between events and specify delivery destinations or event display using other tooling.

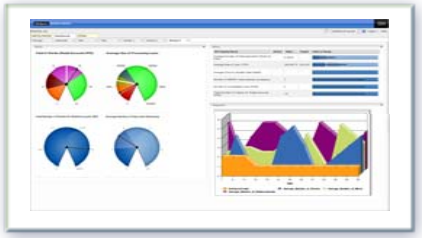


Existing Application

CICS Event Processing Support

CICS TS

Event Consumer



Application Analyst identifies events in application

LoB Manager

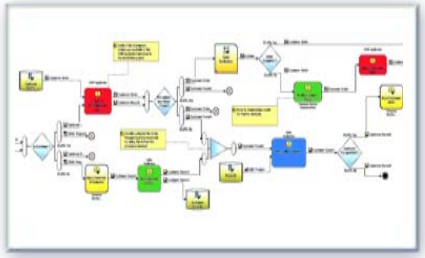
Identify Business Events

Application Analyst

Create Event Capture Specification

Inspects programs to determine how to capture the business events and collect the required data. Specifies where and how event is to be emitted.

Systems Programmer



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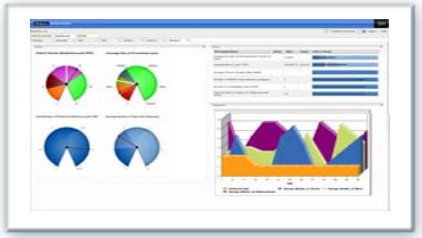


Business Dashboard

Systems Programmer configures the infrastructure

LoB Manager

Identify Business Events

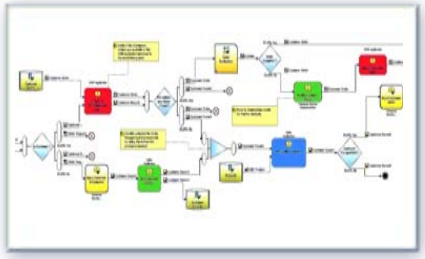
Application Analyst

Create Event Capture Specification

Specifies format and destination for the captured events. Defines CICS resources to deploy the events

Systems Programmer

Deploy Events



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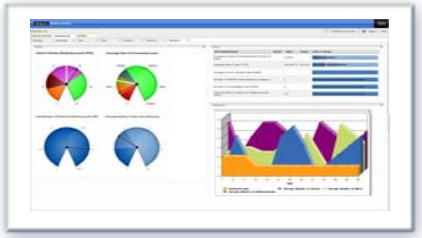


Business Dashboard

LoB defines the business actions

LoB Manager

Identify Business Events

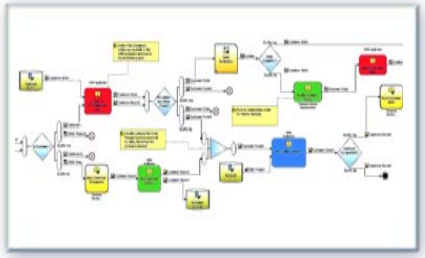
Specify Business Actions

Application Analyst

Specifies the actions to take on consuming an event

Systems Programmer

Deploy Events



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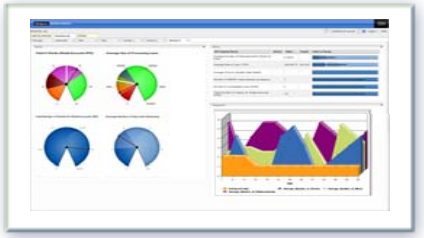


Business Dashboard

LOB may configure a dashboard

LoB Manager

Identify Business Events

Specify Business Actions

Optionally Configure Dashboard

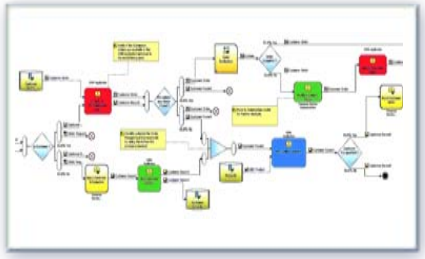
Application Analyst

Create Eve
Capture
Specificati

Optionally configures a business dashboard to display metrics based on events from CICS and other components of the application system

Systems Programmer

Events



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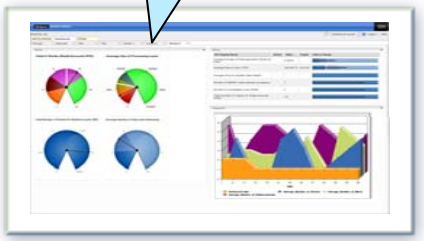
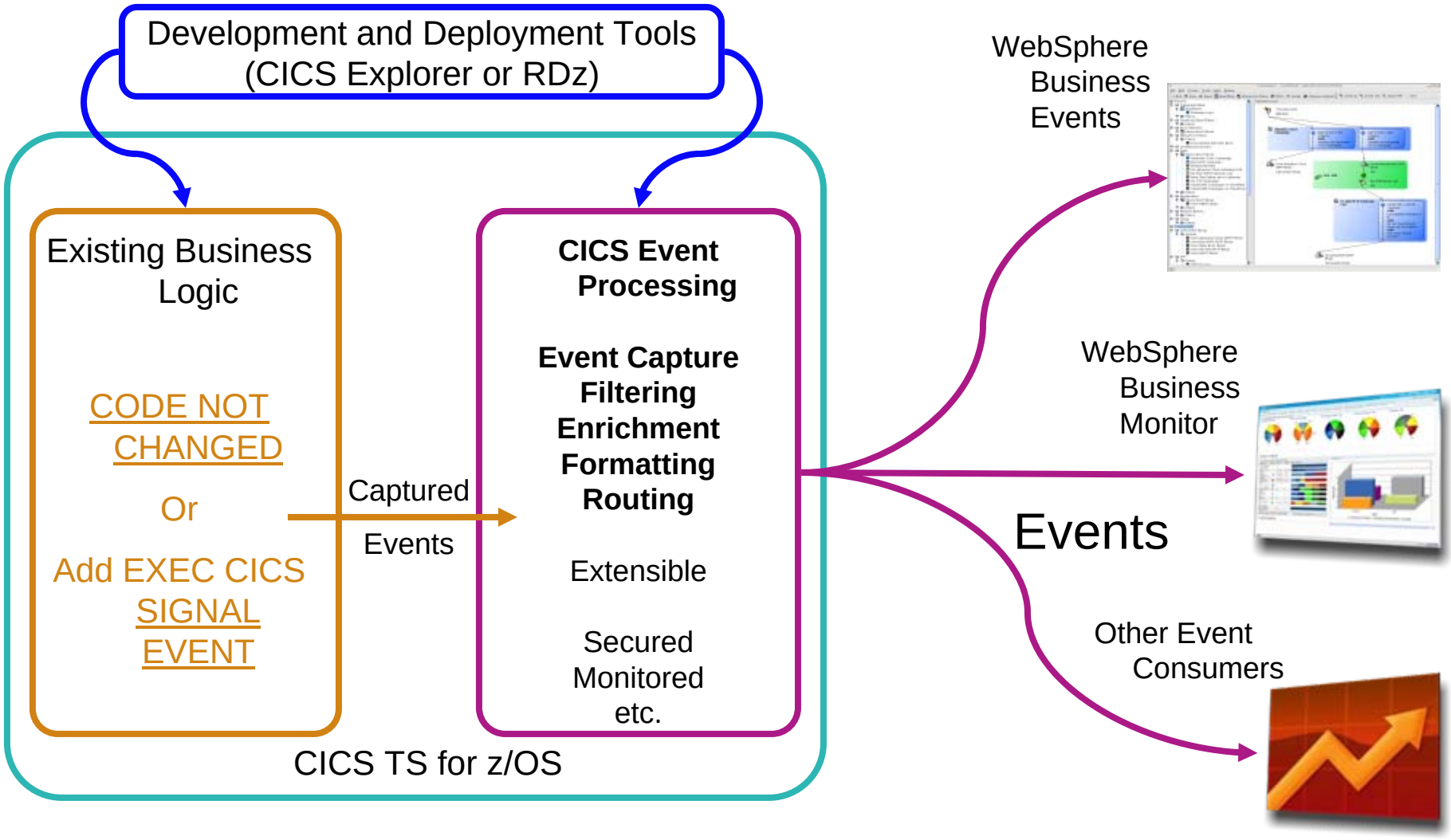


Business Dashboard

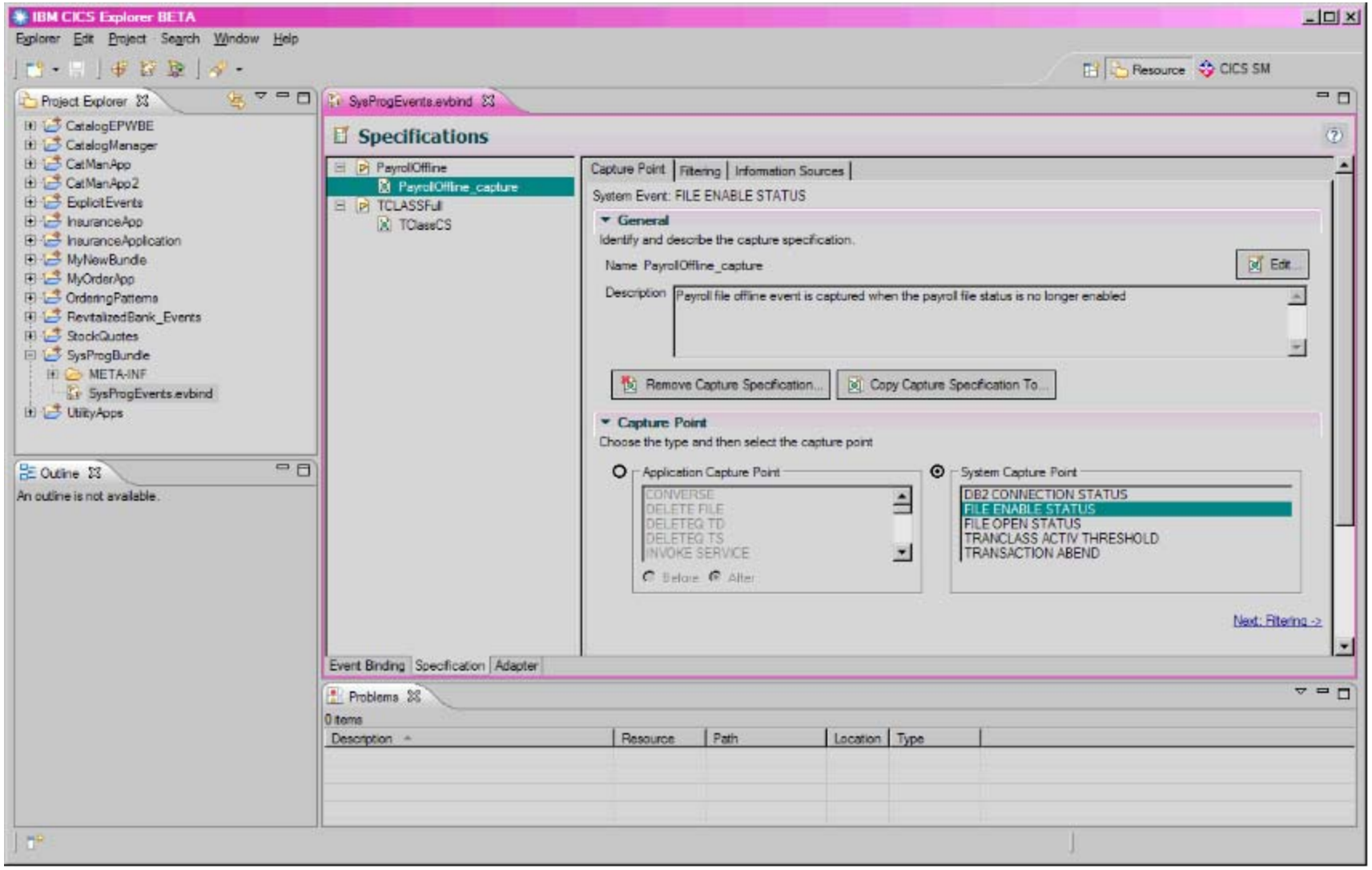
Event Processing…



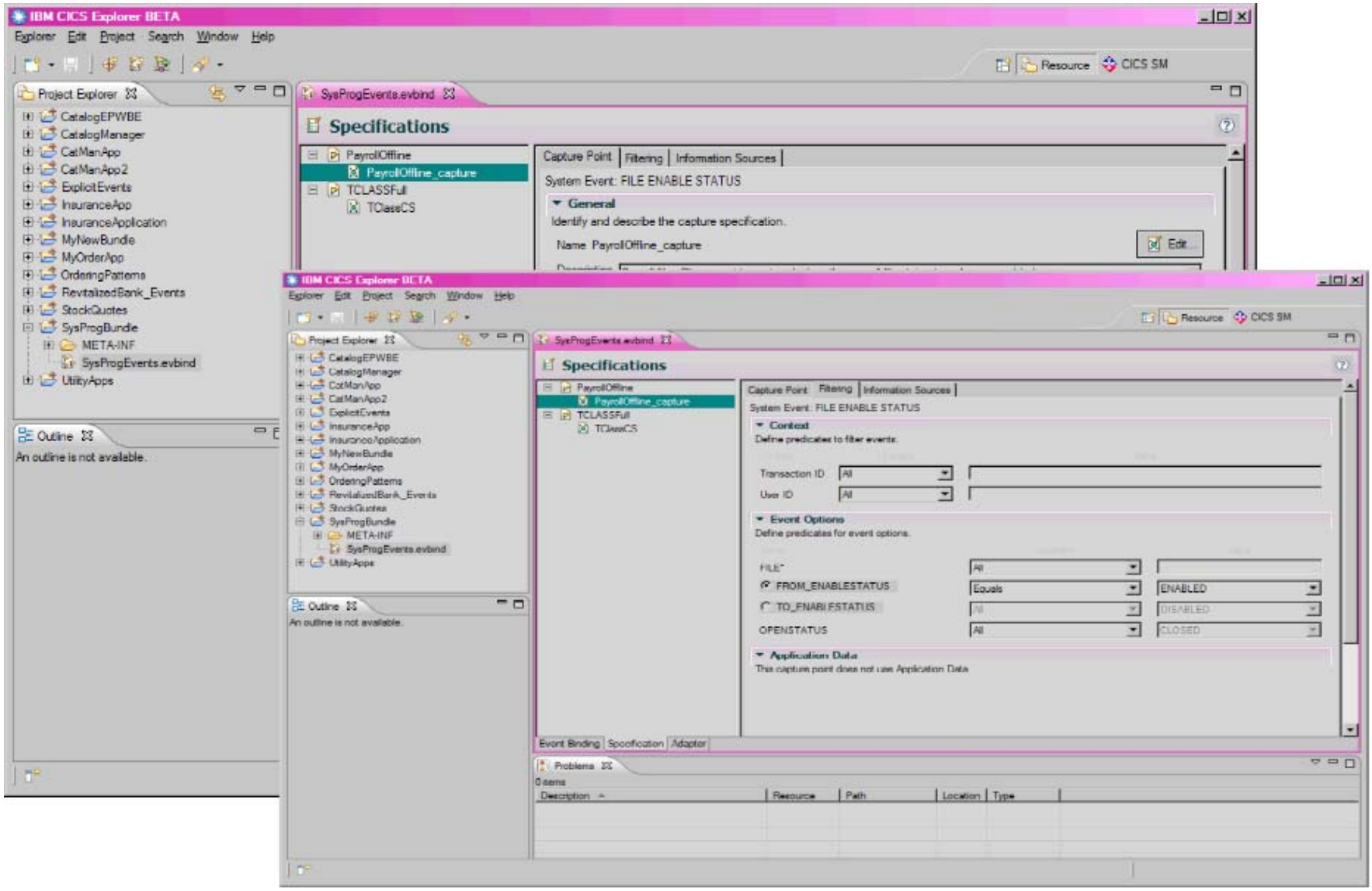
System Events

- Capture events when the state of certain resources changes
- System Events in CICS TS V4.2
  - File state events - file enablement or open state change
  - DB2 connection state events (DB2 connection state changes)
  - TRANCLASS task threshold events (number of tasks in TRANCLASS goes above or below a % of MAXACTIVE)
  - Task threshold events (number of tasks in system goes above or below a % of maxtasks)
  - Transaction has abended (with unhandled abend), Filter by transaction and/or abend code
- System Events in CICS TS V5.1
  - 'One-to-many' emission
  - Write Operator
  - System Messages
- Uses the existing event infrastructure
  - Specify in Event Binding Editor, emit via an EP adapter
- Examples of use
  - Notify an application or support staff that a file it uses has become disabled
  - Start an additional cloned CICS region if the number of tasks goes above 90% of maxtasks limit for that region
  - With WebSphere Business Monitor, monitor frequency of transaction abends during month

System Event Specification Example



System Event Specification Example



Summary

Not your Father's CICS

New features/technology

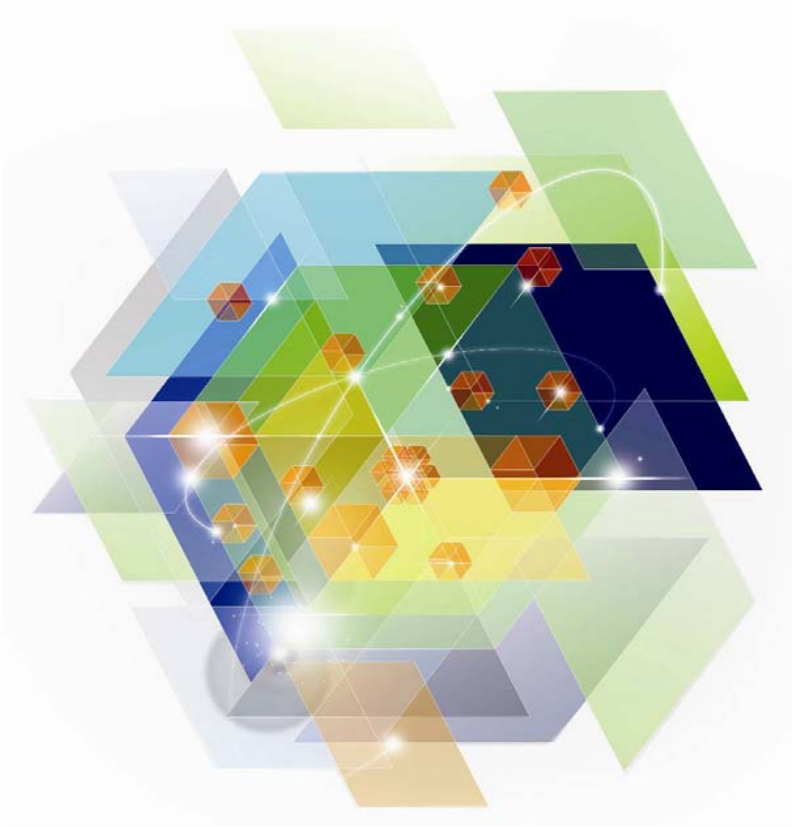
Events, SOA, mobile

Classic capability enhancements

Threadsafe, connectivity, Performance

No Charge Developer Trial

Reference materials



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CICS Explorer Forum
ibm.com/developerworks/forums/forum.jspa?forumID=1475&start=0

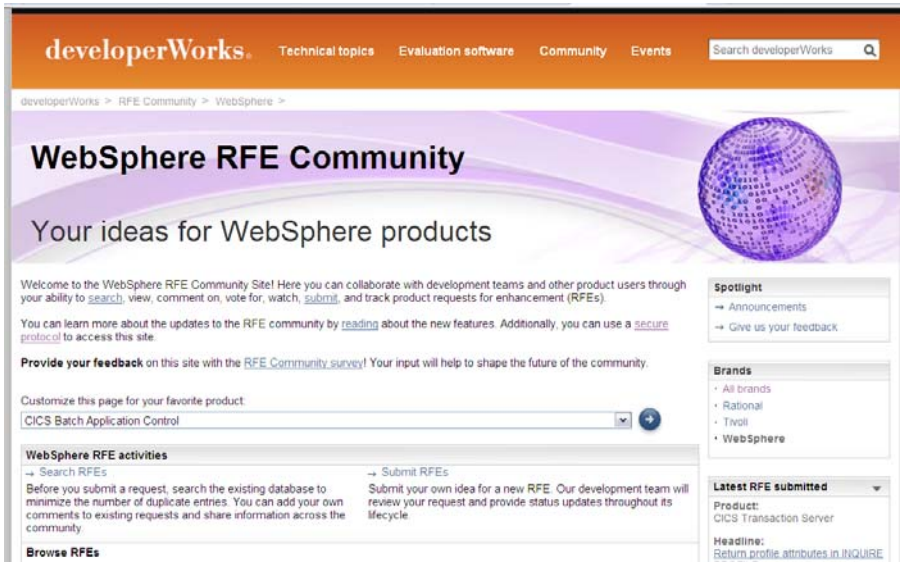
CICS-L list Forum
listserv.uga.edu/archives/cics-l.html

Key documents

- **Analyst papers**
  - Lustratus Research - New project platform section for CICS Users ftp://public.dhe.ibm.com/software/htp/cics/pdf/Lustratus_Research_Paper_New_project_platform_selection_for_CICS_users.pdf
  - Branham Group: IBM CICS Tools: Unrealized Productivity Gains and True Cost Savings ftp://public.dhe.ibm.com/software/htp/cics/tools/IBM_CICS_Tools_Whitepaper_2009.pdf
  - Software Strategies: IBM z/OS Problem Determination Tool Suite Leads Again https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en_US&source=swg-rszswg
- **IBM Redbooks**
  - **CICS Transaction Server from Start to Finish**, SG24-7952-00
  - **Smarter Banking with CICS Transaction Server**, SG24-7815-00
  - **Implementing Event Processing with CICS**, SG24-7792
  - **CICS and SOA: Architecture and Integration**, SG24-5466-06
  - **Implementation of Popular Business Solutions with CICS Tools**, REDP-4824-00
  - **Threadsafe considerations for CICS**, SG24-6351-04
  - **Architects guide to CICS on System z**, SG24-8067-00 Draft
  - **CICS Transaction Server Application Architecture**, Redbooks solution guide

Raising new requirements with RFE

- **You can now raise and track requirements using the new IBM RFE system for**
  - CICS Transaction Server
  - CICS Explorer
  - TXSeries
  - WXTR
  - IBM CICS Tools
  - CICS Transaction Gateway
  - PD Tools - coming soon (target end Jan 2012)



- **All previous FITS requirements have been processed, and either be transferred to RFE or closed and returned**
- **All brands https://www.ibm.com/developerworks/rfe/ - select Brand: WebSphere**
- **WebSphere only https://www.ibm.com/developerworks/rfe/?BRAND_ID=181**
- **Select Product Family: Transaction Processing - for CICS Transaction Server, TXSeries, and WXTR**
- **Select Product Family: Enterprise Tooling - for the CICS Tools, CICS Transaction Gateway, and PD Tools**
- **Raise CICS Explorer base requirements against the Explorer component of CICS TS.**
- **Raise plug-in requirements against the Explorer component of related product.**