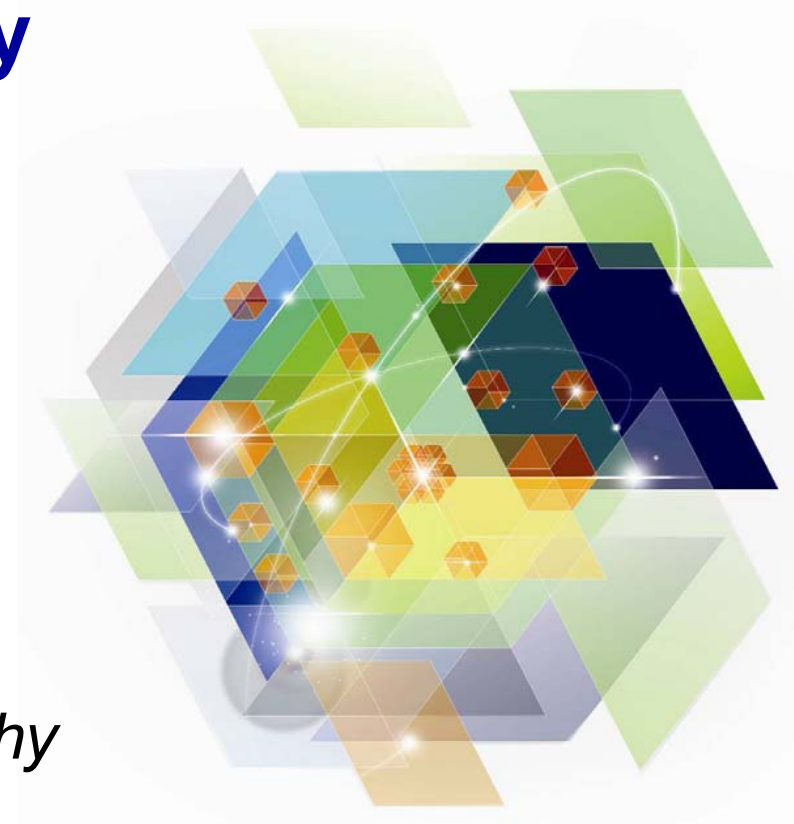# IBM System z Technology Summit

Presenter – Dennis Weiand or Leigh Compton

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

Date: 1Q 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

- Demo

- 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 **New**

Some Key Architectural Principles

Architectural Principle	Relevant technology
Use industry standards	Web services, OSGi
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® V1.1

New!

Session and user views, Configuration, Broadcast, User and Admin commands	**Daemon & Connection Status & Test**
ISM	**TG**

Threadsafe, File, CPU, Response Time, Statistics, Alerts, Graphical and Sheet views	**Deployment, Discovery, Visualization, Cloning, Automation & Control**
PA	**DA**

Execution Tree Dependencies Queries Command Flow	**CRUD/Install History, Audit Backout Search, Compare**
IA	**CM**

Develop Test Etc				
RDz				

CRUD/Install, Control Filter, Sort, Topolo Events, ATOM. Java. z/OS, Txn Tracking, WLM
SM

Configuration Status Control, Test
MQ

New!

Manipulate, browse z/OS data sets, z/FS, MQ
FM

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

Status Situations Topology
XE

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

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

Enhanced!

ibm.com/cics
ibm.com/cics/tools
ibm.com/cics/explorer

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

CICS TS

APA	Application Performance Analyzer
FA	
DT	Fault Analyzer
FM	Debug Tool
	File Manager
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

– 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,

  • CICS Dynamic Scripting,

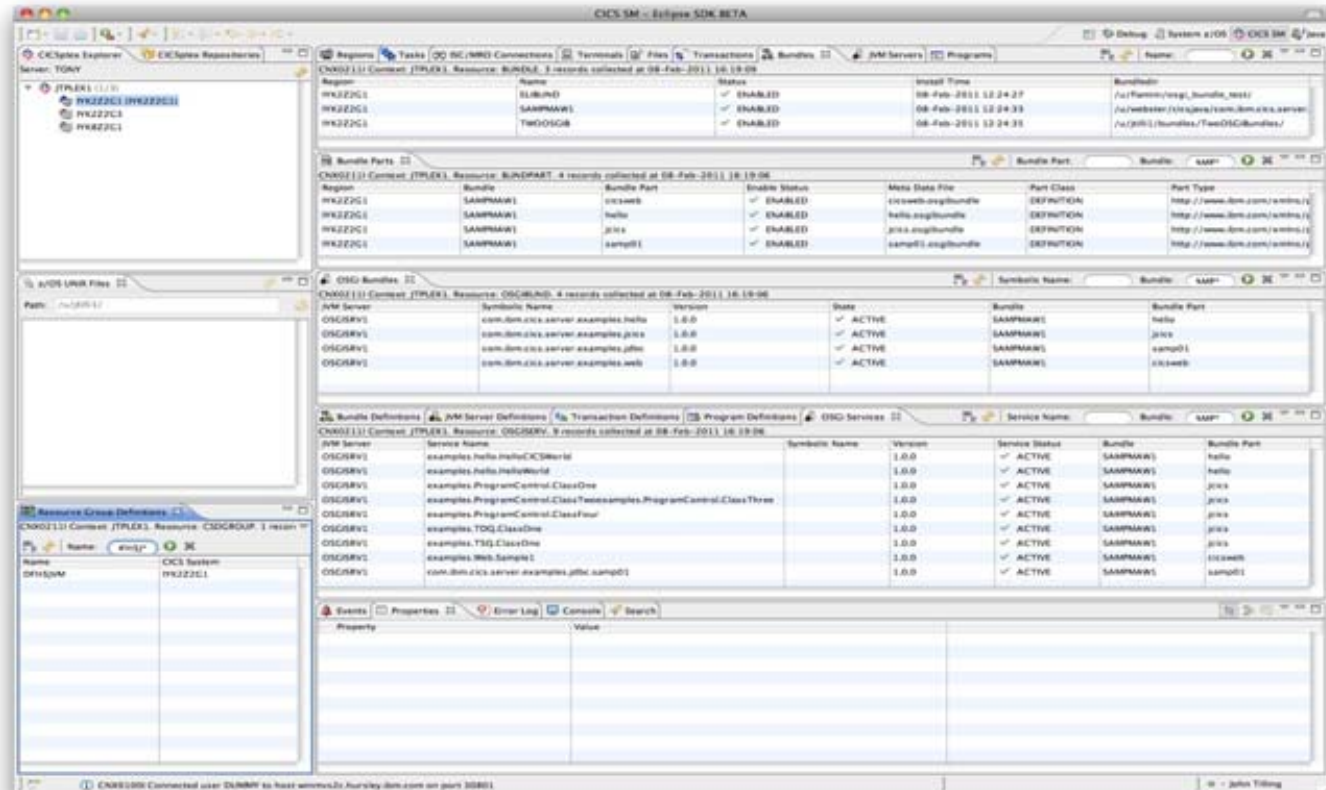 • Container for compute grid (CN11)

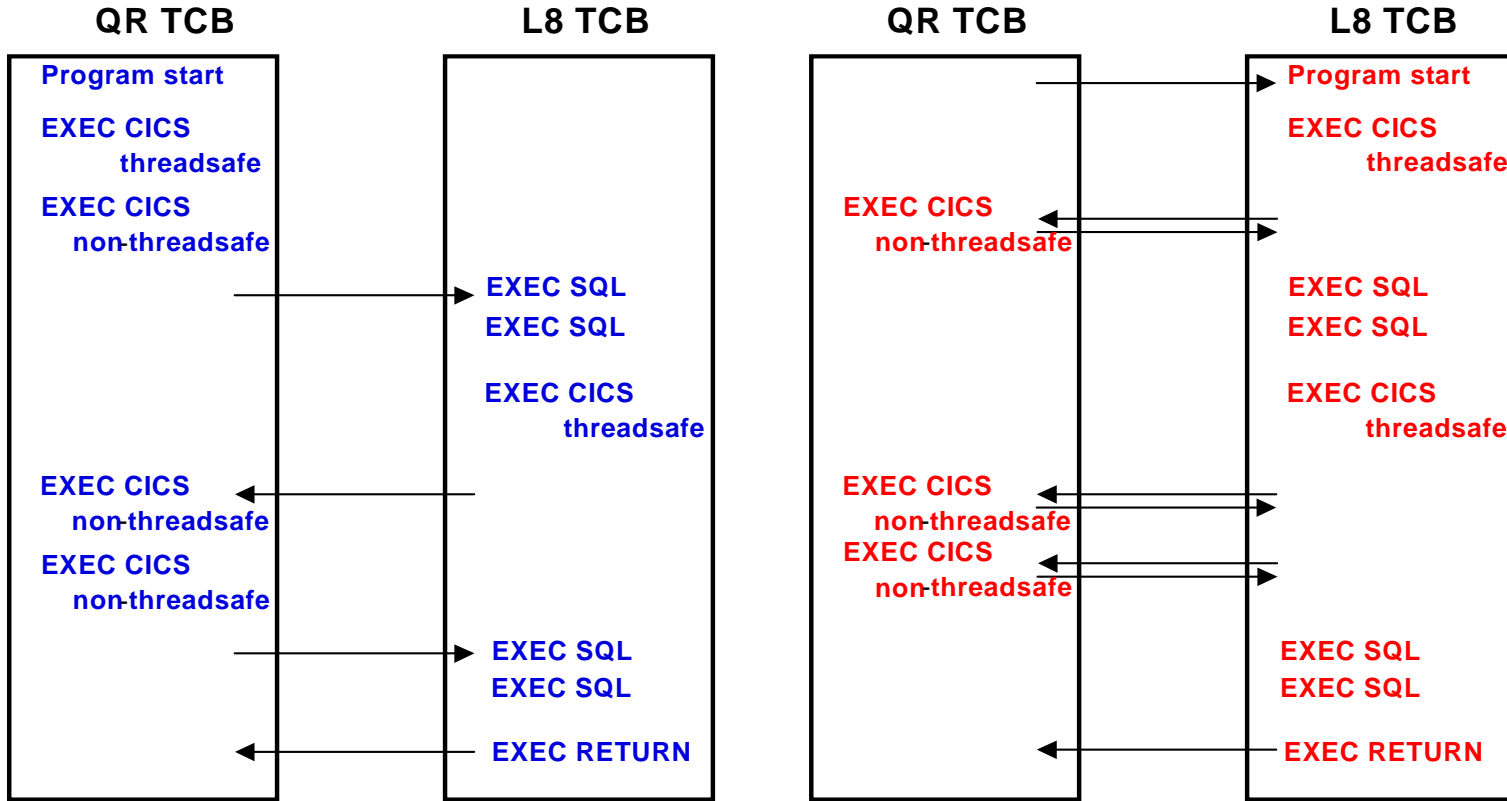# OSGi support in CICS
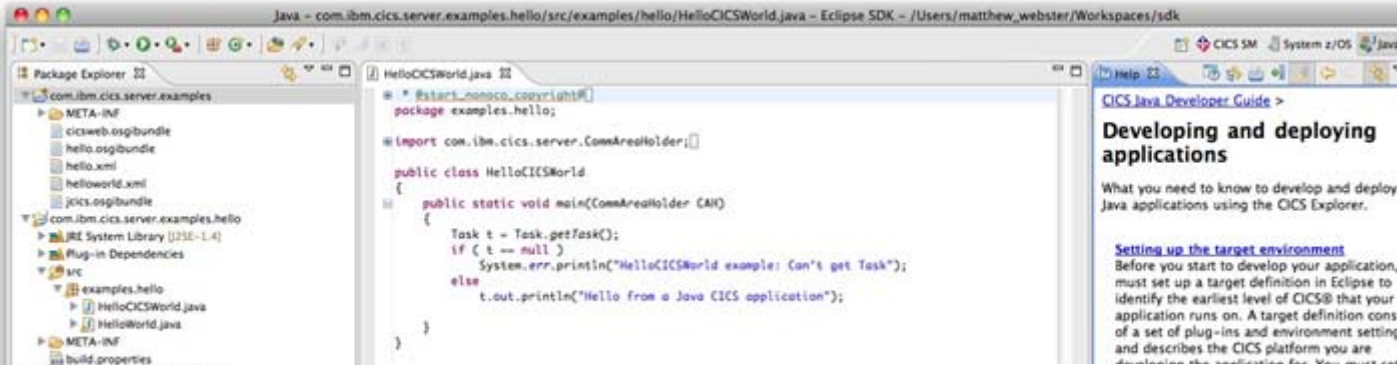
CICS
Explorer
SDK

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 V4.2 Scalability Enhancements

QR TCB	L8 TCB	QR TCB	L8 TCB
Program start			**Program start**
EXEC CICS threadsafe			**EXEC CICS** threadsafe
EXEC CICS non-threadsafe		**EXEC CICS** non-threadsafe	
	EXEC SQL **EXEC SQL**		**EXEC SQL** **EXEC SQL**
	EXEC CICS threadsafe		**EXEC CICS** threadsafe
EXEC CICS non-threadsafe		**EXEC CICS** non-threadsafe	
EXEC CICS non-threadsafe		**EXEC CICS** non-threadsafe	
	EXEC SQL **EXEC SQL**		**EXEC SQL** **EXEC SQL**
	EXEC RETURN		**EXEC RETURN**

**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)

CICS Developer Trial

New

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

https://www.ibm.com/developerworks/connect/cicsdev
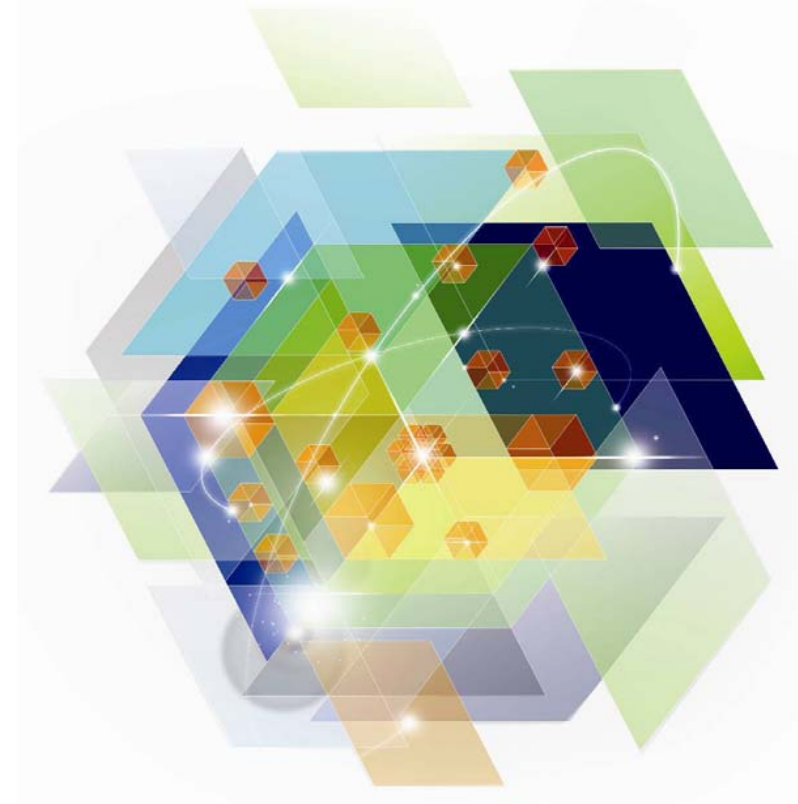
GENAPP – SupportPac and Redpaper

Coming Soon

- **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

IBM
REDP-4824-00

Draft Document for Review December 7, 2011 1:57 pm

Learn How to Perform Popular Business Solutions with the CICS

Chris Rayns
Peter Siddell
Eric Higgins

ibm.com/redbooks

Redpaper

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
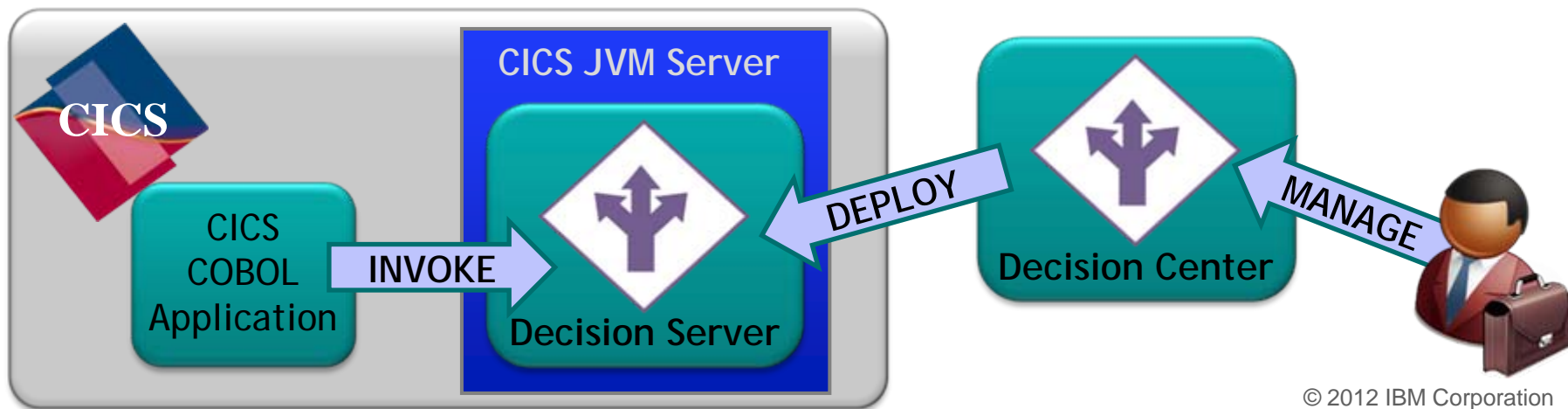
Events from CICS TS V4 with WODM

Event Sources   Event Emission   Event Processing   Business Action

CICS TS V4   WODM V7.5

User COBOL Application (Unmodified)
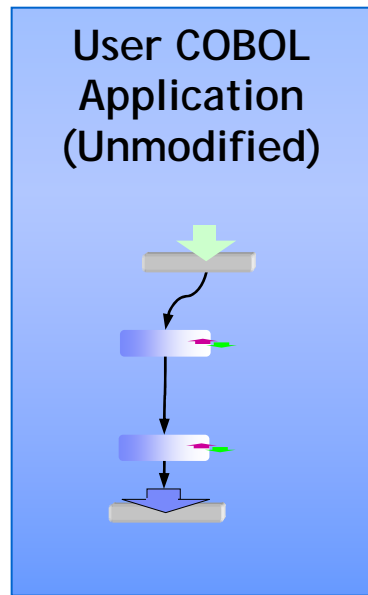
Events captured by CICS runtime

CICS Events Runtime Analysis

Transform into an event format (WODM XML)

Add application context

Events

Event Execution Runtime
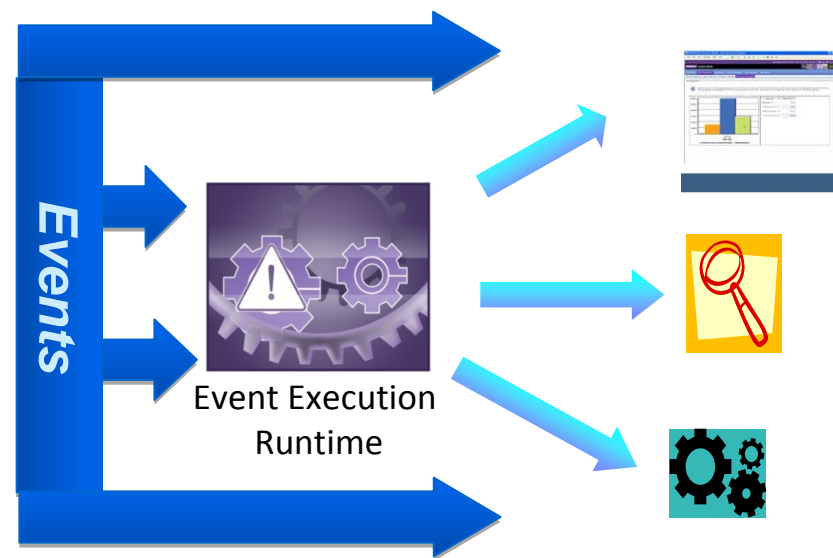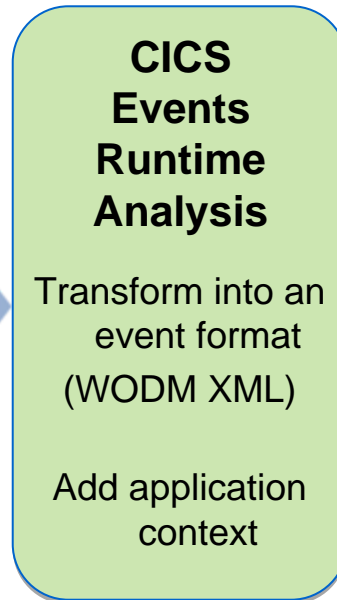
CICS Events help you to
- *Observe business processes*
- *Recognize suspicious activity*
- *Drive new processing*

Everyone wants to Lower The Cost Curve

How?

- Make **reuse** a fundamental tenant of application development
- Speed delivery by **dramatically reducing need to write code**
- Support **self-service development**, freeing up central IT to work on more strategic initiatives

Cost Per Application (y-axis)

Number of Applications / Time (x-axis)

Traditionally Developed Applications

A new method is needed to lower cost

Mashups

CICS TS Dynamic Scripting

- Integrates Project Zero technology into CICS TS V4, for a robust environment for PHP and Groovy situational reports, dashboards, and web feeds

- Helps meet the long tail of application demand and exploit business opportunities, by rapidly creating and deploying situational applications which access CICS assets, while complying with key IT processes like manageability, scalability, and security

- Feature Pack is built on scalable CICS TS V4 JVM server technology

- **Quickly** try out new business ideas, prototyping, build productivity applications like reports, dashboards, and widgets, or application front-ends for IT and Line of Business users.
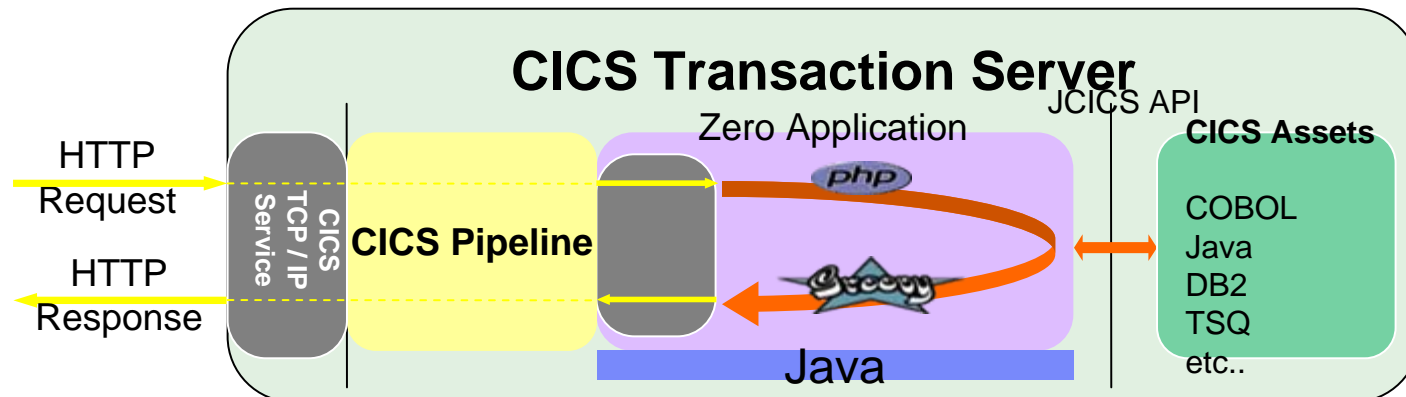
Connectivity

CICS and connectivity

Service Consumers

Service Provider

- delivering critical applications at the heart of your enterprise
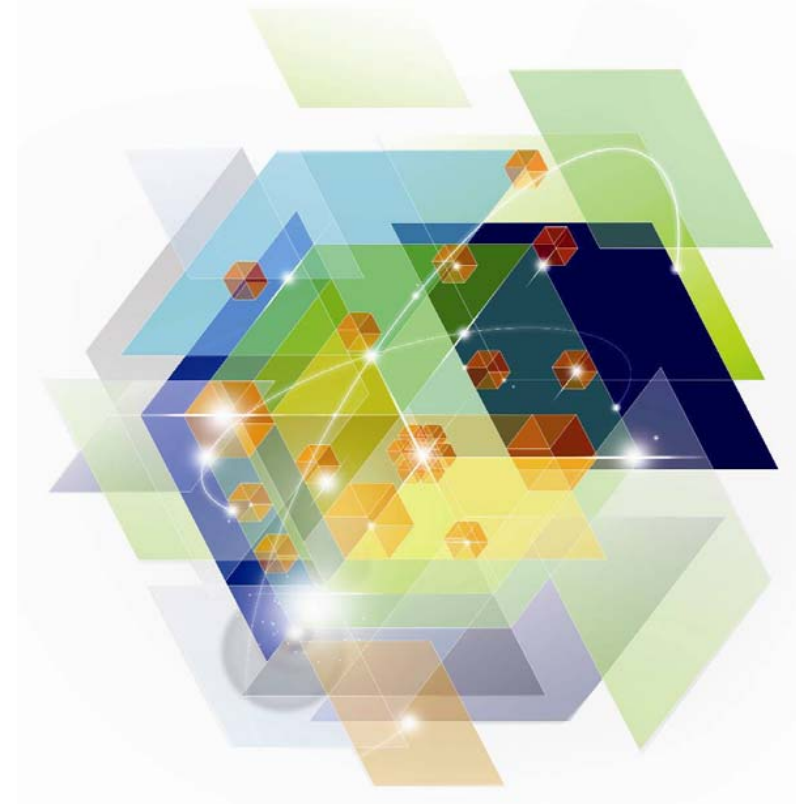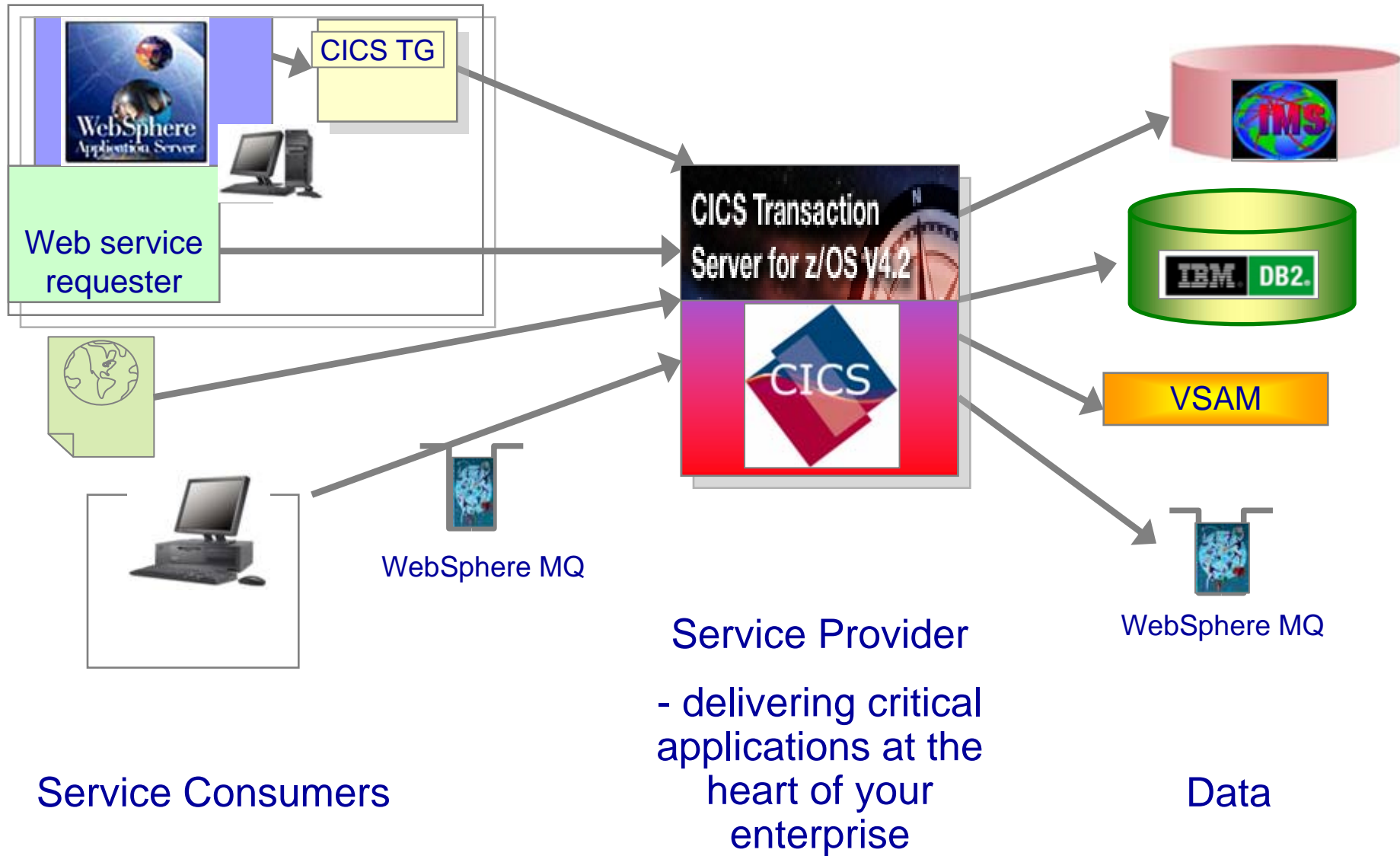
Data

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.

Mainframe

z/OS

DFSMSvsam

CICS Transaction Server

ATOMSERVICE ATOMSERVICE

DB2 for z/OS

Terminal locations in VSAM data set

Atom feeds

Account Transactions in DB2

Mobile Application Mashups

GPS Data

Mobile device
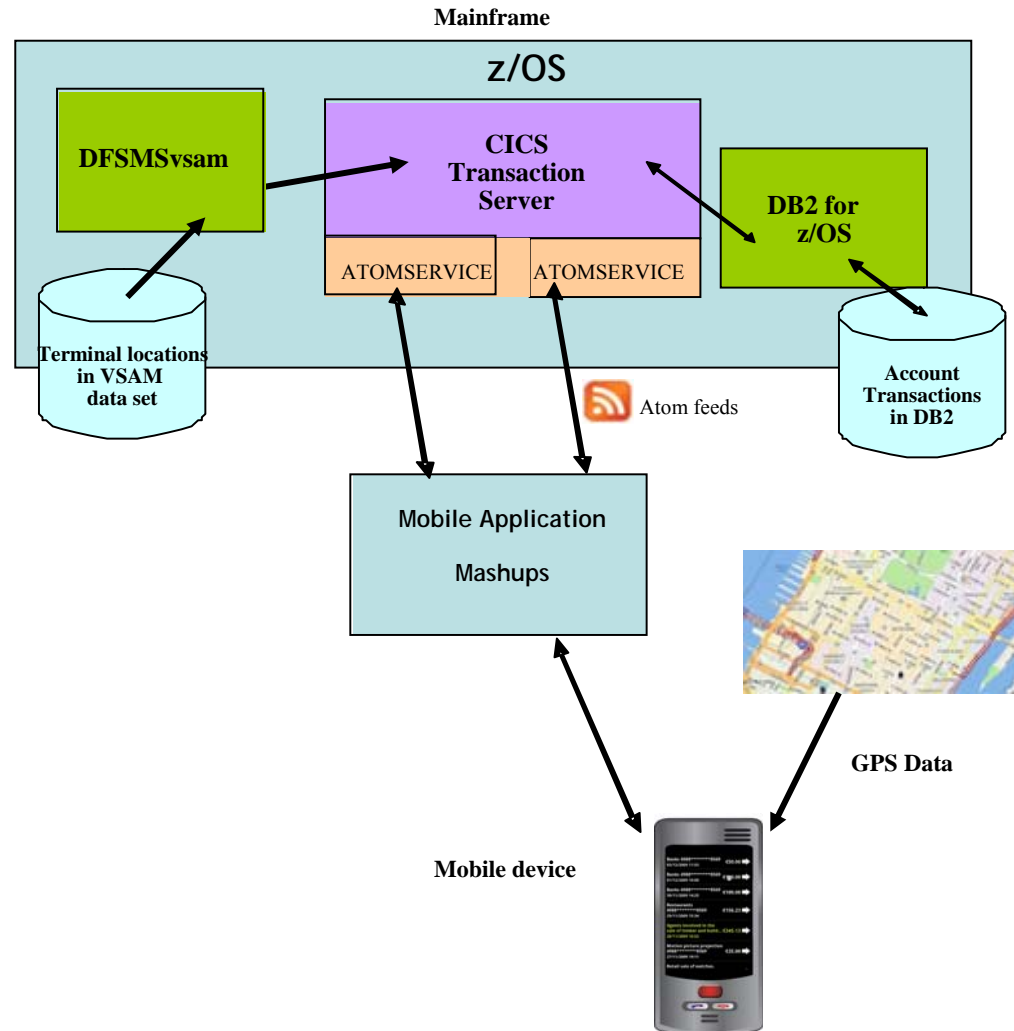
Define clean and clear interfaces

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

- Dynamic Scripting

Web Services: Definitions

- **Architecture for**
  - <u>Application to application</u>
    - 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
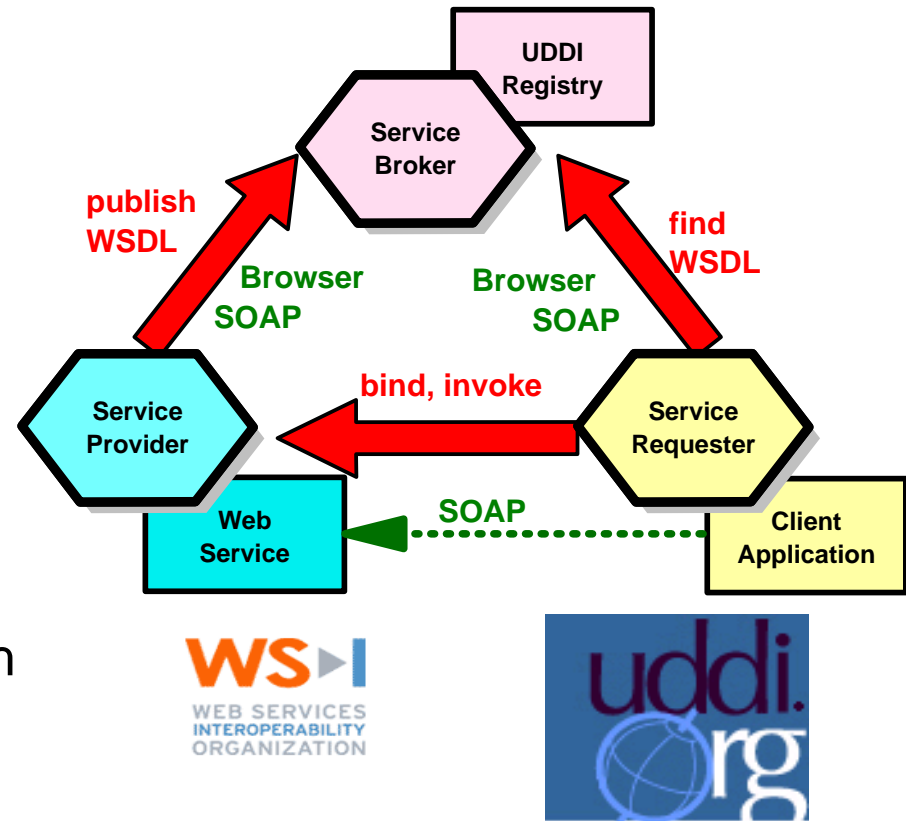
The entire industry is agreeing on one set of standards !!

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
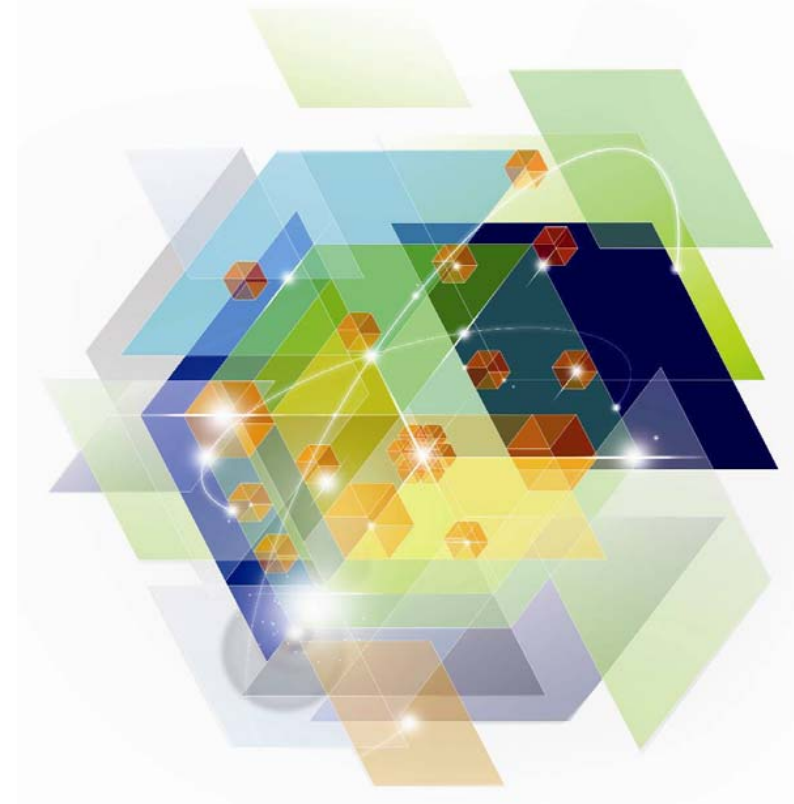
The Role-Based CICS Event Workflow
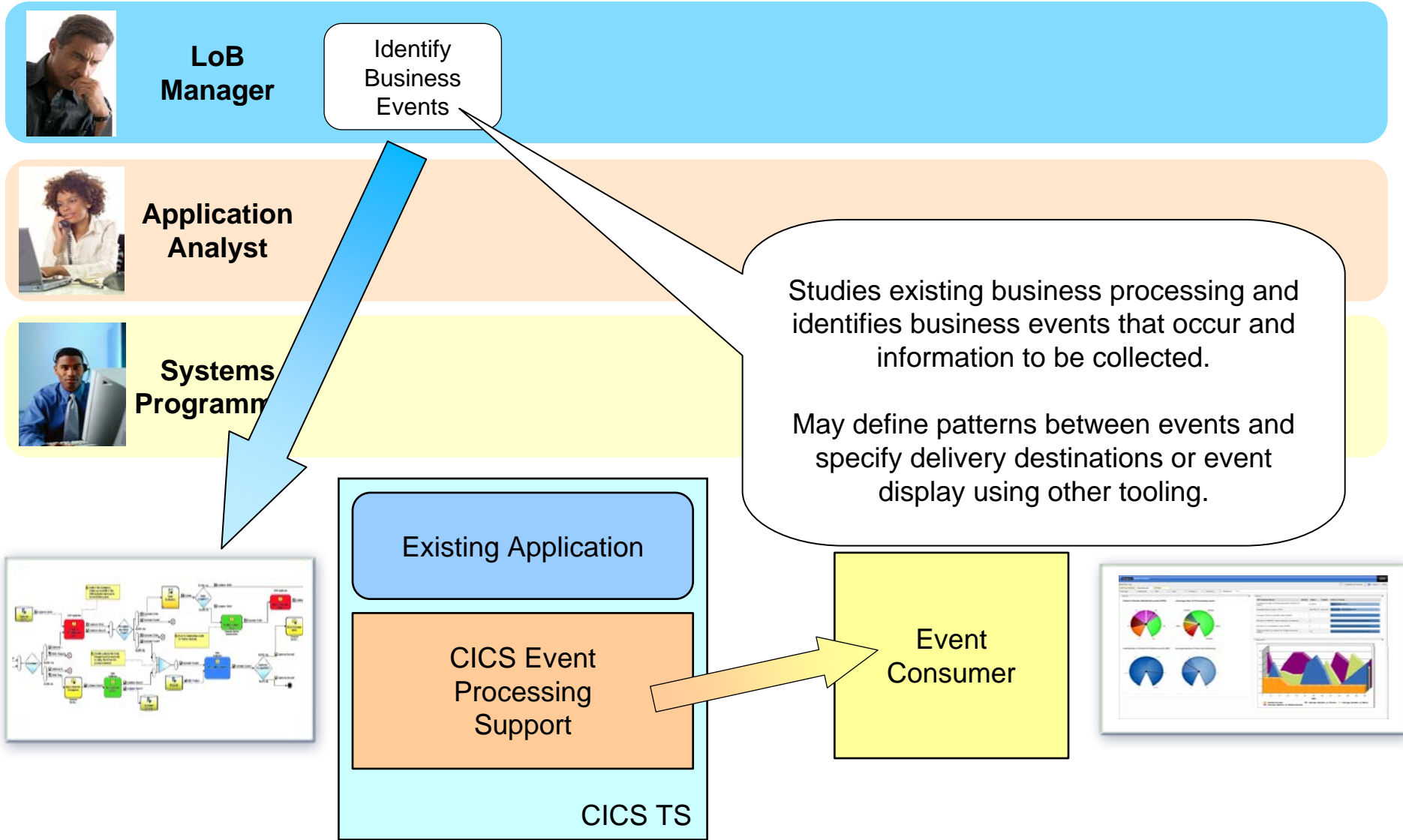
LoB Manager

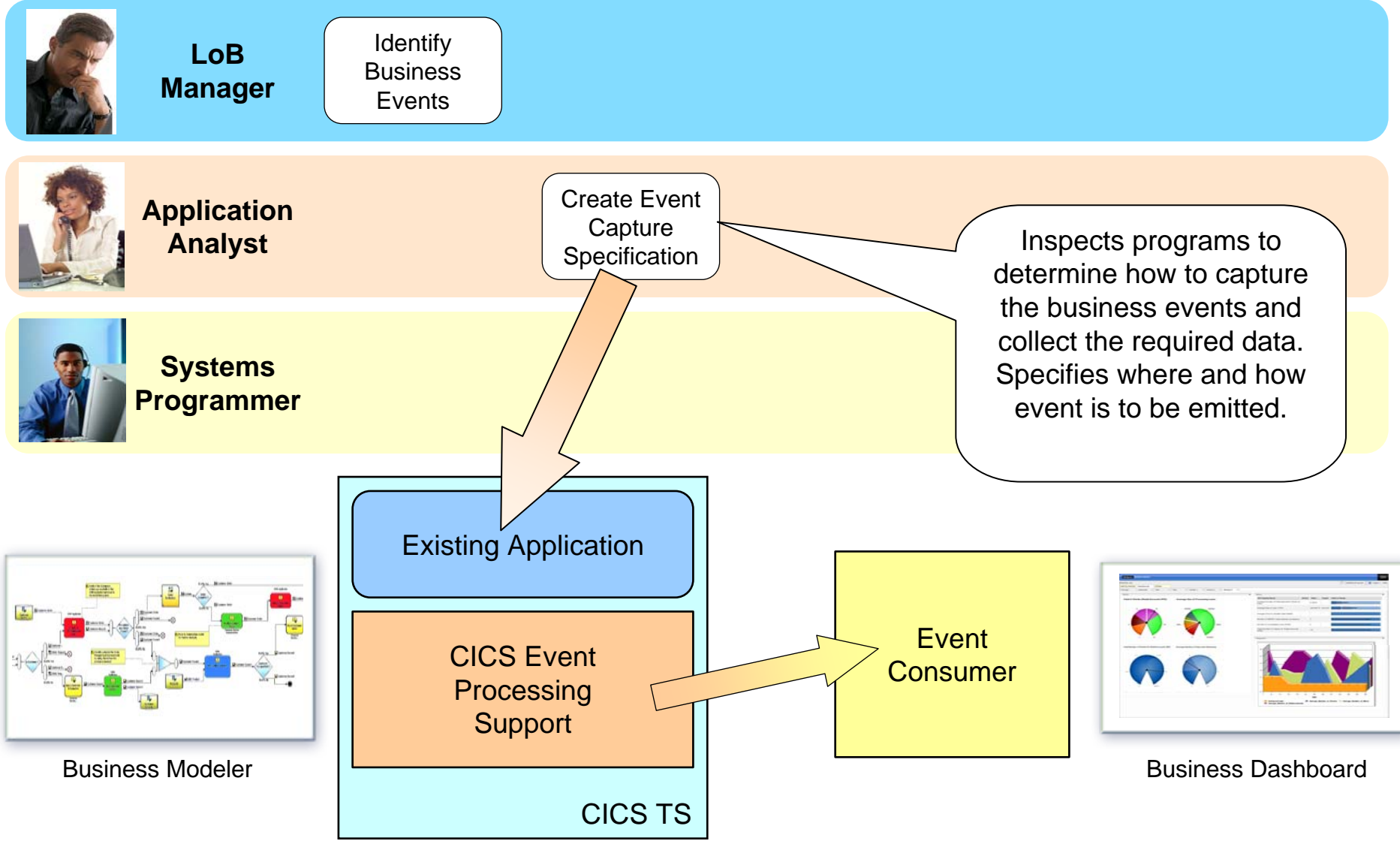**Application Analyst**
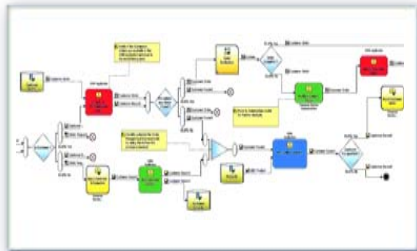
Systems Programmer

Business Modeler

Existing Application

CICS Event Processing Support

CICS TS

Event Consumer

Business Dashboard

LoB defines the business events

LoB Manager

Identify Business Events

Application Analyst

Systems Programmer

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.

CICS TS
- Existing Application
- CICS Event Processing Support

Event Consumer
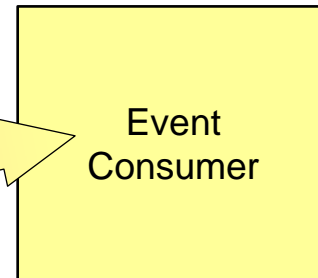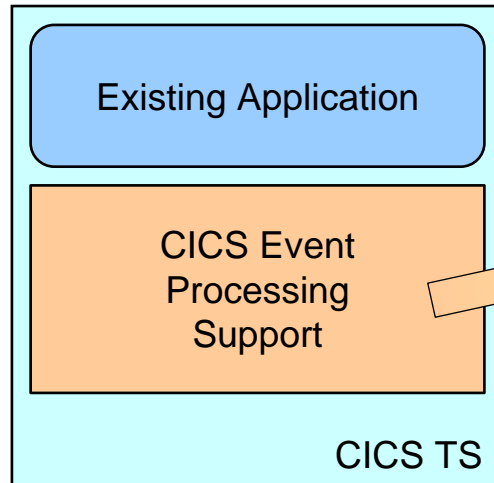
Application Analyst identifies events in application

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

Business Modeler

CICS TS
- Existing Application
- CICS Event Processing Support

Event Consumer

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

Business Modeler

CICS TS

Existing Application

CICS Event Processing Support

Event Consumer
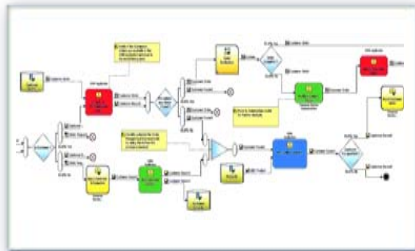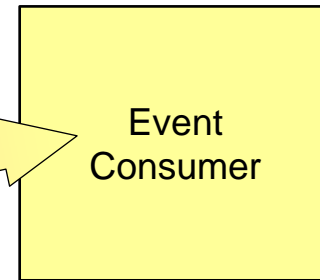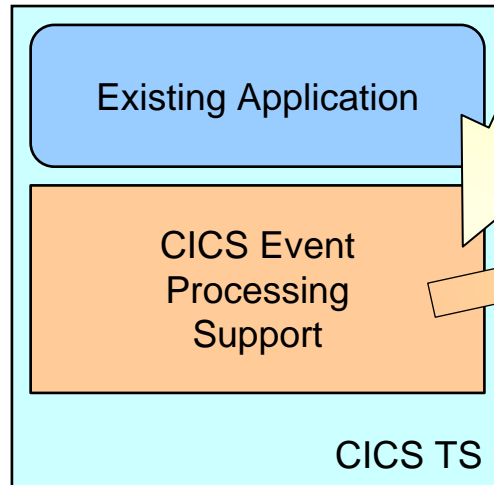
Business Dashboard

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

Business Modeler

CICS TS

Existing Application

CICS Event Processing Support

Event Consumer

Business Dashboard
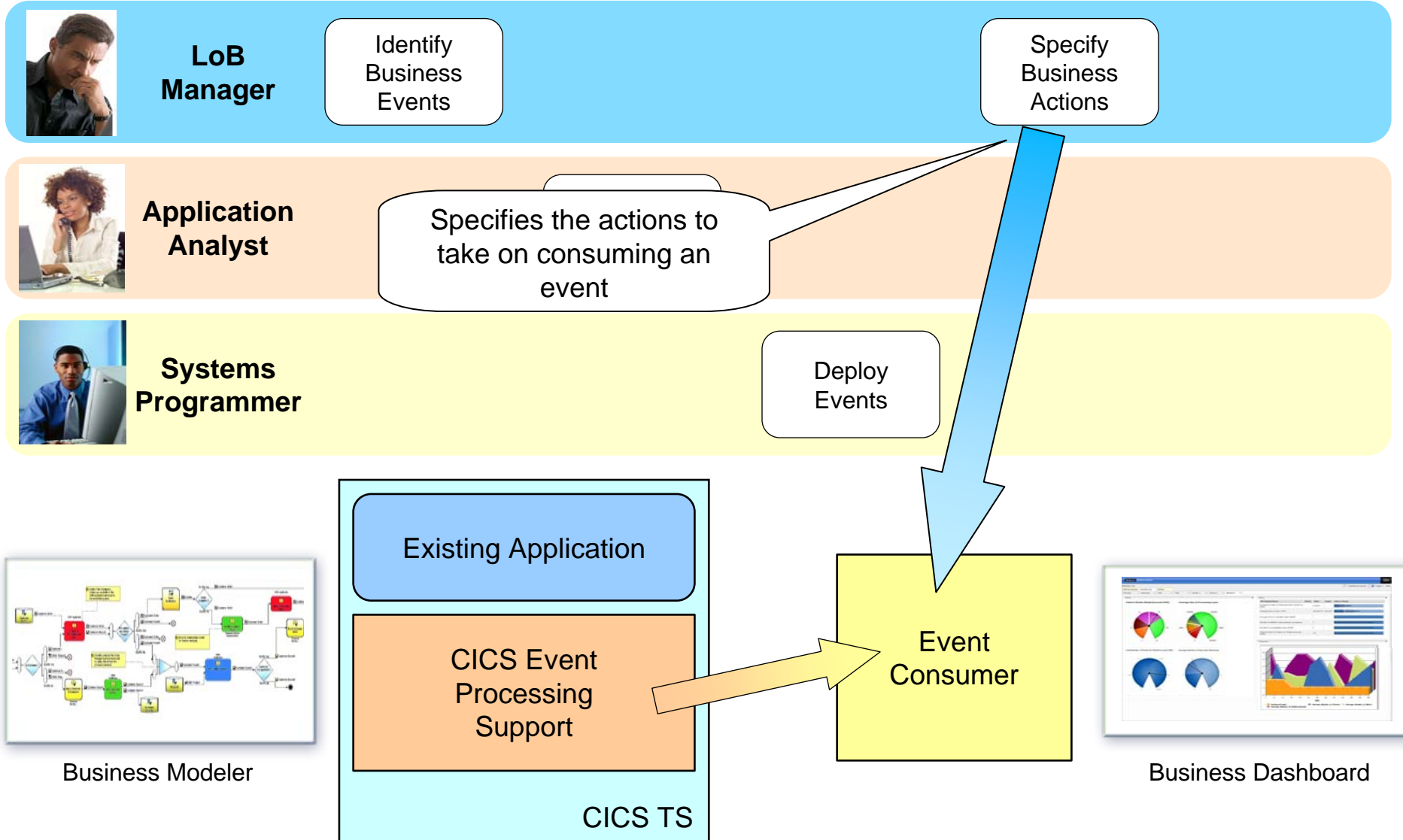
LOB may configure a dashboard

LoB Manager

Identify Business Events

Specify Business Actions

Optionally Configure Dashboard

Application Analyst

Create Event Capture Specification

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

Systems Programmer

Events

Business Modeler

Existing Application

CICS Event Processing Support

Event Consumer

Business Dashboard

CICS TS

Event Processing…

Development and Deployment Tools
(CICS Explorer or RDz)

Existing Business
Logic

CODE NOT
CHANGED

Or

Add EXEC CICS
SIGNAL
EVENT

Captured

Events

**CICS Event
Processing**

**Event Capture
Filtering
Enrichment
Formatting
Routing**

Extensible

Secured
Monitored
etc.

CICS TS for z/OS v4.1

WebSphere
Business
Events

WebSphere
Business
Monitor

Events

Other Event
Consumers

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

- 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

Demo

Summary

Not your Father's CICS
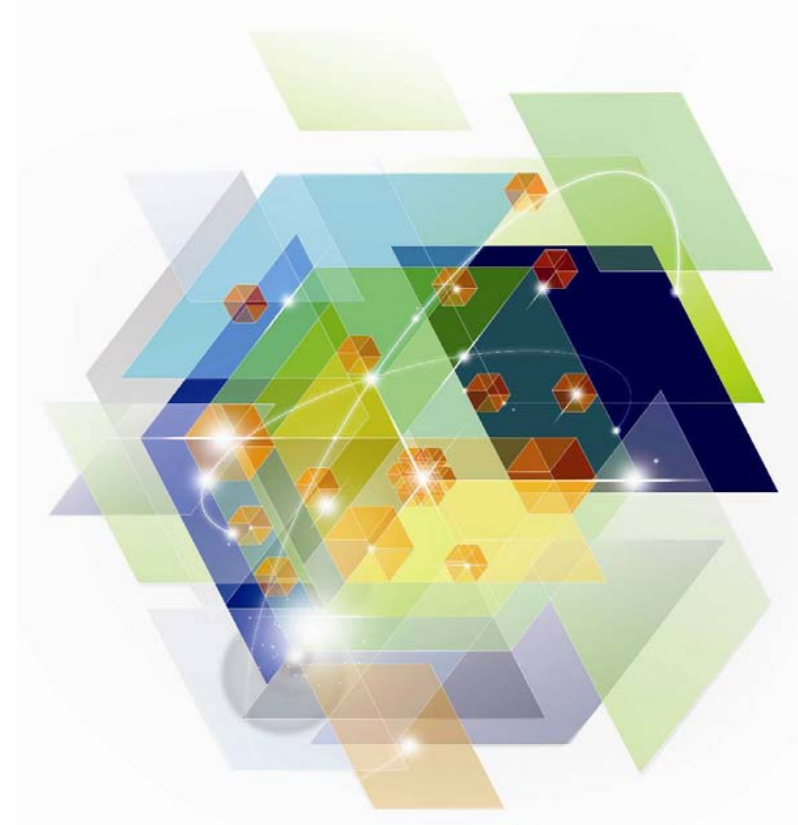
New features/technology

     Events, Dynamic Scripting, SOA, mobile

Classic capability enhancements

     Threadsafe, connectivity, Performance

No Charge Developer Trial

Reference materials

CICS Communities and Information

- **Web pages**
  - Transaction Server V4.2 http://ibm.com/cics/tserver/v42
  - CICS Tools ibm.com/cics/tools
  - PD Tools ibm.com/software/awdtools/deployment/
  - CICS Explorer ibm.com/cics/explorer
- **CICS Explorer Forum**
  - http://tinyurl.com/68bndw
  - IBM developerWorks forum with FAQs, Links and resources, ISV Contributions, etc. Ask questions, suggest improvements, report problems, chat
- **CICSdev community**
  - Public community with blog, forum etc aimed at application developers
  - https://www.ibm.com/developerworks/connect/cicsdev
- **Twitter**
  - Subscribe to the IBM_System_z channel and the ibm_cics channel to get System z and CICS news flashes
- **CICS Blog**
  - Information, comment and opinion at TheMasterTerminal.com
- **CICS eNews**
  - Subscribe for news about CICS and related products – share with your clients
- **YouTube channels**
  - CICS Explorer - Videos, demos and other cool stuff
  - CICSFluff - Other CICS videos

New

Home page

CICS Explorer Public Forum
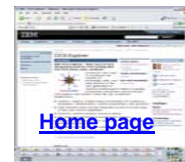
Twitter

Blog

eNews

YouTube

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

  - **Introduction to CICS Dynamic Scripting**, SG-7924

- **Coming soon …**
  - CICS and SOA: Architecture and Integration, SG24-5466-06
  - Implementation of Popular Business Solutions with CICS Tools, REDP-4824-00

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)
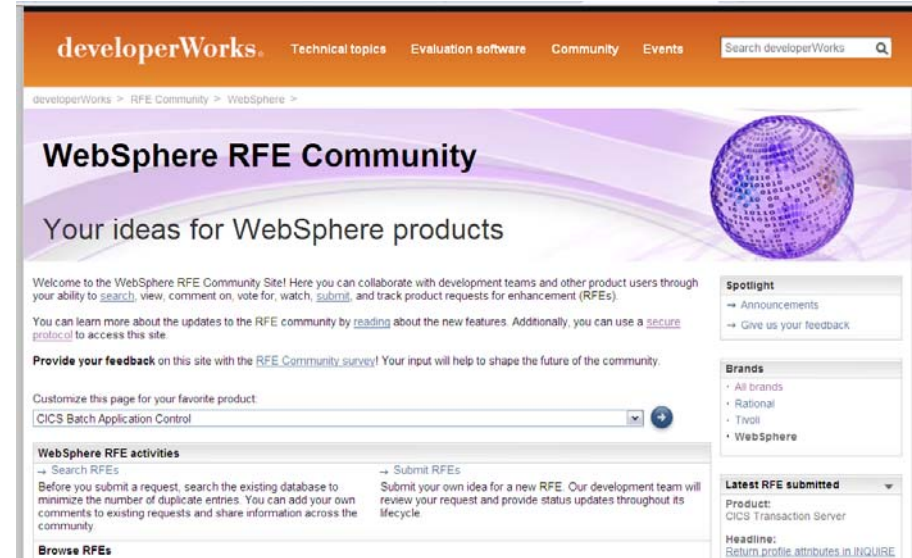
- **Existing FITS requirements are currently being processed, and will either be transferred to RFE or closed and returned.**

- **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.**

30 sessions and labs in the CICS Track
Visit the zSoftware Solutions Suite for live demos and technical discussions

Early registration discounts available!
http://www-01.ibm.com/software/websphere/events/impact/registration.html