CICS TS V4.2 Technical Overview

Ian J Mitchell, IBM Distinguished Engineer
IBM Hursley

Monday 8th August 2011
Session 9322

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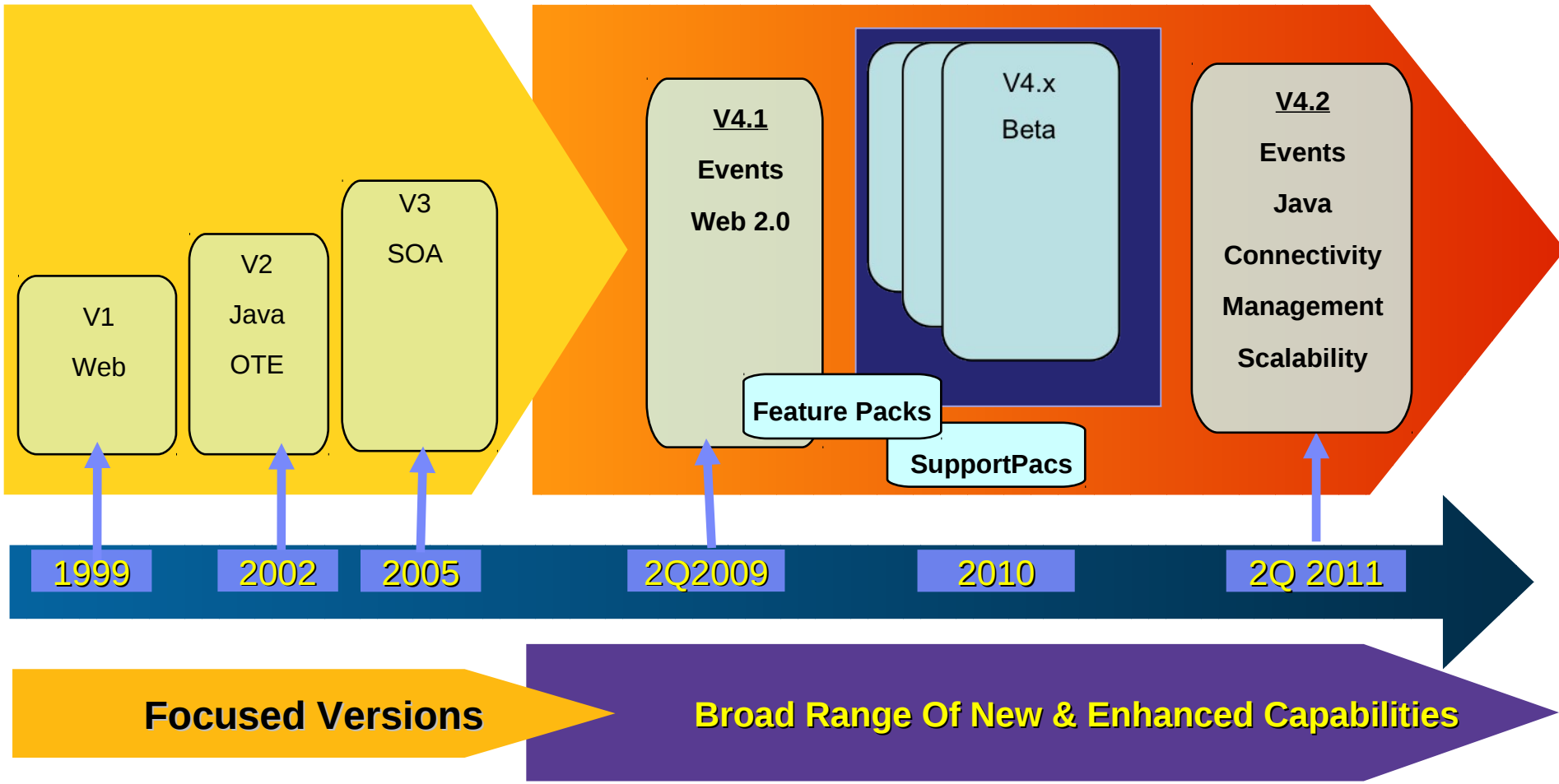
Agenda

- CICS TS V4 Themes and V4.2 Highlights
- CICS TS V4.2 Functionality
  - Events
  - Java
  - Connectivity
  - Management
  - Scalability
- Summary and Q&A

CICS TS V4 Themes and CICS TS V4.2 Highlights

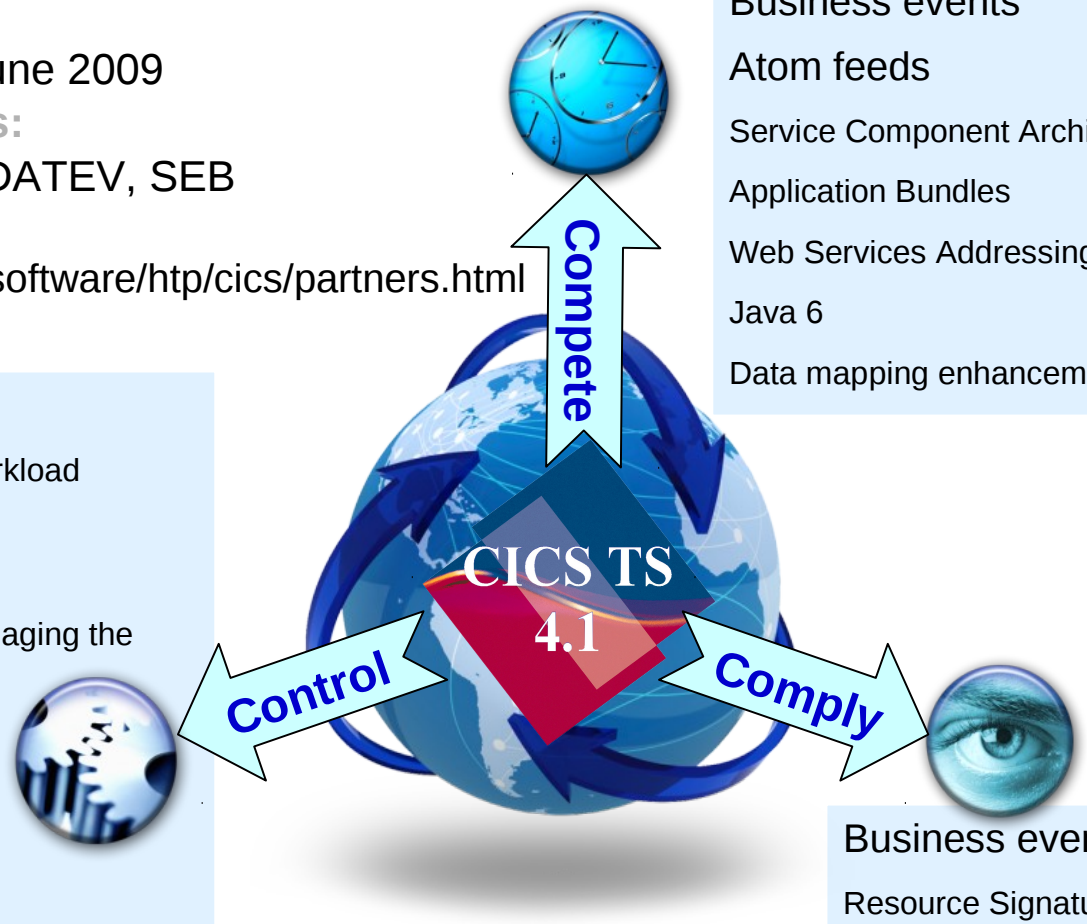
CICS Transaction Server: The Story so far...



CICS TS V4.1 – at the Heart of Smart Business

Announced: April 2009
Generally Available: June 2009
Customer References:
- John Lewis, BCX, DATEV, SEB

ISV support:
- http://www.ibm.com/software/htp/cics/partners.html



Business events

Atom feeds

Service Component Architecture

Application Bundles

Web Services Addressing

Java 6

Data mapping enhancements

CICS Explorer

Optimized CICSPlex SM workload management

IPIC Transaction Routing

New SPI commands for managing the CSD

Performance Improvements

WMQ Group Attach

Discovery Library Adapter

IPv6

Large file hosting

Improvements to XML parsing

Business events

Resource Signatures

WebSphere Registry & Repository Support

Support for distributed identities

CICS Transaction Server for z/OS V4.2

SHARE
Technology · Connections · Results

Events

- System Events
- Assured Events
- Lifecycle Management

Management

- Transaction Tracking
- Workload Management
- Password Phrases

Java

- 64-bit Applications
- Multithreaded Server
- OSGi Management

Scalability

- More Threadsafe
- Optimised Threadsafe
- 64-bit Exploitation

Connectivity

- Axis2 Web Services
- Web Services Offload
- HTTP & IP Extensions

new and enhanced capability across five major technology areas

CICS Transaction Server for z/OS V4.2

Events

- Discover Faster
- React Quicker
- Compete Better

Management

- Understand More
- Control Better
- Manage Easier

Java

- Perform Better
- Manage Easier
- Innovate Quicker

Scalability

- Process More
- Lower Costs
- Perform Better

Connectivity

- Connect Easier
- Lower Costs
- Manage Better

delivering a smarter transaction processing experience for everybody

Events

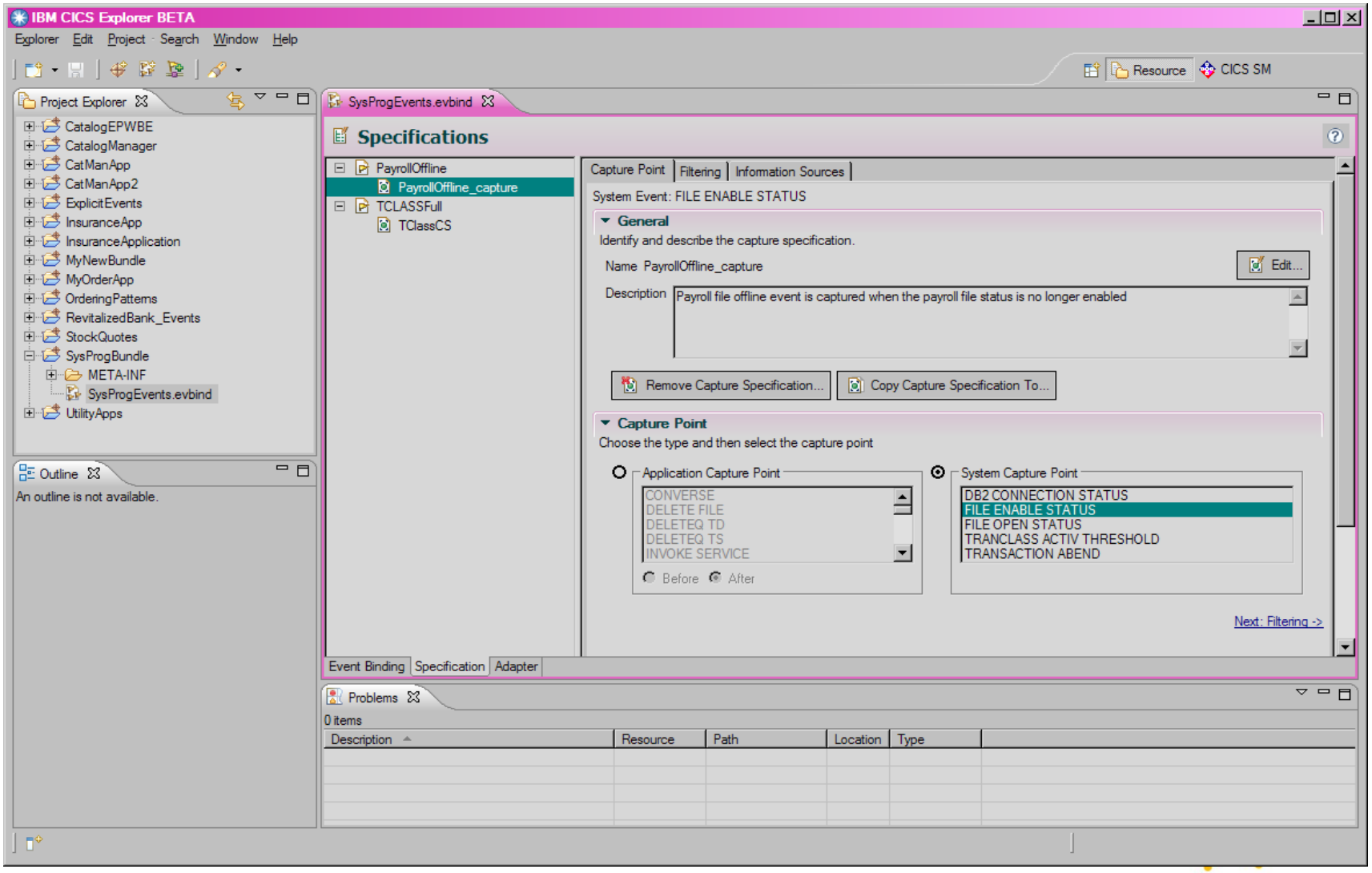
Overview of enhancements to Event Processing support

- System Events – events for change in state of some resources, threshold events, transaction abend events
- Improved event 'Lifecycle' management
  - Separate EP Adapter, to separate the system programmer concerns from event specification, make it easier to change how an event is emitted, and allow sharing of EP adapters across event bindings
  - Understand impact of application changes on events, to reduce risk to events of application change
- HTTP EP adapter – emit events over HTTP as entry-level alternative to WebSphere MQ (also available for CICS TS V4.1 via APAR)
- New synchronous emission mode for assured events
- Additional data types supported for filtering and capture, including floating point
- XEPCAP GLUE in CICS event capture, for use by dependency analysis tools
- Relax restrictions on events from CICS facilities (Atom, WMQ DPL Bridge)
- Simpler testing of XML-based event formats
- CA1W EP adapter for Dynamic Scripting

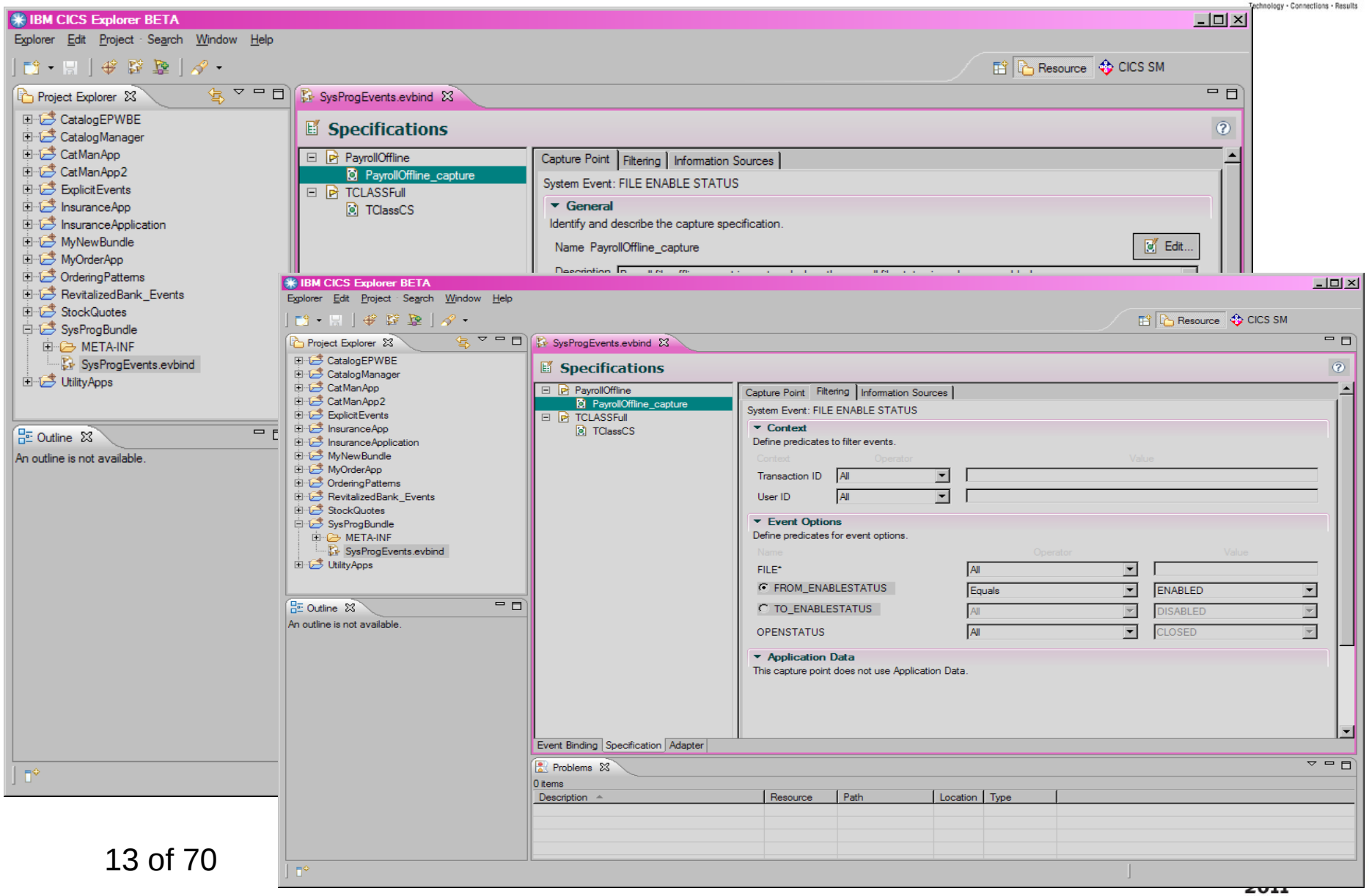
System Events

- 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
- Extensions in future releases could cover more resources and/or the status that can be detected (e.g. depth of tranclass queue), integration with CICSPlex SM RTA
- Uses the existing event infrastructure
  - Specify in Event Binding Editor, emit via an EP adapter
- Examples of use
  - Notify an application 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 Busines Monitor, monitor frequency of transaction abends during month

System Event Specification Example



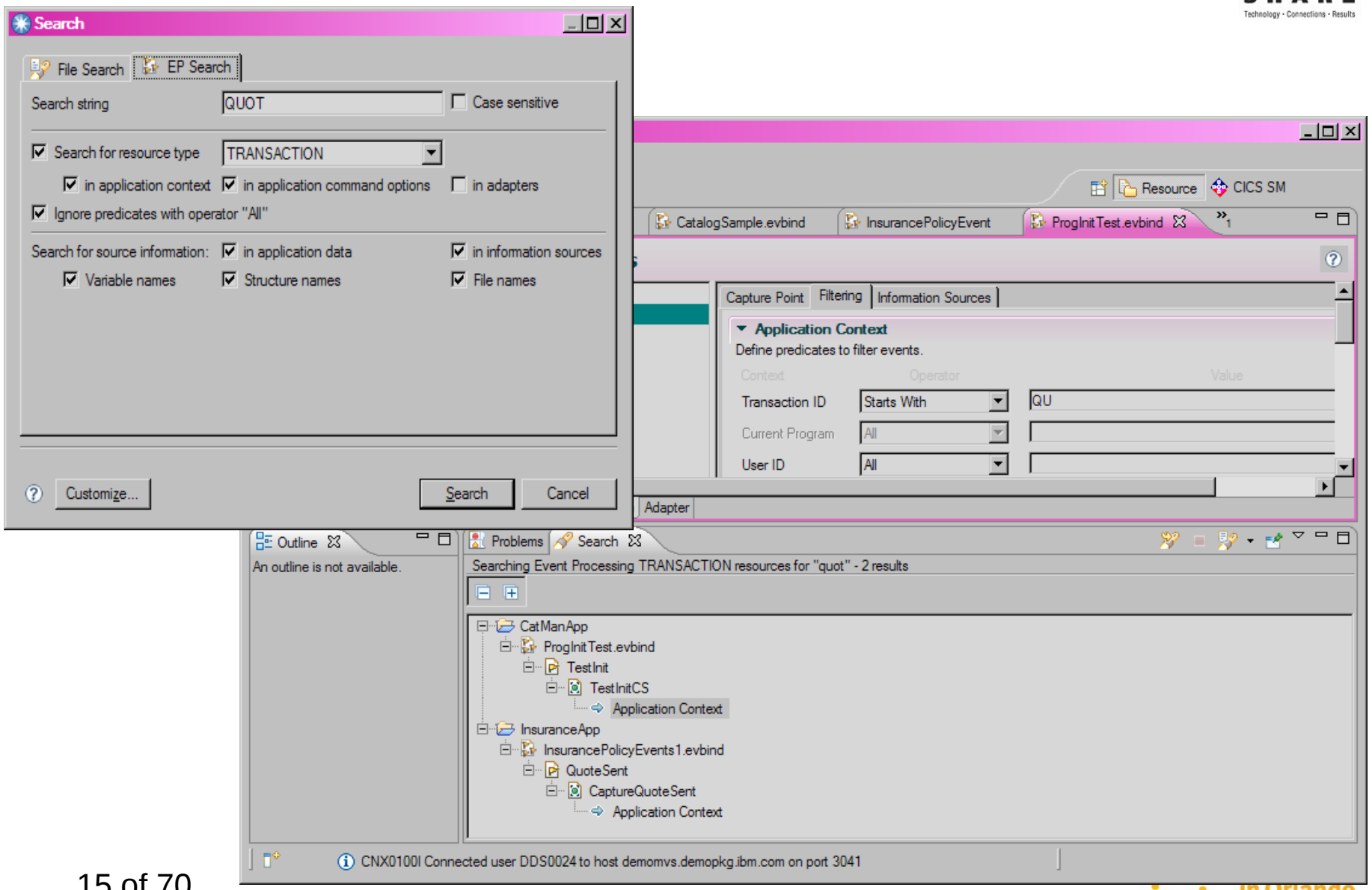
System Event Specification Example



Event Lifecycle Management

- Impact analysis support
  - Could a change to the PAYROLL file affect any events the business is using?
  - If the copybook defining the interface between 2 programs is changed, what events could be impacted?
- From either a running system where events are enabled (or a set of running systems), or at design time from local event specifications, search is provided:
  - For a particular program / file / queue / transaction / map / URIMAP/ service / channel / copybook field /etc. (anything that might be changed), display potentially impacted capture specifications
  - When using Import from Structure in Event Binding Editor, details of the copybook/structure name and field name will be saved in the event binding, to assist in this search
  - Option either to ignore or include predicates specifying 'All'
    - Ignoring reduces the search results, but including ensures all possible impacts are shown
  - In general, in capture specifications, avoiding 'All' and providing a value for the primary predicate is advisable where possible

EP search example



Synchronous Event Emission Mode

- Emission mode can be
  - Asynchronous (the default): event formatting and emission occurs asynchronously to the capturing UOW
  - Synchronous: event formatting and emission becomes part of the capturing UOW

- Synchronous event emission can be used
  - To extend applications where successful emission of the event (which drives the additional processing) is part of the application logic
    - UOW will only complete successfully if the event is emitted successfully
  - For the most business critical event-driven applications, requiring assured event emission – those which require events to be successfully emitted even in CICS failure situations
  - Use WebSphere MQ transport with persistent queues, and any persistence options on the event consumer, to assure event *delivery*

Java

Java Enhancements summary

- 64-bit JVM support in CICS
  - Improve scalability of single CICS region for Java appliications
  - Industry standardization
  - Removes constraints on heap storage
  - Performance benefits on z196 hardware
  - Java pool and JVM server environments
- Multi-threaded JVM server and OSGi
  - JCICS API support in JVM server
  - Consistency with other Java application server runtimes
  - New environment for hosting Java-based technology
  - Uses industry-standard OSGi for improved management of Java applications
  - CICS Explorer SDK for Java development and deployment
- JVM monitoring for capacity planning
  - Data for garbage collection, heap usage, class cache
  - Better capacity planning and reliability
  - Simplifies tuning of Java applications

Multi-threaded JVM Server and OSGi

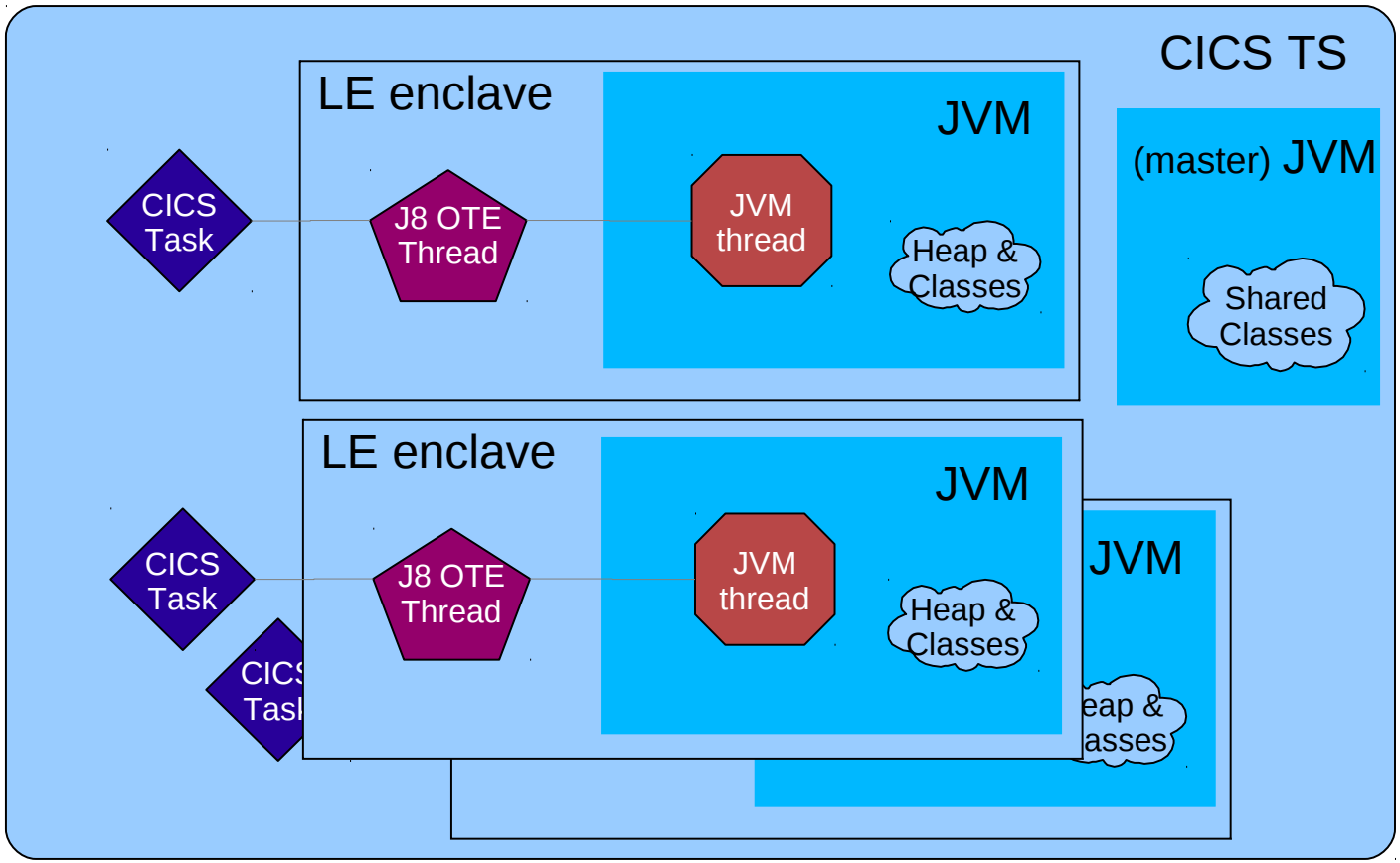
Existing JVM Pool Architecture

Single CICS task dispatched into a JVM in the *pool*

Concurrent task count limited to the number of JVMs that can fit in the region

Each JVM 'costs' ~20Mb plus the application heap value

Result is about max 20 task/JVMs concurrently in each region



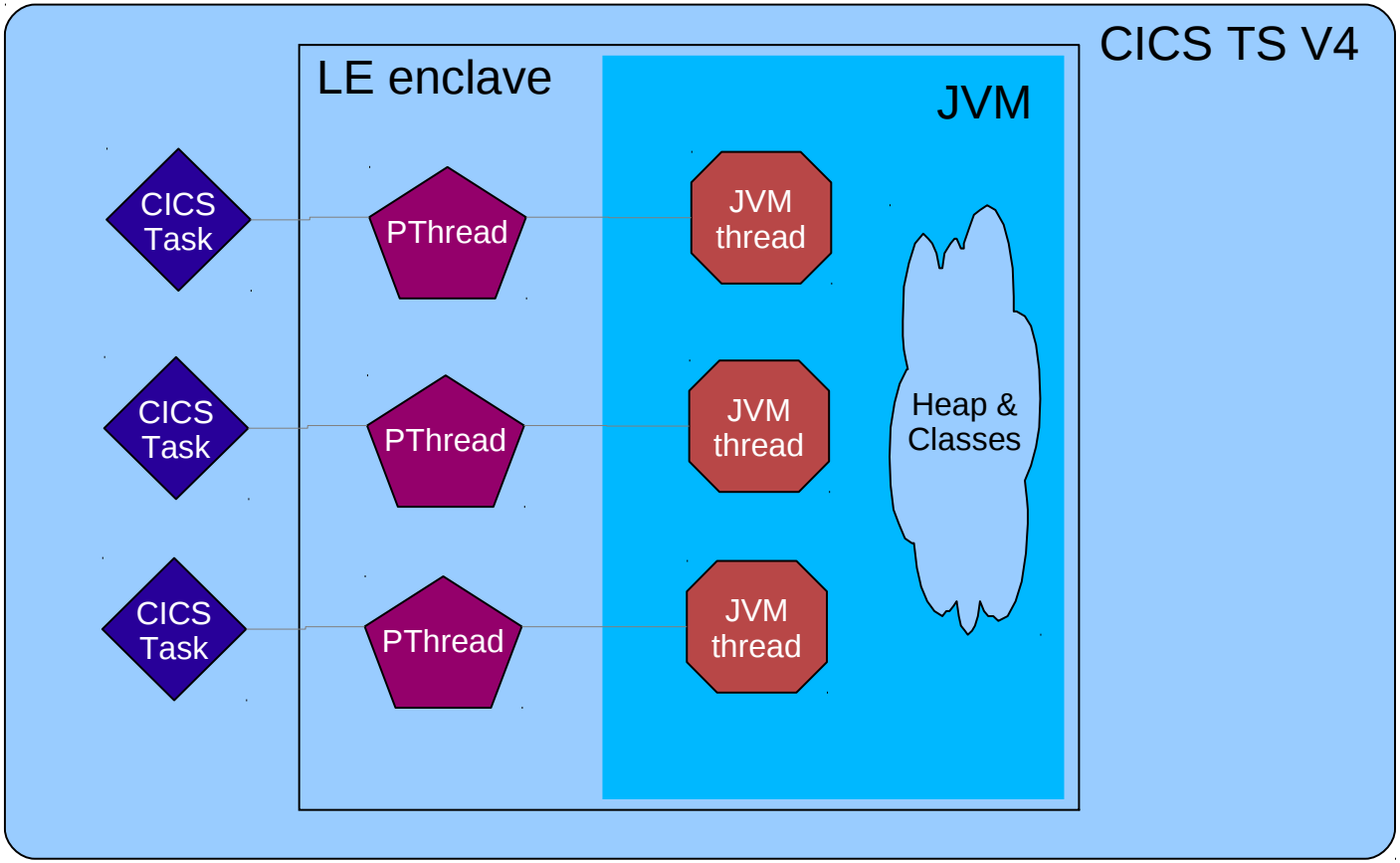
JVM Server Architecture

Can attach multiple pthreads/CICS tasks to the JVM at the same time

Therefore serve more requests using a single JVM

Result is increased tasks per region – up to 256 programs simultaneously on T8 TCBs

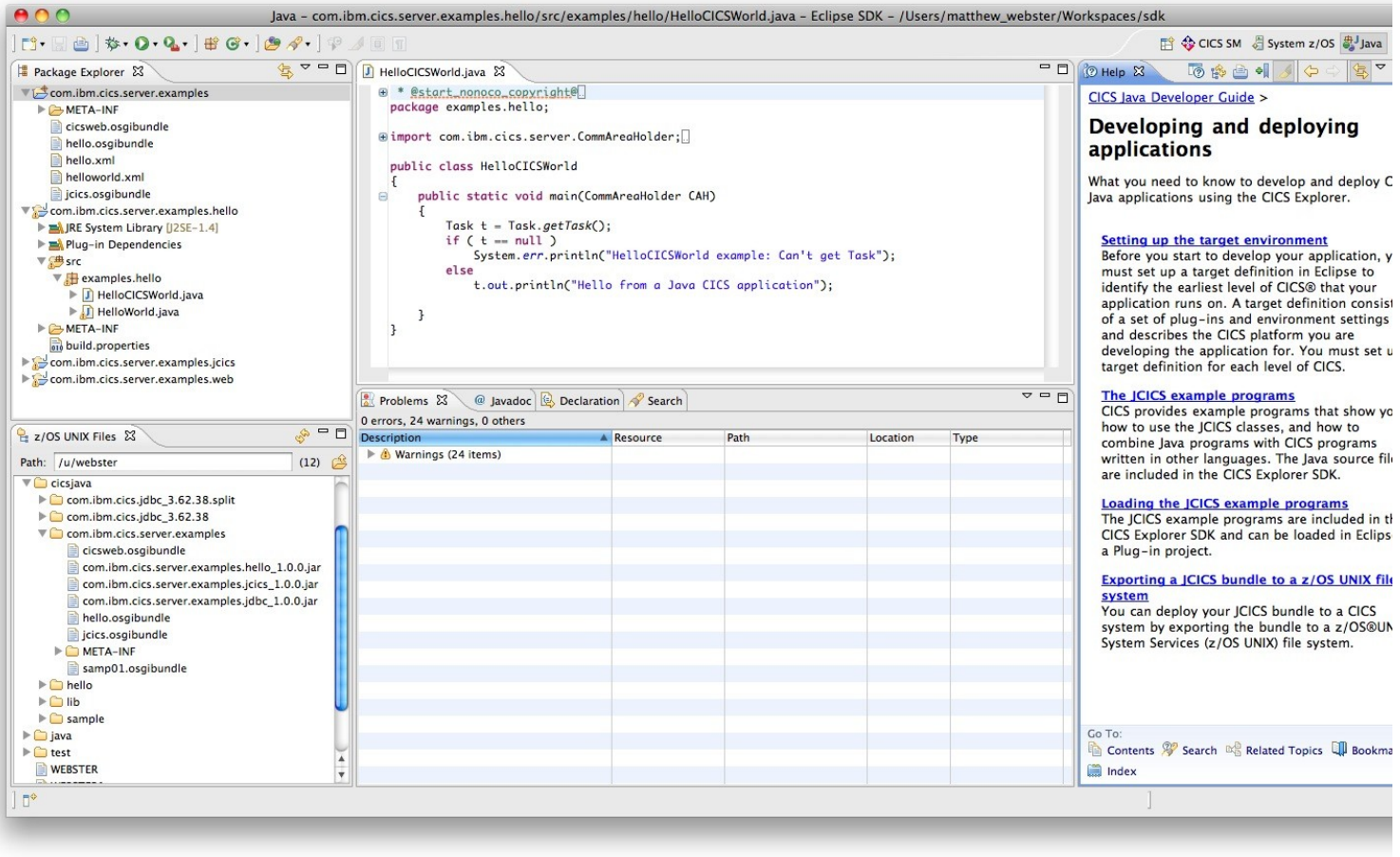
For 3rd party JVM technology (CICS TS V4.1)
and user programs (CICS TS V4.2)



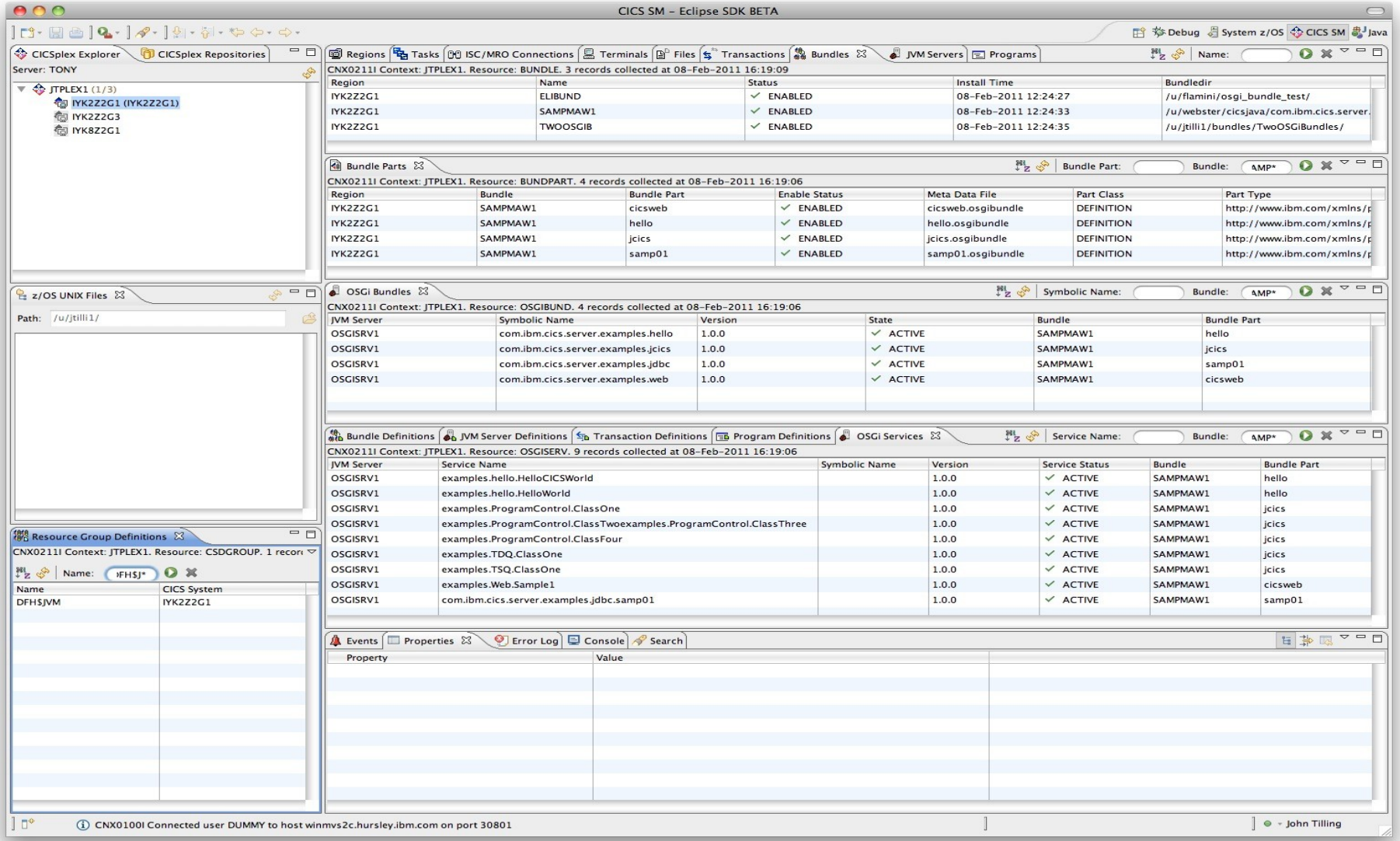
OSGi management of Java applications

- OSGi: Open Services Gateway initiative
- OSGI provides industry standard model for managing Java applications, complements what is already available in Eclipse and WAS
  - Consistency with other products
- Improve deployment and management lifecycle of Java applications in CICS
  - Support deployment of OSGi bundled applications into the CICS JVM server
  - Allows CICS administrators to make controlled changes to Java applications without restarting CICS *or* the JVM
  - Provides application isolation and versioning
  - Simplifies upgrade of application packages using in-built versioning
  - Simplifies cross-package prereq checking
- Java applications packaged into an OSGi bundle, then deployed as part of a CICS BUNDLE resource, referencing the OSGi bundle by symbolic name and version (and the JVM server into which It is deployed)
  - Removes need to load Java applications from statically-defined CLASSPATH
  - Packaged by CICS Explorer SDK tooling
- Previous focus has been on “Java for CICS programmers”; this provides “CICS for Java programmers”

CICS Explorer SDK



OSGi bundle and service views in Explorer



Connectivity

Overview of connectivity items

- IP Interconnectivity between CICS regions extended to function shipping
- Web services
  - Option to use Axis2 stack for web services
  - Simpler Java applications in web services
  - Service Discovery support
    - Retrieve WSDL from CICS via HTTP GET against ServiceURI?WSDL
    - Can be used by WSRR
- Outbound HTTP connection pooling
- Inbound HTTP connection throttling
- DB2 connection management
- WebSphere MQ support
- Atom Enhancements
- Items for WebSphere Optimized Local Adapters

IP Interconnectivity (IPIC)

IPIC Reminder

- IPIC – IP InterCommunications Protocol
  - Provide CICS communications support over TCP/IP as an alternative to that provided over ISC and MRO
- TCP/IP alternative to SNA for CICS communications, to
  - Enable network convergence and simplification
  - Address SNA skills shortage
  - Reduce cost of infrastructure
  - Take advantage of TCP/IP features on z/OS
  - Exploit high bandwidth OSA connectivity (QDIO)
- Multi-version delivery
  - No plans to remove existing SNA support
  - Migration of infrastructure without modification of CICS applications
  - Provide CICS with IP choice for most of the CICS comms-related programming model
- White paper 'CICS delivers IP interconnectivity' available at:
  - http://www.ibm.com/software/htp/cics/tserver/v32/library/index6.html

IPIC functions and releases

- IPIC extensions in CICS TS V4.1
  - Asynchronous processing (STARTs), restricted to function shipping of START, START CHANNEL, and CANCEL commands
  - Supported with or without terminal
  - Transaction routing for 3270 terminals only
  - Simplified CICSPlex SM definitions for IPIC (SYSLINKs)
- IPIC extension in CICS TS V4.2
  - Function shipping (small bullet point, large value)
  - Enhanced routing for terminal-based STARTs

IPIC for function shipping

- Function Shipping between CICS TS V4.2 regions (or later) for
  - File Control
  - Transient Data
  - Temporary Storage
    - Including TS MAIN function shipping (which is supported by MRO but not APPC)
- Enhanced routing (i.e. ROUTABLE=YES) of terminal-based START requests (previously only traditional routing supported over IPIC)
- Requests function shipped over IPIC are threadsafe due to mirror program running threadsafe (exception is TD, which is not yet threadsafe)
- New MIRRORLIFE option on IPCONN
  - Can provide efficiency and performance benefits
  - REQUEST, UOW or TASK

Web Services

Axis2 engine for Web services

- Axis2: Java-based open source web services engine
- New option to use Java SOAP message handlers that use Axis2 to process SOAP messages
  - Specified via pipeline configuration
  - Add Java SOAP handler to pipeline configuration file, and enable a JVM server for Axis2 processing to run in
  - Optionally, write Axis2 handlers (in Java) to process SOAP headers
  - Same externals as native stack: no need to regenerate bind files etc.
- Axis2 SOAP processing and some of the CICS pipeline processing become eligible for zAAP offload
  - Can reduce processing costs
- Can be used entirely transparently to applications
  - Also opens the opportunity for applications to do data mapping themselves – data mapping by CICS rewritten in Java, and with exit points

Java applications as web services

- Deploy Axis2-style webservices: POJO as provider web services
  -
- Java interfaces for Web services
  - Use Java (zAAP offloadable) for data mapping of Web services
  -
- Improve integration of CICS and Java applications for in-bound Web services
  - Pipeline can call directly to CICS service provider applications written in Java
  -
- Improve price performance of existing Web Services by allowing the data mapping (bind file processing) to be executed in a JVM server (and thus be eligible for zAAP offload).
  -
- Suitably written Java applications/components can interact directly with the Java object model of incoming messages, rather than containers used by traditional languages
  - Avoids cost of serializing to XML and parsing the XML
  - Axis2 pipeline handler will already have built the object model for the message

Connection Management

HTTP Outbound Connection Pooling

- Reuse of connections for outbound HTTP requests in *or across* tasks
- Re-use connections which have the same properties, as defined by URIMAP
- SOCKETCLOSE timeout option on client URIMAP
  - Non-zero value means HTTP requests using that URIMAP can use connections (sockets) from a pool
    - Applies to any HTTP requests using the same client URIMAP
    - No code changes needed to benefit, except when using CICS WEB interface
    - Benefits HTTP EP adapter
  - SOCKETCLOSE is timeout time for length of time socket remains available for reuse from the pool
  - Socket will be removed from pool if errors returned, or if any problems are detected

HTTP Inbound Connection Throttling

- Option to limit the number of persistent connections from web clients that are allowed on a port (at any one time)
- MAXPERSIST option on TCPIPSERVICE
  - Number of persistent connections
  - Socket 'closed' if number exceeded
  - Default is NO
- Provides a way to “throttle” incoming requests without leaving them queueing

DB2 Connection Management

- Enhancements to DB2 thread reuse
- REUSELIMIT on DB2CONN to control number of times a thread can be reused
  - Default is 1000
  - 0 means no limit on thread reuse (same as before)
- Address problems where long-running CICS DB2 threads can cause resource issues in DB2

WebSphere MQ

WebSphere MQ support

- Updated CICS-WebSphere MQ Adapter to support WebSphere MQ V7
  - Supports 12 new MQ V7 API commands for message properties, publish subscribe, and asynchronous consume
  - Also available via APARs PK89844 and PK66866 for CICS TS V3.2 and V4.1

- Support for WebSphere MQ Group units of work recovery
  - CICS TS V4.1 introduced support for WMQ group attach
    - If CICS has any outstanding UOWs with the WMQ server, need to reconnect to that specific WMQ server to resolve them
  - With CICS TS V4.2, will be able to attach to any local WMQ server in the queue sharing group and have it resolve outstanding UOWs
- This option can be used only when running a release of WebSphere MQ that supports group unit of recovery for CICS and when the GROUPUR attribute has been enabled in the WebSphere MQ queue managers.

Other Connectivity Enhancements

Atom Consumability enhancements

- Simplified deployment and administration of ATOM services
- ATOMSERVICE and XMLTRANSFORM resources can be deployed via CICS BUNDLEs
    - Appropriate URIMAP will be dynamically generated
- CICS Explorer enhancements to generate and deploy the BUNDLE
- Sample BUNDLEs provided with general-purpose XMLTRANSFORM resources for use in creating ATOM Feeds

WebSphere Optimized Local Adapter (WOLA) Enhancement

- In support of WebSphere z/OS Optimized Local Adapter
  - Interface to CICS services for 2-phase commit of WAS to CICS workload when using WOLA
  - Context TRUE (invoked on EXEC CICS START) updated to allow future provision of ICRX by users of TRUE, such as WOLA

Management

Overview of management items

- Transaction Tracking for tracking and correlating transactions across CICS systems
- CICSPlex SM Workload Management enhancements
- Extensions to CICSPlex SM CMCI
- Up to 100 character password phrases
- CICS Explorer enhancements

CICS Transaction Tracking

Transaction Tracking

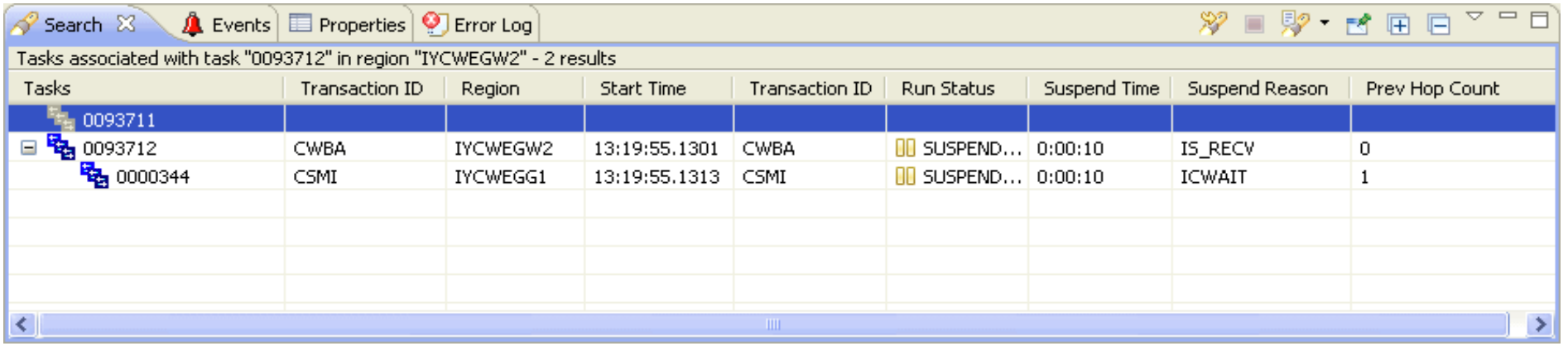
- As the name implies....
  - Track a transaction through the system
  - Provide means to track and correlate the progress of
    - Simple linearly routed tasks, asynchronous tasks, spawned CICS tasks
    - Across distributed CICS systems including over CICS managed TCP/IP
  - Extends and uses Association data
    - Previous hop, association data and origin data for both MRO and IPIC connections
  - Expose tracking information via CICS Explorer
  - Answers questions like
    - Why is this transaction suspended?
    - Where was this transaction routed to?
    - What was the point of origin for this transaction?

Transaction Tracking – Origin Data from other products

- “non-CICS” Adapters (non-terminal starts) can set origin data
  - e.g. WebSphere MQ, WOLA, CICS sockets
- Provide unique tracking data
- New fields to TRUE context management parameter list (DFHECON), can be used to set information about what started the transaction, to provide (say):
  - Product (e.g. WebSphere MQ and version)
  - Server (e.g. queue manager)
  - Resource within the server (e.g. init queue)
  - Client or request instance (e.g. queue name, message ID), or reason for start
- Requires updates to TRUE programs to exploit

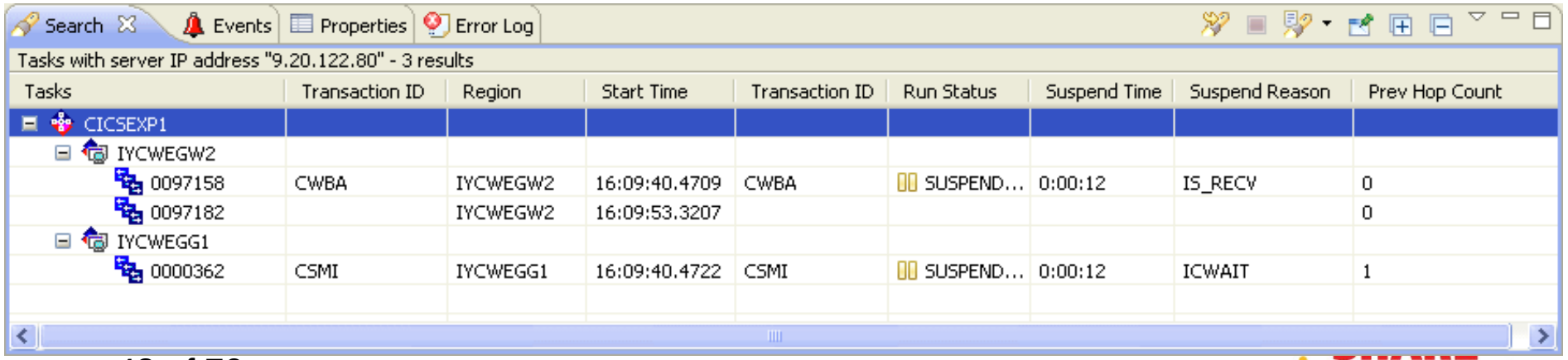
Transaction Tracking Example – Explorer views

Associated tasks, with previous hop data



Tasks	Transaction ID	Region	Start Time	Transaction ID	Run Status	Suspend Time	Suspend Reason	Prev Hop Count
0093711								
0093712	CWBA	IYCWEGW2	13:19:55.1301	CWBA	SUSPEND...	0:00:10	IS_RECV	0
0000344	CSMI	IYCWEGG1	13:19:55.1313	CSMI	SUSPEND...	0:00:10	ICWAIT	1

Tasks originating from an IP address



Tasks	Transaction ID	Region	Start Time	Transaction ID	Run Status	Suspend Time	Suspend Reason	Prev Hop Count
CICSEXP1								
IYCWEGW2								
0097158	CWBA	IYCWEGW2	16:09:40.4709	CWBA	SUSPEND...	0:00:12	IS_RECV	0
0097182		IYCWEGW2	16:09:53.3207					0
IYCWEGG1								
0000362	CSMI	IYCWEGG1	16:09:40.4722	CSMI	SUSPEND...	0:00:12	ICWAIT	1

CICSPlex SM Enhancements

CICSPlex SM Workload Management

- Additional routing algorithms to control workload across regions in different ways
  - QUEUE, GOAL – existing algorithms, use link weights to favour local systems in routing decisions
  - LNQUEUE, LNQUEUE – *NEW* location neutral algorithms – ensure all types of links are treated equally, share workload more evenly across local and remote systems
    - LNQUEUE: route to region with most favourable load, health, abend probability, RTA event impact (and affinities)
    - LNGOAL: route to region that will best meet response time goal
- Transaction-level control for routing
  - Can specify routing algorithm on TRANGRP and override the WLMSPEC setting
- UOW affinities
  - Prevent possible deadlocking caused by multiple DPL requests within a single UOW
  - Ensure routing of subsequent requests to the necessary region

Other CICSPlex SM Enhancements

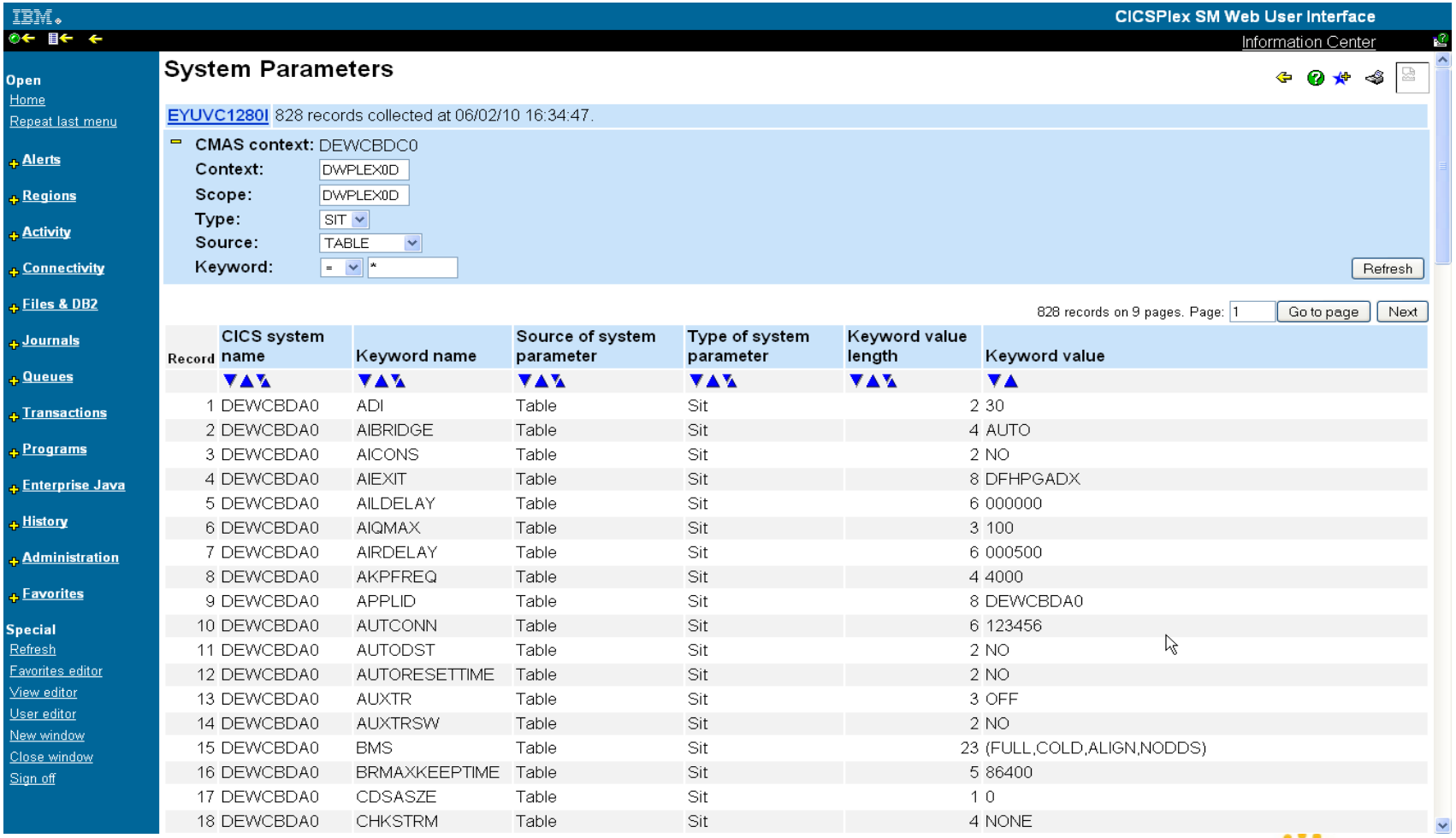
- CMCI Sort
  - To enable Explorer column sorting in ascending or descending alphabetical (CVDA/EUYDA) order, as well as the default order
- Not forgetting...
  - CMCI updates for all new SPI etc.

Interrogation of region configuration

- Primarily provided for use by CICS Deployment Assistant
- Can also be more generally useful
- Retrieve system initialization parameter values
- CICSPlex SM SYSPARM resource
    - CMCI support for SYSPARM

New CICSPlex SM SYSPARM resource

- Example view in CICSPlex SM WUI



Record	CICS system name	Keyword name	Source of system parameter	Type of system parameter	Keyword value length	Keyword value
1	DEWCBDA0	ADI	Table	Sit	2	30
2	DEWCBDA0	AIBRIDGE	Table	Sit	4	AUTO
3	DEWCBDA0	AICONS	Table	Sit	2	NO
4	DEWCBDA0	AIEXIT	Table	Sit	8	DFHPGADX
5	DEWCBDA0	AILDELAY	Table	Sit	6	000000
6	DEWCBDA0	AIQMAX	Table	Sit	3	100
7	DEWCBDA0	AIRDELAY	Table	Sit	6	000500
8	DEWCBDA0	AKPFREQ	Table	Sit	4	4000
9	DEWCBDA0	APPLID	Table	Sit	8	DEWCBDA0
10	DEWCBDA0	AUTCONN	Table	Sit	6	123456
11	DEWCBDA0	AUTODST	Table	Sit	2	NO
12	DEWCBDA0	AUTORESETTIME	Table	Sit	2	NO
13	DEWCBDA0	AUXTR	Table	Sit	3	OFF
14	DEWCBDA0	AUXTRSW	Table	Sit	2	NO
15	DEWCBDA0	BMS	Table	Sit	23	(FULL,COLD,ALIGN,NODDS)
16	DEWCBDA0	BRMAXKEEPTIME	Table	Sit	5	86400
17	DEWCBDA0	CDSASZE	Table	Sit	1	0
18	DEWCBDA0	CHKSTRM	Table	Sit	4	NONE

Security

Support for 100 character password phrases

- Alternative to traditional passwords
  - Improved system security - harder to attack
  - Easier to remember
- Introduced in z/OS 1.8 and updated in z/OS 1.9 to allow
  - 9-100 character password phrases (or 14-100 without ICHPWX11 exit)
- Users can have password or passphrase and password
- CICS support for password phrases
- API
  - New CHANGE PHRASE and VERIFY PHRASE commands
  - New PHRASE options on SIGNON
  - WEB SEND and CONVERSE already allow long passwords
- New CESL transaction for password or passphrase signon, CESN remains unchanged – can specify CESL as alias for CESN
- XWBAUTH supports passphrase

Scaleability

Overview of support for Scalability

- Threadsafe enhancements for additional multi-processor exploitation
  - New concurrency option for greater throughput
  - Threadsafe access to IMS DB (IMS support needed)
  - Threadsafe mirror, enabling threadsafe function shipping for file control and temporary storage
  - More threadsafe CICS commands
- 64-bit exploitation for trace, temporary storage, message tables, and VSCR below the bar
- Greater number of LSR pools enabling greater optimization choices

Threadsafe enhancements for multi-processor exploitation

CONCURRENCY(REQUIRED) program attribute

- CONCURRENCY (QUASIRENT ¦ THREADSAFE ¦ REQUIRED)
- Programs coded to threadsafe standards can start on open TCB
- Allow threadsafe DB2, WebSphere MQ, sockets applications to start on an open TCB and gain even more throughput benefits
- Better reuse of open TCBs
  - Like OPENAPI but without having to match TCB key
  - L8 TCBs can be used for all CICSAPI workloads, L9 TCBs are not required
- Allows applications using only CICS APIs to start on an open L8 TCB
  - Especially useful for programs using CICS-DB2, CICS-MQ, CICS-sockets and threadsafe CICS-VSAM
  - Avoids TCB switching (except when using non-threadsafe CICS commands)

Threadsafe IMS DB

- Threadsafe support for CICS applications that access IMS DB
- Enables CICS-DBCTL (used by CICS applications to access IMS) to run on L8 TCBs
- Applications that are already OPENAPI (running on L8 TCBs) will avoid four TCB switches for each call to IMS
  - Lower CPU and higher throughput
  - Savings also for applications that were previously non-threadsafe
  - Requires IMS 12

- At General Availability of CICS TS V4.2, IMS 12 is available through a Quality Partnership Program (QPP).
- For more information, visit http://www.ibm.com/software/data/ims/

Other threadsafe enhancements

- Function shipping over IPIC and OPENAPI mirror program
  - Threadsafe support for remote files, and remote TS queues
  - Better throughput in FORs/QORs
  - Specify FCQRONLY=NO as there is no longer any need to turn off threadsafety in the FOR
- QUERY SECURITY now threadsafe
- Named Counter server API now threadsafe
- EXTRACT CERTIFICATE and EXTRACT TCPIP threadsafe
- All new SPI is threadsafe
- Syncpoint
  - Optimise syncpoint if have threadsafe participants
  - Only switch to QR where needed

CICS 64-bit Exploitation

CICS 64-Bit Support

- CICS Internal 64-bit Exploitation
  - Enable CICS internally to run in, and exploit, 64-bit addressing mode
  - Move some CICS internal control blocks and storage above the bar
  - Begin to provide the foundation for enabling CICS applications to use and exploit 64-bit addressing mode *at some point in the future*
  - Provide below the bar VSCR
    - Single System Scaling: more concurrent tasks, larger applications
    - Address increasing pressure on storage usage above the line

- CICS Java
  - Move to 64-bit JVM (Java 6.0.1)
    - For pooled JVM and JVMServer
  - 31-bit Java not supported

CICS 64-Bit Exploitation

- CICS Trace
  - Internal Trace Table above the bar
    - Internal trace table in 64-bit storage only if Transaction Isolation inactive (TRANISO=NO) *or* APAR OA34311 applied on z/OS 1.12
  - Transaction Dump Trace Table in 64-bit storage
  - CICS trace domain runs AMODE(64), with many trace control blocks above the bar
- Temporary Storage
  - TS Main above the bar (subject to TRANISO restriction)
  - TSMAINLIMIT to control use of above bar storage by TS Main
    - Additional (unrelated) TS enhancement: EXPIRYINT on TSMODEL for cleanup of unused TS queues
  - CICS Temporary Storage domain will run AMODE(64), with many TS control blocks above the bar
- Message tables are above the bar (subject to TRANISO restriction)
- Minimum MEMLIMIT increased to 4G

Other Scaleability Items

VSAM LSR Performance Option

- LSRPOOL limitation relaxed
- Increase in number of LSR Pools supported
  - From 8 to 255
- Potential performance optimization where greater subdivision of files across LSRPOOLs is required
  - e.g. Place highly-used files in their own LSRPOOL

Summary and Q & A

CICS TS V4.2 Highlights

- **Events**
  - NEW: System Events
  - ENH: Event Lifecycle Management
  - NEW: Assured events
- **Java**
  - NEW: Support for 64-bit JVM
  - NEW: Multithreaded JVM server environment with OSGi support
  - NEW: Application developer toolkit for Java
  - Java runtime support of copybook importers
- **Connectivity**
  - NEW: Java Axis2 engine for Web services
  - NEW: Web services offload to zAAP
  - NEW: HTTP Connection Management
  - ENH: IPIC extended to function shipping
- **Management**
  - NEW: CICS Transaction Tracking
  - ENH: Workload management
  - NEW: 100 character password phrases
  - NEW: Interrogation of region configuration
- **Scalability**
  - NEW: Threadsafe function shipping
  - NEW: Threadsafe IMS interface
  - NEW: More threadsafe API
  - ENH: Threadsafe performance
  - NEW: Key CICS functions 64-bit enabled
  - ENH: CICS/VSAM LSR performance options

We love your Feedback!

- Please fill out your session evaluation

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