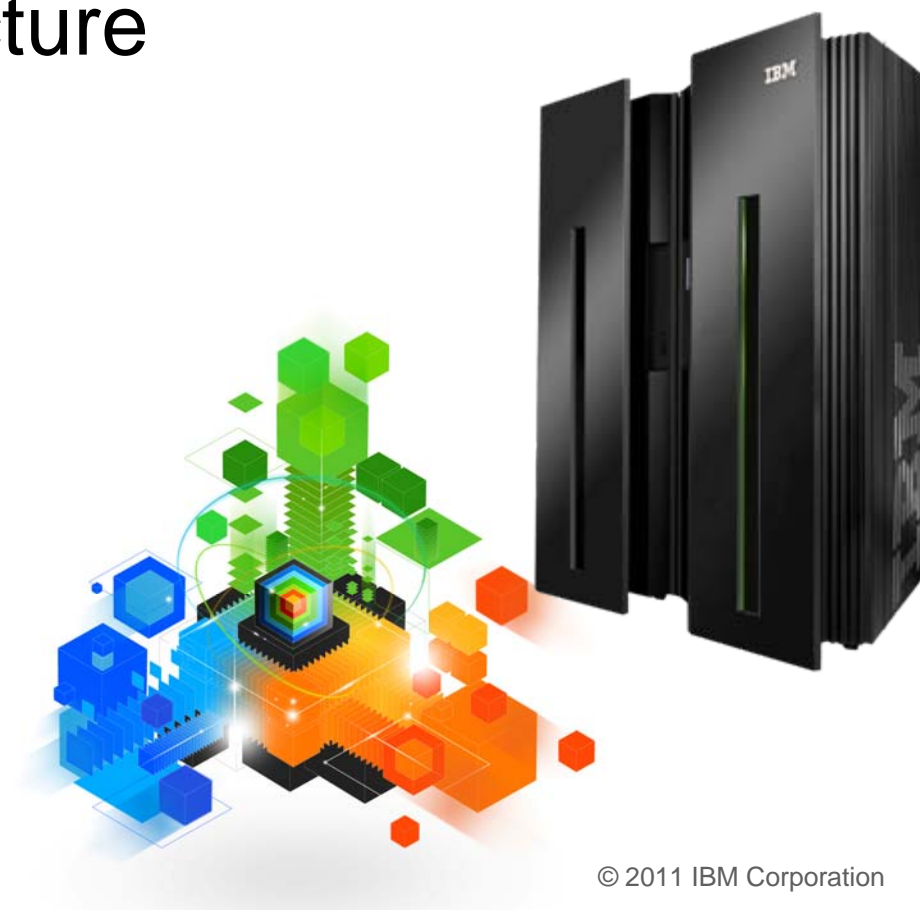# IBM System z Technology Summit

Simplify your infrastructure

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Session 4. Abstract

- **Looking for ways to accelerate the transfer of knowledge, skills, and best practice to the next generation of technical experts? Need to maintain productivity and protect service levels? CICS Explorer and zEnterprise lead the way to infrastructure simplification. In this session, you will learn how to identify and package applications in a more flexible way, increase your utilization of zAAP processors, reduce dependency on SNA, improve the throughput of your CICSplex, and simplify the authentication of distributed CICS users. You will also see how the CICS Explorer offers a much more powerful tooling environment that can improve the productivity with a more intuitive experience.**

Agenda

- **IP Connectivity in CICS**

- **ID Propagation**

- **CICSPlex SM Workload Manager**

- **CICS Explorer**

- **Threadsafe optimization**

- **CICS Configuration Manager**

- **CICS Deployment Assistant**

CICS Support for IPv6

- **Allow for IPv4, IPv6 or host names in:**

  - Resource definitions

  - Application Programming Interface

  - Systems Programming Interface

  - User Replaceable Modules

  - Global User Exits

  - Monitoring Records

IP Interconnectivity

- **Continuation of the CICS IP interconnectivity strategy**

  – Provide a new transaction IP communications protocol for connectivity between and into CICS

  – Long term plan to provide CICS with IP choice for most of the CICS programming model

- **Enhancements to support 3270 transaction routing**

  - BMS, security and monitoring support
  - Shippable terminals supported
  - Restrictions
    – Routable(YES) on transaction definition
    – No EDF
    – No routing for APPC devices

- **Enhancements to Asynchronous Starts**

  – ATI over IPIC supported

Identity Context Propagation

- **z/OS Identity Propagation initiative to provide asserted identity for end-to-end distributed security**

  - Logically tie together distributed end-user identities with z/OS userids

  - Enhance the ability for z/OS applications to participate centrally in SOA solutions

  - Function will require z/OS 1.11

- **ID Context Propagation allows an end user's identity to be propagated through to CICS**

  - Currently, the end users' identity is lost before the request gets to CICS

Identity Context Propagation…scenarios

- **Support for Inbound Web services, propagating on as Web Service provider**

  – Provides support for Web Services callers

- **Support for Inbound over IP Interconnectivity (IPIC)**

  – Used by CICS TG when operating as a WebSphere connector

    • Will require use of JCA resource adapter

- **Sysplex Support**

  – CICS will propagate on over MRO and IPIC Connections only

Identity Propagation – current problem

System z

z/OS Run-time
security context

userid

CICS

Audit records do not
show who the user is,
<u>accountability</u> has
been lost.

User's Identity
• DN & Realm

Application Server

running remotely

User's DN & Realm
discarded

userid

Inadvertent and
artificial barrier

SMF
Audit

Audit Record
✓ **SAF user-ID**

User's identity within
the mainframe

User's identity in the
'distributed' world

Remedy

- **Platform-architected Distributed Identity solution that subsystems participate in**

- **An asserted identity for end-to-end distributed security**

- **That logically ties together distributed end-user identities with userids on the host**

- **An Identity Context Reference that flows in a trusted way**

  - X.500 distinguished name of end-user

  - X.500 DN of original registry

  - Optional SAF userid

Identity Propagation – proposed solution

System z

z/OS Run-time security context

extended

Userid +DiD

CICS

Accountability has been restored

User's Identity
• DN & Realm

Application Server

running remotely

User's DN & Realm packaged up and sent

New structure
➤ DiD

SMF **Audit**

Audit Record
✓ **SAF user-ID**
✓ **DN & Realm**

User's identity within the Mainframe

User's identity in the 'Distributed' world
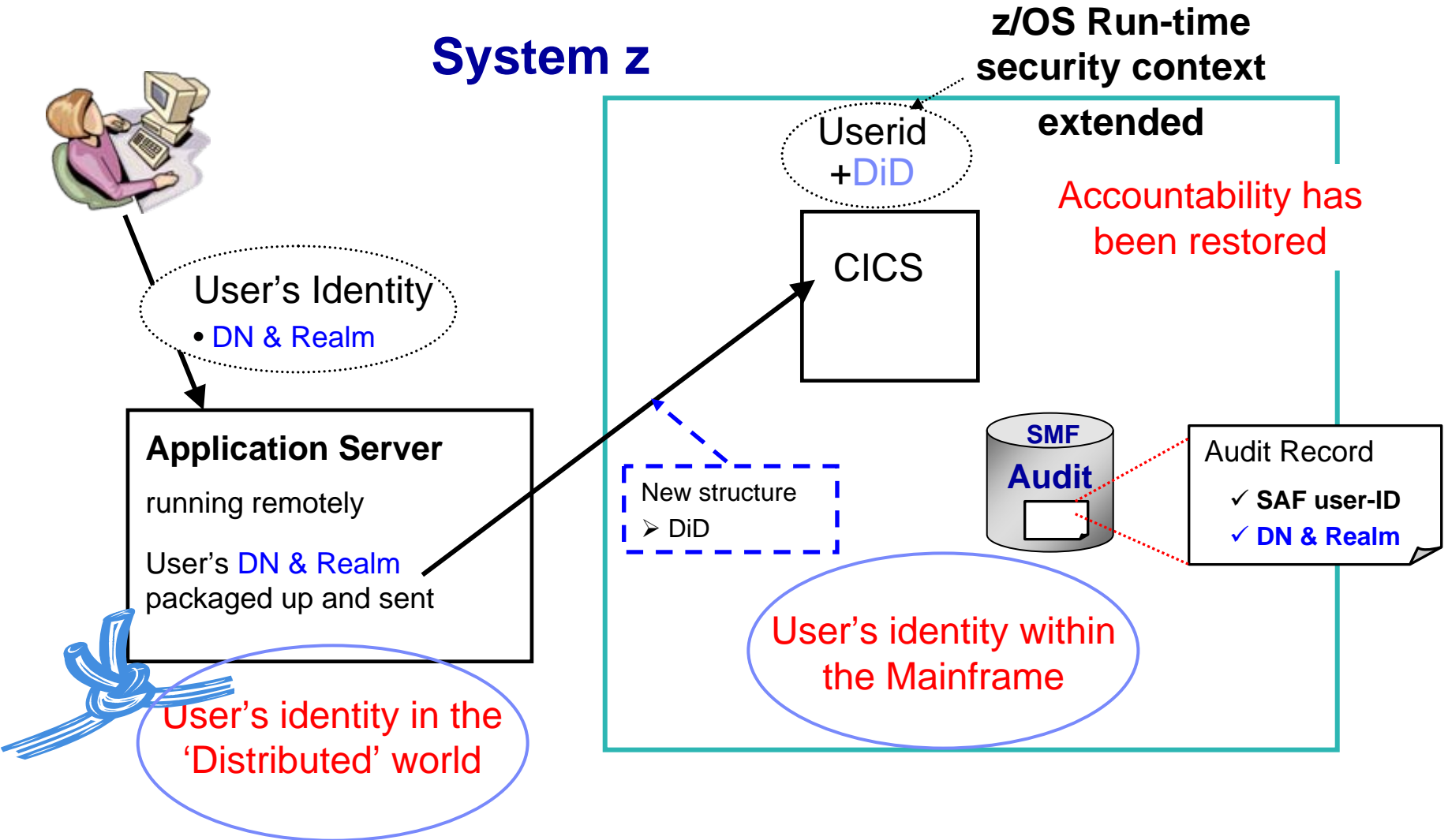
Workload Management and CICSPlex SM

- **Sysplex-optimization to significantly reduce workload batching effects**

  - Exploitation of z/OS coupling facility

    - "Near real time" Sysplex-wide focus on target region status
    - No impact to "non-optimized" WLM

  - Optimized WLM routing enabled by configuring a Region Status Server

    - Uses CF Data Table to hold Region Status information
      - SOS, MaxTask, System or transaction dump in progress, Current Tasks?
    - Shared by all routing regions (in the Sysplex)

- **Percentile goals**

  - CICSPlex SM WLM support for percentile goals

- **Support in CICSPlex SM for all new resources, statistics, etc**

CICSPlex SM WLM: Optimized versus Non-optimized Routing

Non Sysplex Optimized Workload

Sysplex Optimized Workload
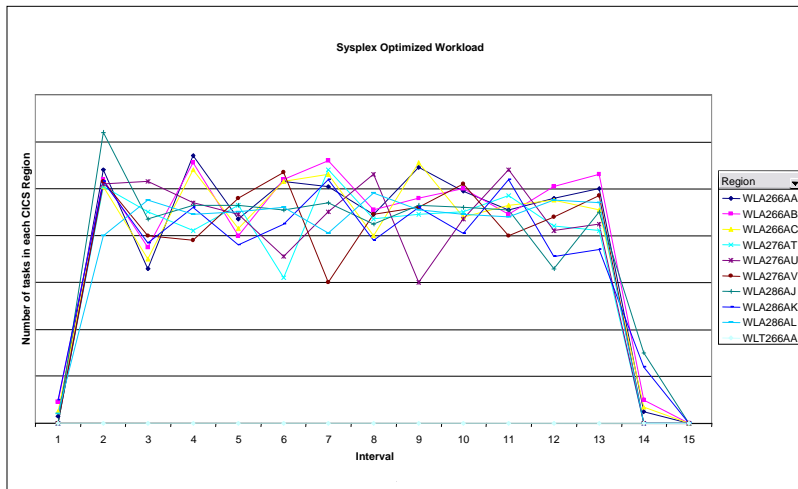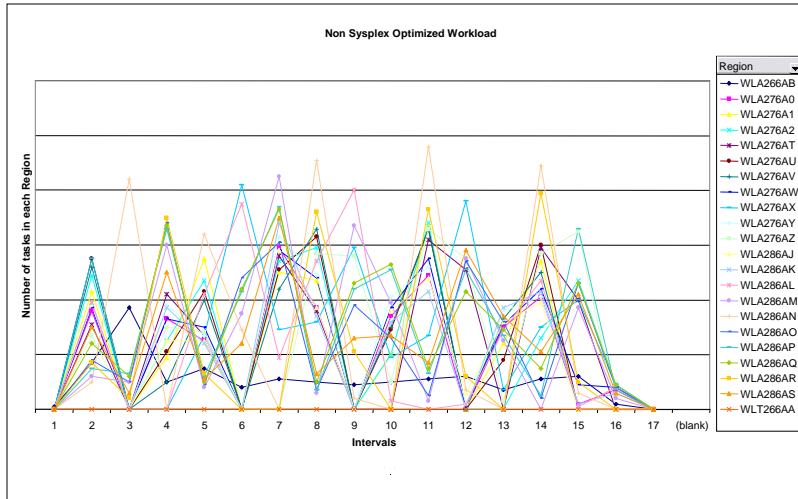
- **Non-optimized Routing**
  - 27 CICS regions on 3 LPARs

- **Optimized Routing**
  - 9 CICS regions on 3 LPARs

- **Comparison**
  - Workload is 10K started transactions
  - Number of tasks in each region measured every 10 second interval

- **Results**
  - Non-optimized environment shows "batching effects
  - Optimized results shows smoother distribution of work and higher throughput

Java and JVMServers

- **JVM implementation in CICS continues to evolve**

  - JDK 1.1.8, HPJ and Hotpooling, IBM Persistent Reusable JVM, Continuous mode, Java 5, Java 6, ...

- **JVMs in CICS TS V2 and V3**

  - Single task, serial reuse

  - Large memory footprint

  - Excellent isolation characteristics

- **JVMServers in CICS TS V4.1**

  - Multiple tasks (threads) in a JVM concurrently

  - Larger capacity

  - Risk of collateral damage

  - Not for customer application use in V4.1

JVMPool Architecture - CICS TS V3 (and V2)

Single CICS task dispatched into a JVM in the pool at a time. So concurrent task count limited to the number of JVMs that can fit in the region.

Result is about 20 tasks/JVMs concurrently in each region.

CICS TS V3

LE enclave
- CICS Task → J8 OTE Thread → JVM thread — JVM — Heap & Classes
- (master) JVM — Shared Classes

LE enclave
- CICS Task → J8 OTE Thread → JVM thread — JVM — Heap & Classes
- CICS Task
- JVM — Heap & Classes
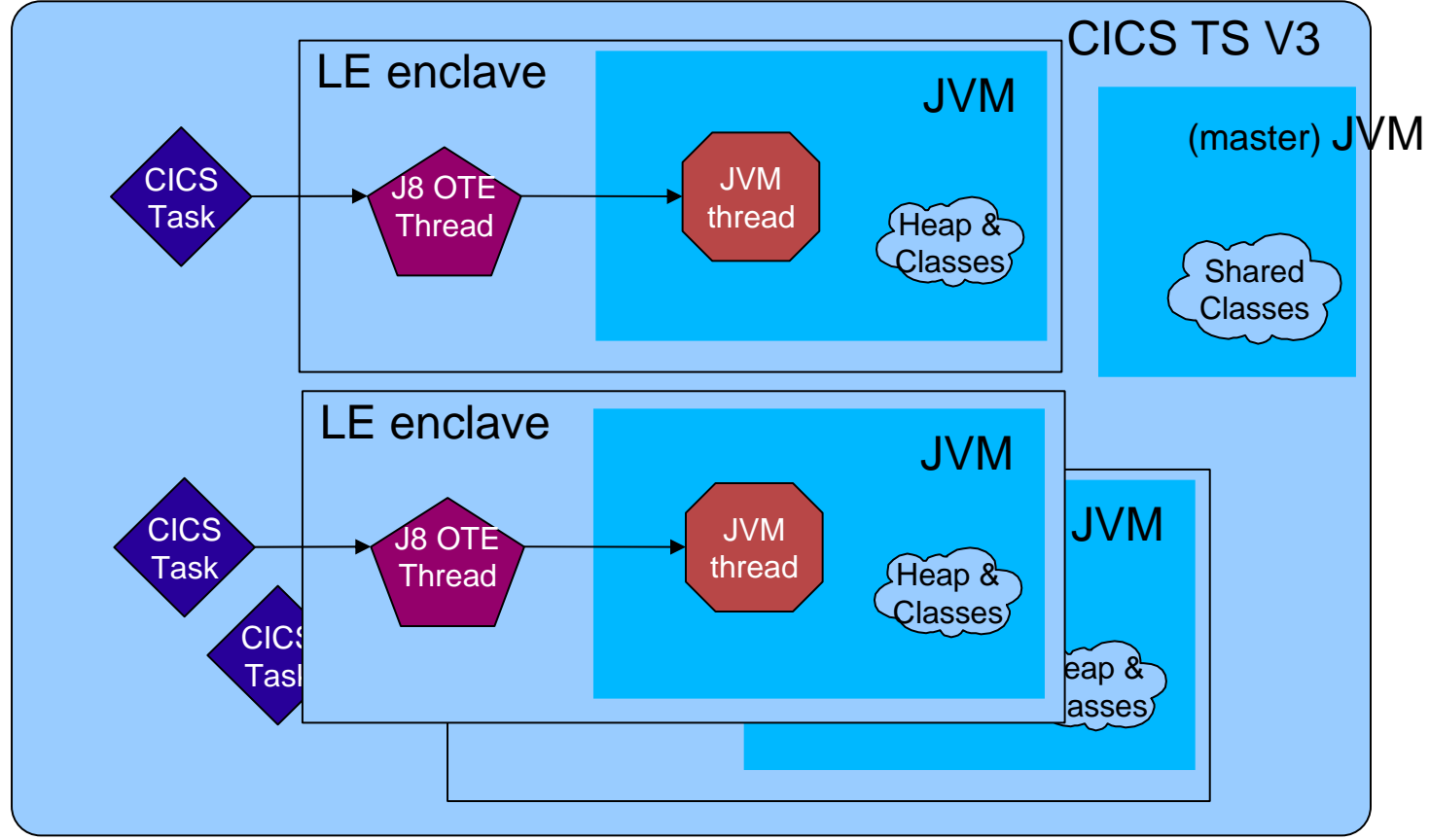
JVMServer Architecture

Can attach multiple pthread/T8/CICS tasks to the JVM at the same time.

Therefore serve more requests using a single JVM.

Result is 100s tasks per region.
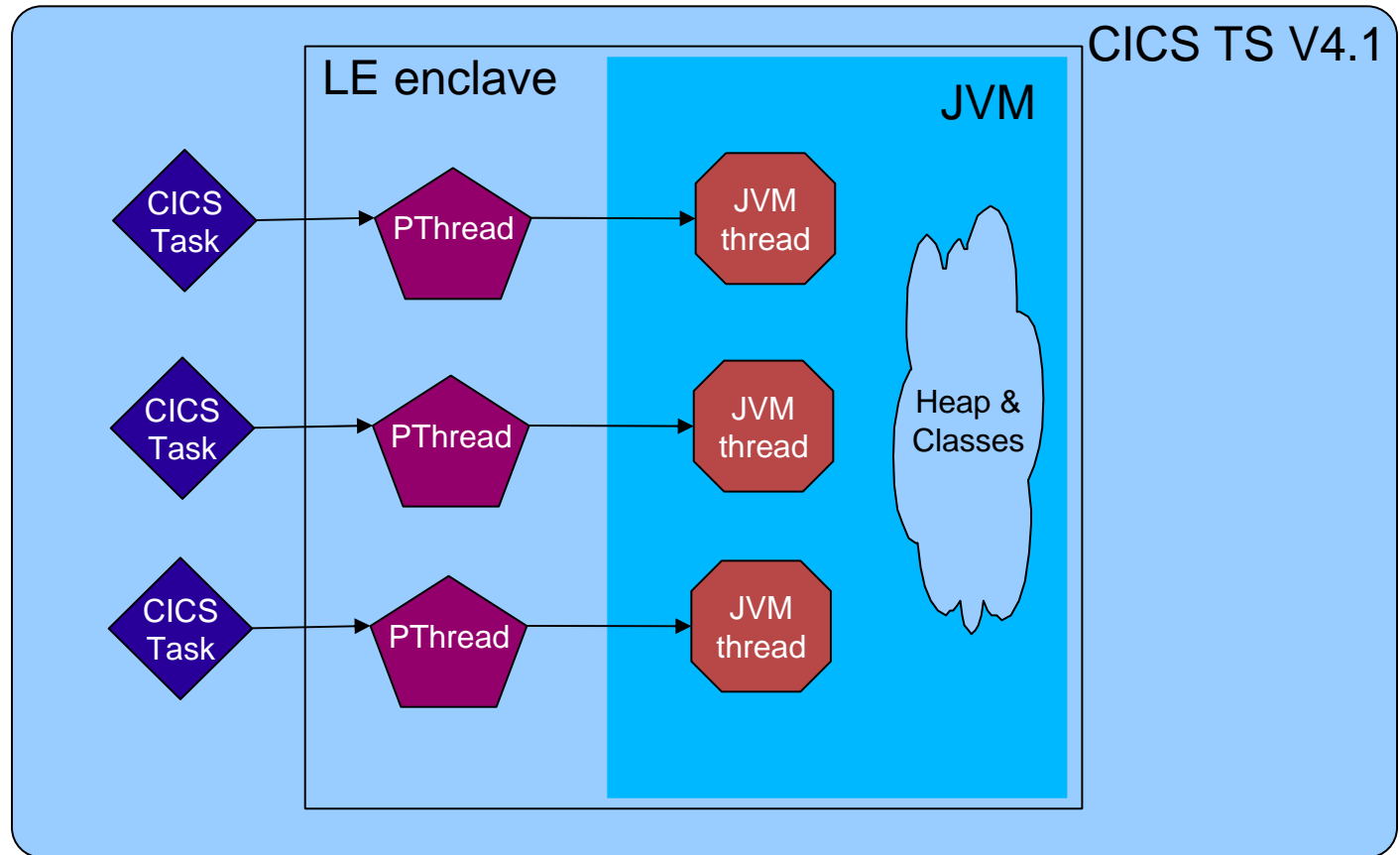
IBM **CICS** Explorer™ - The New Face of CICS
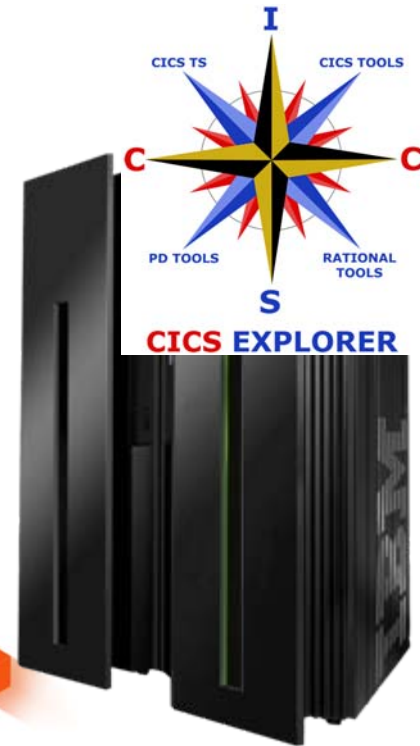
The changing face of CICS tooling

CICS Explorer reduces need for multiple interfaces

Previously…

Now …
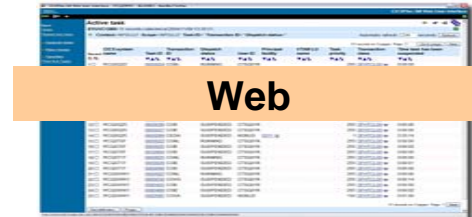
Web
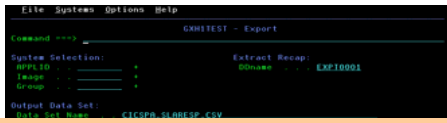
ISPF

CICS 3270

Eclipse
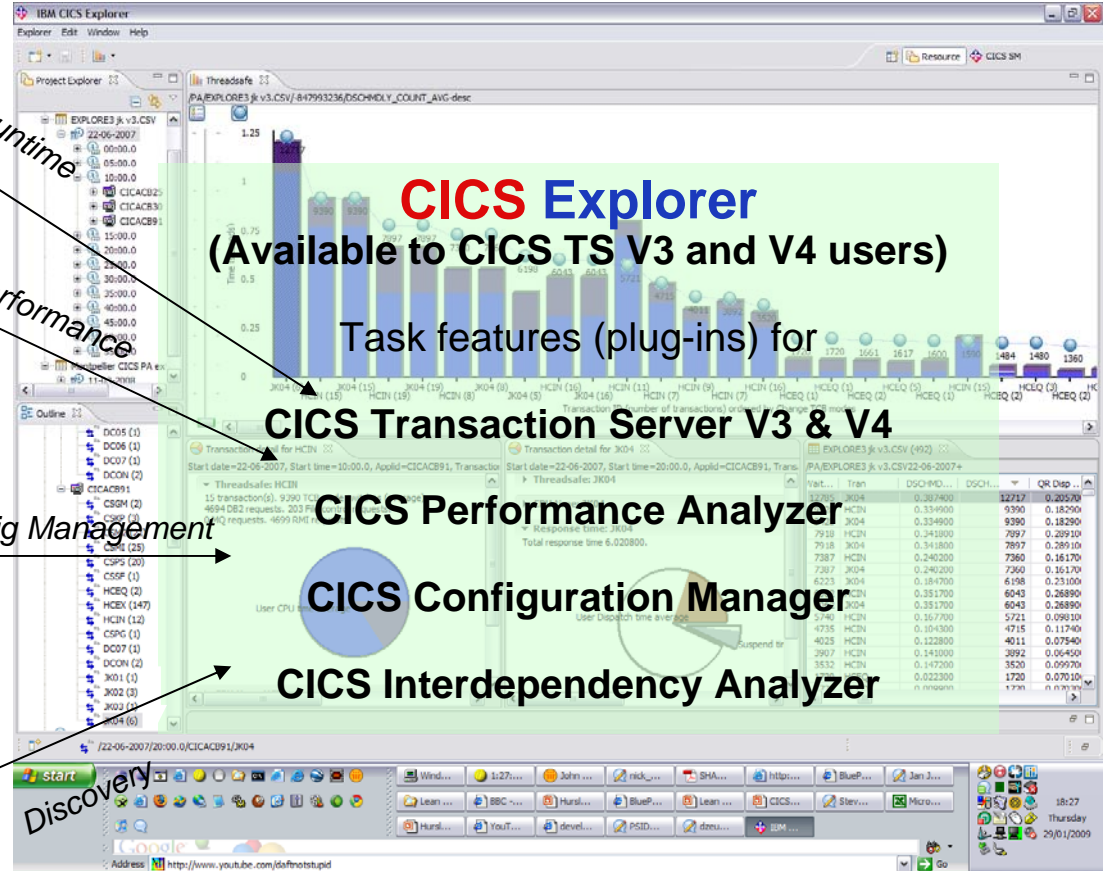
Runtime

Performance

Config Management

Discovery

CICS Explorer
(Available to CICS TS V3 and V4 users)

Task features (plug-ins) for

CICS Transaction Server V3 & V4

CICS Performance Analyzer

CICS Configuration Manager

CICS Interdependency Analyzer

IBM CICS Explorer™

Configuration Status Control, Test

MQ

Status Situations Topology

XE

Daemon & Connection Status & Test

TG

Threadsafe, File, CPU, Response Time analysis Graphical and Sheet views

PA

Develop Test Etc

RDz

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

FA

New!

CICS EXPLORER

Execution Tree Dependencies Queries Command Flow

IA

Deployment Discovery, Visualization, Automation & Control

DA

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

DT

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

APA

CRUD/Install History, Audit Backout Search, Compare

CM

CRUD/Install Control, Filter Topology Events, ATOM

SM

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

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

CICS TS

APA	Application Performance Analyzer
FA	Fault Analyzer
DT	Debug Tool
MQ	WebSphere MQ
XE	OMEGAMON XE for CICS
RDz	Rational Developer for System z

CICS Explorer - Program Definition editor – CICSPlex SM

Everything greyed out because …

… it's a 3.1 system that uses the CICSPlex SM WUI server that is read only.

CICS Explorer - Program Definition editor - CICS CM

The history view shows who made changes, when changed, by attribute

The editor is input capable (i.e. fields aren't grey) and changes can be made

…because same system connected to using CM

CICS Explorer - Powerful, context-sensitive resource editors

This shows how for a non-CM connection the history view just gracefully says that the function isn't available.

Editors only show applicable attributes and tabs - overview/runtime/printer are all specific for a TDQ of type "Extra Partition"

CICS Explorer - No "magic" values - File definition editor

Operations

Add option	☐	No ▾
Browse option	☐	No ▾
Delete option	☐	No ▾
Read option	☐	Yes ▾
Update option	☐	No ▾

Auto journalling

Journal number	☐	NO	(NO, 1-99, bl...
Read operations recorded on journal	☐	None ▾
Synchronous auto journaling for input	☐	No ▾
Rewrite/delete operations recorded on journal	☐	No ▾
Add operations recorded on journal	☐	None ▾
Synchronous auto journaling for outp...		Yes ▾

File_Definition (FC02) ✕

File_Definition (FC02) Joe}s test file

📄 **Runtime** ⑦

Usage

The kind of operations that can be performed by programs against the file can be controlled to only a subset of allowable CICS functions

☑	Read	Records can be read
☐	Browse	Records can be read sequentialy
☐	Add	Records can be added
☑	Delete	Records can be deleted
☑	Update	Records can be updated

Auto Journal

CICS journal names are of the form DFHJnn, where nn is in the range 1 through 99

- ◉ Do not use auto journalling
- ◯ CICS journal name: [   ]

Synchrouslly auto-journal records for ☐ Input ☑ Output

Operations to be recorded in the journal

- ☐ Read only
- ☑ Read update
- ☐ Rewrite and delete
- ☑ Add write operation before the VSAM I/O operation
- ☑ Add write operation after the VSAM I/O operation

Specifying which attributes to log in a journal for a file is very involved in CEDA and the WUI

Compare again the CICS Explorer with the WUI

CICS Explorer - Editor validation

An advantage of an Eclipse client over a browser/TSO/ISPF interface which is that keystroke by keystroke client validation occurs making the GUI more responsive (no server roundtrips) and less errors get sent down the wire to CICS making it faster.

The pipeline definition below has two errors - 20p is not a valid number …

… and the configuration file name has an invalid character entered.

Each error field has a red X next to it to show it's bad, and hovering over the red X bring up a tooltip with the error. All errors can be seen by hovering over the red X at the top of the screen.

CICS PA plug-in to the CICS Explorer

- **Provides numerous methods of visualizing historical transaction performance summary data**

- **Access to performance data summaries and reporting scenarios using CICS PA created …**
  - CSV files from SMF 110 performance data
  - CSV files or database (DB2) from HDB performance data

- **Integrates with the strategic CICS Explorer and other tooling plug-ins**

- **Evolutionary and responsive solution**

See extracts of the raw data in the Sheet view

Powerful active outline view speeds selection

Drill into data files using the explorer view
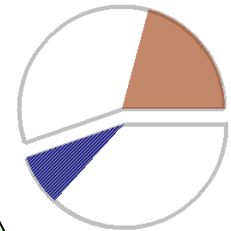
Flexibility in what you want to see

..or follow Analysis Scenarios like Threadsafe to highlight issues

CICS and threadsafe (OTE) – what is it ?

- **Threadsafe allows introduction of extreme parallelism into CICS application serving of legacy workloads**

  - Significant CPU reduction is possible which allows cost reduction for existing applications

  - This cost savings - thru technology - should also be positioned as a means to introduce new workloads onto CICS at reduced TCO

  - These new workloads can be managed more efficiently using tools targeted for both old and new workloads running under CICS

  - These multiple benefits will allow the driving of new workloads to System z leveraging new SOA capabilities of CICS

  - This is part of the overall System z strategy to protect client application assets while improving the operational efficiency of the platform

Customer Threadsafe experiences

- **Danske Bank**
  - Threadsafe conversion MIPS saving of about 300 MIPS during the peak processing period – directly attributed to reduced TCB switching
  - Customer looking forward to CICS Transaction Server Version 3.2 where WMQ, local File Control, and VSAM RLS are threadsafe, promising even greater improvements
- **"Large financial services organization in the US"**
  - Estimated $32M per year in savings based on data canter chargeback reduction
  - Estimated 10-15% of their total available savings
  - Public domain information, delivered at Impact 2008
  - The above is based on 1 non-dedicated systems person for 6-7 months without using tools
  - Can easily cost-justify tools to speed the process
  - Savings may be difficult to quantify beforehand
- **"Major US bank"**
  - Saved 700 MIPs by making one major application threadsafe
- **Saving we have seen with other similar projects**
  - CICS CPU savings of 2-15%
  - Reduced VSAM Transparency product overhead by over 12%

CICS PA finds the best candidates for threadsafe optimization

Problem

- **Identifying the best candidates for threadsafe optimization and knowing when to stop - you've achieved your goals**

Solution

- **Performance summary, list, and list extended reports plus metrics like TCB use by transaction, dispatch and CPU time, number of TCB switches and change mode delay time and Getmain usage help zero-in on the programs with most to gain**
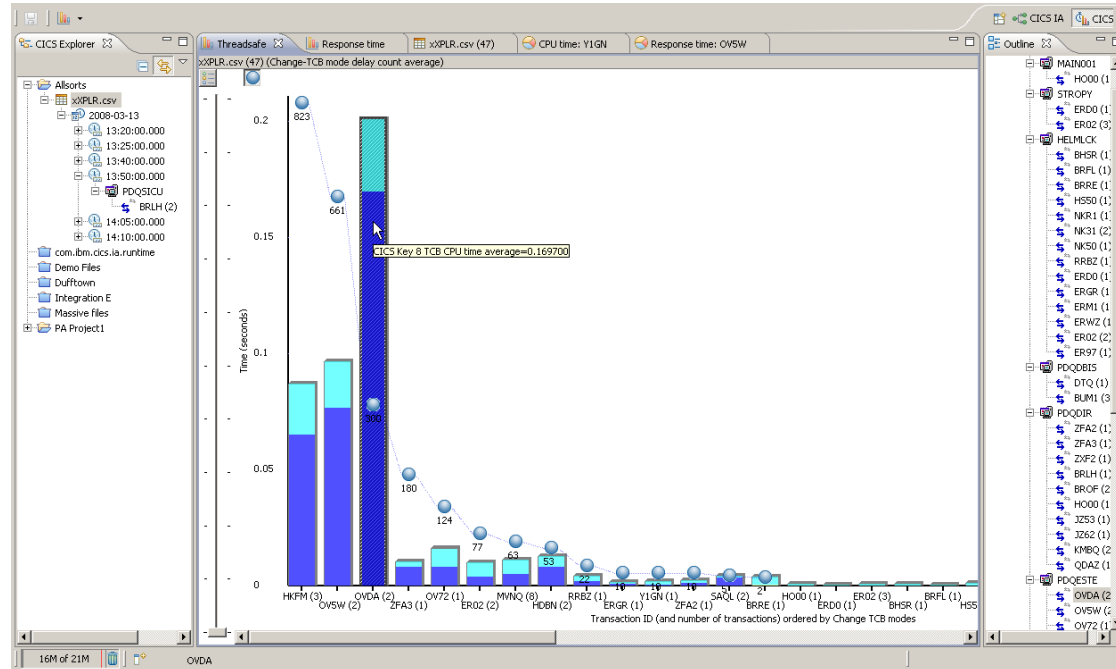
Value

- **CICS PA easily helps improve CICS threadsafe performance, validate savings and track service levels**

CICS IA helps get the best out of threadsafe CICS TS V3.2

Problem

- **Migrating large number of complex CICS applications without retesting entire portfolio**

- **Identifying suitable candidates for thread-safe optimization**

Solution

- **CICS IA identifies programs most sensitive to CICS API changes enabling more focussed testing**

- **CICS IA shows non-threadsafe programs and highlights what's needed to optimize them**
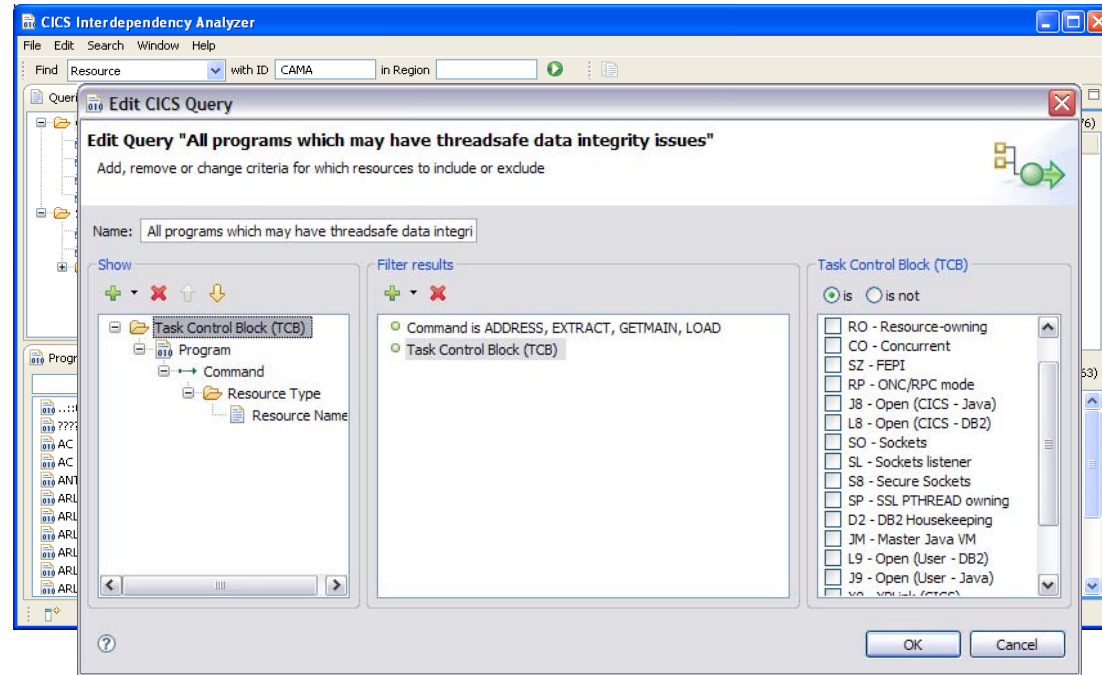
Value

- **Helps customers under time pressure to migrate to latest versions with reduced risk**

- **Even without deep CICS skills, you can optimize your portfolio and benefit from threadsafe**

CICS PA - Comparison views

Comparison between "before" and "after" situations

CICS PA - Integration with CICS IA

CICS PA - Integration with CICSPlex SM perspective

CICS TG in CICS Explorer

CICS Explorer & CICS Tools: Putting it all Together

Interdependency Analyzer **Performance Analyzer** **Configuration Manager**
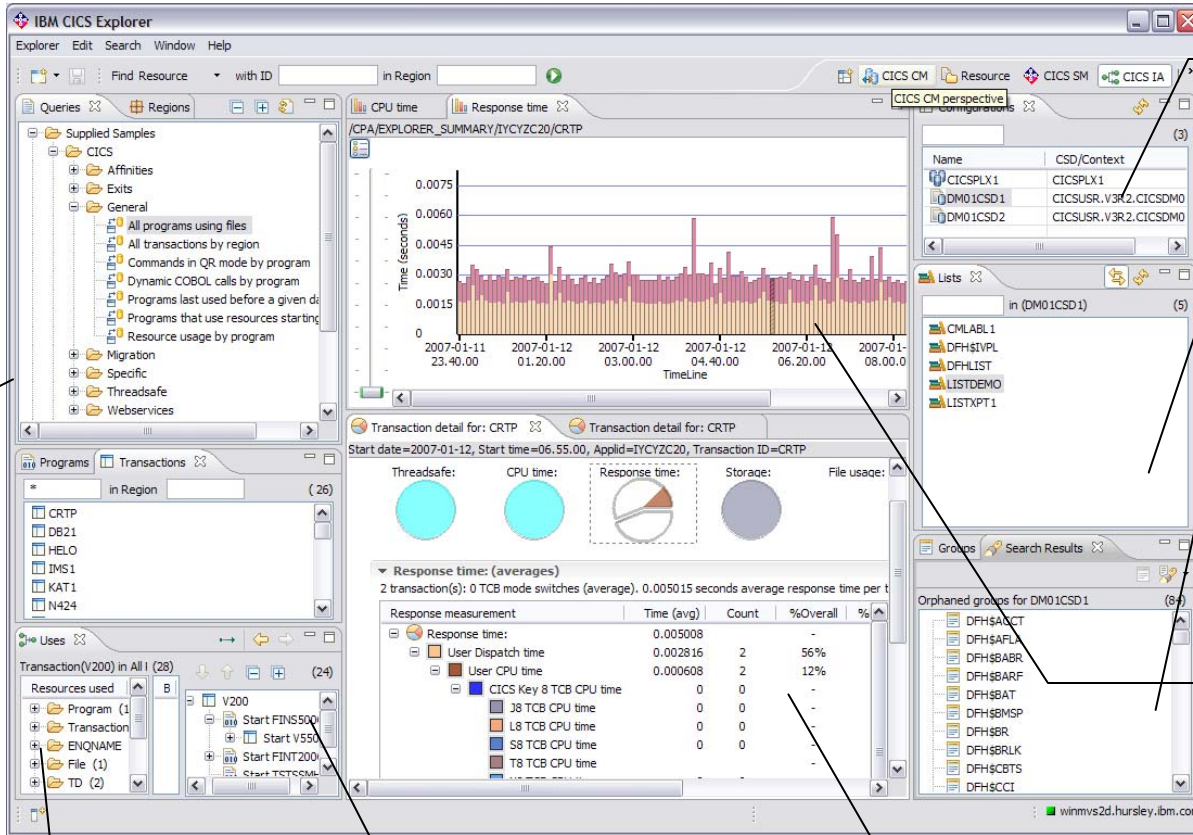
Single point of control for CSDs and DREPs

Lists and ResDescs

Search for Orphaned groups

Timeline of response times

Shipped Sample Queries

View tree of resources used

Resources used by a transaction

Drilldown into transaction

CICS administration problems solved using CICS CM

- **Working with multiple CSDs**

- **Working with CSD files and CICSPlex SM DREPs**

- **Migrating changes between environments**

- **Delegating and approving changes**

- **Changes across LPAR boundaries**

- **Backout**

- **Audit compliance**

- **Cleanup and analysis**

- **Comparisons and exception analysis**

- **Cold start analysis**

Installation
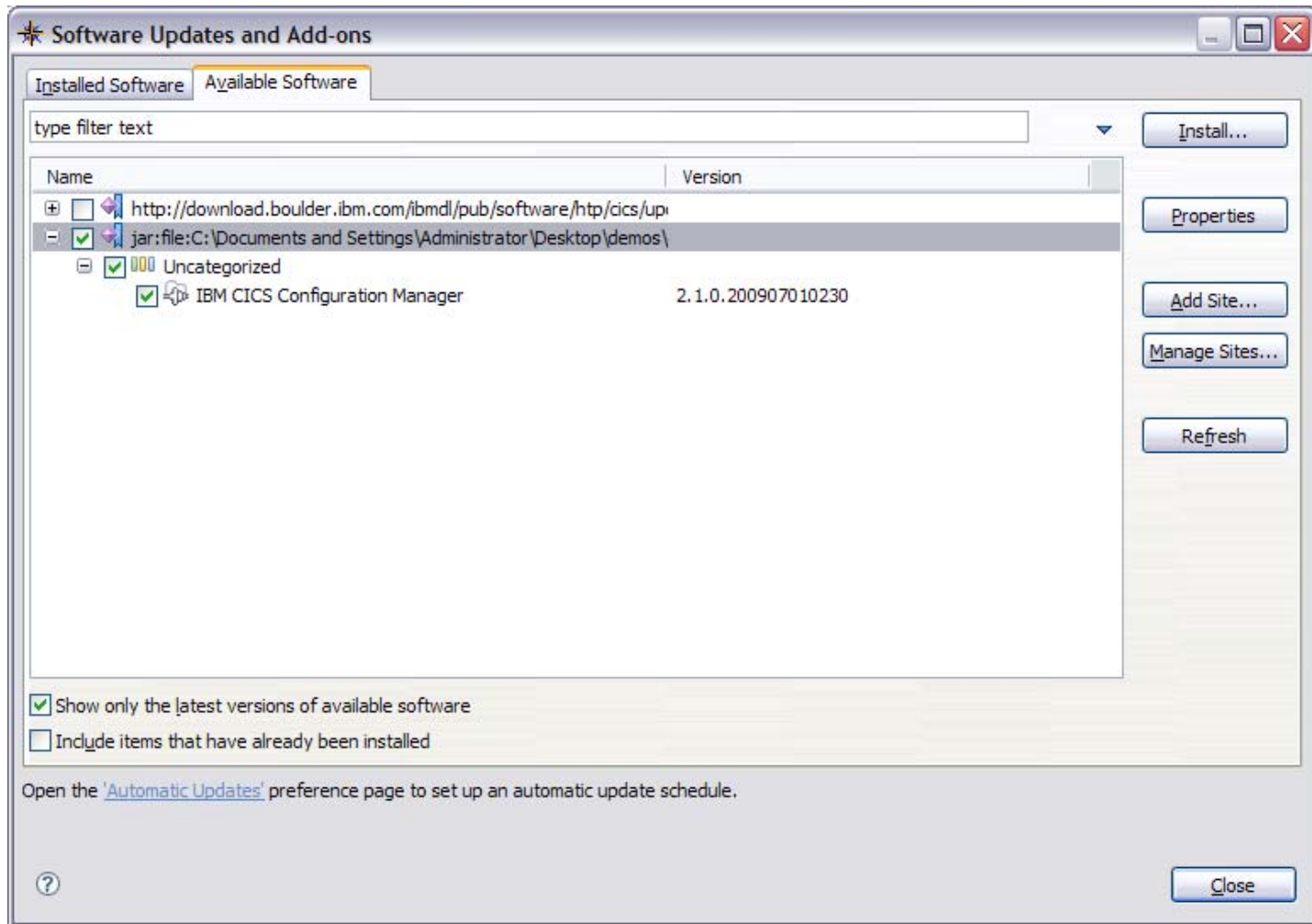
CICS CM Explorer plug-in installs through the update site mechanism in the CICS Explorer

CM - Configurations, Lists, Groups
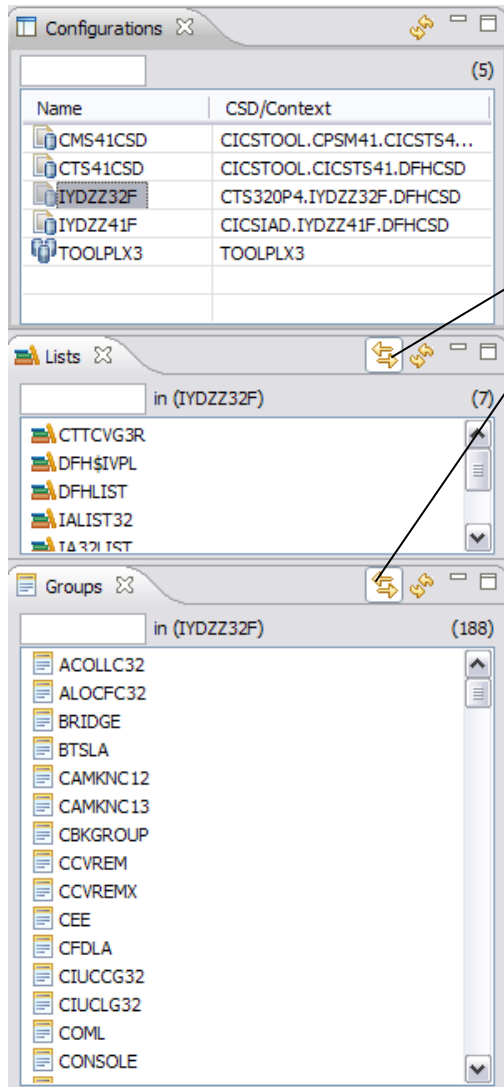
Views display configurations, lists and groups

Linked to selection – the lists and groups are displayed for the currently selected configuration. Can be toggled on and off.

Groups can also be displayed for the currently selected list

CM - Creating, editing and deleting a resource definition
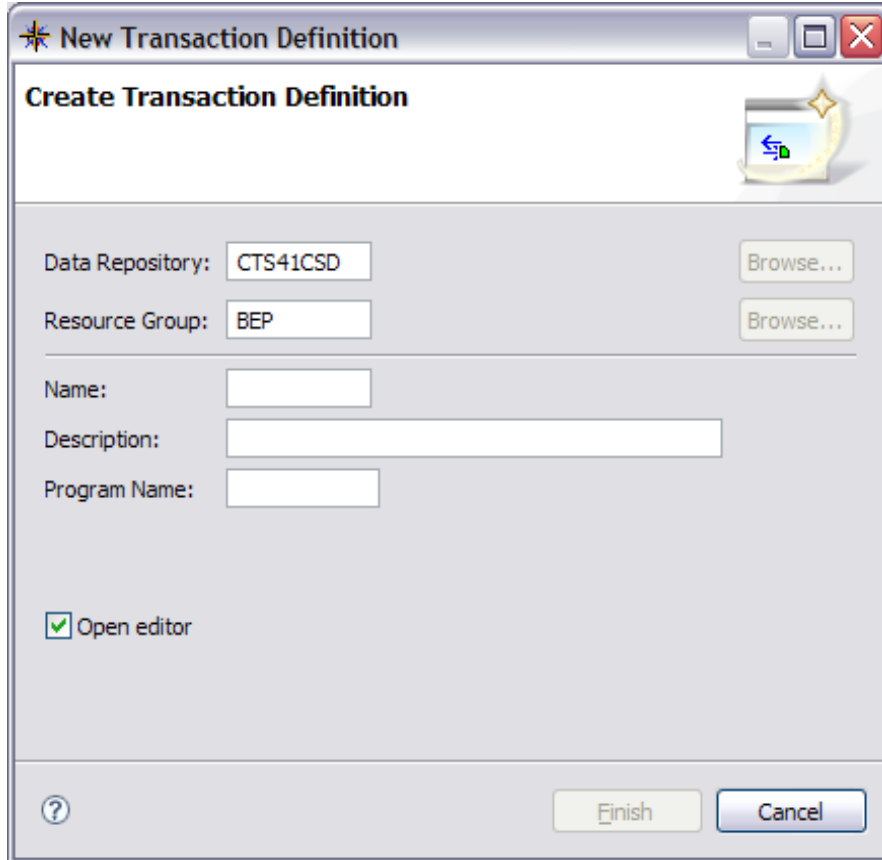
Can open a creation wizard from different paths.

Within a definitional view select the "New…" menu.

Select a group and select an option from the "New…" menu.
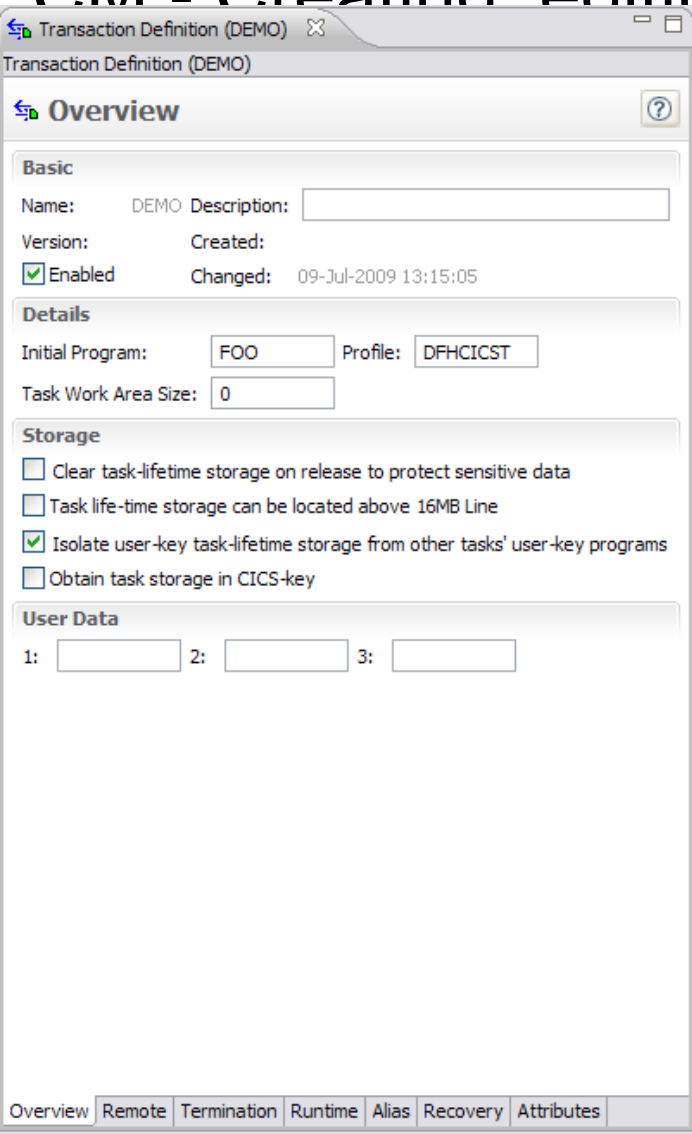
CM - Creating, editing and deleting a resource definition

Different resource types have slightly different creation wizards.

Only the basic attributes need to be entered at this point. Others are defaulted.

CM - Creating, editing and deleting a resource definition

Once create completes the resource is opened in an editor, where further changes can be made.

The resource has been created at this point.

These editors are the same as those used for the CICS Explorer, they inherit the validation and embedded help framework.

CM - History

Display by date groupings

Revision Time	Resource Name/After	Resource Type/Before	Group	User Name	Command	Change P...	Scheme
Today							
2009/07/09 13:43 FOO9		TRANDEF	BEP	CICSUSER	UPDATE		
Older Than This Month							
2009/05/07 17:52 FOO9		TRANDEF	BEP	CICSUSER	CREATE		

Resource History for FOO9 from earliest to latest entry

Sort by columns by clicking on column header

Resource History for BEP from 2009/04/09 13:07:41 to latest entry

Revision Time	Resource Name/... ▲	Resource Type/Before	Group	User Name	Command	Change P...	Sch
2009/05/27 09:31:41	A	ATOMDEF	BEP	CICSUSER	DELETE		
2009/05/27 09:31:37	A	ATOMDEF	BEP	CICSUSER	CREATE		
2009/07/09 13:18:35	DEMO	TRANDEF	BEP	CICSUSER	DELETE		
2009/07/09 13:15:28	DEMO	TRANDEF	BEP	CICSUSER	CREATE		
2009/05/07 17:53:37	FC02	TRANDEF	BEP	CICSUSER	CREATE		
2009/07/09 13:43:41	FOO9	TRANDEF	BEP	CICSUSER	UPDATE		
2009/05/07 17:53:19	FOO9	TRANDEF	BEP	CICSUSER	CREATE		
2009/05/18 14:40:28	FOOOO	TCPDEF	BEP	CICSUSER	CREATE		
2009/06/05 15:27:20	J000	CONNDEF	BEP	CICSUSER	DELETE		

CM - History

Select Filters to apply to history entries
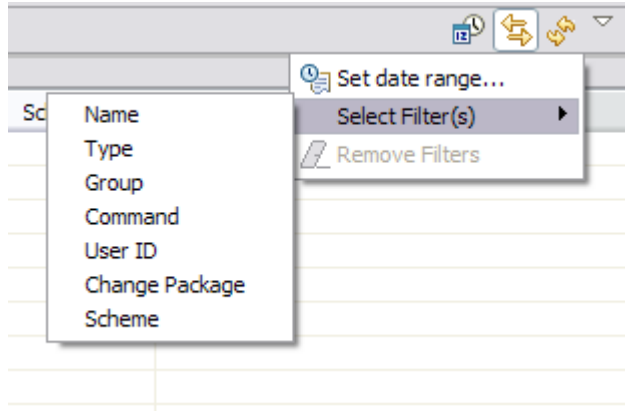
Once filters have been selected you can populate the values, choose "equals" or "not equals" and apply the filters

CM - History

Set Date range to apply to history entries
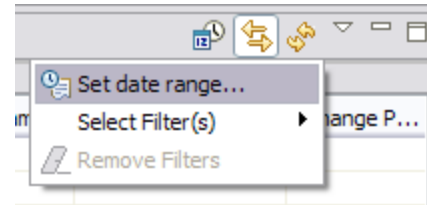
Select the range using the dialog box

This range will then be used to limit the results displayed to changes within these times

CM - Searching

You can drive the search dialog from the toolbar
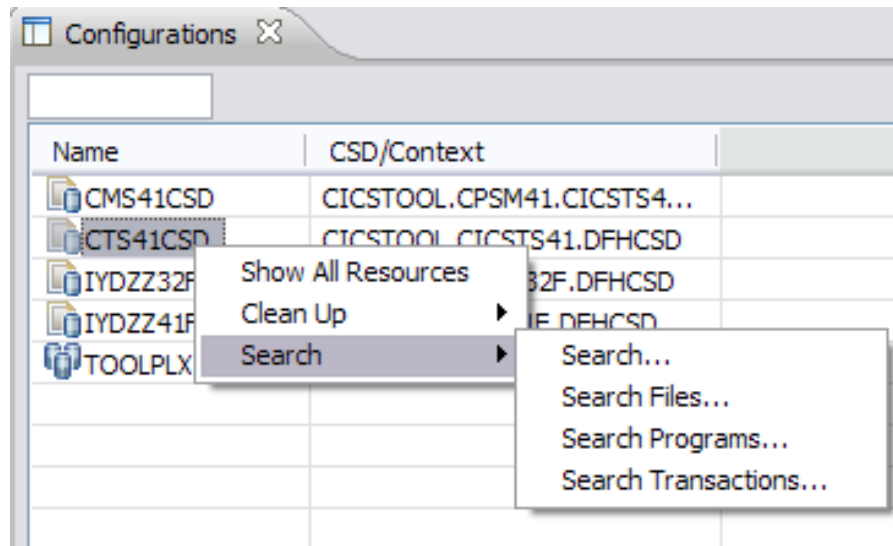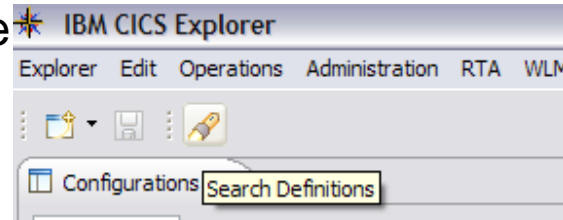
Or from one of the search options on a configuration or group

CM - Searching

From the search dialog you can specify name, type, configurations(s) and groups within a particular configuration

CM - Searching

If a resource type is specified further filtering can be done on attribute values

CM - Searching

Results are displayed in the
Search results view
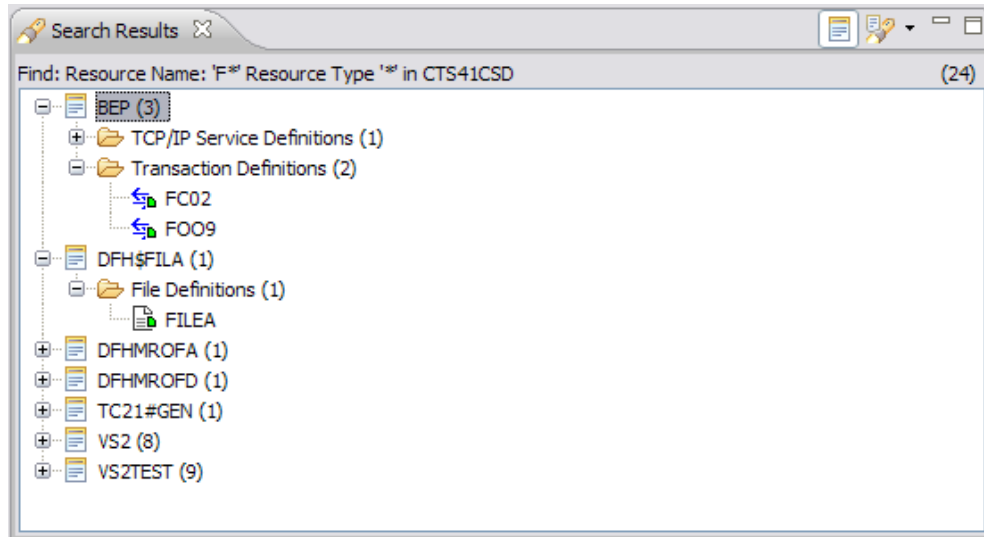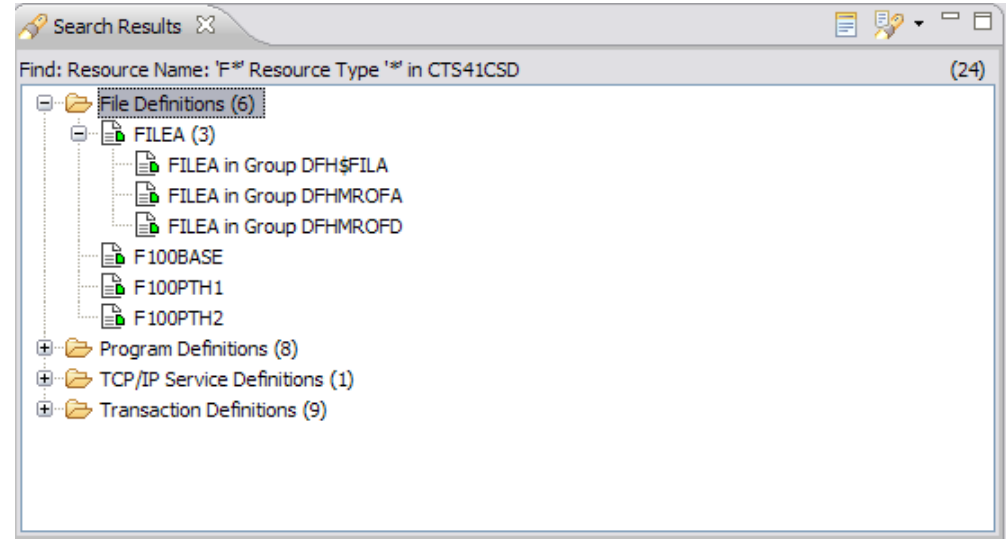
Results can be arranged by
group

Result history
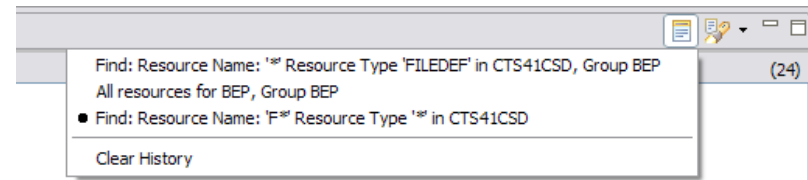
CM - Clean Up – Specific Searches
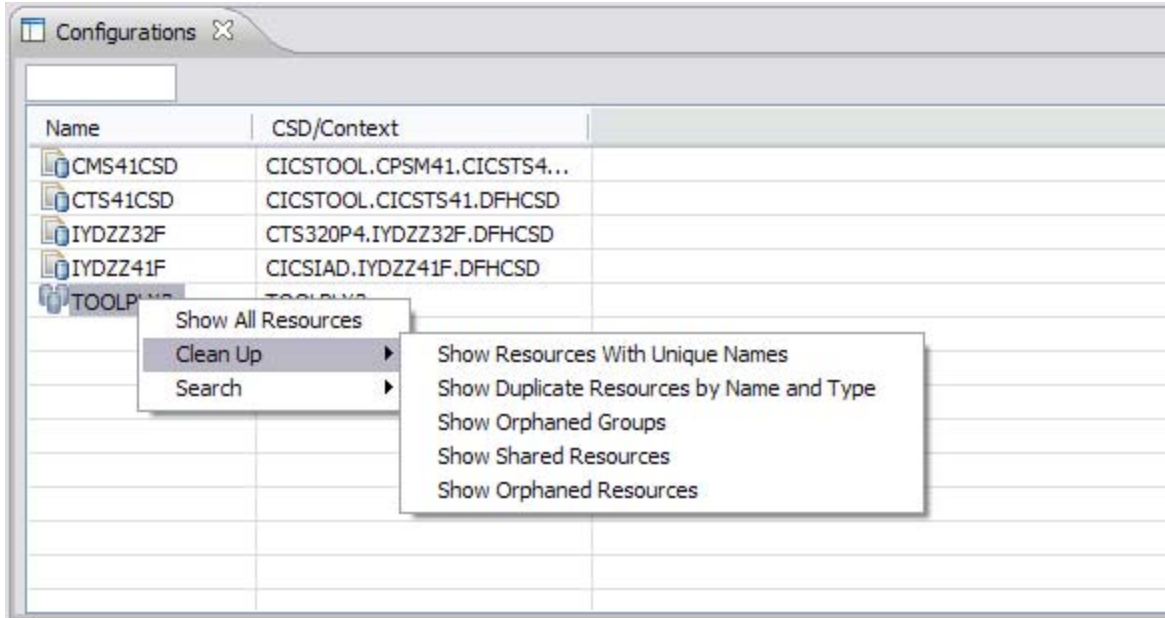
Some searches to aid in resource and CSD clean up have been provided

Show All Resources
Clean Up ▸
  Show Resources With Unique Names
  Show Duplicate Resources by Name and Type
Search ▸
  Show Orphaned Groups
  Show Shared Resources
  Show Orphaned Resources

Some specific searches on certain resource types:
LSRPool
Program

New...
Open
Install...
Add to Group...
Remove from Group
❌ Delete
Find ▸
  Similar Resources
  Transactions referencing Program

CM - Operational Definitions

You can associate a CMCI or a CICSPlex SM Data connection with your CM connection, to allow management of operational resources alongside use of CM

CM - Operational Definitions

This enables you to manage any regions connected to the WUI server and install CICSPlex SM definitions into those regions

Accelerating return on your CICS investments
IBM CICS Deployment Assistant for z/OS

- **New Deployment perspective integrates with CICS Explorer**

- **Discovery, Modelling and cloning CICS Systems**

- **Topology Visualization**

- **Automated creation, deployment, customization, and control of CICS regions**

- **Edit files, submit JCL, view output**

- **Simplify tasks, save time, and reduce risk**

- **More info at http: ibm.com/software/htp/cics/deployment/**

  – Features and benefits, data sheet, announcement letter …
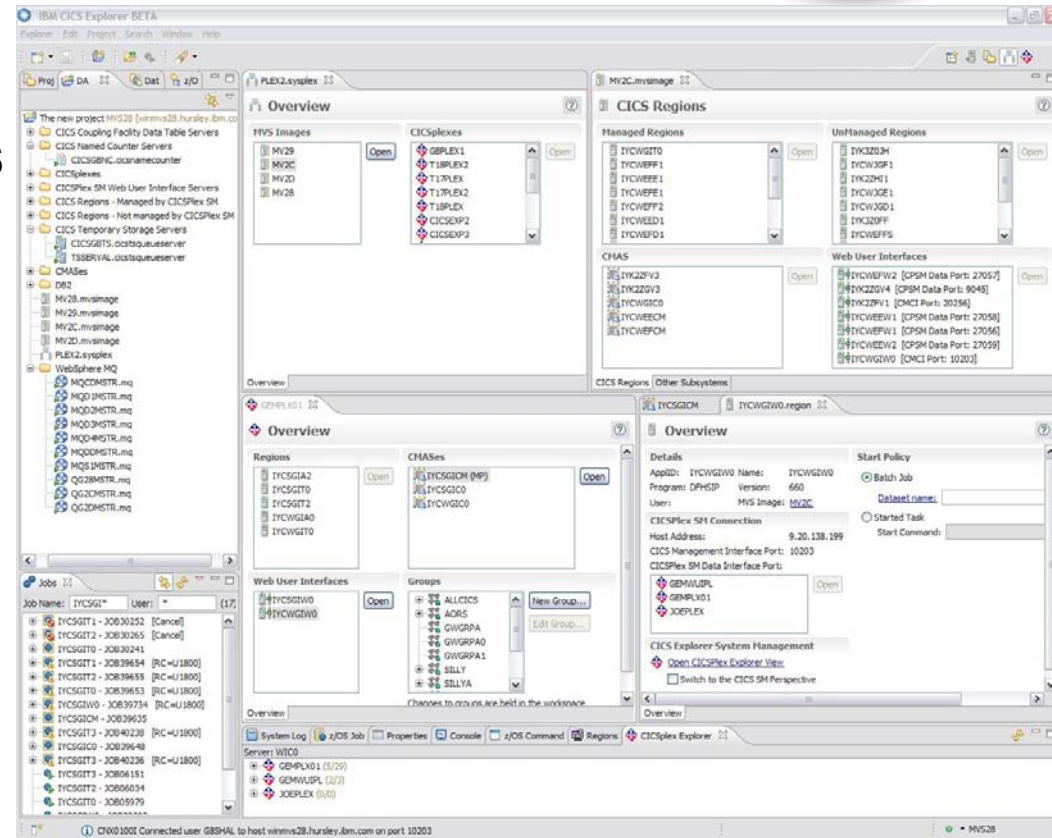
Discovery – 5 simple steps

Visualization - Sysplex

Sysplex view shows all MVS images and CICSplexes in the LPAR

CICSplex views shows managed regions and groups, CMASs and WUIs

Visualization - CICSPlex

Navigate from CICSplex to Managed region, CMAS, and WUI

Visualization – MVS image

Navigate from MVS image to all CICS regions and other sub-systems

Automated SM connection set-up

DB2, WMQ, and other CICS sub-systems

Visualization – Managed and Unmanaged regions

Clone region

Add to CICSplex

Clone – 3 simple steps

Specify new names

New dataset names chosen automatically - edit if required

Cloned region added to model

Console view shows all cloning actions and list of oustanding manual tasks

z/OS Command Line

Type in any authorized z/OS command
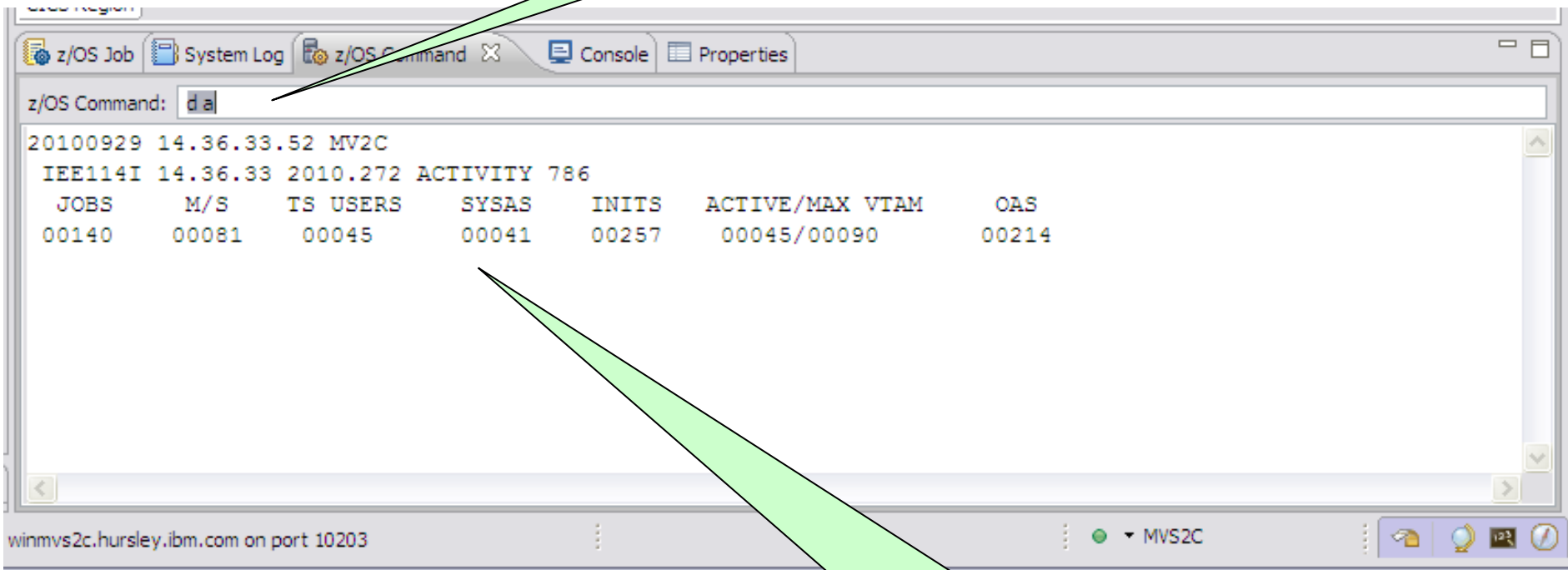
```
z/OS Job | System Log | z/OS Command X | Console | Properties

z/OS Command:  d a

20100929 14.36.33.52 MV2C
 IEE114I 14.36.33 2010.272 ACTIVITY 786
  JOBS     M/S     TS USERS     SYSAS     INITS     ACTIVE/MAX VTAM     OAS
 00140    00081     00045       00041     00257     00045/00090        00214
```

winmvs2c.hursley.ibm.com on port 10203   ● ▾ MVS2C

Command output shown below

Cheat Sheets

Summary

- **Revitalize your infrastructure …**

  - Simplify network set-up moving to IP

  - Manage distributed security with ID Propagation

  - Improve workload balancing with CICSPlex SM

  - Reduce skills costs with CICS Explorer

  - Save money with Threadsafe optimization

  - Ease management burden with CICS Configuration Manager

  - Discover and clone complex environments with CICS Deployment Assistant

Resources

For more information

CICS Development Technical Services

Engage the IBM Hursley CICS development team to ensure that you get the maximum value from your CICS investments.

Consultants are now available via a funded services engagement directly from CICS development providing a complete range of CICS services - no one has more experience!

- **For more information please contact: CICSDTS@uk.ibm.com**

CICS On Demand Seminars

**Free customised technical agenda of CICS TS and CICS tools products**

- Web Services, Events, Web 2.0, version upgrades, tooling etc.

Targeted at AD, System Programmers and Architects at customers' own location

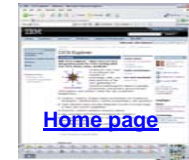**Demonstrates how to use the new features in the latest releases to leverage existing solutions**

Can be tailored to customers interests

- **For more information please contact: cicssem@uk.ibm.com**
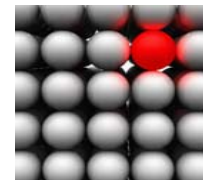
CICS Communities and Information

- **CICS Transaction Server V4.1**
  - http://ibm.com/cics/tserver/v41/

- **CICS Explorer**
  - Home page ibm.com/cics/explorer
  - Forum http://tinyurl.com/68bndw

- **Twitter**
  - Subscribe to the IBM_System_z channel & CICSfluff channel to get CICS news flashes

- **CICS Blog - Comment and opinion**
  - TheMasterTerminal.com

- **CICS eNews**
  - Subscribe for news about CICS and related products

- **CICS Links regular updates all in a single presentation deck**

- **YouTube channels**
  - CICS Explorer - Videos, demos and other cool stuff
  - CICSFluff - Other CICS videos

Home page

CICS Explorer Public Forum

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Thank You !