IBM System z Technology Summit

Presenter – Dennis Weiand or Leigh Compton

CICS - Minimize costs and maximize your CICS investments to your Advantage.

Date: 1Q 2012
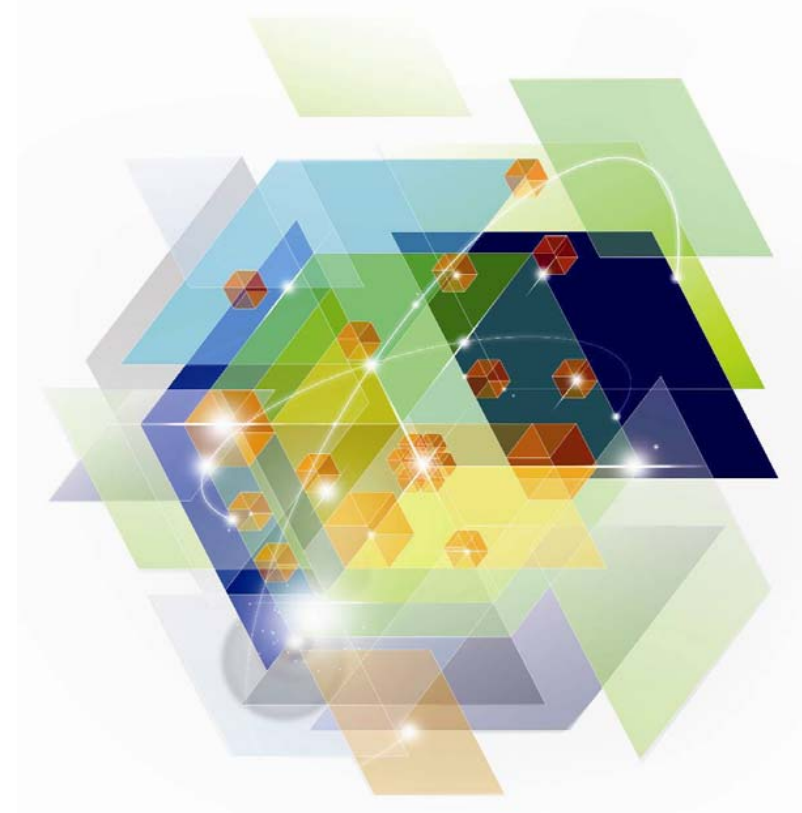
Agenda

- Issues facing CICS operational staff
- Extract Information – predict problems
- Operational Health
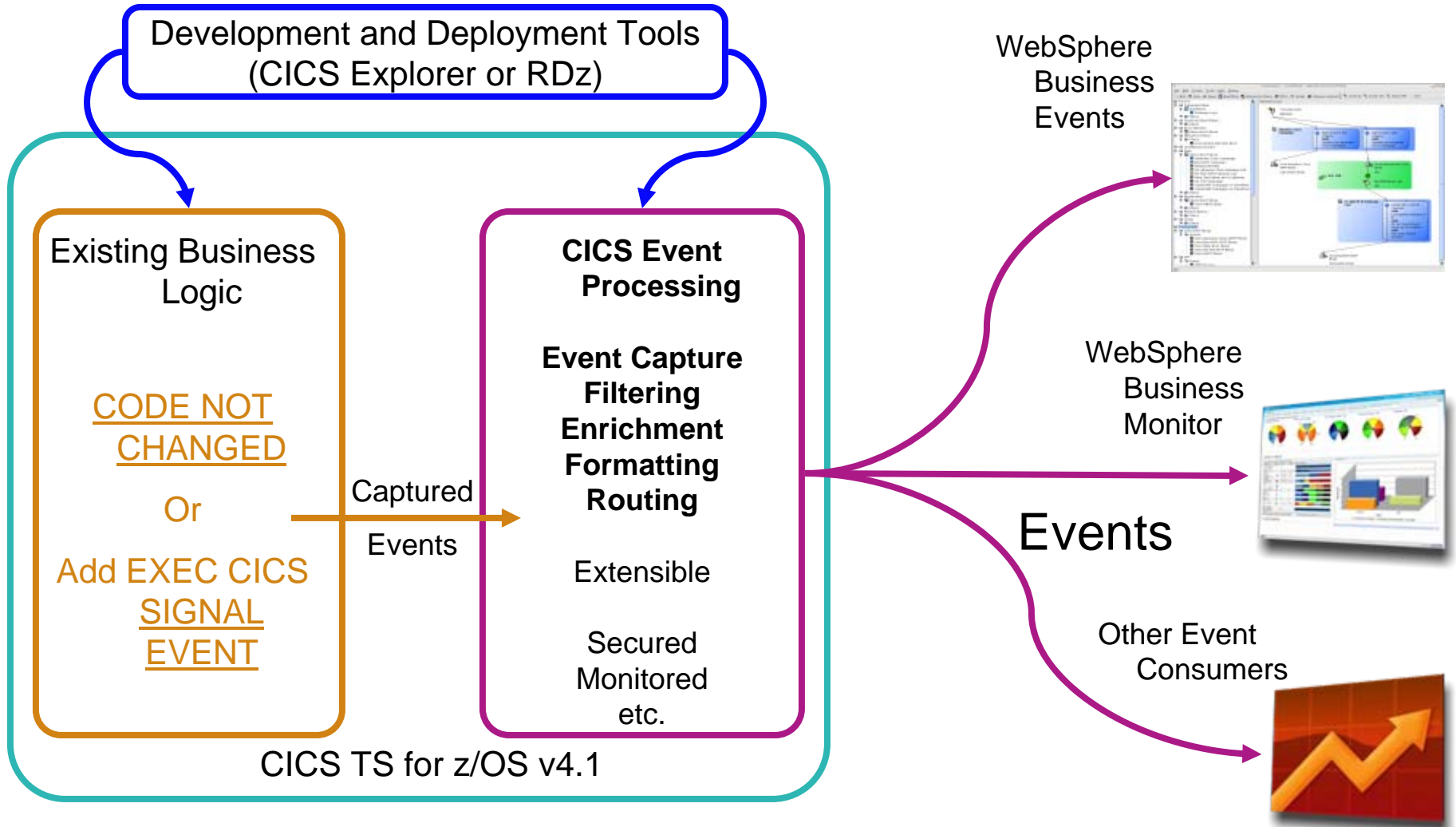- Integration
- Summary
- References

Issues facing CICS operational staff

- Extract information across systems
- Predict problems
- Operational health
- Integration (Monitoring / Config)
- Best Practices

Extract Information from CICS

Event Processing…

Development and Deployment Tools
(CICS Explorer or RDz)

WebSphere
Business
Events

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
Monitor

Events

Other Event
Consumers

CICS TS V4.2 Event Processing Enhancements

- **System events**

  - 6 new system event capture points

- **Capture events when:**

  - DB2 connection status changes

  - FILE enable status changes

  - FILE open status changes

  - Unhandled transaction abends

  - Current active tasks for a TRANCLASS goes above or below a certain percentage of MAXACTIVE.

 - Current active task in a region goes above or below a certain percentage of MAXTASKs.

System Capture Point
DB2 CONNECTION STATUS
FILE ENABLE STATUS
FILE OPEN STATUS
TASK THRESHOLD
TRANCLASS TASK THRESHOLD
TRANSACTION ABEND
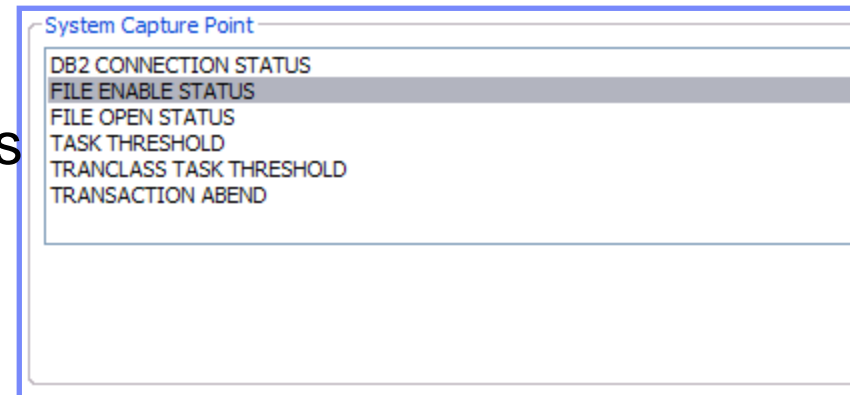
CICS TS V4.2 Event Search Capability

– Available in the CICS Explorer

  - Enter the name of the "thing" you have changed and EP search will tell you which event bindings may be affected

– 'Things' include:

  - CICS resource names
  - Language Structure names
  - Language Structure field names

– Searches event bindings in the CICS Explorer workspace and those installed in CICS regions that Explorer is connected to
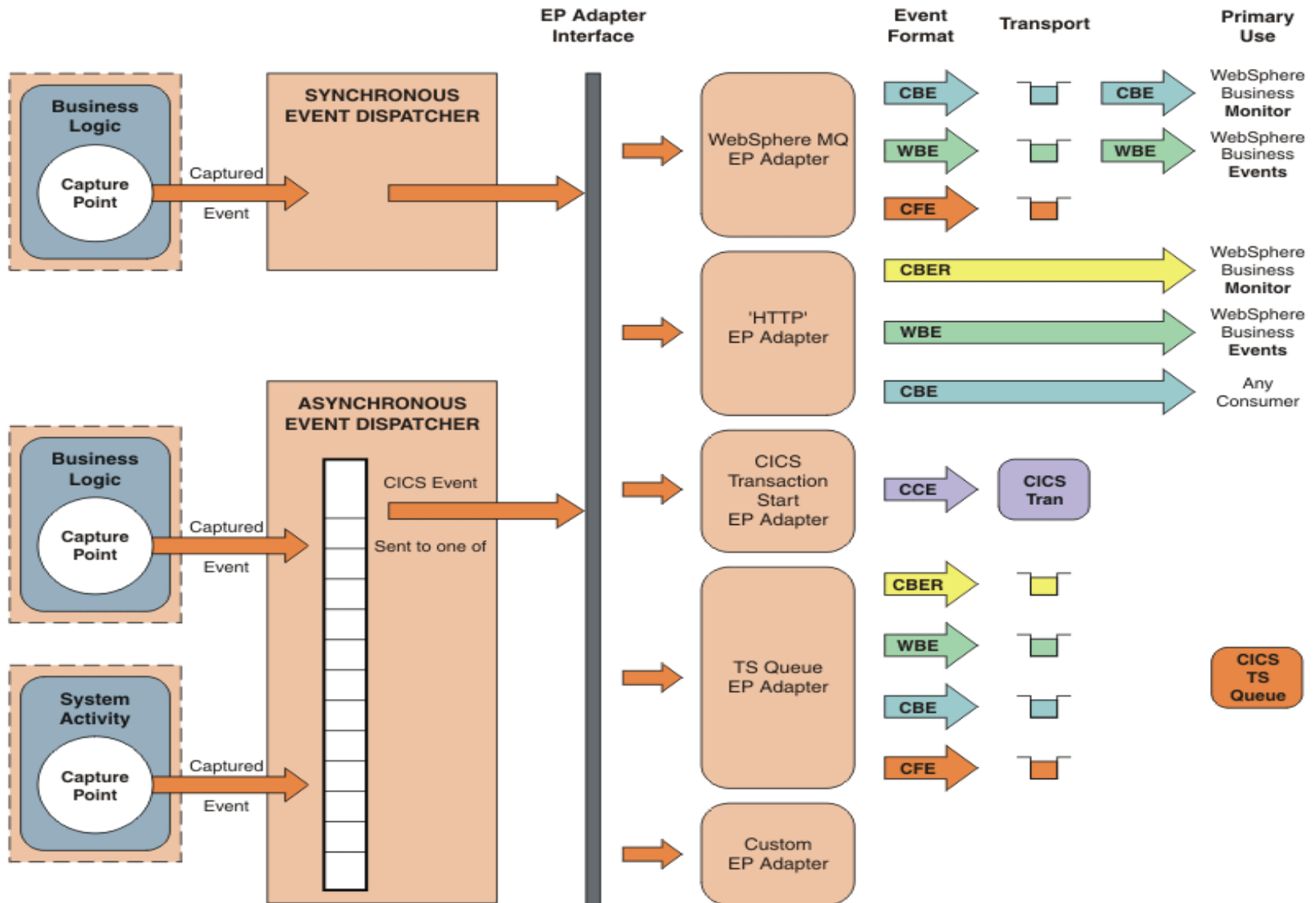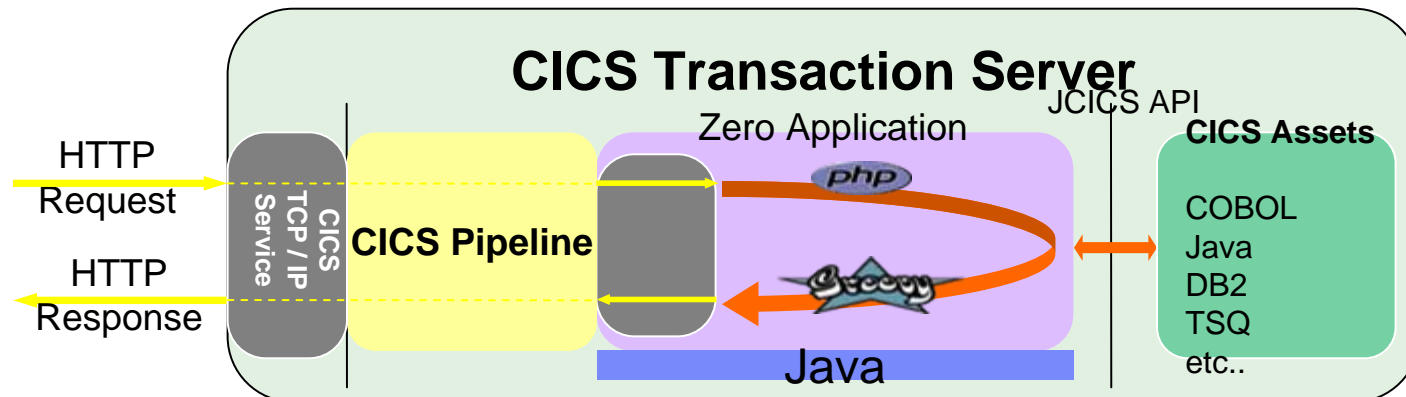
CICS TS V4.2 Event Search Capability

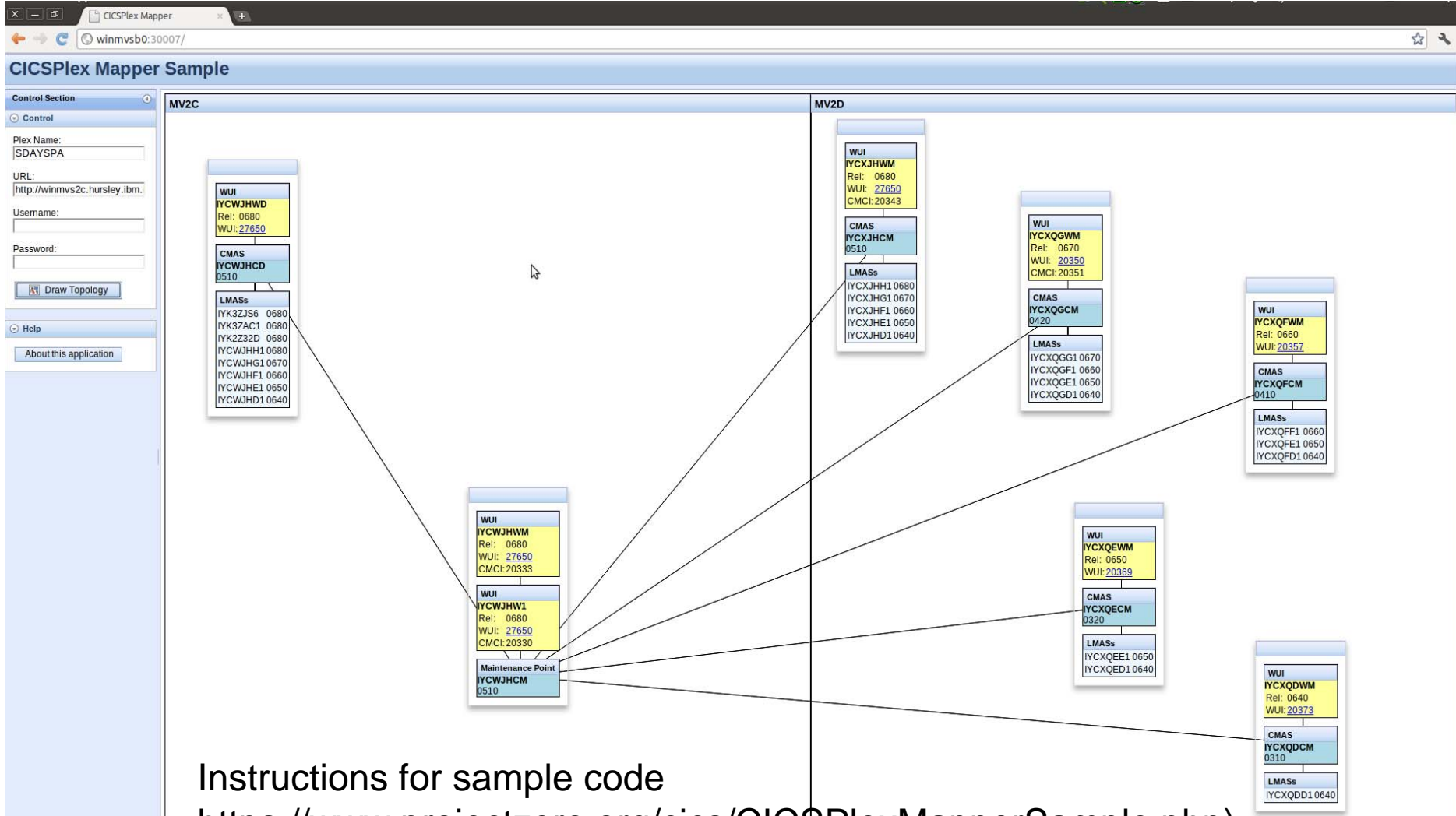EP Search Interface
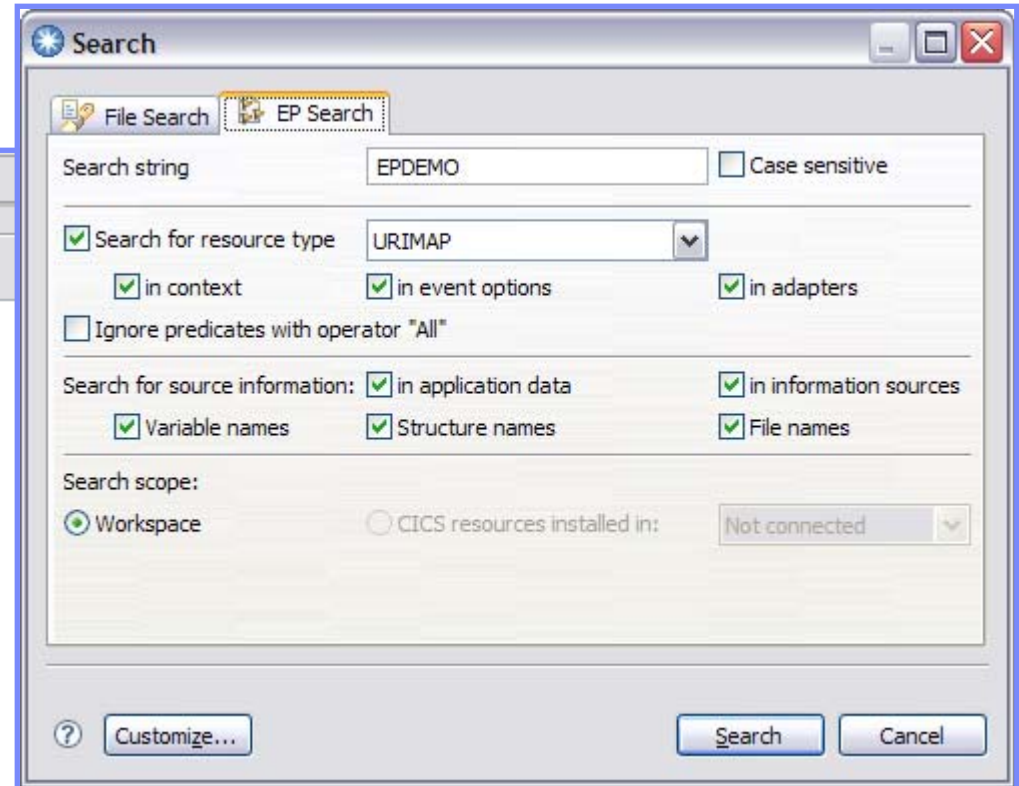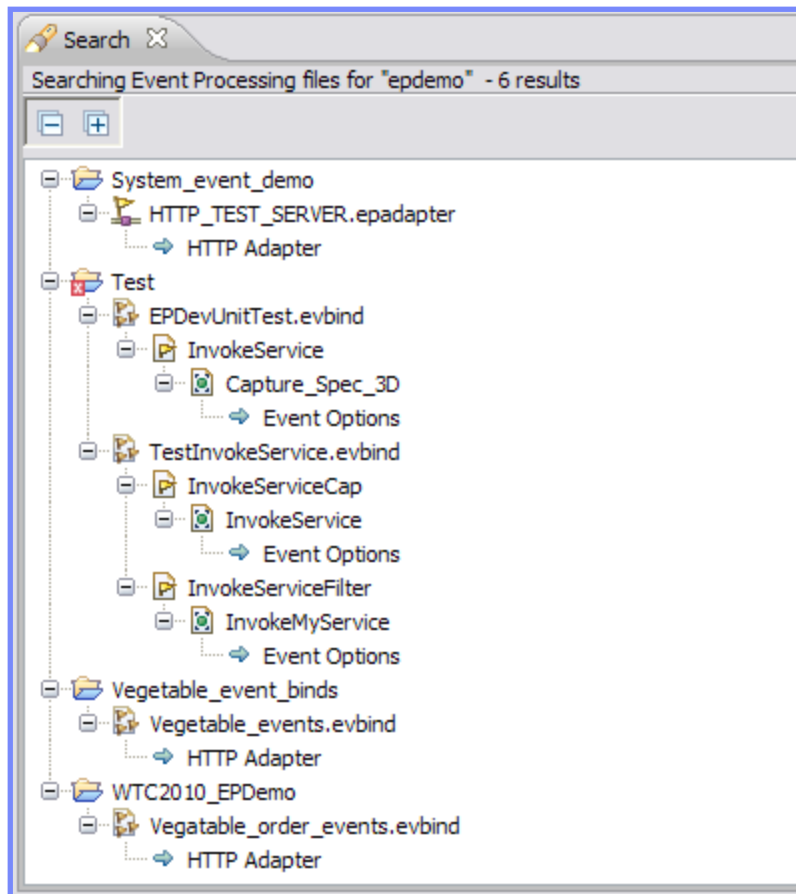
CICS TS V4.2 Event Deployment Options

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, build productivity applications like reports, dashboards, and widgets, or application front-ends for IT and Line of Business users

# Dynamic Scripting Sysplex Mapper example

Instructions for sample code
https://www.projectzero.org/cics/CICSPlexMapperSample.php)

CICS TS V4.2 Transaction Tracking

As the name implies....

– Follow the path of a transaction through the system

– Provide means to track and correlate the progress of
  - Simple linearly routed tasks, asynchronous tasks, spawned CICS tasks
    – Across distributed CICS systems including over CICS managed TCP/IP

– Extends and uses Association data
  - Previous hop, association data and origin data for both MRO and IPIC connections

– Expose tracking information via CICS Explorer

– Helps to answer questions like
  - Why is this transaction suspended?
  - Where was this transaction routed to?
  - What was the point of origin for this transaction?

Operational Health

Performance
Threadsafe
WLM
 64 bit
Function Shipping
Transaction Tracking
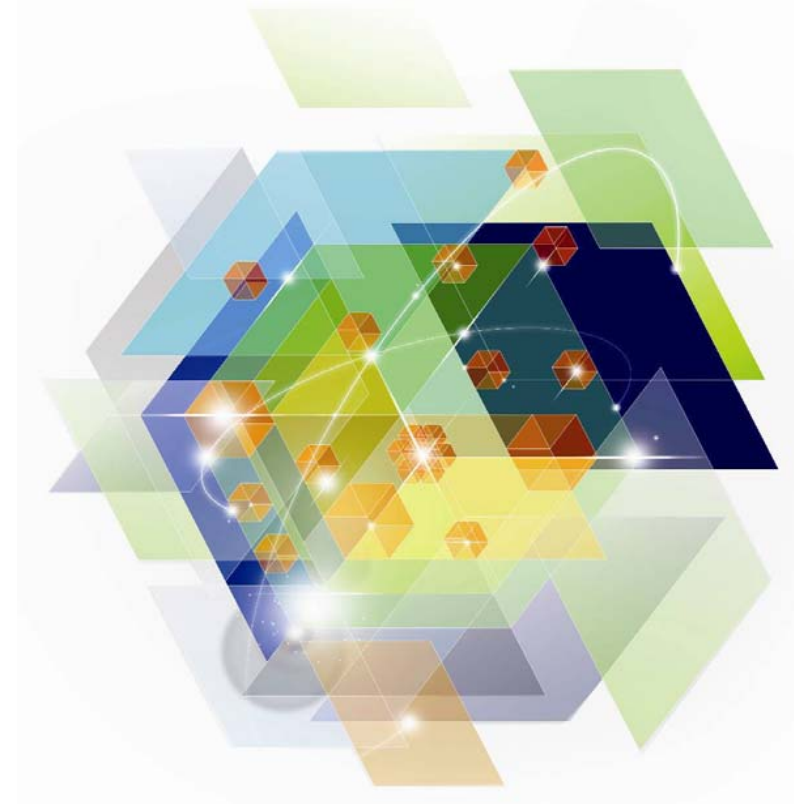
CICS V4.1 Performance

- **Traditional workloads**
  - Changes to TIMEUSED – up to 5% improvement in some workloads vs 3.2

- **IPIC**
  - Up to 10% improvement

- **WLM**
  - Sysplex Optimised routing

- **Web Services**
  - Up to 33% improvement

- **Threadsafety**
  - More API made threadsafe

Sysplex Optimized Workload
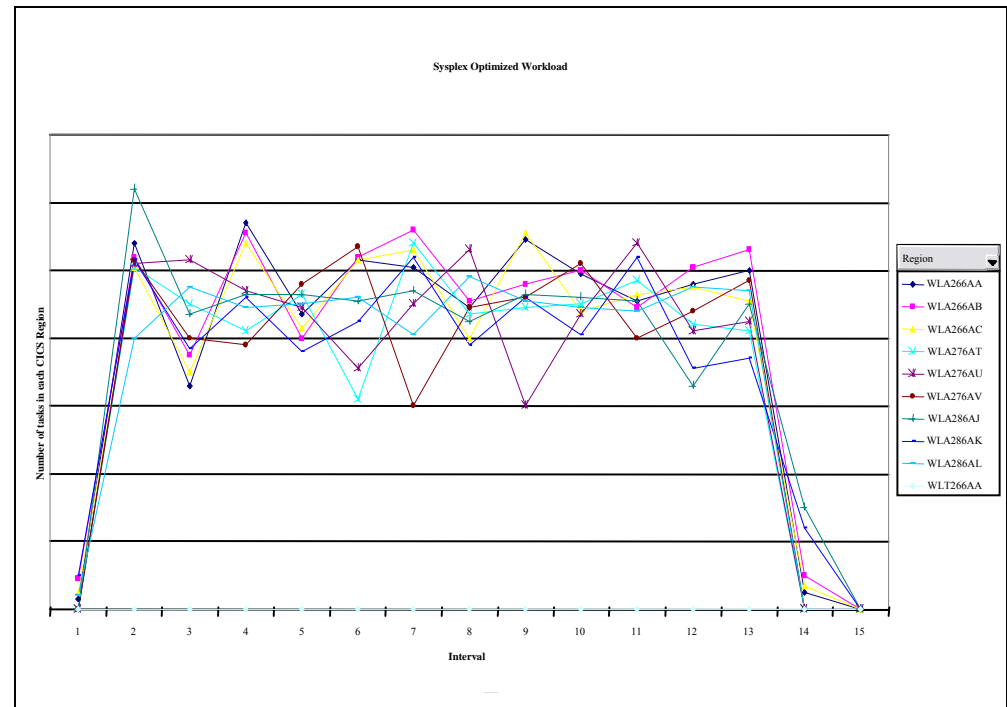
CICS V4.2 Performance

- **Traditional workloads**
  - Parity with V4.1
- **WLM**
  - Link Neutral algorithms
  - Unit of Work affinity prevents dead locks
- **Threadsafety**
  - Concurrency 'Required' to get started on an Open TCB
  - More API made threadsafe
  - IMS DBCTL adapter made threadsafe
  - IPIC mirror made threadsafe
- **Virtual Storage relief**
  - Trace, Temporary Storage JVM all 64 bit

CICS V4.2 Performance

- **Pooled HTTP connections**
  - CPU savings for outbound connections
  - WEB Services and WEB API

- **More LSR Pools**
  - Better opportunity for tuning VSAM files

- **Java**
  - Increased throughput with 64 bit JVM server

- **CLDM transaction**
  - Create Module maps to support HIS

CICS TS V4.2 CICS and 64-bit

– *CICS Transaction Server for z/OS V4.2 contains significant changes to the CICS domain architecture that exploits the underlying z/Architecture for 64-bit addressing and provides the infrastructure for CICS domains to utilize and exploit 64-bit addressing mode.*

– *Enables CICS to remove some of the limitations that affected scalability and availability by delivering large address spaces*

– *CICS can now make use of 64-bit virtual storage to increase capacity by supporting a larger number of concurrent users and transactions, as well as keeping up with virtual storage demands*

CICS TS V4.2 64-bit enablers

- CICS Trace Domain
  - Internal Trace Tables above the bar
    - Internal Trace Table in 64-bit storage only …
      - if CICS Transaction Isolation inactive (TRANISO=NO) *__or__*
      - if CICS running on z/OS 1.12 with APAR OA34311 applied
  - Transaction Dump Trace Table in 64-bit storage
  - Trace control blocks in 64-bit storage
    - Auxiliary and GTF Buffers moved from 24-bit to 31-bit storage
  - 64-bit GTF Trace (OA32611 required for z/OS 1.11 & 1.12)
- CICS Message Domain
  - CICS Message tables are above the bar (subject to TRANISO restriction)

CICS TS V4.2 64-bit enablers

- CICS Dump Domain

  - 64-bit storage SDUMP support
    - Requires z/OS APAR OA32271 (z/OS 1.11 and 1.12)
    - Use is now made of z/OS IARV64 DUMPRIORITY option

- CICS Monitoring Domain

  - Association Data control blocks are above the bar (subject to TRANISO restriction)

- CICS Java

  - Updated to 64-bit JVM (Java 6.0.1) for Pooled and JVMServer
    - 31-bit Java not supported

CICS TS V4.2 64-bit enablers

– CICS Temporary Storage Domain

- MAIN TS above the bar (subject to TRANISO restriction)
  - Limiting MAIN Temporary Storage use
    - > SIT parameter: TSMAINLIMIT={64M|amount}
  - Maximum is 32G, not greater than 25% of z/OS MEMLIMIT
- Many Temporary Storage control blocks above the bar

- Automatic TS Cleanup
  - EXPIRYINT can be specified on a TSMODEL definition
  - Applies to MAIN TS Queues and non-recoverable AUX TS Queues
  - Does NOT apply to:
    - > Remote TS Queues, Recoverable AUX TS Queues
    - > Shared TS Queues, CICS internal TS Queues
    - > TS Queues that don't match a TSMODEL

CICS TS V4.2 Threadsafe Enhancements

- **Commands now made threadsafe**
  - EXEC CICS SYNCPOINT
  - EXEC CICS SYNCPOINT ROLLBACK
  - EXEC CICS RESYNC
  - JCICS
    - COMMIT and ROLLBACK methods
- **Non-threadsafe Recovery Manager clients will force a switch to the QR TCB**
  - Switch to QR made by the Recovery Manager
  - Examples:
    - MRO, Transient Data, etc
- **Recovery Manager clients may force an internal switch to the QR TCB**
  - Switch to QR made by the client
  - Examples:
    - File control for BDAM files
    - RMI for a quasi-reentrant TRUE
- **DFHMIRS is now Threadsafe**
  - Supplied definition now specifies CONCURRENCY(THREADSAFE)

CICS TS V4.2 Scalability Enhancements…

- **IPIC transformers are now threadsafe**

  – Non IPIC code remains non threadsafe

- **Only requests function shipped over IPIC will run on an Open TCB**

  – File Control

  – Temporary Storage

  – Distributed Program Link

    - If the target program is defined as threadsafe and the mirror already on an open TCB

CICS TS V4.2 Threadsafe Enhancement

- **CICS-DBCTL interface will use OTE when connected to IMS 12**

  - At connect time CICS & IMS determine if each other can support OTE

  - With IMS 10 & 11
    - CICS-DBCTL TRUE enabled as QUASIRENT
    - Toleration APAR PM31730 (IMS 10), PM31729 (IMS 11)

  - With IMS 12
    - CICS-DBCTL TRUE enabled as OPENAPI
    - Exploitation APAR PM31420 is required

CICS TS V4.2 Performance Enhancements…

- **CICS historically has allowed use of 8 LSR pools**

  – In the days of local DLI, DLI used the other 8

  – When local DLI was removed, CICS File Control was not changed

- **Since z/OS 1.4, DFSMS have allowed up to 256 lsr pools per address space.**

- **In CICS TS V4.2 we will allow use of 255 LSR POOLs (1-255)**

  – Will not use pool 0

- **Potential performance optimization where greater subdivision of files across LSR POOLs is required**

  – e.g. Place highly-used files in their own LSRPOOL

CICS TS V4.2 Management Enhancement

- Workload Management is about providing CICS with the **'<u>best</u>'** target region at the moment the request is made from all of the possible region candidates.

It's NOT about evenly distributing work!
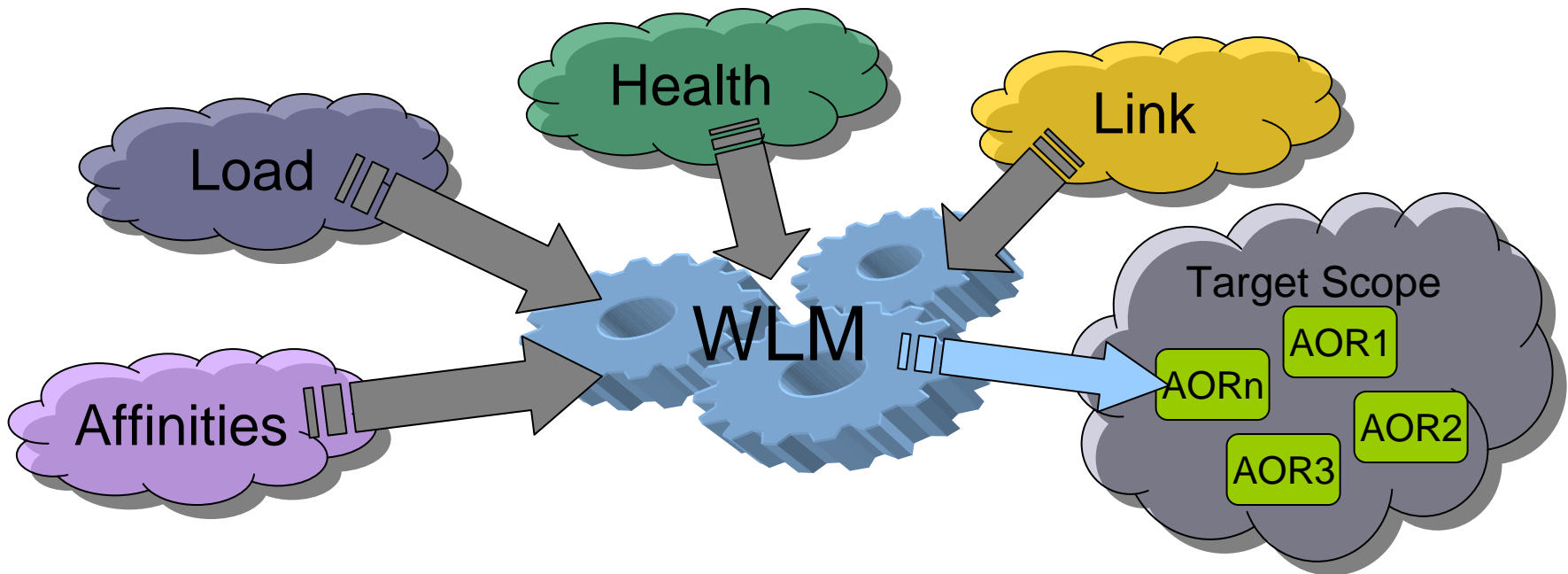
CICS TS V4.2 Management Enhancements…

- **New WLM routing algorithms**

- **Exclude LINK weighting in target region selection**

  – LNQUEUE

  - Route the transaction to the target region with best combination of:
    - Health (MaxTask, Short-on-storage, Dumping, Stalled)
    - Task queue depth (or load)
    - Abend probability, when calculated
    - RTA event impact, when defined

  – LNGOAL

  - Route the transaction to the target region that:
    - Is the most likely to allow the transaction to meet its response time goal

Transaction Tracking

- **Follows the path of a transaction through the system**
- **Provides means to track and correlate the progress of**
  - Simple linearly routed tasks, asynchronous tasks, spawned CICS tasks
    - Across distributed CICS systems including over CICS managed TCP/IP
- **Extends and uses Association data**
  - Previous hop association data & origin data for both MRO and IPIC connections
- **Helps to answer questions like**
  - Why is this transaction suspended?
  - Where was this transaction routed to?
  - What was the point of origin for this transaction?

CICSA Task 1 CICS 4.2	CICSB Task 2 CICS 4.2	CICSC Task 3 CICS 4.2
Associated Data • UOWID • APPLID • USERID / Prev Hop Data (empty) Count = 0	**Associated Data** • UOWID • APPLID • USERID / Prev Hop Data Region = CICSA Task = 1 Count = 1	**Associated Data** • UOWID • APPLID • USERID / Prev Hop Data Region = CICSB Task = 2 Count = 2
Origin Descriptor	Origin Descriptor	Origin Descriptor

MRO or IPIC Connected CICS regions
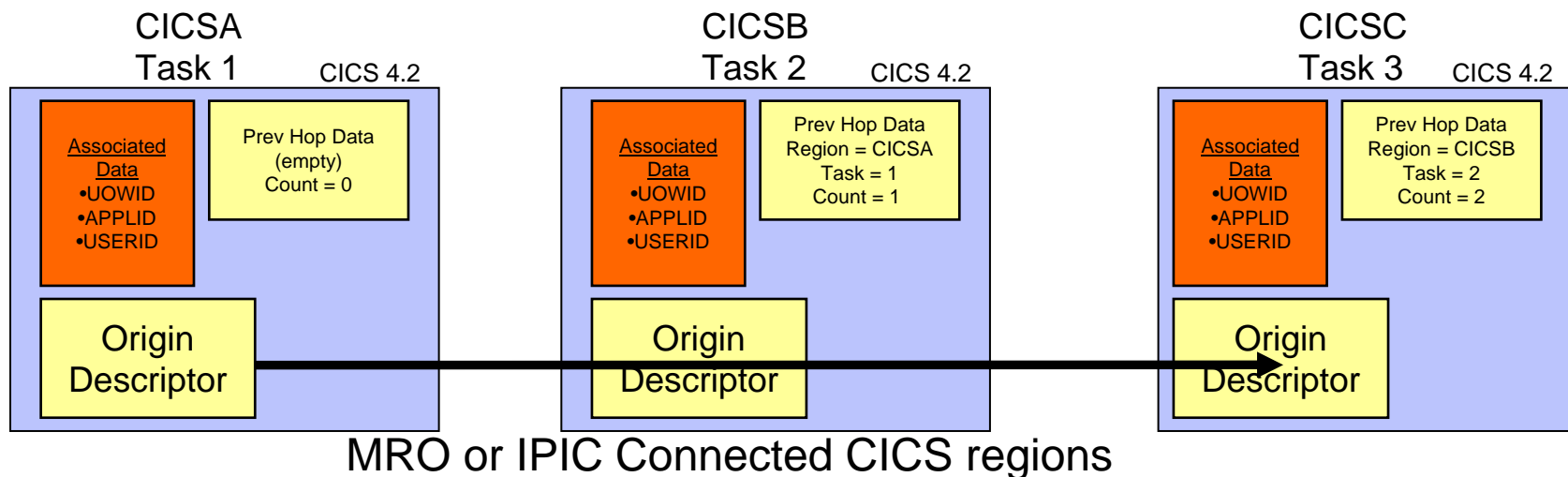
Transaction Tracking

Identify A Task to Analyze

Transaction Tracking

Right Click and Search Associated Tasks

Transaction Tracking

A Search Analysis is run

Transaction Tracking

Transaction Tracking

Results show up in the Search View

IBM CICS Explorer

Explorer Edit Project Operations Definitions Sear...   ...source ⬥ Events ⬥ Atom 🌐 MQ Explorer

Tasks | Task Associations | Transactions | Programs | Files | TCP/IP Services | TS Queues | ISC/MRO Connections

CNX0211I Context: CICSPLX1. Resource: TASK. 61 records collected at Sep 5, 2011 5:06:40 PM   Task ID: ____ ▶ ✖

Region	Task ID	Transaction ID	Run Status	User ID	Principal Facility	Priority	Class Name	Suspend Time	Dispatcher TCB HWM	Dispatcher TCB ...
CICSAOR1	0000029	CONL	▶ RUNNING	SYSSTC		255	DFHTCL00	0:00:00	0	0000:00:00.000...
CICSAOR1	0000048	CKAM	SUSPENDED	SYSSTC		255	DFHTCL00	2:29:53	0	0000:00:00.000...
CICSAOR1	0000050	CSKL	SUSPENDED	SYSSTC		255	DFHTCL00	0:00:24	0	0000:00:00.000...
CICSAOR1	0000056	COI0	SUSPENDED	SYSSTC		255	DFHTCL00	0:00:00	0	0000:00:00.000...
CICSAOR1	0000060	COIE	SUSPENDED	SYSSTC		255	DFHTCL00	0:00:06	0	0000:00:00.000...
CICSAOR1	0000062	OMEG	SUSPENDED	SYSSTC		55	DFHTCL00	0:05:54	0	0000:00:00.000...
CICSAOR1	0000063	OMEG	SUSPENDED	SYSSTC		55	DFHTCL00	0:05:54	0	0000:00:00.000...
CICSAOR1	0000134	ABRW	SUSPENDED	DDS0363	0050	1	DFHTCL00	0:00:05	0	0000:00:00.000...
CICSAOR2	0000027	CONL	▶ RUNNING	SYSSTC		55	DFHTCL00	0:00:00	0	0000:00:00.000...
CICSAOR2	0000044	CKAM	SUSPENDED	SYSSTC		55	DFHTCL00	4:56:41	1	0000:00:00.000...
CICSAOR2	0000045	CKTI	SUSPENDED	SYSSTC		55				0000:00:00.000...

1) Tran ABRW Started in CICSAOR1

2) Dynamic Transaction Routed to CICSAOR6

3) Static Transaction Routed to CICSAOR4

4) Function Shipped to CICSAOR7

Regions | Properties | 🌐 Internal Web Browser | 🔔 RTA Events | 🔍 Search | ⚠ Error Log

Tasks associated with task "0000134" in region "CICSAOR1" - 4 results - 5:08:59 PM

Tasks	Region	Trans ID	Run Status	Suspend Time	Suspend Reason	Program	Current Program	Origin User ID	CPU Time	Pr
🗖 0000134	CICSAOR1	ABRW	SUSPENDED	0:02:38	IRLINK					0
🗖 0000916	CICSAOR6	ABRW	SUSPENDED	0:02:24	IRLINK					1
🗖 0000127	CICSAOR4	ABRW	SUSPENDED	0:02:24	IRLINK			DDS0363	0000:00:00.000910	2
🗖 0000610	CICSAOR7	CSMI	SUSPENDED	0:02:24	EDF	DFH$ABRW	DFH$ABRW	DDS0363	0000:00:00.000368	3

○ ▼ DemoMVS - CICSPlex SM

Transcription Tracking
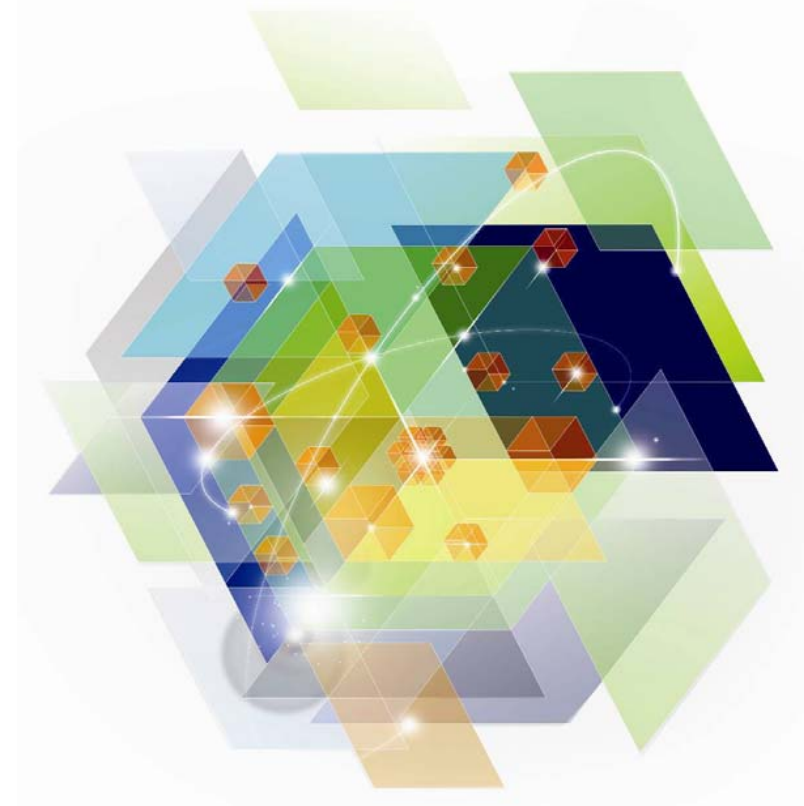

Can PURGE the Offending Task from the Search View

CPU Speciality Engines

CICS workload can be placed on speciality engines for

Reduced costs, where appropriate

- Dynamic Scripting

- Java

- Axis2

- WODM

- XML Parsing

    - XMLSS Web Services XML parsing

    - XML, RDz, Enterprise COBOL

Integration

IBM CICS Explorer - The New Face of CICS
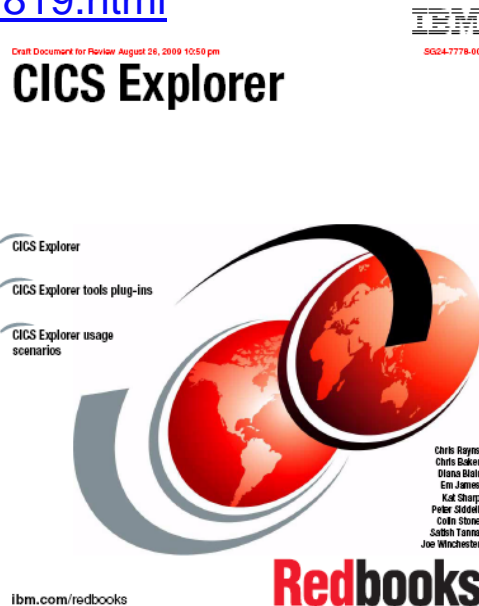

3270

Web

Eclipse

CICS Explorer Redbooks

- This Redbook® focuses on the new CICS Explorer

- The first part of the Redbook overviews the CICS Explorer, along with all the CICS Tools plug-ins

- The second part of the Redbook focuses on different scenarios in which the CICS Explorer can be used, along with the CICS Tools plug-ins to resolve different problems

- http://www.redbooks.ibm.com/redpieces/abstracts/sg247819.html

- This Redbook® focuses on the new CICS Explorer SDK
- The first part of the Redbook gives an overview of the CICS Explorer, along with an overview of PlugIns and Eclipse
- The second part of the Redbook focuses on the SDK and how to write a PlugIn and how to Extend the Explorer via PlugIns
- Two Demos are included
- http://www.redbooks.ibm.com/redpieces/abstracts/sg247819.html

Draft Document for Review August 26, 2009 10:50 pm   SG24-7778-00

CICS Explorer

- CICS Explorer
- CICS Explorer tools plug-ins
- CICS Explorer usage scenarios

Chris Rayns
Chris Baker
Diana Blair
Em James
Kat Sharp
Peter Siddell
Colin Stone
Satish Tanna
Joe Winchester

ibm.com/redbooks   **Redbooks**

Draft Document for Review January 4, 2010 11:12 am   SG24-7819-00

Extend the CICS Explorer: A smart way to manage your CICS

- How to add value to the CICS Explorer with Eclipse plug-ins
- Unlock the CICS Explorer SDK
- Examples of tool Integration

Chris Rayns
Scott Clee
Taku Miura
Shayla Robinson
Yusuke Tamura
John Taylor
Steve Wall

ibm.com/redbooks   **Redbooks**

CICS Tools

z/OS Perspective
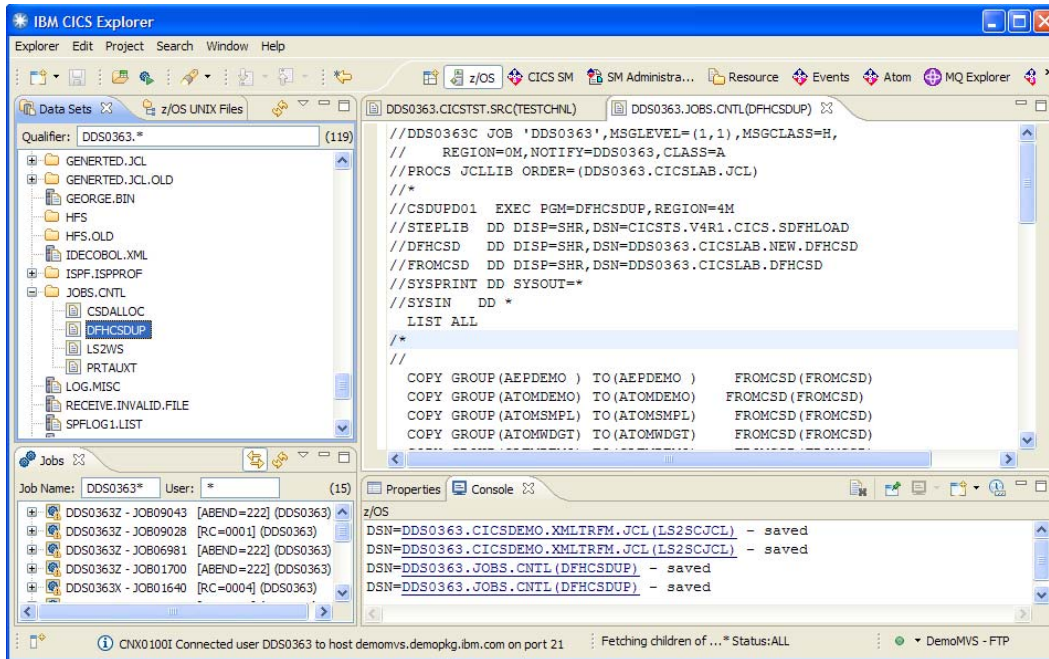
- **Respond to user feedback to help desk** *CICS PA data*

High response time SLA says <=1 sec

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Summary

- **CICS has been made easier to manage, configure and administer – CICS Explorer**

- **Non-intrusive tooling to easily take advantage of new technology introduced in to CICS – Events, Transaction Tracking**

- **High performance sustained**

- **More threadsafe options for more savings**

- **Even more value when combined with the tooling (stick around for the next session)**

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
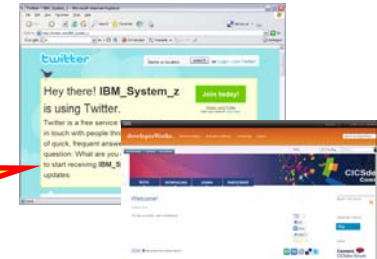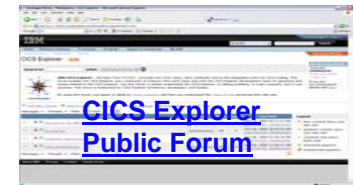
Key documents

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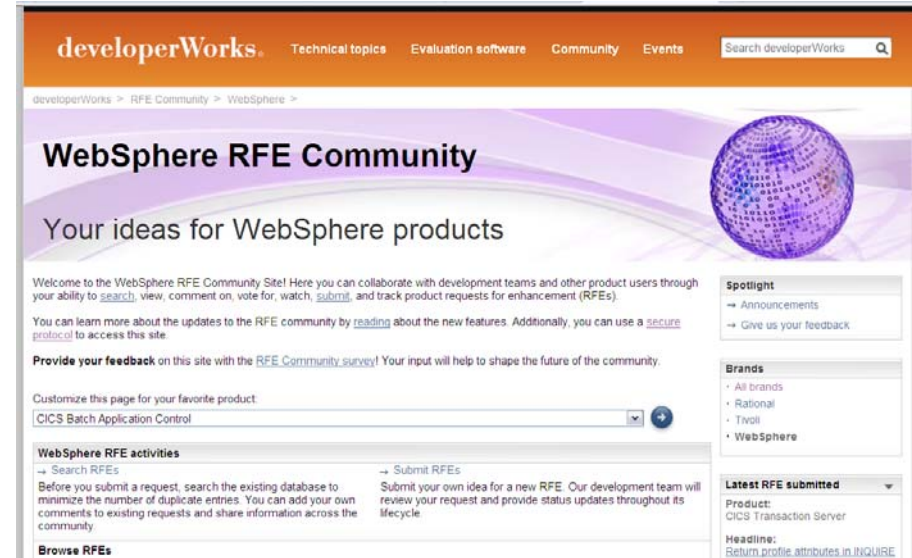
- **Existing FITS requirements are currently being processed, and will either be transferred to RFE or closed and returned.**

- **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.**

IBM Software

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30 sessions and labs in the CICS Track
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Early registration discounts available!
http://www-01.ibm.com/software/websphere/events/impact/registration.html