



# CICS

## What's in it for the Application Programmer?

Share session 12438

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# Abstract



According to the CICS Information Center, a CICS application is "a collection of programs that together perform a business operation. Each program runs as part of a transaction under the control of CICS and using CICS-provided services and interfaces to access resources." But what are these services and interfaces? In today's environment with many application servers available, why would an application programmer choose to develop applications for CICS? How does CICS benefit the application programmer? You'll find answers to these questions and more at this session.

# Agenda



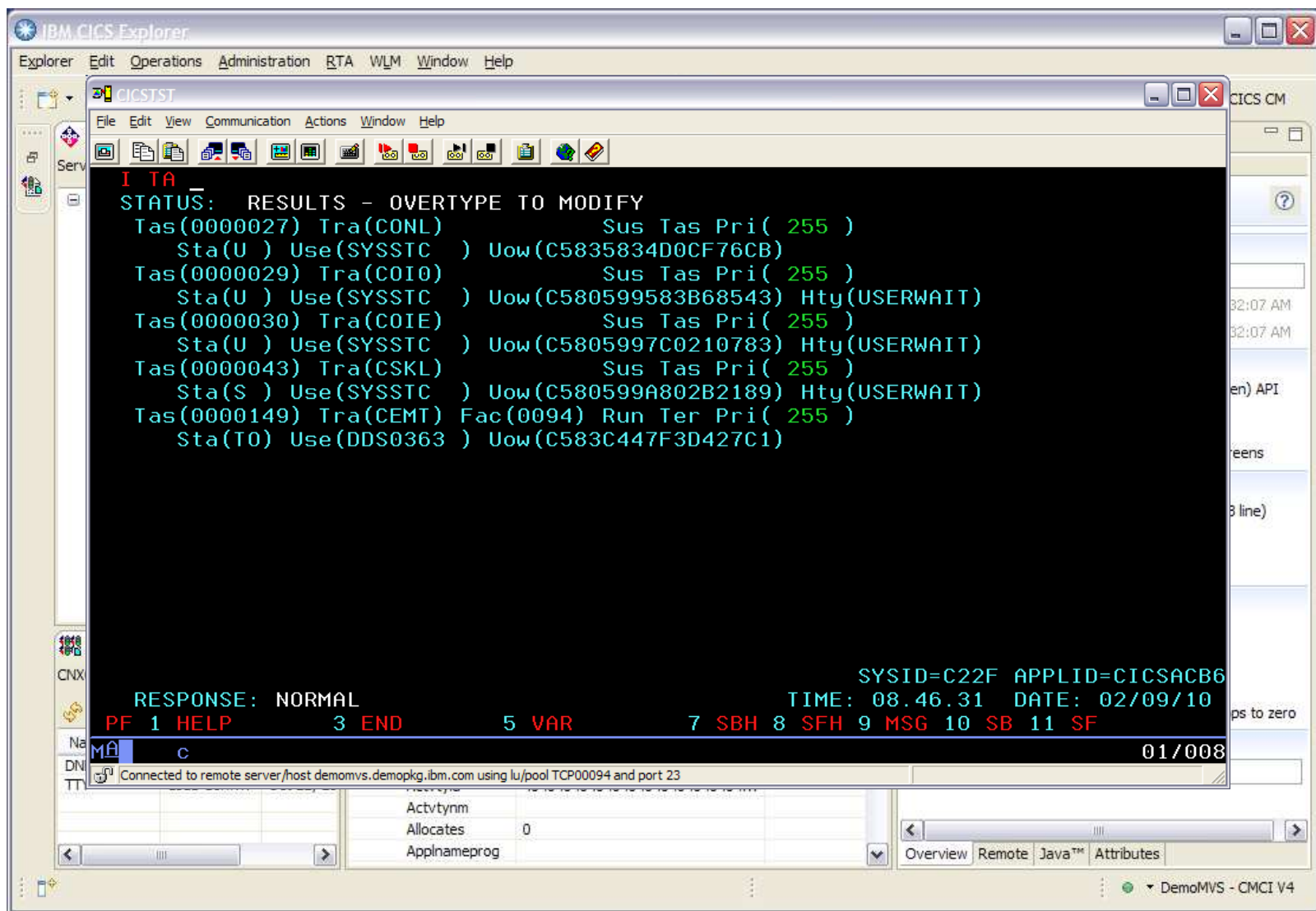
- CICS Explorer
- Application development
  - Languages
  - APIs
- Connectivity
- Events
- Interfaces

# CICS Explorer

# IBM CICS Explorer - The New Face of CICS

- New Modern Interface
  - Common look and feel
- Base functionality for operations
  - CEMT
  - CEDA
- Provides a Platform for Product and Tools Plugins
- New Function Enabler for application developers
  - Event Binding Editor
  - ATOM Binding Editor
  - OSGI Binding Editor
  - Application Binding Editor
- Interfaces with RDz as a PlugIn
- Customizable Interface via SDK

# IBM CICS Explorer – New Modern Interface



The screenshot displays the IBM CICS Explorer application window. The main terminal area shows the following text:

```

I TA
STATUS: RESULTS - OVERTYPE TO MODIFY
Tas(0000027) Tra(CONL)          Sus Tas Pri( 255 )
  Sta(U ) Use(SYSSTC ) Uow(C5835834D0CF76CB)
Tas(0000029) Tra(COIO)         Sus Tas Pri( 255 )
  Sta(U ) Use(SYSSTC ) Uow(C580599583B68543) Hty(USERWAIT)
Tas(0000030) Tra(COIE)         Sus Tas Pri( 255 )
  Sta(U ) Use(SYSSTC ) Uow(C5805997C0210783) Hty(USERWAIT)
Tas(0000043) Tra(CSKL)         Sus Tas Pri( 255 )
  Sta(S ) Use(SYSSTC ) Uow(C580599A802B2189) Hty(USERWAIT)
Tas(0000149) Tra(CEMT) Fac(0094) Run Ter Pri( 255 )
  Sta(TO) Use(DDS0363 ) Uow(C583C447F3D427C1)

RESPONSE: NORMAL
SYSID=C22F APPLID=CICSACB6
TIME: 08.46.31 DATE: 02/09/10
PF 1 HELP      3 END      5 VAR      7 SBH 8 SFH 9 MSG 10 SB 11 SF
  
```

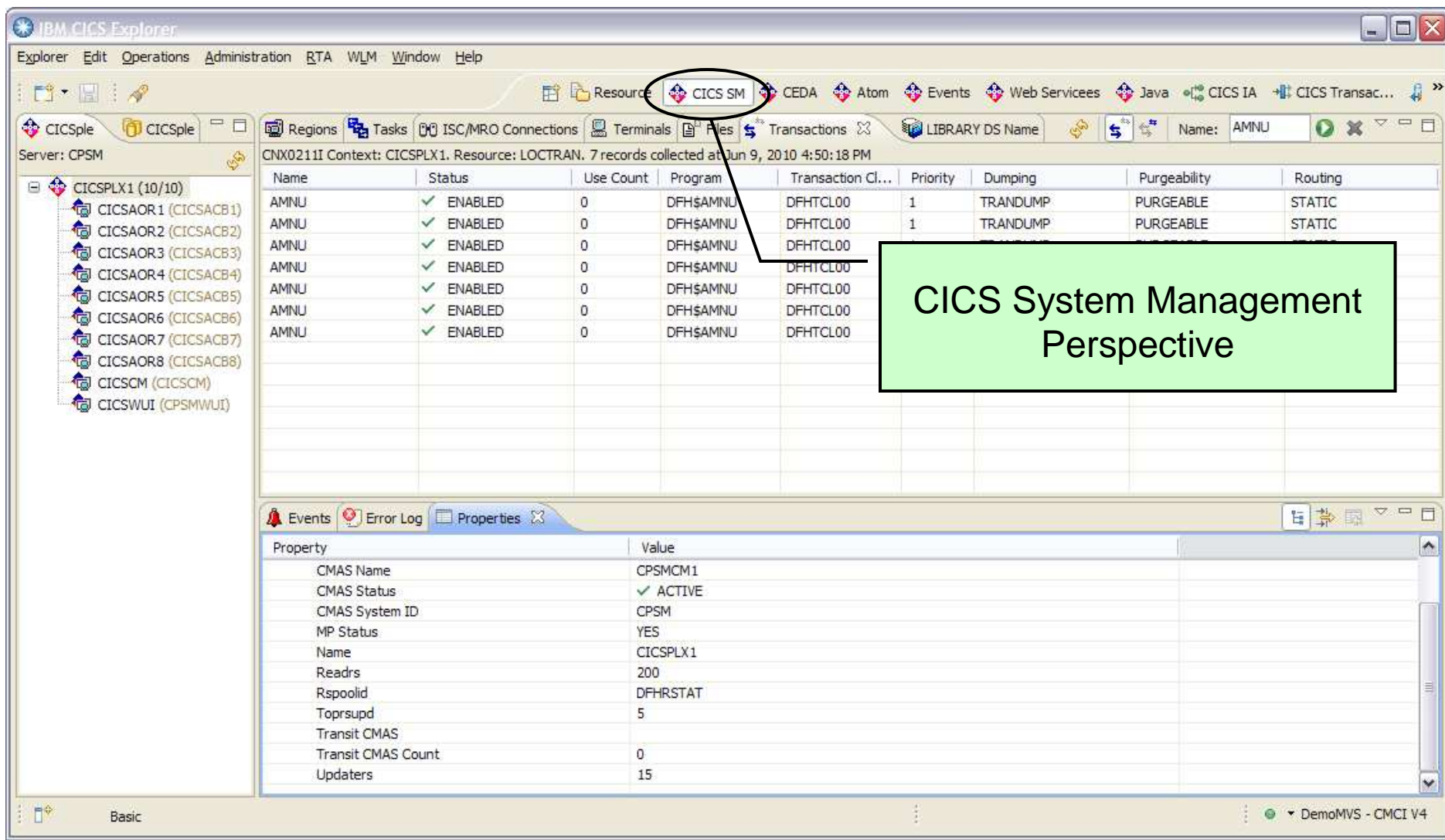
At the bottom of the terminal, a status bar shows: **01/008**. Below the terminal, a table displays connection details:

Actvtynm	
Allocates	0
Applnameprog	

The interface also includes a menu bar (Explorer, Edit, Operations, Administration, RTA, WLM, Window, Help), a toolbar, and a sidebar with various icons. The status bar at the bottom right indicates the connection: DemoMVS - CMCI V4.



# IBM CICS Explorer – CICS System Management Views



IBM CICS Explorer

Explorer Edit Operations Administration RTA WLM Window Help

Regions Tasks ISC/MRO Connections Terminals Files Transactions

Server: CPSM

CNX0211I Context: CICSPLX1. Resource: LOCTRAN. 7 records collected at Jun 9, 2010 4:50:18 PM

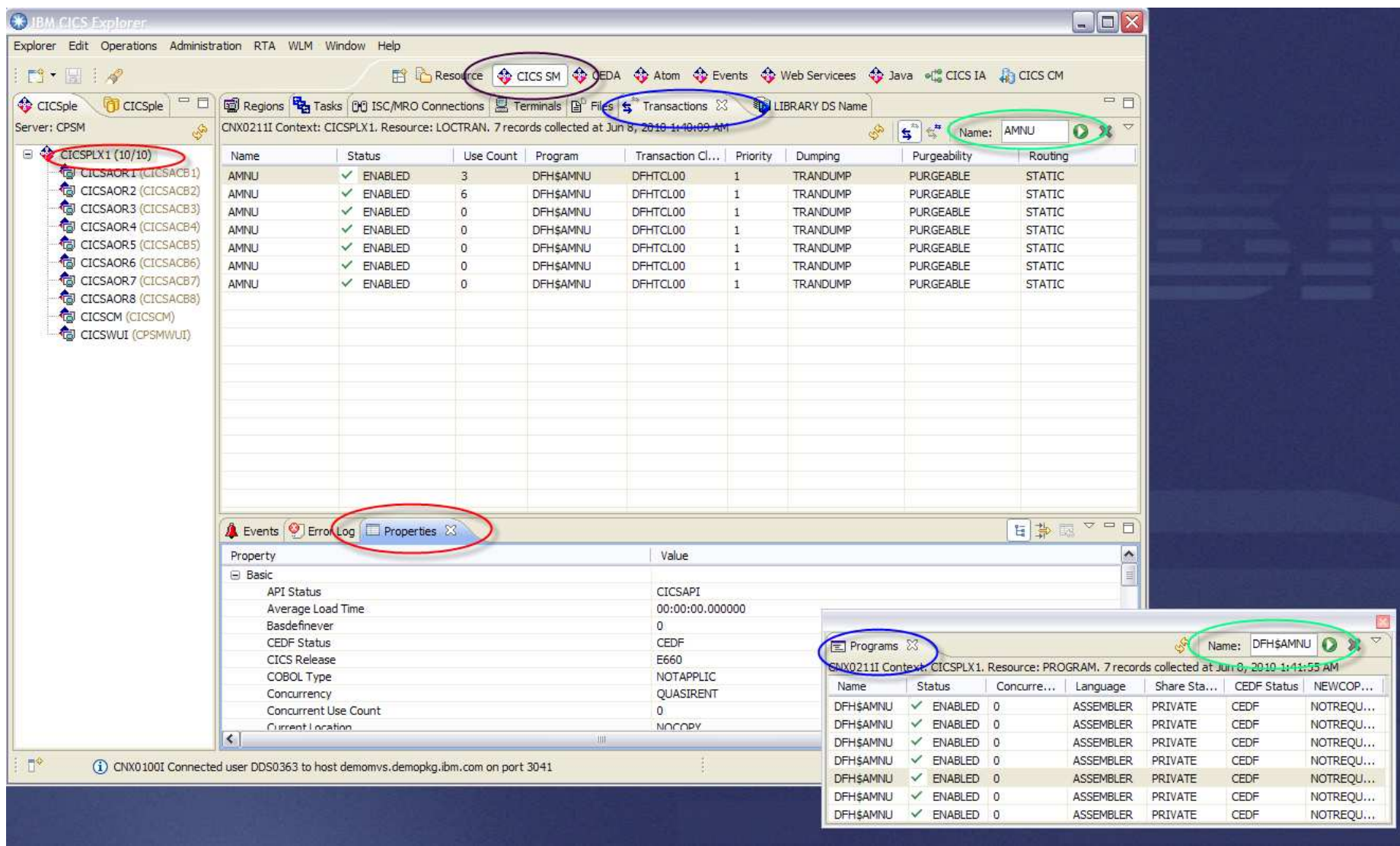
Name	Status	Use Count	Program	Transaction Cl...	Priority	Dumping	Purgeability	Routing
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00				
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00				
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00				
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00				
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00				

Events Error Log Properties

Property	Value
CMAS Name	CPSMCM1
CMAS Status	✓ ACTIVE
CMAS System ID	CPSM
MP Status	YES
Name	CICSPLX1
Readrs	200
Rspoolid	DFHRSTAT
Toprsupd	5
Transit CMAS	
Transit CMAS Count	0
Updaters	15

Basic DemoMVS - CMCI V4

# IBM CICS Explorer – CICS System Management Views



**Table 1: CICS Resources (AMNU)**

Name	Status	Use Count	Program	Transaction Cl...	Priority	Dumping	Purgeability	Routing
AMNU	✓ ENABLED	3	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	6	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC
AMNU	✓ ENABLED	0	DFH\$AMNU	DFHTCL00	1	TRANDUMP	PURGEABLE	STATIC

**Table 2: Properties View**

Property	Value
API Status	CICSAPI
Average Load Time	00:00:00.000000
Basdefnever	0
CEDF Status	CEDF
CICS Release	E660
COBOL Type	NOTAPPLIC
Concurrency	QUASIRENT
Concurrent Use Count	0
Current Location	NOCOPY

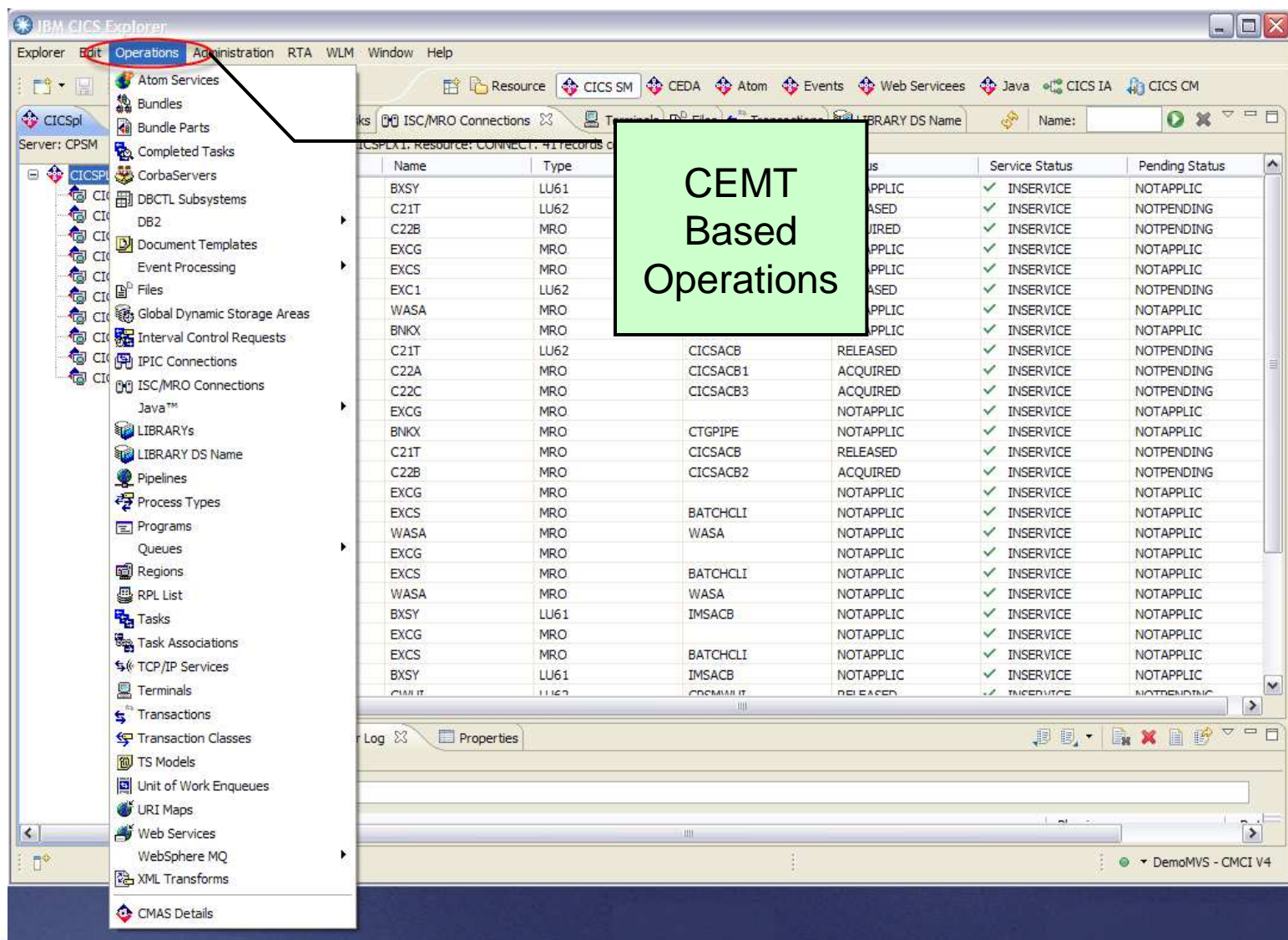
  

**Table 3: Programs View**

Name	Status	Concurre...	Language	Share Sta...	CEDF Status	NEWCOP...
DFH\$AMNU	✓ ENABLED	0	ASSEMBLER	PRIVATE	CEDF	NOTREQU...
DFH\$AMNU	✓ ENABLED	0	ASSEMBLER	PRIVATE	CEDF	NOTREQU...
DFH\$AMNU	✓ ENABLED	0	ASSEMBLER	PRIVATE	CEDF	NOTREQU...
DFH\$AMNU	✓ ENABLED	0	ASSEMBLER	PRIVATE	CEDF	NOTREQU...
DFH\$AMNU	✓ ENABLED	0	ASSEMBLER	PRIVATE	CEDF	NOTREQU...
DFH\$AMNU	✓ ENABLED	0	ASSEMBLER	PRIVATE	CEDF	NOTREQU...
DFH\$AMNU	✓ ENABLED	0	ASSEMBLER	PRIVATE	CEDF	NOTREQU...



# IBM CICS Explorer – Operations Views



The screenshot shows the IBM CICS Explorer interface with the 'Operations' menu highlighted. A green box contains the text 'CEMT Based Operations' overlaid on a table of resource data.

Name	Type	Resource	Service Status	Pending Status
BXSY	LU61		✓ INSERVICE	NOTAPPLIC
C21T	LU62		✓ INSERVICE	NOTPENDING
C22B	MRO		✓ INSERVICE	NOTPENDING
EXCG	MRO		✓ INSERVICE	NOTAPPLIC
EXCS	MRO		✓ INSERVICE	NOTAPPLIC
EXC1	LU62		✓ INSERVICE	NOTPENDING
WASA	MRO		✓ INSERVICE	NOTAPPLIC
BNKX	MRO		✓ INSERVICE	NOTAPPLIC
C21T	LU62	CICSACB	✓ INSERVICE	NOTPENDING
C22A	MRO	CICSACB1	✓ INSERVICE	NOTPENDING
C22C	MRO	CICSACB3	✓ INSERVICE	NOTPENDING
EXCG	MRO		✓ INSERVICE	NOTAPPLIC
BNKX	MRO	CTGPIPE	✓ INSERVICE	NOTAPPLIC
C21T	MRO	CICSACB	✓ INSERVICE	NOTPENDING
C22B	MRO	CICSACB2	✓ INSERVICE	NOTPENDING
EXCG	MRO		✓ INSERVICE	NOTAPPLIC
EXCS	MRO	BATCHCLI	✓ INSERVICE	NOTAPPLIC
WASA	MRO	WASA	✓ INSERVICE	NOTAPPLIC
EXCG	MRO		✓ INSERVICE	NOTAPPLIC
EXCS	MRO	BATCHCLI	✓ INSERVICE	NOTAPPLIC
WASA	MRO	WASA	✓ INSERVICE	NOTAPPLIC
BXSY	LU61	IMSACB	✓ INSERVICE	NOTAPPLIC
EXCG	MRO		✓ INSERVICE	NOTAPPLIC
EXCS	MRO	BATCHCLI	✓ INSERVICE	NOTAPPLIC
BXSY	LU61	IMSACB	✓ INSERVICE	NOTAPPLIC
C21T	LU62	C21T	✓ INSERVICE	NOTPENDING



# IBM CICS Explorer – CICS Event Binding Editor



Business Leader

CICS Business Applications

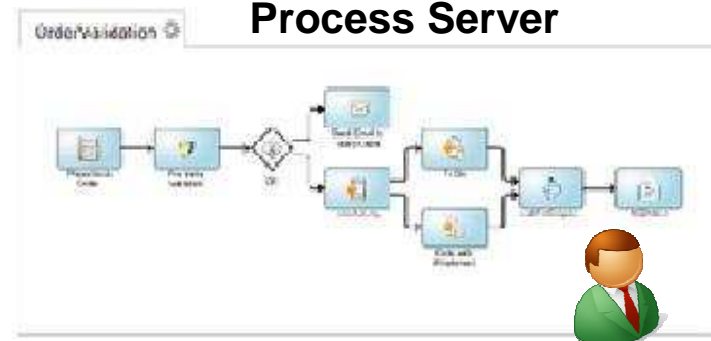
CICS TS 4.1

WebSphere Business Events



WebSphere Business Monitor

WebSphere Process Server

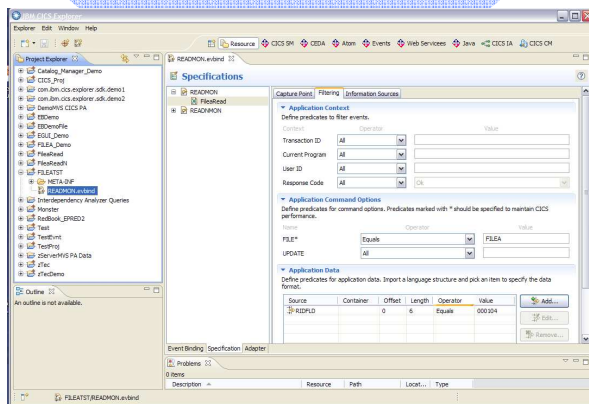


Business Professional

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2013

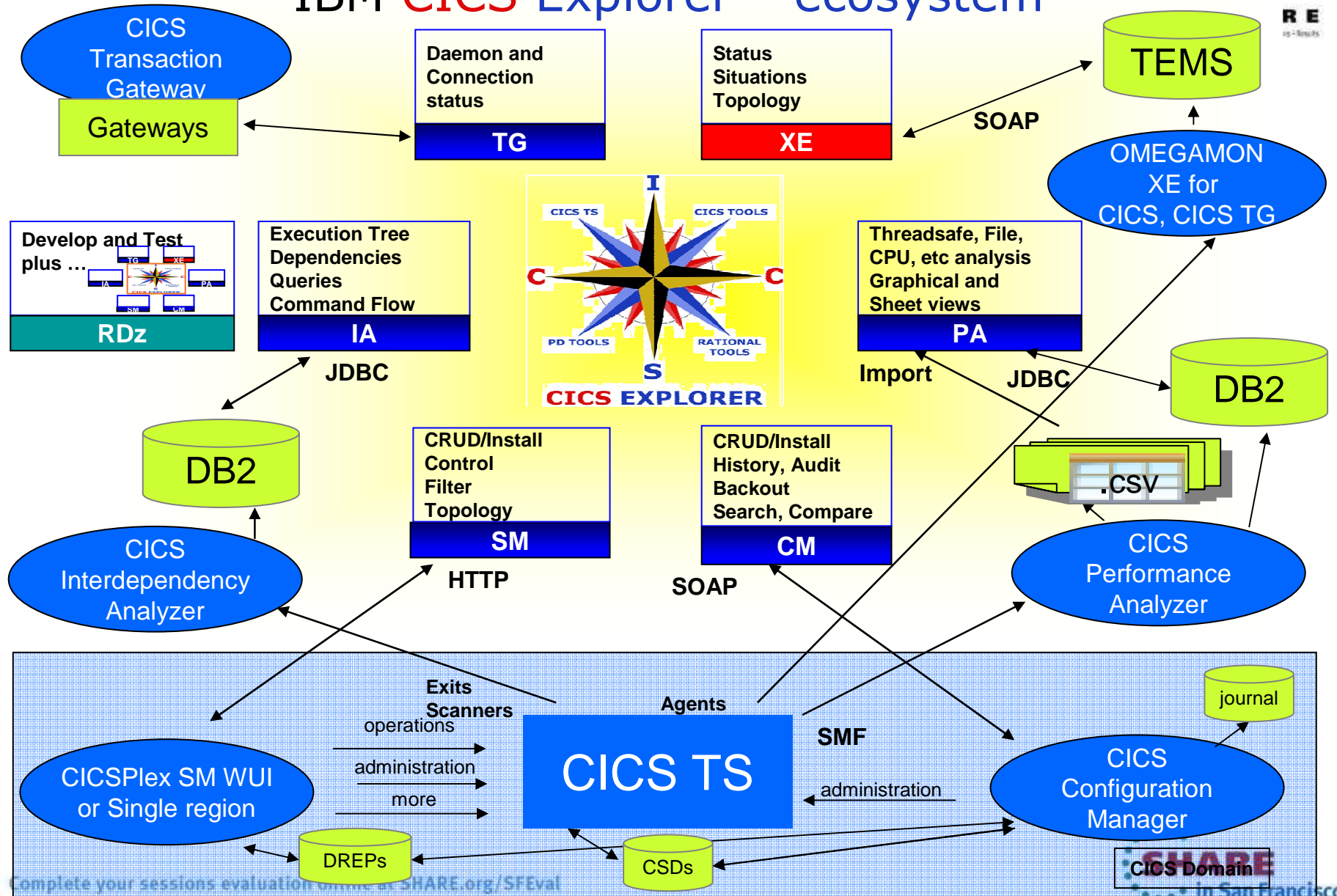
CICS TS Version 4.1



**NO APPLICATION CHANGE REQUIRED with CICS V4.1**



# IBM CICS Explorer™ ecosystem



Complete your session evaluation online at [SHARE.org/SFEval](http://SHARE.org/SFEval)



# Development



# Programming Languages



- ASM
- COBOL
- PL/I
- C/C++
- REXX
- Java
- PHP

# APIs

- CICS
  - Application Programming Interface (EXEC CICS)
  - Systems Programming Interface
  - JCICS classes
- Databases
  - DB2 (EXEC SQL)
  - IMS (EXEC DLI)
- Messaging
  - WMQ (CALL 'MQPUT', etc.)
- Communications
  - Socket API (CALL 'EZASOCKET')

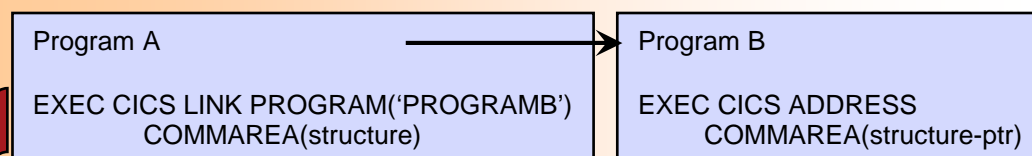
# The CICS API

- File control – VSAM data sets
- Interval control – timer services
- Terminal control and Basic mapping services
- Storage control and task control
- Transient data and Temporary storage
- Documents
- Business Transaction Services
- FEPI – 3270 terminal simulation

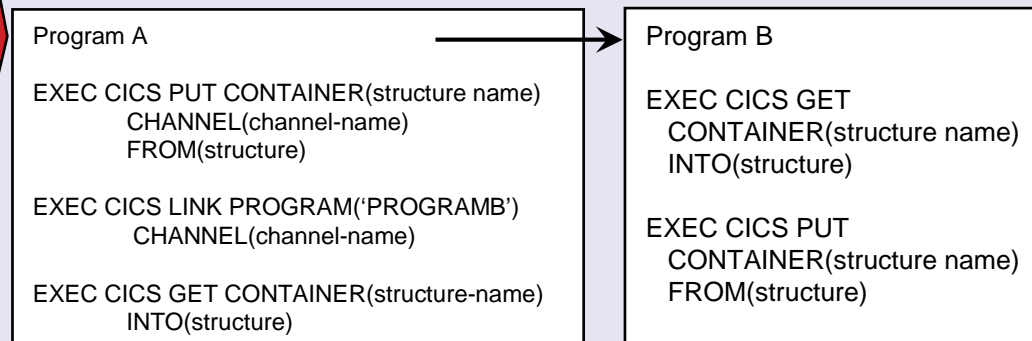
# Optimized data exchange between CICS programs with Channels and Containers

- Offers a more flexible and intuitive alternative to the COMMAREA
  - By using separate containers for logically different data it will simplify language structures and minimize the impact of changes to the interface
    - For example; input, output, error
    - Avoids “overloading”
  - Dynamic creation and discovery by applications
- Enables large amounts of data to be passed between CICS applications
  - Not subject to 32KB restriction
- Optimized and managed by CICS
- Requires minimal application changes required to use

## Existing application using a COMMAREA



## Application using a Channel and Container



# Channels and Containers

- **Container**
  - Named block of data designed for passing information between programs
  - No CICS enforced size limitation
    - Channels are stored above the bar in CICS TS V3.2 and above
  - Multiple containers can be passed between programs
- **Channel**
  - A group of Containers
    - No limit on the number of containers in a channel
  - Non-persistent
    - Non-recoverable resource
  - Specified on LINK, XCTL, START and RETURN commands
    - Only one channel can be passed
    - Channels and COMMAREAS are mutually exclusive
- Supported between CICS regions and within the Web services support
  - Only modified data is transferred between regions
- Dynamic data conversion via GET and PUT APIs and transport resource definitions
  - Uses CICS or z/OS Support for Unicode



# Channel and Container commands

- Container commands
  - PUT CONTAINER
  - GET CONTAINER
  - MOVE CONTAINER
  - DELETE CONTAINER
- Program transfer commands
  - LINK PROGRAM  
[CHANNEL|COMMAREA]
  - XCTL PROGRAM  
[CHANNEL|COMMAREA]
- Inquiry commands
  - ASSIGN CHANNEL(data-area)
  - STARTBROWSE CONTAINER  
[CHANNEL(data-area)]
  - GETNEXT CONTAINER (data-area)
  - ENDBROWSE CONTAINER
- Transaction transfer commands
  - RETURN TRANSID  
[CHANNEL|COMMAREA]
  - START TRANSID  
[CHANNEL|FROM]

New JCICS classes Channel, Container, ContainerIterator provide access to containers and channels for Java programs

## CICS XML Extensions

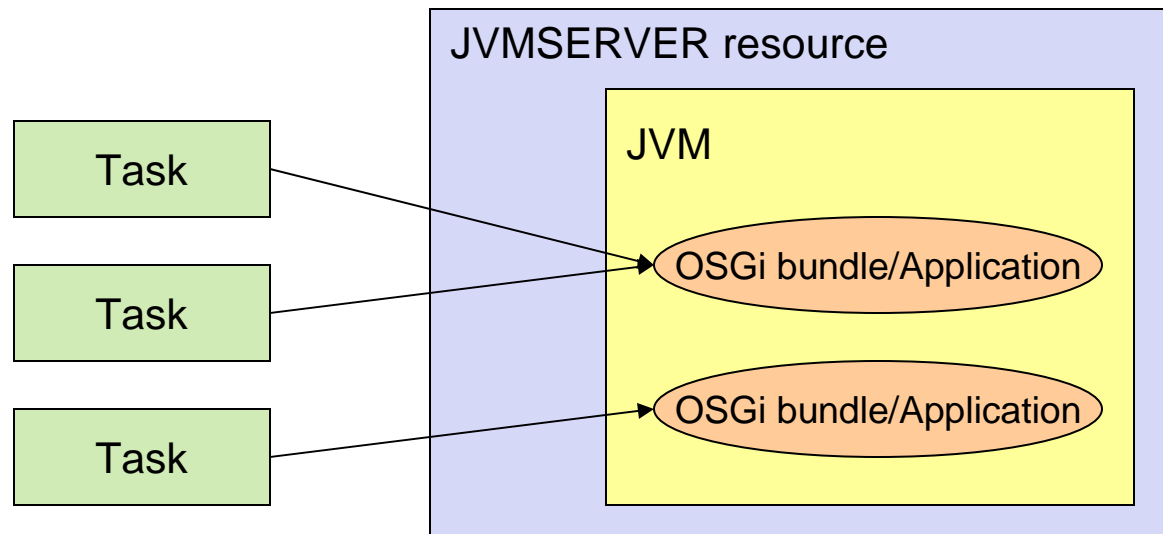
- New Markup Language Domain (ML)
- Generic XML Mapping
  - EXEC CICS TRANSFORM command
    - XML to Data
    - Data to XML
- New XML Assistants
  - Generates a language structure from a schema
  - Generates a schema from a language structure

# Java

# Java and CICS

- Support for 64 bit JVMs
  - Java stack and heap are now allocated in above the bar storage
  - Java 6.0.1 for CICS TS V4.1
  - Java 7 for CICS TS V5.1
    - IBM zEnterprise optimized version of Java
      - *Exploits new z196 and EC12 instruction sets*
      - *Improved GC*
      - *Improved JIT*
      - *Significant performance improvements*
  - Support for 31 bit JVMs dropped
- OSGi
  - OSGi development and packaging now required to deploy CICS applications to a JVM server
  - Existing CICS Java applications using main() method linkage can run unchanged if wrapped in an OSGi bundle
  - All JVM server applications must be thread-safe

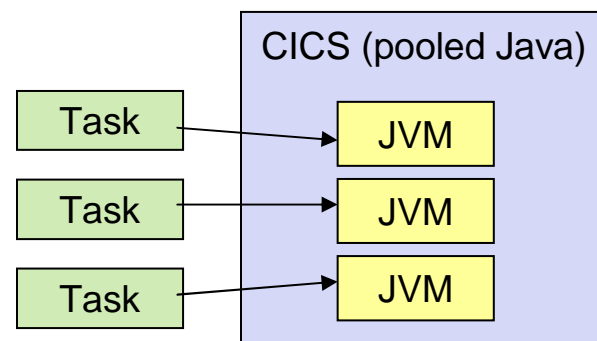
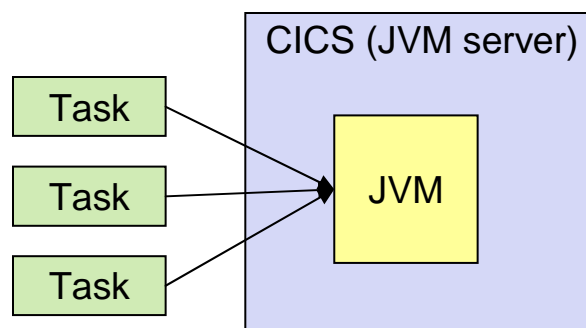
# What is a JVM server...?



- A new CICS resource containing a **long-running** JVM.
- The strategic direction of Java in CICS
  - Pooled Java discontinued in V5.1
- A JVM that serves multiple transactions concurrently.
- A JVM in which applications/tasks run as OSGi bundles.



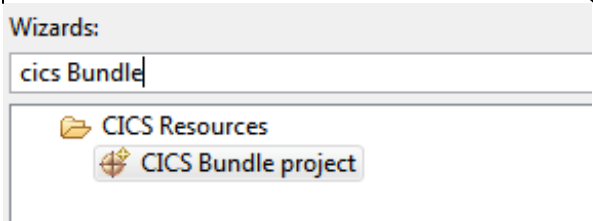
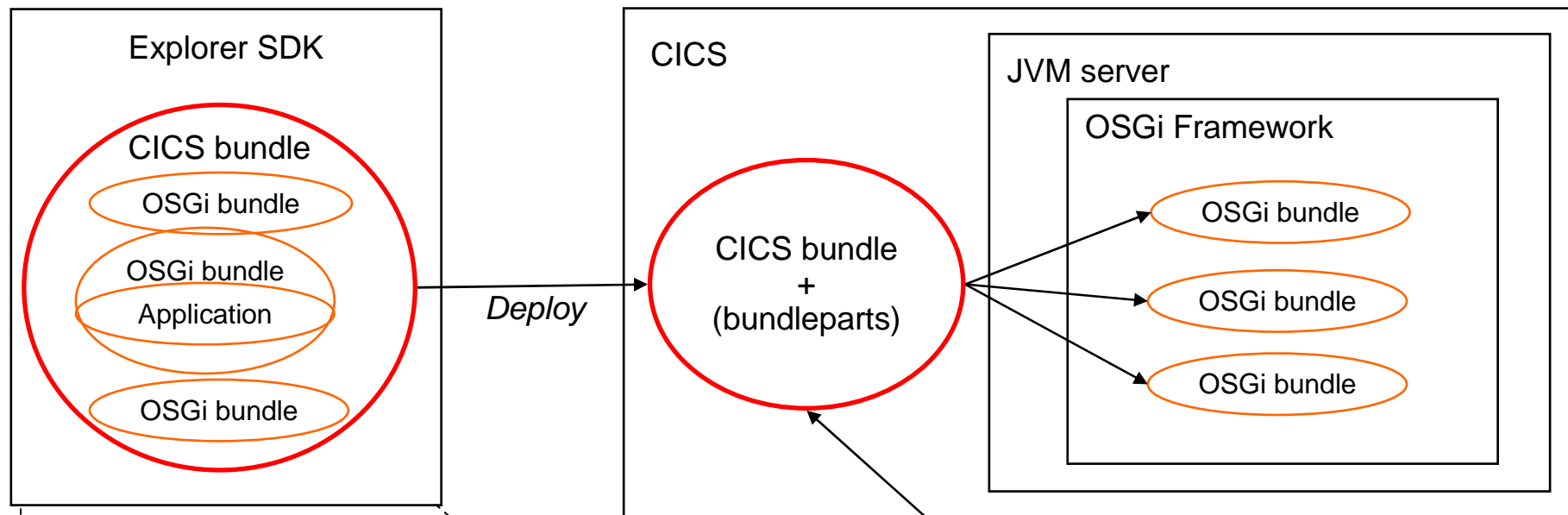
# JVM server vs. previous Java support?



<b>Single JVM - serves many tasks (reduced storage)</b> (concurrent, multi-threaded, up to 256 threads per JVM server)	<b>Pool of JVMs - each serves only a single task.</b> Java Program Isolation
<b>T8 (CICS key)</b>	<b>J8 (CICS key), J9 (User key)</b>
<b>MAXTHRDCBS (automatically calculated), up to max of 1024 per region</b>	<b>MAXJVMTCBS, SIT parm</b>
<b>More standard Server model (+ data-sharing)</b>	<b>Difficult, convoluted to share data and state.</b>
<b>Dynamic update and replace of modules</b>	<b>JVMs must be restarted to effect changes</b>

# CICS TS V4 Java...

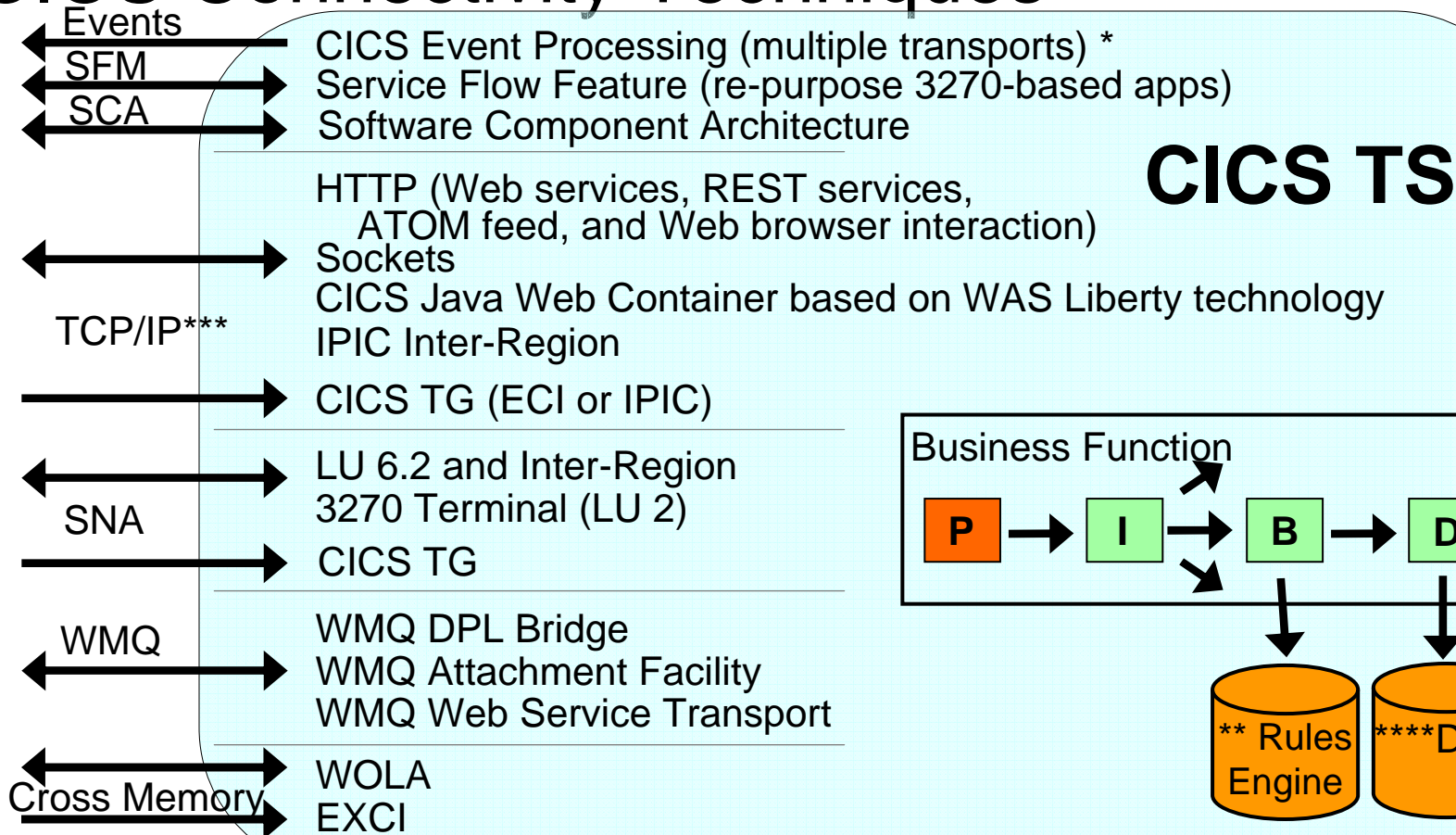
## Deploying OSGi Applications



**Install/enable/disable/discard bundle**

# Connectivity

# CICS Connectivity Techniques



\* Events can have different transports or CICS can process its own events

\*\* IBM Operational Decision Manager

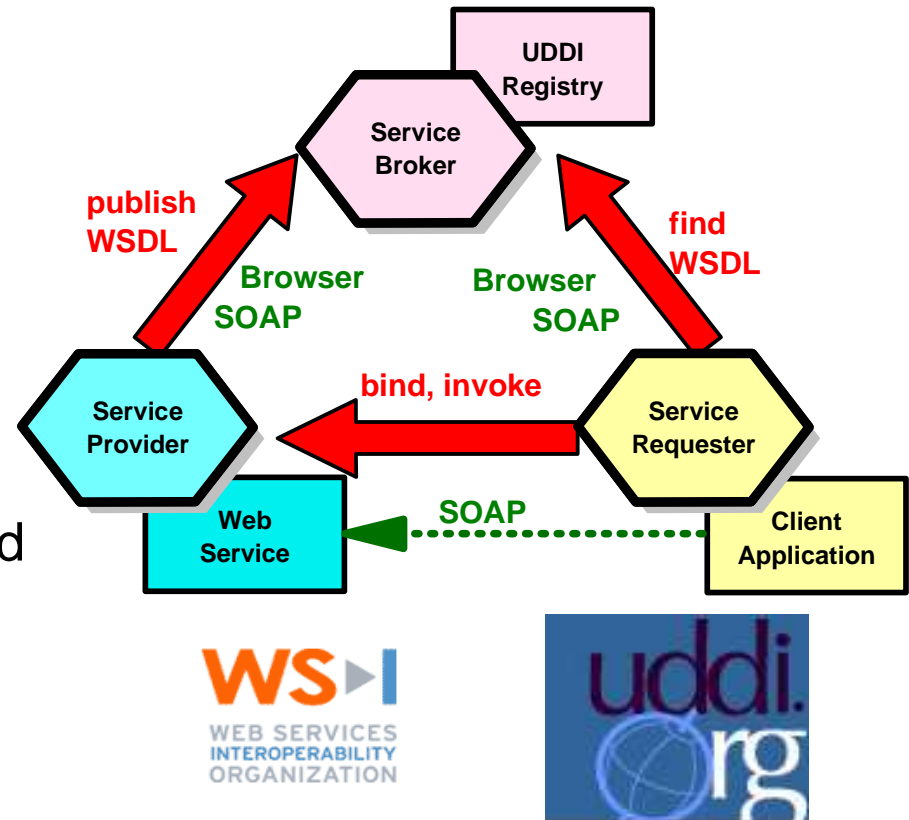
\*\*\* IBM Worklight – can access CICS Data using REST, Web Services, and ATOM feeds

\*\*\*\* VSAM, DB2, and IMS

# Web Services



- 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



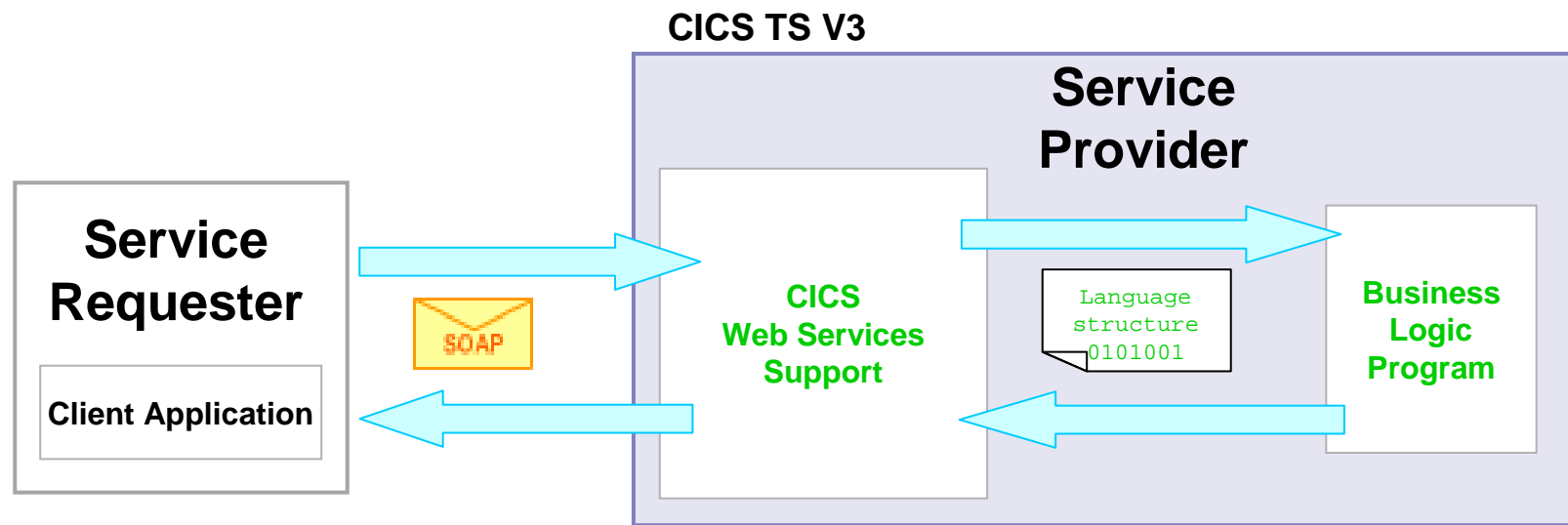
The entire industry is agreeing on one set of standards !!



# Reasons to use Web Services in CICS

- Transform Existing Applications
- Extend existing applications to new audiences and opportunities
- Exploit existing resources and skills
- Improve performance of existing workloads for faster response times and reduced costs
- Improve system management to enable management of more with less
- Simplify the development process to reduce application development costs and time to deployment

# Very High Level: CICS Web Services



SOAP Message - XML, tag delimited data

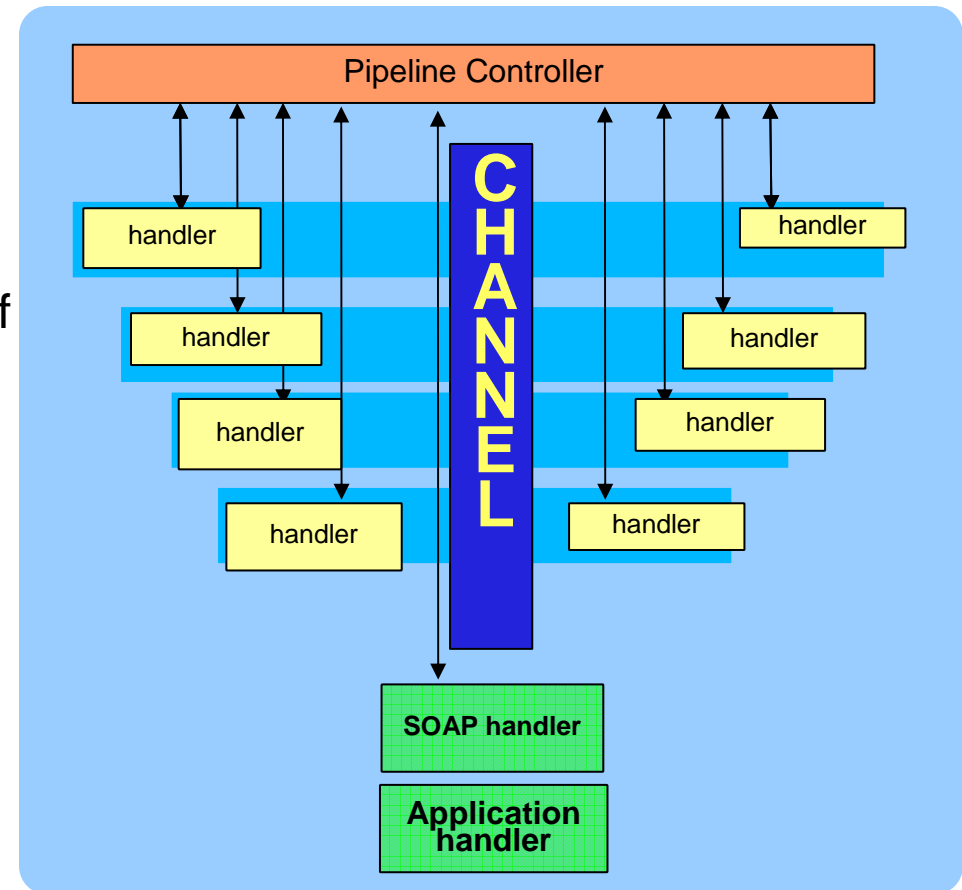
zero or more headers      body containing application data

Languages Structure – e.g. COBOL copybook

```
01 DFHCOMMAREA.
   03 CUSTOMER-FIRST-NAME PIC X(30).
   03 CUSTOMER-LAST-NAME  PIC X(30).
   ...
```

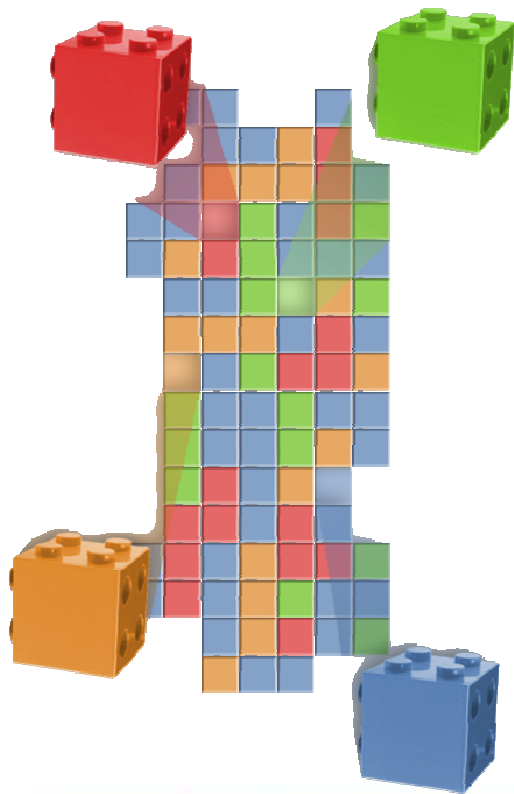
# Axis2 for Web Services

- Axis2
  - Java-based open source web services engine
- Axis2 Java SOAP message handlers
  - Axis2 SOAP processing and some of the CICS pipeline processing become eligible for zAAP offload
- Application handler written in Java
  - Executes in a JVMSERVER
  - Eligible for zAAP off-load processing
  - XML data conversion can be off-loaded



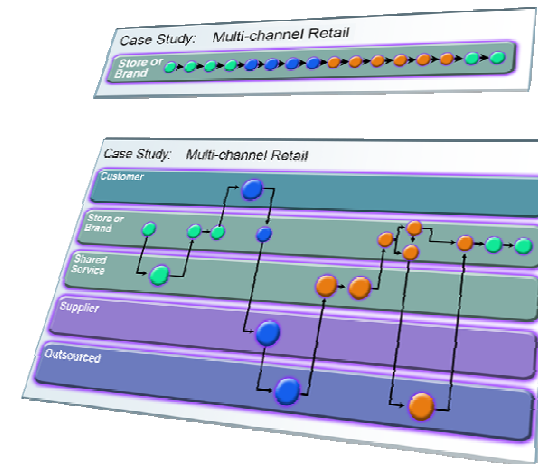
# Service Oriented Architecture

- Reuse of Services (encapsulated Business functions)
- Align with Business process to respond faster to Business needs
- Compose new applications by combining Services



## SOA Levels

- **Service Enablement** - Transform existing applications to services
- **Service Integration** –Align with business, abstract integration layer, look into ESB
- **Process Integration** – Composite applications with process choreography and service aggregation



# Web 2.0: A Philosophy, not just a Technology

- An important trend in delivering software applications
- An enabler for richer web applications
  - New business models
  - Peer-to-peer user participation
  - New technologies
  - Interactive filtering, presentation, data entry
- A combination of core technology components
  - Rich user experience (maps, grids, animation, D&D, etc)
  - Loose-coupling, composite applications via reuse and integration
  - Technologies (SOAP, REST, JSON, ATOM, Java, PHP, D, etc, Ruby, Python, Perl, etc)



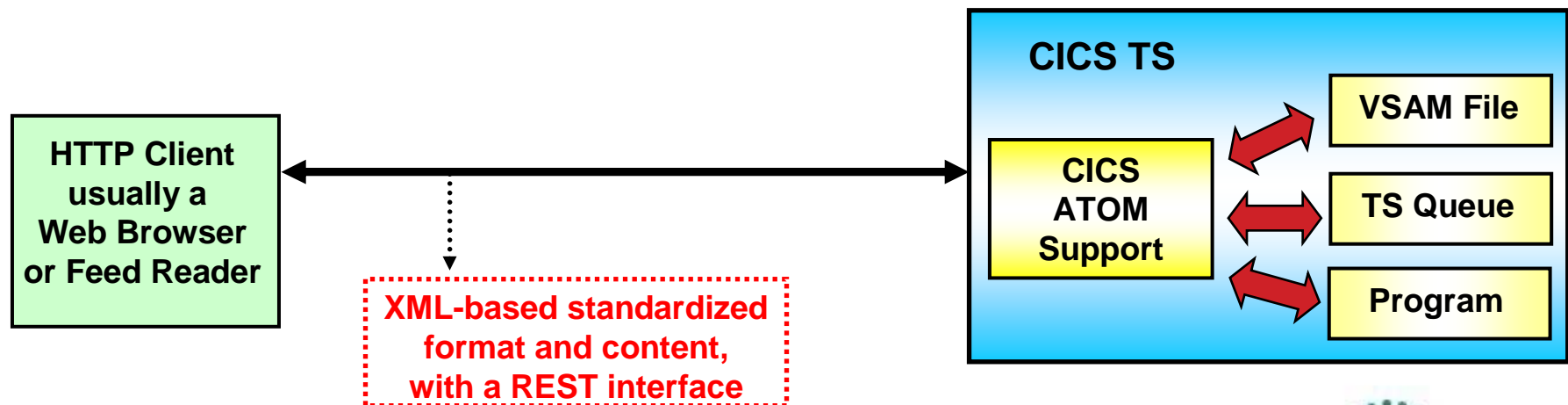
# REST Services

- Similar in concept to hyperlinked data
- Lightweight data transfer
- Representational State Transfer
  - Nouns (URLs) indicate what is being worked on
  - Verbs (GET, PUT, POST, DELETE) indicate the action to be performed (List, Create, Read, Update, Delete)
- Format of results is not defined
  - Popular formats of returned data are XML and JSON
- Can use EXEC CICS TRANSFORM for XML parse/create
- Approaches in CICS
  - CICS WEB API
  - ATOM Feed (CICS TS V4.1+)
  - Dynamic Scripting (CICS TS V4.1 and CICS TS V4.2)



# CICS ATOM Support...

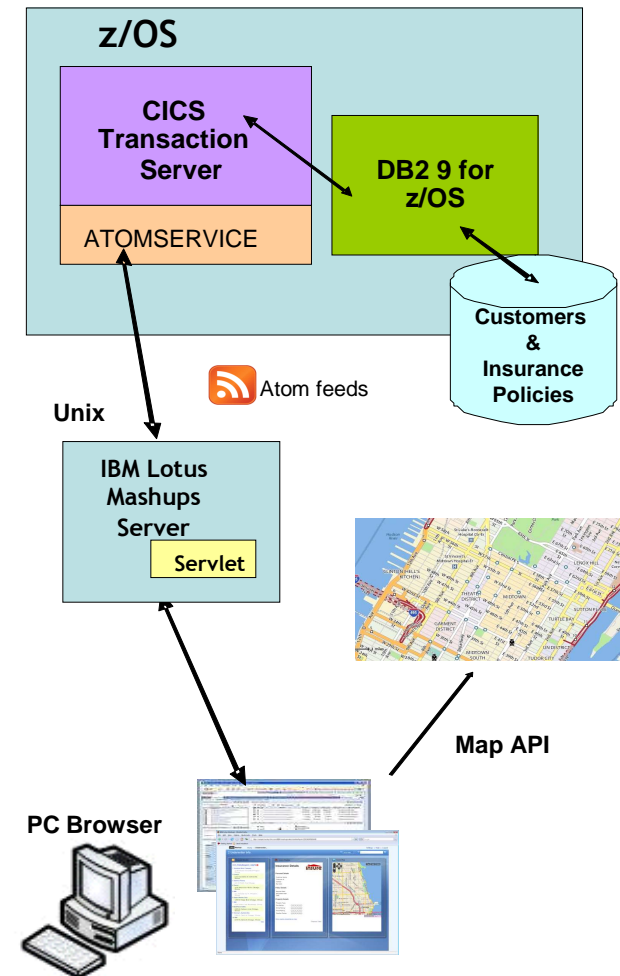
- An Atom Feed is a standards-based protocol and XML format for content publishing
  - Provide XML-based feed of updated content
  - Process is known as syndicating a feed
    - *Follow-on to Real Simple Syndication (RSS)*
  - Simple publish/subscribe implementation
    - *Polling model*



# CICS ATOM Support...

- Enables CICS applications to:
  - Provide live information for Web 2.0 consumption
  - Integrate with related data
  - Give full picture in a single holistic view
- Create new applications based on up-to-date content and information
  - Decision-support tools for knowledge workers
  - Composite user interfaces for expert workers
  - Information feeds & widgets to consumers for use in their own mashups
- Develop using WebSphere sMash or RD/z with EGL

## Example High level architecture: CICS Atom feeds



# Modern Application Interfaces

# Modern Application Interfaces

- CICS Web Support
  - CICS API commands for HTTP communication
  - CICS Document support
- Dynamic Scripting Feature Pack for CICS
  - PHP and Groovy for CICS TS V4.1 and V4.2
- Liberty Profile Web Container
  - Standard Java servlet and JSP support in CICS TS V5.1
- Interoperability with Mobile Apps
  - Browser-based
  - REST & Web 2.0
  - Web services
  - Etc.

# Browser-based Application Interface



From 2005

CICS TS V3 | Account Request Results - Windows Internet Explorer

http://zserveros.demos.ibm.com:9002/account/prog/CustH

Account Access Sample Application...  
Account Access Home | Google Search | Help | Terms of Use

Account Access Home  
Display Account  
Add Account  
Update Account  
Delete Account  
Browse Accounts

Simple Account Access Application Request Results...

The **result** of the requested operation is **Customer information retrieved**

CICS TS V3 | Account Browse - Windows Internet Explorer

http://zserveros.demos.ibm.com:9002/account/prog/CustH

Account Access Sample Application...  
Account Access Home | Google Search

Account Access Home  
Display Account  
Add Account  
Update Account  
Delete Account  
Browse Accounts

Simple Account Access Application - Bro

Browse Information: Start Id: , Number of rows: 0010, Direction:

Action	Customer Id	Last Name	First Name	Phone
Upd Del	00000001	Weiland	Dennis	800-555-1212
Upd Del	00000027	Leach	Jeff	5551212
Upd Del	1112111	ferguson	donald	12321231221
Upd Del	1115000	Seubert	Bill	888-555-1212
Upd	CustomerId: 1115000	Addr1: 325 McDonnell Blvd	3456889	04/22/09
Upd	City: Hazelwood	888-800-8000	04/24/09	
	State: MO			

Browse direction: Backward Forward

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http://zserveros.demos.ibm.com:9002/account/prog/CustHttp?reques

Carrier

Access Sample Application IBM.

Home Get Add Upd Del Brws

Browse Data...

Start Id: ,Number of rows: 0005,Direction: Forward

Action	Id	LName	FName	Phone
Upd Del	00000001	Weiland	Dennis	800-1212
Upd Del	00000027	Leach	Jeff	5551
Upd Del	1112111	ferguson	donald	1232
Upd Del	1115000	Seubert	Bill	888-1212
Upd Del	12344321	Bates	Andy	1234

Browse direction: Backward Forward

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Carrier

Account Access Application IBM.

Home Get Add Upd Del Brws

Account Results...

**Result: Customer information retrieved**

Id: 00000001  
FName: Dennis  
LName: Weiland  
Company: IBM  
Addr1: 1503 LBJ Freeway  
Addr2:  
City: Dallas  
State: TX  
Country: USA  
Zip: 76234  
Phone: 800-555-1212  
Updated: 07/20/09

Choose one of the menu options on the top.

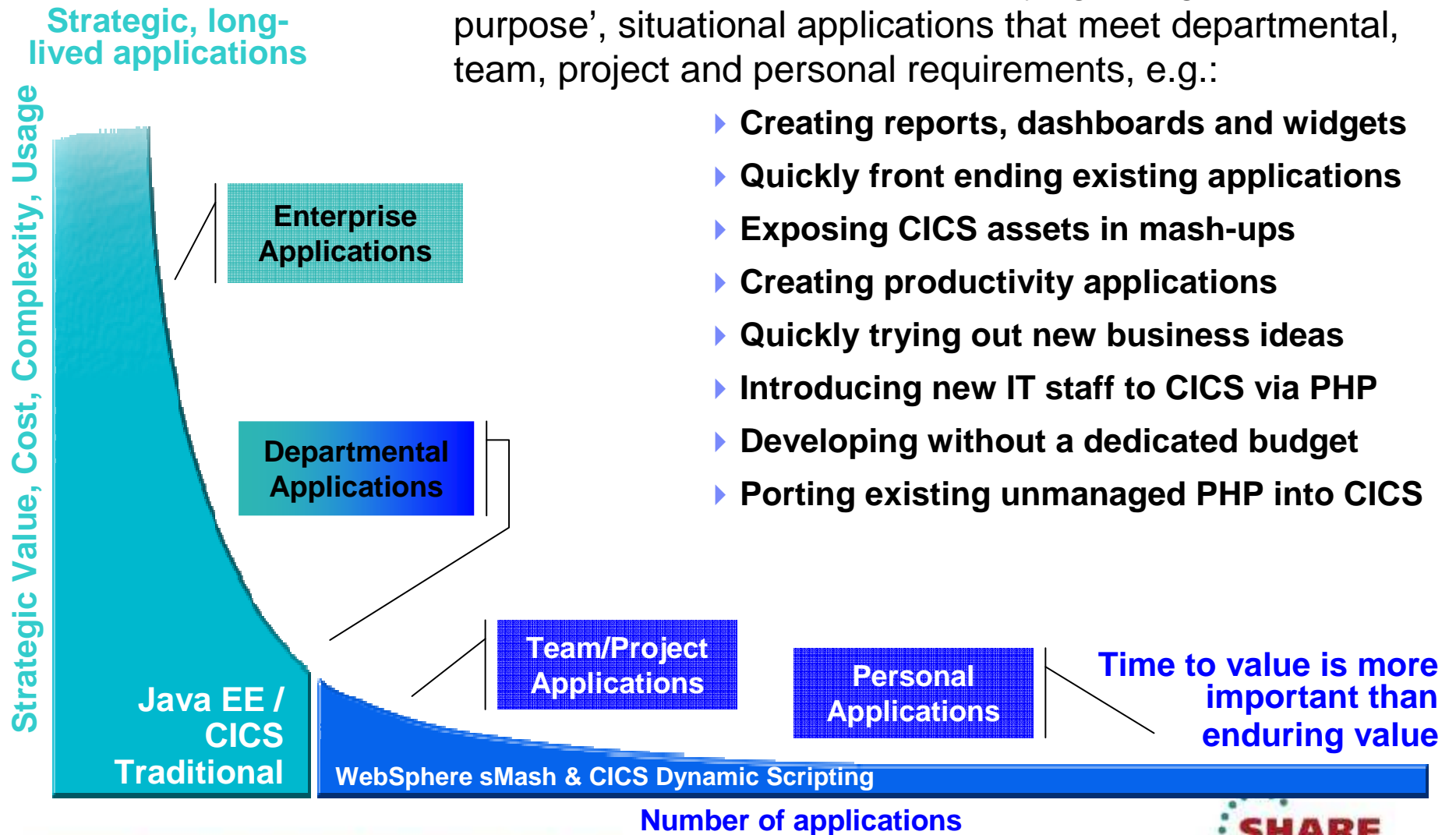
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# CICS Dynamic Scripting

Can be used to develop and deploy lightweight, 'fit for purpose', situational applications that meet departmental, team, project and personal requirements, e.g.:

- ▶ Creating reports, dashboards and widgets
- ▶ Quickly front ending existing applications
- ▶ Exposing CICS assets in mash-ups
- ▶ Creating productivity applications
- ▶ Quickly trying out new business ideas
- ▶ Introducing new IT staff to CICS via PHP
- ▶ Developing without a dedicated budget
- ▶ Porting existing unmanaged PHP into CICS



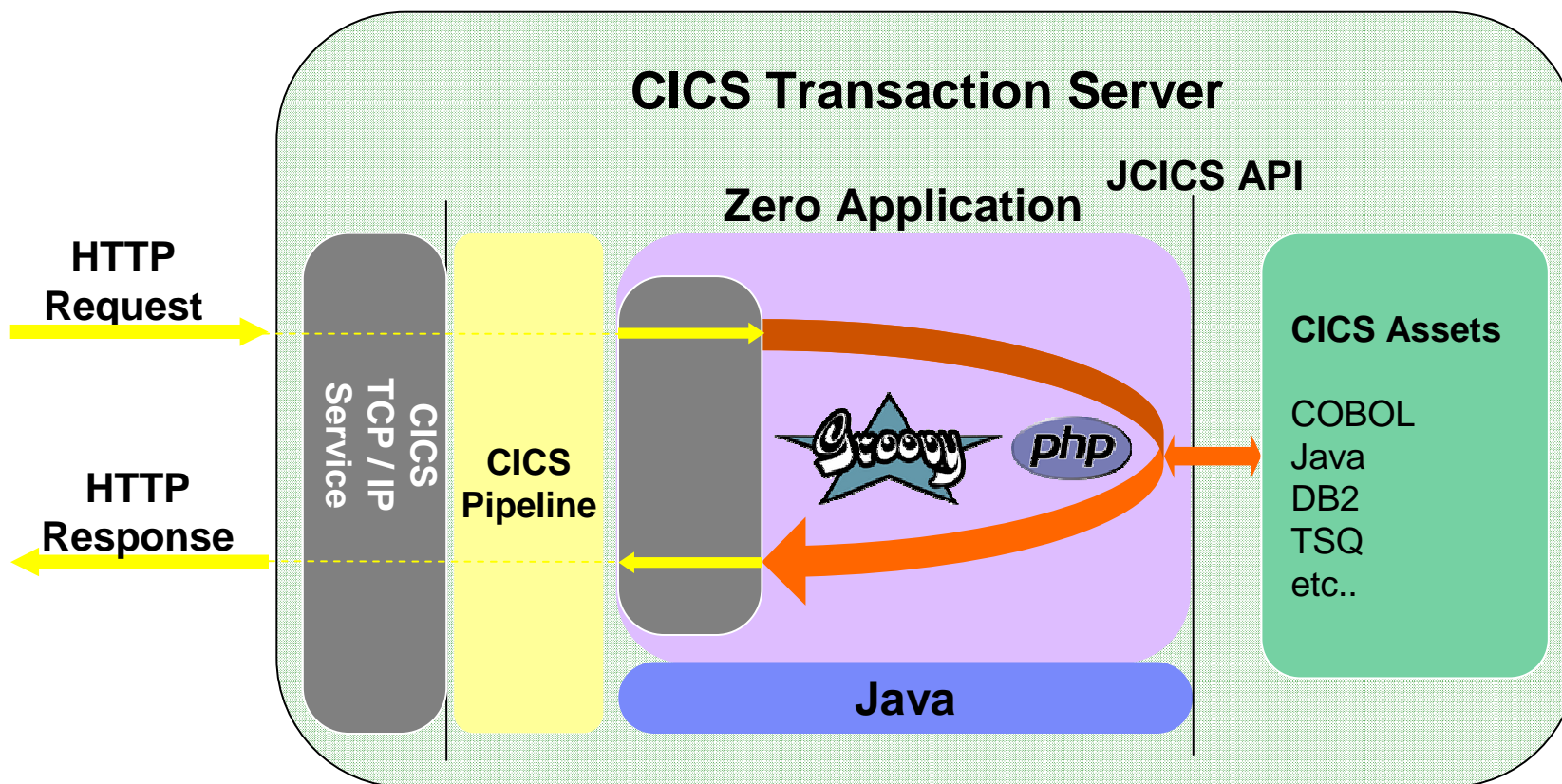




# CICS Dynamic Scripting Feature Pack

- Provides PHP and Groovy support in CICS – agile, productive environment
- Technology from Project Zero, WebSphere sMash v1.1.1.3 (projectzero.org)
- Robust environment for situational reports, dashboards, and Web feeds
- Manageability, Scalability, and Security
- Zero Resource Model (ZRM) with data managed by DB2 for z/OS
- Uses CICS TS JVMServer Technology
- Situational applications - Quickly try business ideas
- Introduce new staff to CICS via PHP
- Run unmanaged PHP and WebSphere sMash applications in CICS
- Easily expose CICS assets with RESTful interfaces
- Optional no charge product extension to CICS TS V4.1 and V4.2

# Project Zero Environment (in CICS)



# Interacting with CICS

- Data passed to or from CICS is in byte arrays
- Can generate a Java data class with getters and setters plus a method to get and set the data as a byte array
  - Using JZOS classes supplied with Java on z/OS
  - Using RAD and CICS Java Data Bindings

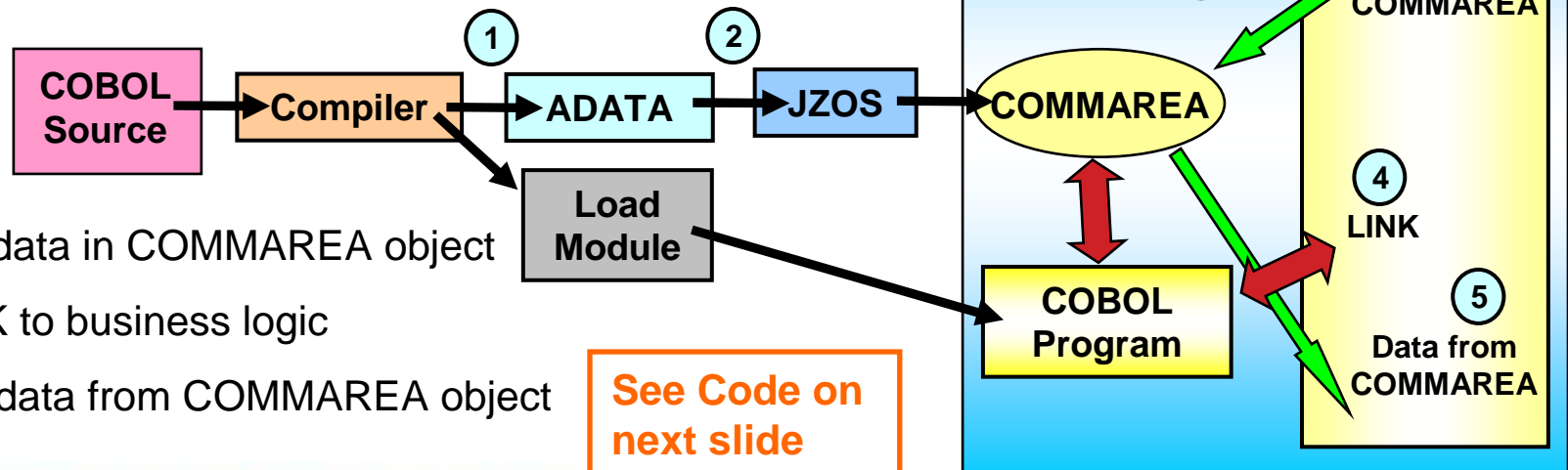
① Generate ADATA from compiler (data layout info)

② Generate Java Data object using JZOS

③ Set data in COMMAREA object

④ LINK to business logic

⑤ Get data from COMMAREA object

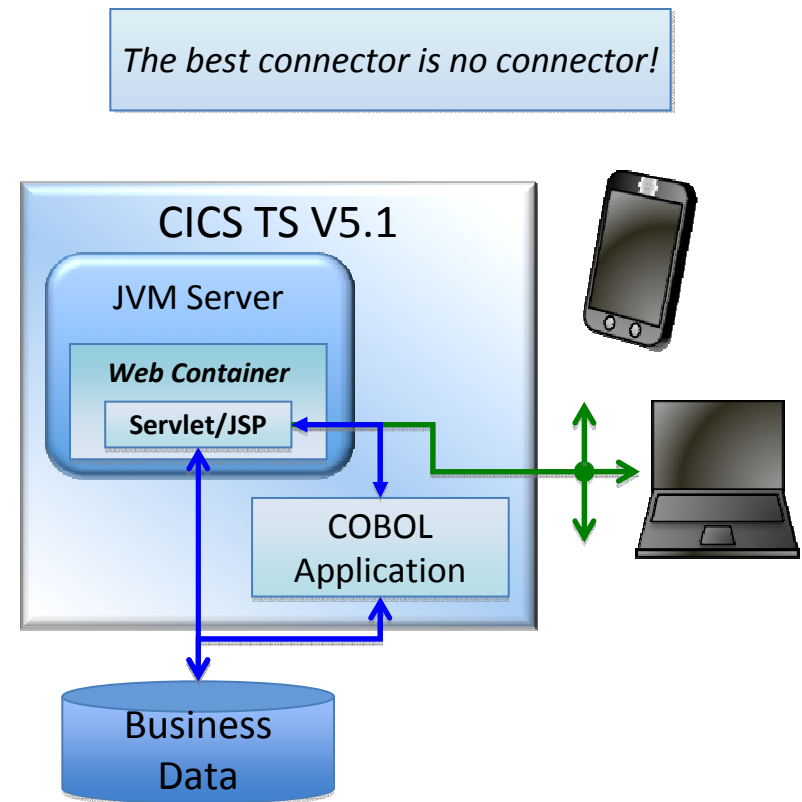


# Liberty Profile Web Container

- 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.

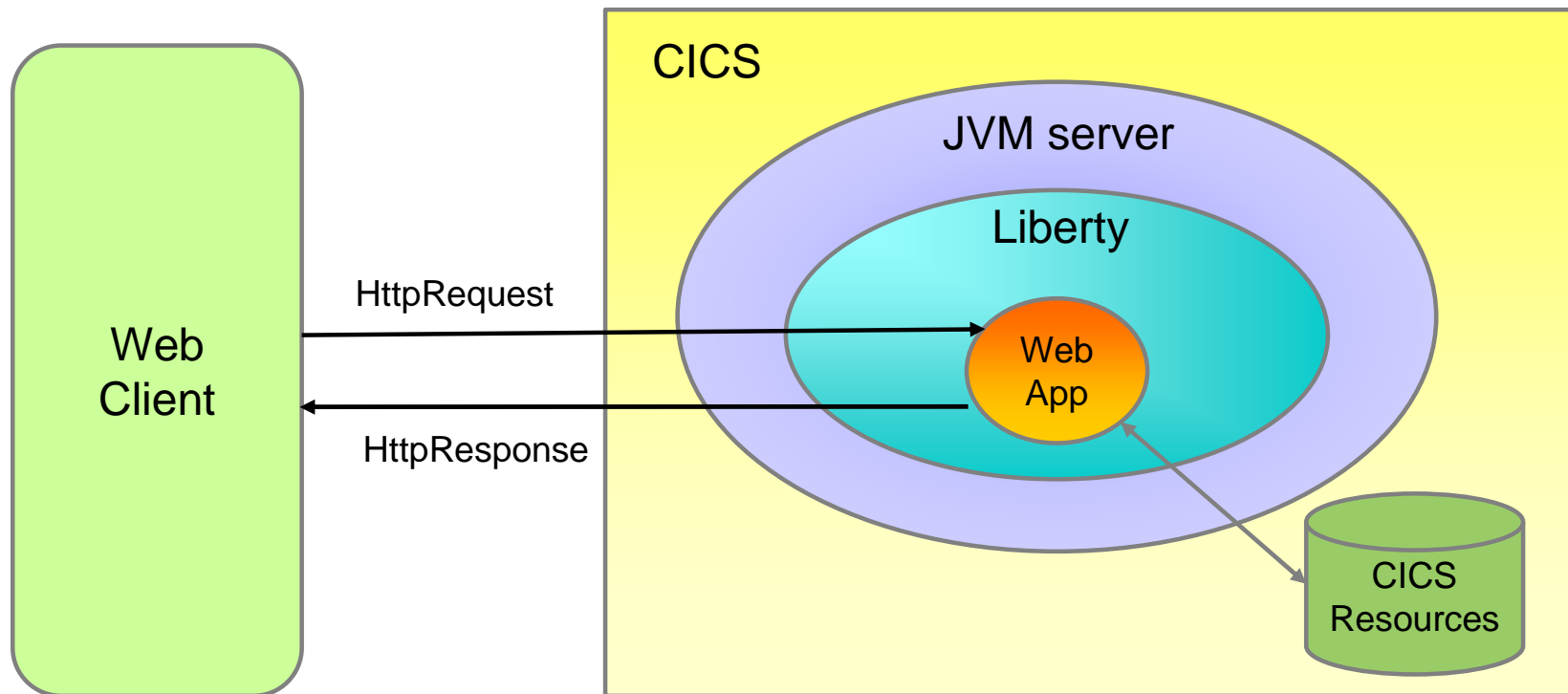
# Liberty Profile Web Container

- The Web Container enables:
  - A production-ready web container with CICS qualities of service
  - Deployment of lightweight Java servlets and Java Server Pages (JSP)
  - Improved performance through local access to CICS applications and data
  - Rapid roll-out of interface updates through OSGi-packaged deployments
  - Full integration with first-class applications and platforms
  - Technology built on the WebSphere Application Server Liberty profile for compatibility





# 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

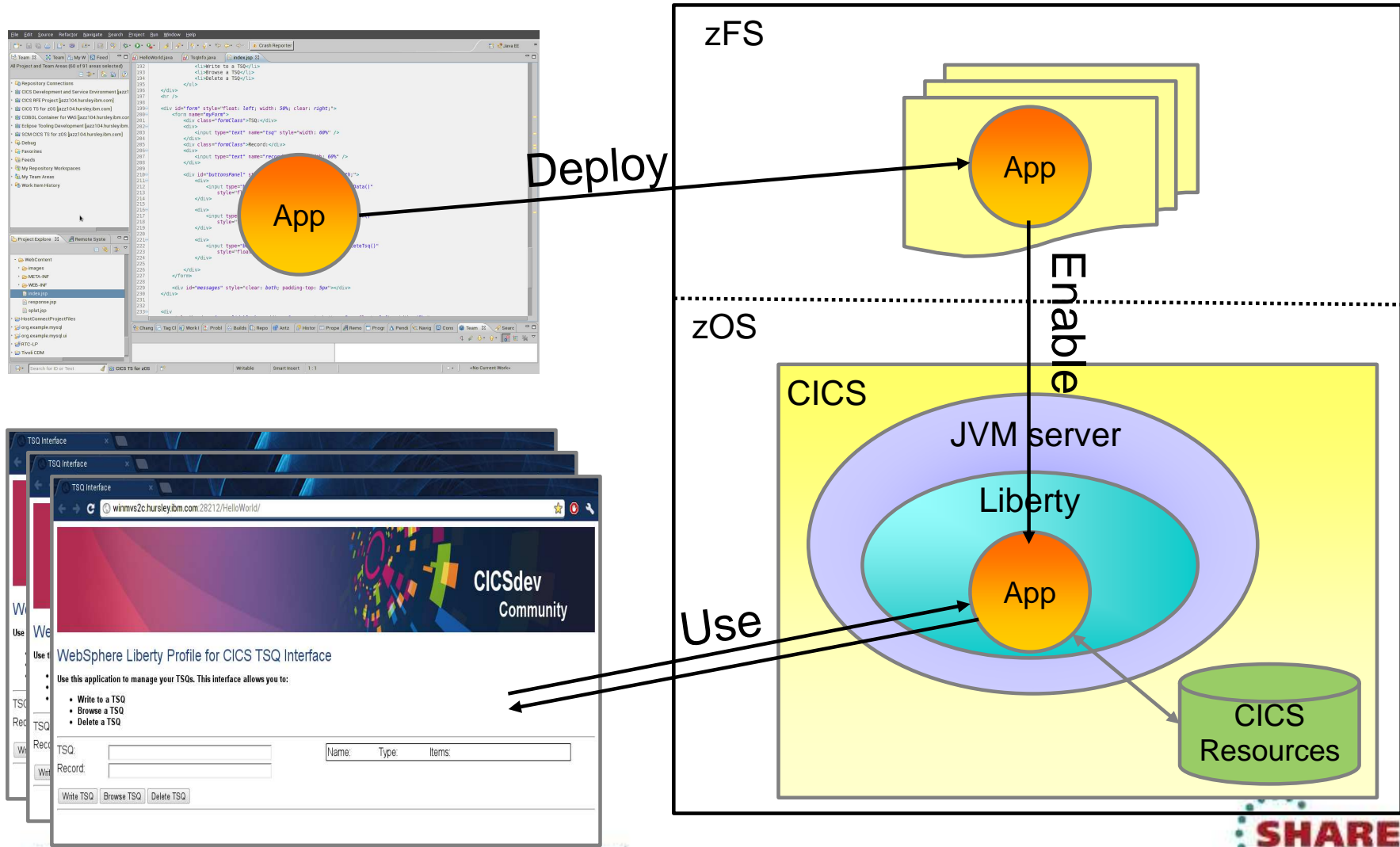




# Modern interfaces - Putting it all together



## Eclipse with CICS Explorer SDK & Liberty Tools



Complete your sessions evaluation online at [SHARE.org/SFEval](http://SHARE.org/SFEval)





**SHARE**  
Technology - Connections - Results

# Events

Complete your sessions evaluation online at [SHARE.org/SFEval](http://SHARE.org/SFEval)

**SHARE**  
in San Francisco  
2013

# What is Business Event Processing?



*“Turn insight into action”*

**Event**  
Pos Purchase



**Business Context**

2nd purchase in a week  
and total purchases  
this year > \$1000



**Action:** Offer  
loyalty program  
membership  
before  
customer  
leaves the store

**Event**  
No meter signal



**Business Context**

Third consecutive period  
without signal



**Action:** Trigger  
automated  
troubleshooting  
process

**Event**  
GPS Signal



**Business Context**

Calculated arrival > 30  
min over SLA



**Action:** Phone  
customer to re-  
arrange delivery

# Event Processing...

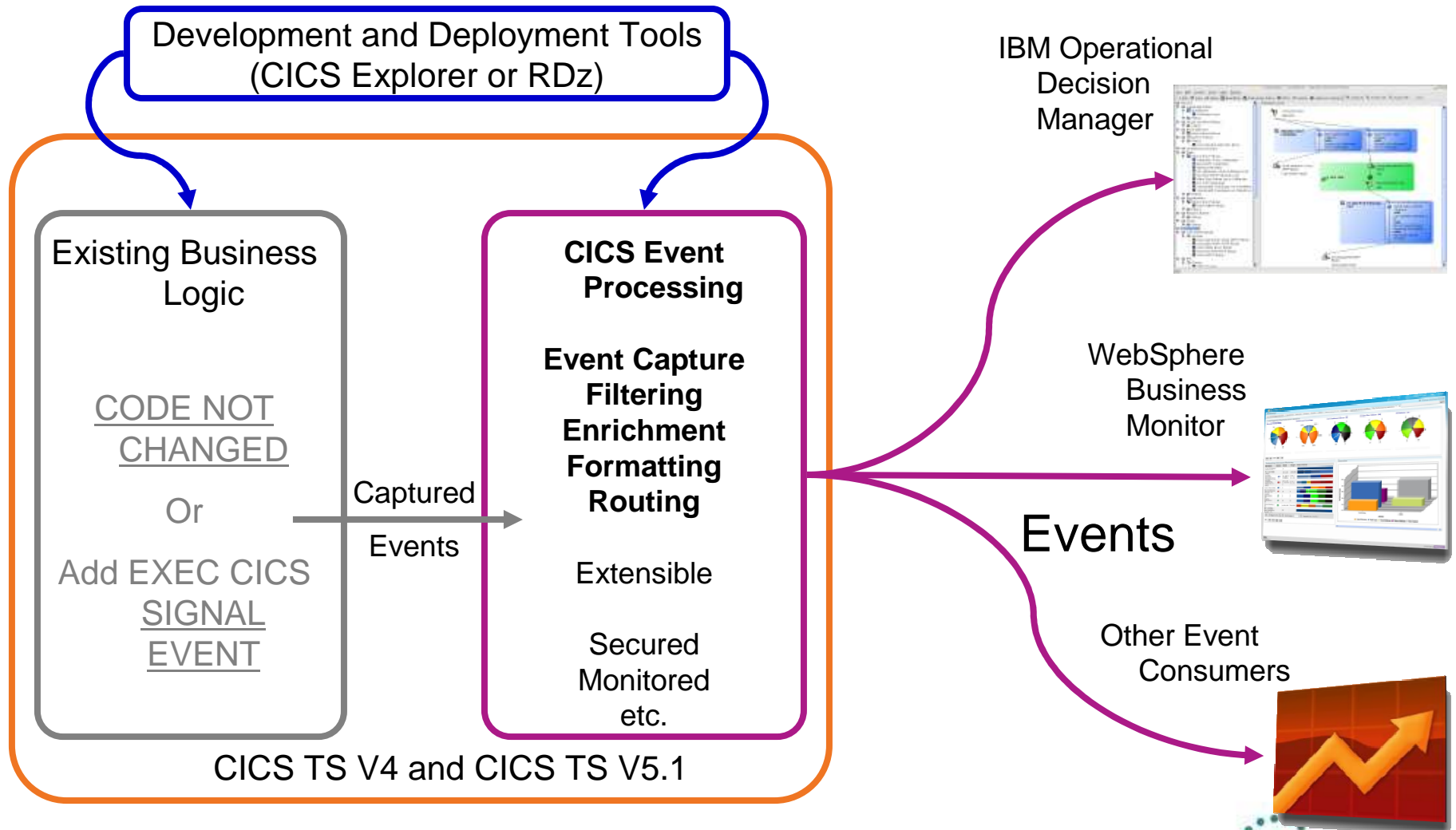
- An event is something that happens that is relevant to the business
  - “**simple**” event: meaningful in itself (not an aggregation of information)
    - Order placement, stock trade
  - “**complex** event processing”: detect and respond to patterns of events
    - 3 orders from a customer in 2 days, suspicious pattern of ATM activity
  - “Business Event Processing” extends event processing capabilities to business users
- CICS can be significant source of events
  - Focus is on events relevant to the Line-of-Business
  - **CICS emits single events**
  - Events emitted by CICS could
    - Drive another CICS transaction
    - Be written to a temporary storage queue
    - Be input to a monitor or business manager’s dashboard
    - Be sent to a “complex event processing” engine such as IBM Operational Decision Manager
- Can be business events (CICS TS V4.1+)
- System events (CICS TS V4.2+)
- Policy notifications (CICS TS V5.1)

# CICS Event Processing



- Provide information relevant to your business processes to a variety of systems
  - IBM Operational Decision Manager
  - WebSphere Business Monitor
  - Emit to WMQ queues or via HTTP
  - CICS-based transactions and programs
  - User-written programs
- Receiving system analyzes business information from one or more sources and takes appropriate action

# Event Processing...

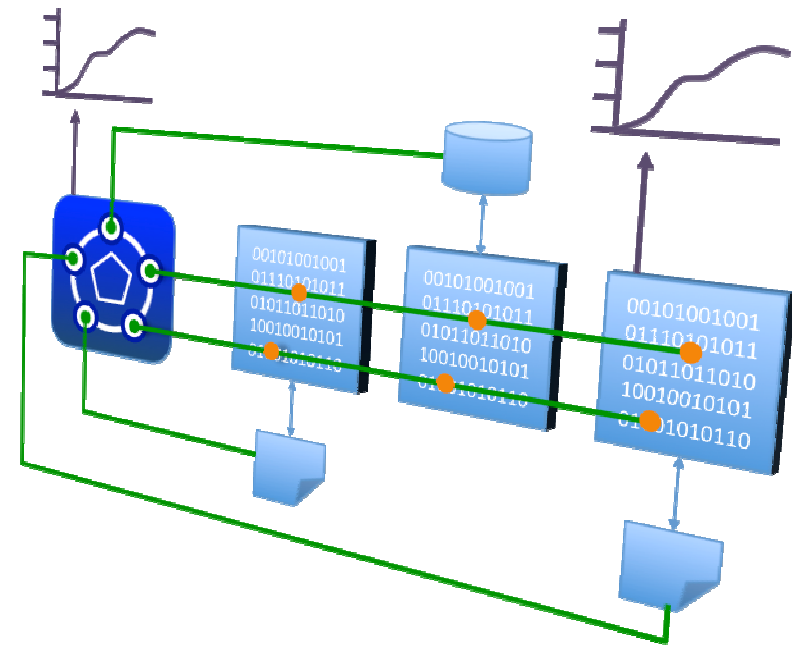




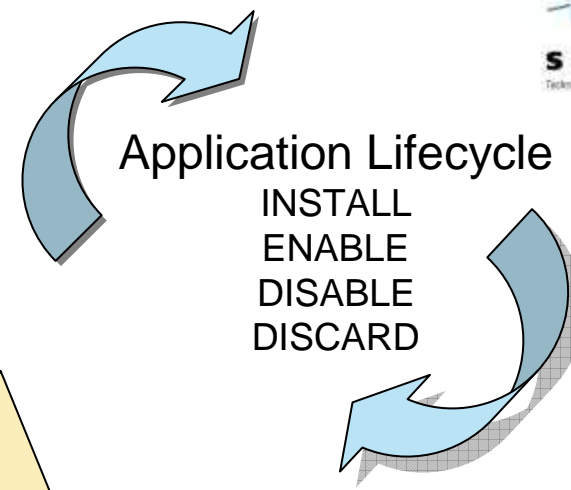
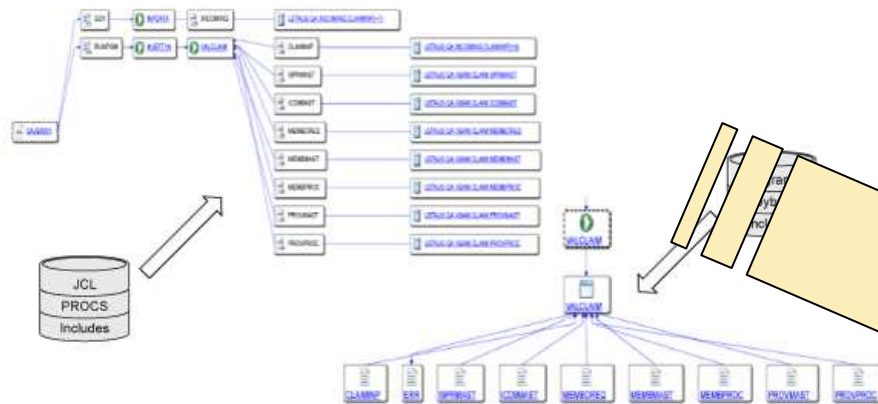
# New view of applications

# Create agile services from existing assets

- By defining an application you can:
  - Combine and manage disparate application resources as a single entity
  - Rapidly move versioned applications through development, test and production
  - Automate dependency management throughout the application lifecycle
  - Ensure rigorous yet flexible provisioning with application bindings
  - Measure entire application resource usage for tracking and internal billings
  - Dynamically manage applications by applying policies during runtime



# First-class applications



## Application

**Name**  
- org.maw.banking.Loans

**Version**  
- 1.2.1

**Resources**  
- LIBRARY, PROGRAM, TRANSACTION, URIMAP  
- (EVENTBINDING, OSGIBUNDLE, ...)

**Dependencies**  
- DB2CONNECTION, JVMSERVER, TCPIPService, ...

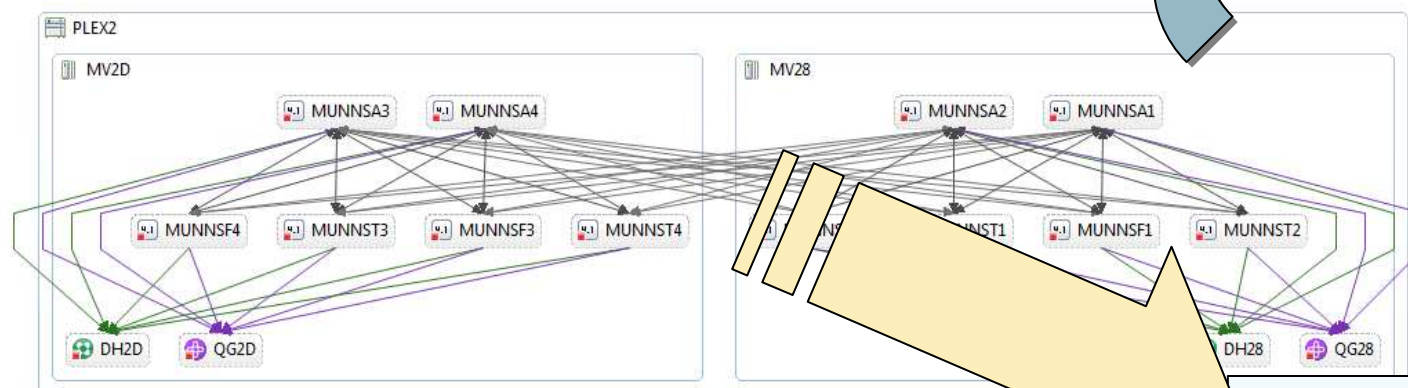
**Entry points**  
- operation: browse, update, ...  
- resource: PROGRAM

- A collection of one or more CICS bundles
- Life-cycle as a single entity
- Measure and control resource usage
- Develop in Eclipse/Rational
- Share and promote through SCM

# Application context

- Allows measurement and resource usage control at the application level
- Define the application entry point
  - PROGRAM...
- Associate Task with Application operation
  - PROGRAM LINK...
- The application context follows the application flow from Task to Task & Region to Region across MRO and IPIC connections
- Recorded in monitoring data
  - Includes Platform, Application, Version (major.minor.micro), Operation

# First-class platforms



## Platform

Region Type

Region Type

Region Type

- Set of one or more region types
- Life-cycle as a single entity
- Hides complexity of underlying topology
- Provides services for Applications
- *Control Applications through Policy*

# Summary

- CICS TS provides
  - An environment for running transactions; CICS Transaction Server manages concurrency, sharing of resources, integrity of data, and prioritization of work.
  - Support for business applications written in COBOL, C, C++, PL/I, Java, and Assembler, providing an application programming interface to access CICS services.
  - Access by applications to data stored in DB2 and DL/I databases and in VSAM and BDAM data sets.
  - Connectivity with WebSphere MQ and access to the Message Queue Interface from CICS application programs.
  - Distribution of work between multiple CICS regions in a z/OS sysplex.
  - Connectivity with other systems in client/server and peer-to-peer configurations.
  - Interfaces for configuring and managing your CICS regions.
  - Aids for debugging application programs, and for diagnosing problems in your system.