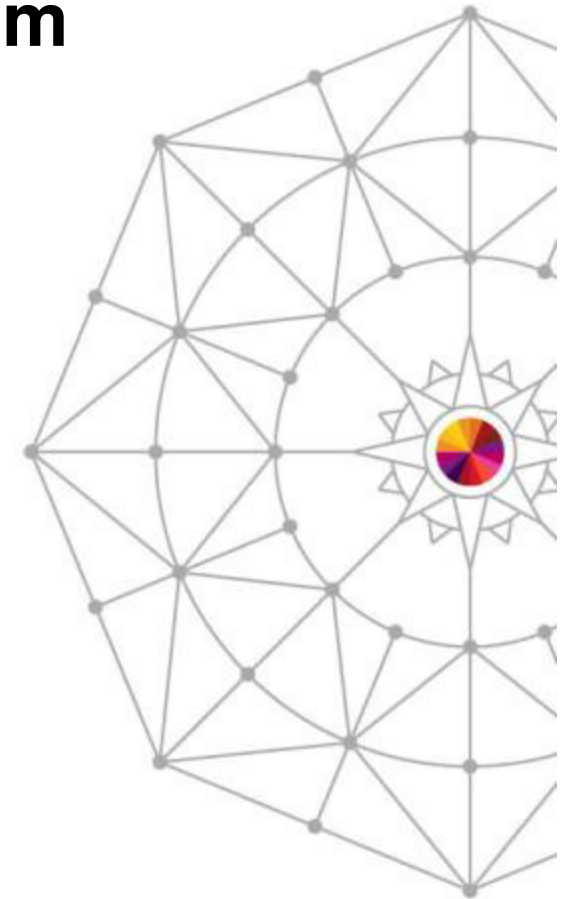




# What's New In the IBM Problem Determination Tools

Francisco M Anaya  
IBM Problem Determination Tools Architect  
Randy Campbell  
IBM Debug Tool Developer

March 10, 2014  
Session 14621



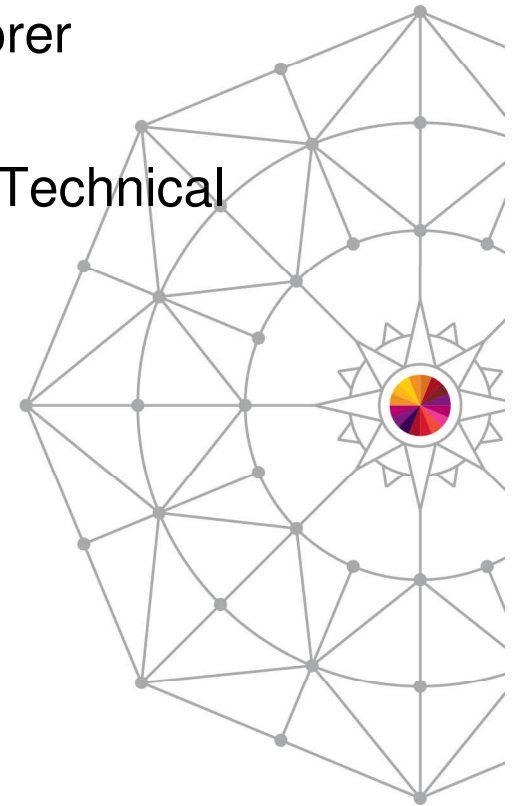
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# Agenda

- What are the IBM Problem Determination Tools
- Functional Alignment with CICS Tools and z/OS Explorer
- Solution Packs
- Problem Determination Tools for Multi-platforms V1.0 Technical Preview
- New Debug Tool Code Coverage
- New Fault Analyzer Web Interface
- COBOL V5 Support
- Playback Support for RD/z
- JCL Instrumentation Eclipse plug-in
- IMS private message region enhancement



# IBM Problem Determination Tools Products



## Products

### Application Performance Analyzer for z/OS

A non-intrusive application performance analyzer that aids developers in the design, development and maintenance cycles.

### Debug Tool for z/OS

IBM Debug Tool for z/OS helps examine, monitor, and control the execution of application programs.

### Fault Analyzer for z/OS

Helps developers analyze and fix application and system failures. Fault Analyzer gathers information about an application and the surrounding environment.

### File Manager for z/OS

Provides comprehensive, user-friendly tools for working with z/OS data sets, DB2®, CICS® or IMS™ data, or MQ queues. These tools include the familiar browse, edit and copy.

### Workload Simulator for z/OS and OS/390

Enables you to conduct stress, performance, regression, function and capacity planning tests, while eliminating the need for large amounts of terminal hardware.

### Problem Determination Tools Studio and Plug-ins

Provides easy access through a graphical user interface (GUI) to the z/OS Problem Determination Tools.

### Problem Determination Solution Pack

Convenient package to help address your problem analysis needs.

### Problem Determination Testing Solution Pack

Convenient package to help address your testing needs.

### Data Set Commander for z/OS

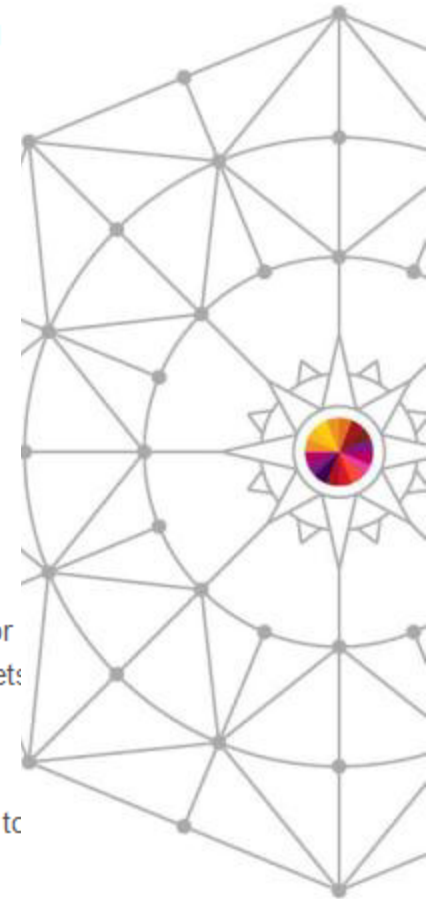
Extends interactive and batch capabilities for performing operations on partitioned data sets and their members.

### Hourglass

Allows sites to alter the Date/Time returned to a z/OS application when a time request is made (SVC 11 or PC Time Requests).

### Migration Utility for z/OS

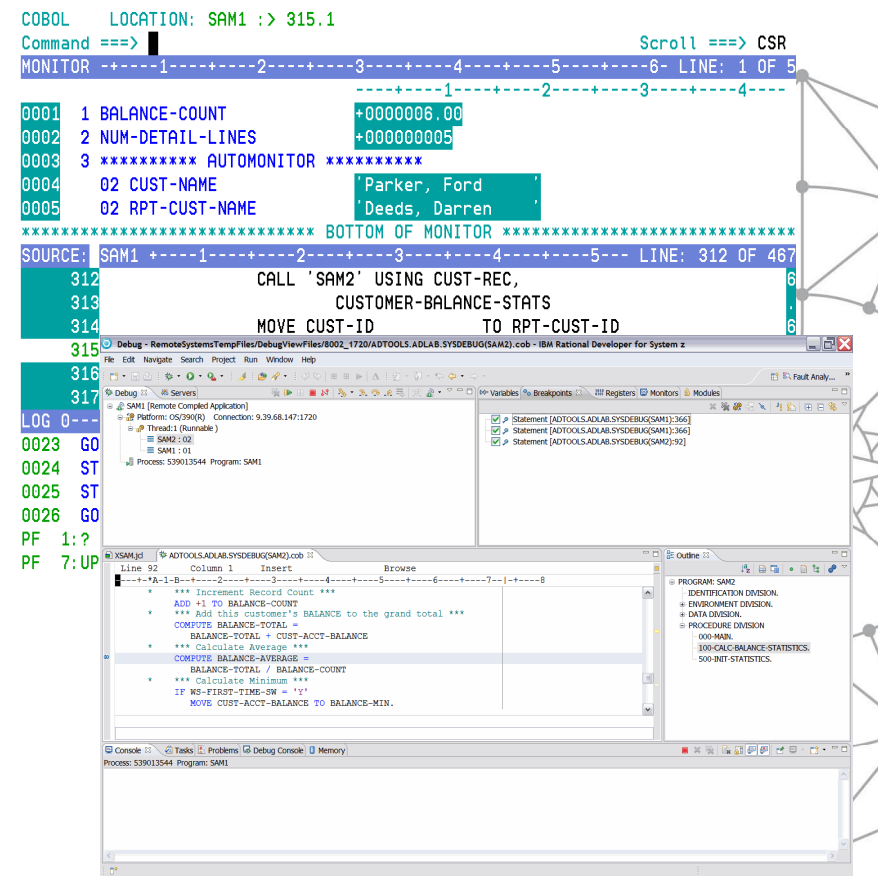
Generates IBM COBOL applications from programs written in the CA Easytrieve® languages.



# IBM Debug Tool Version 13 (Announce: October 1, GA: October 18)



- IBM Debug Tool can help you increase debugging efficiencies and reduce application development cycle times.
- Program testing and analysis aid that helps you examine, monitor, and control the execution of application programs on z/OS (CICS/DB2/IMS/COBOL/PLI/ASM,C/C++/ASM/JAVA w Toolkit)
- Code Coverage Facilities
- Proven 3270-based interface
- Eclipse based GUI
- Support for RD/z



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# IBM Debug Tool Version 13



## What's new?

- Smooth debugging mixed apps JAVA/COBOL/PLI
- Improved Code Coverage. Support for E PL/1
- Automatic start IMS MPP regions, dynamic routing of transactions
- IMS Startup Cross Reference table for WASz and Web started transactions
- RDz Playback
- Support for DB2 V11, IMS V13, CICS TS 5.1, z/OS 2.1, WASz 8.5., COBOL V5.1, Enterprise PLI V4.4, C/C++ for z/OS 2.1, RDz 9.0
- JCL Instrumentation plugin

```
File View Services Help
Synopsis Line 12 Col 1 80
Command ==> Scroll ==> CSR
JOBNAME: DNET246S SYSTEM ABEND: 0C7 DEMOMVS 2007/10/30 20:00:12
Source
Line #
000088 * *** Add this customer's BALANCE to the grand total ***
000089 COMPUTE BALANCE-TOTAL =
000090 BALANCE-TOTAL + CUST-ACCT-BALANCE

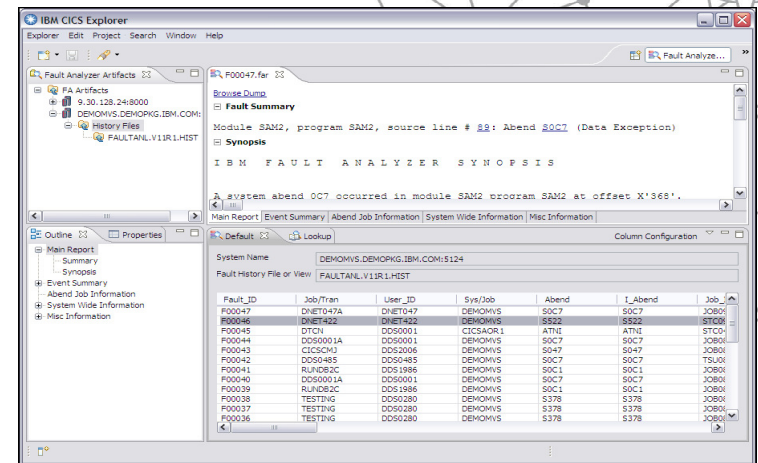
The COBOL source code for data fields involved in the failure:

Source
Line #
000059 05 CUST-ACCT-BALANCE PIC S9(7)V99 COMP-3.
000066 05 BALANCE-TOTAL PIC S9(7)V99 COMP-3.

Data field values at time of abend:

BALANCE-TOTAL = 10948.44
CUST-ACCT-BALANCE = X'7C7B5B6C50' *** Cause of error ***

*** Bottom of data.
```



# IBM File Manager Version 13 (Announce: October 1, GA: October 18)



- **IBM File Manager** allows you to manage production, test, and development data across multiple formats and storage media.
- Create, edit, copy, browse, extract, print, and compare enterprise data (VSAM/DB2/IMS,CICS/MQ)
- Proven 3270-based interface and free graphical user interface.

## What's new?

- IMS GUI
- FM DB2 enhancements
- Batch template and update support
- UNICODE and various CCSIDs support
- Support for DB2 V11, IMS V13, CICS TS 5.1, MQ8.5, z/OS2.1, PL/I 4.4,
- DB2 Large Object (LOB) including XML columns
- A range of other enhancements to address key customer requirements

The screenshot displays the IBM File Manager interface with two main windows. The top window shows a data table with columns for Ref, Field, Picture, Typ, Start, Len, and Data. The bottom window shows a list of records with columns for PERSONID, FIRSTNAME, SURNAME, PHONE, POSTCODE, and COUNTRY.

Ref	Field	Picture	Typ	Start	Len	Data
2	CUSTOMER-KEY		AN	1	5	
3	CUST-ID	X(5)	AN	1	5	02202
4	NAME	X(17)	AN	6	17	Major, Art
5	ACCT-BALANCE	S9(7)V99	PD	23	5	1234.56
6	ORDERS-YTD	S9(4)	BI	28	2	5
7	ADDR	X(20)	AN	30	20	1512 Pine Bluff
8	CITY	X(14)	AN	50	14	Harmon
9	STATE	X(02)	AN	64	2	MN
12	OCCUPATION	X(30)	AN	137	30	College student

PERSONID	FIRSTNAME	SURNAME	PHONE	POSTCODE	COUNTRY
1	100	Roanna Ryan	(581) 219-5666	45760	Colombia
2	101	Jocelyn Clayton	(471) 342-2303	98900	Bolivia
3	102	Alma Massey	(761) 407-1773	96909	Italy
4	103	Emily Ellis	(735) 824-8349	96010	Bermuda
5	104	Talon Dickerson	(865) 152-0625	52311	Nepal
6	105	Keelie Weiss	(998) 495-3164	83644	Cuba
7	106	Orlando Larsen	(800) 753-0647	46120	Bhutan

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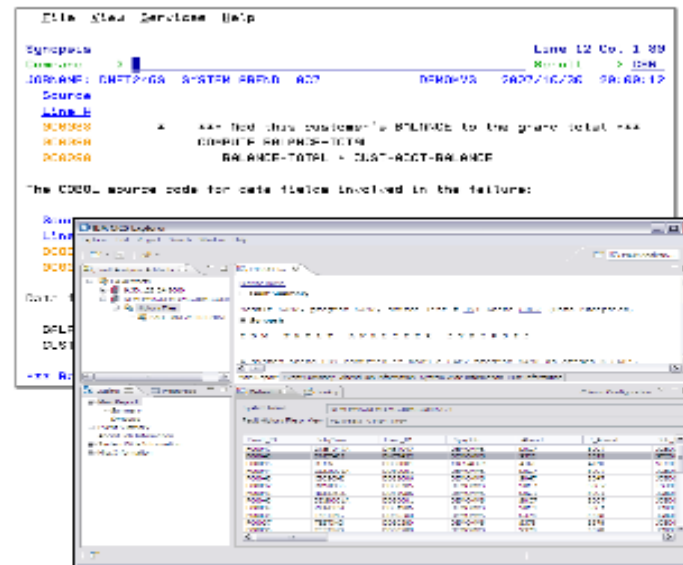
# IBM Fault Analyzer Version 13 (Announce: October 1, GA: October 18)



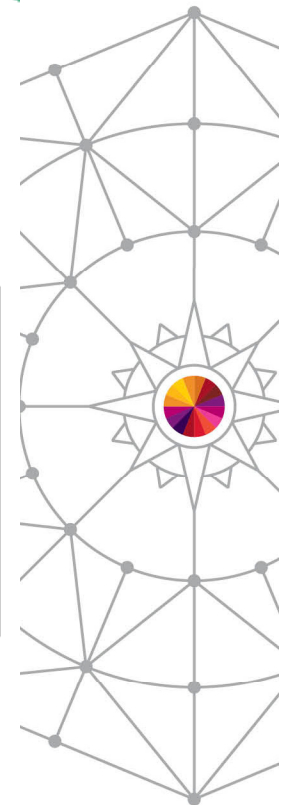
- **IBM Fault Analyzer** improves developer productivity and decreases deployment costs by helping to analyze and correct application failures quickly (CICS/DB2/IMS/MQ/COBOL/PLI/ASM/C/C++/ASM/JAVA).
- Develop and test new and existing applications more productively, helping to reduce costs along the way.
- Proven 3270-based interface and free graphical user interface.

## What's new?

- Optimize
  - Sidefile checking and reporting
  - Customer specific module and abend descriptions
  - ISPF Virtual Relief
- Modernize
  - Enhanced web interface using Dojo
- Enhanced Java support
- Support for DB2 V11, IMS V13, CICS TS 5.1, z/OS 2.1, COBOL V5, PL/I V4.4, Java V7
- 13 A range of key customer requirements



*Helps to identify the cause, analyze the failure, and fix the problem*



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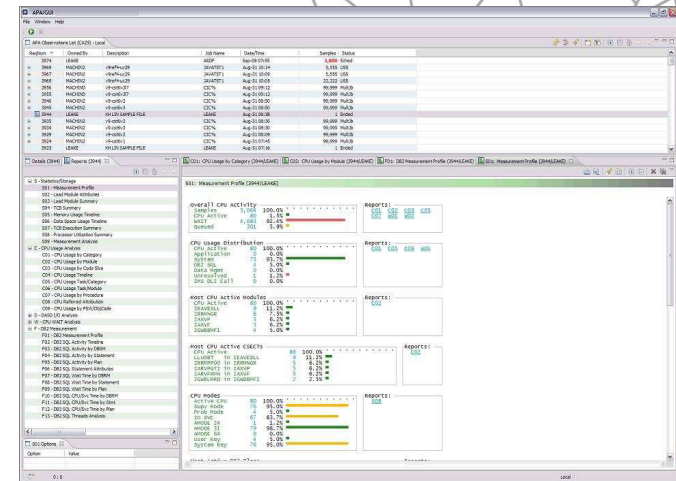
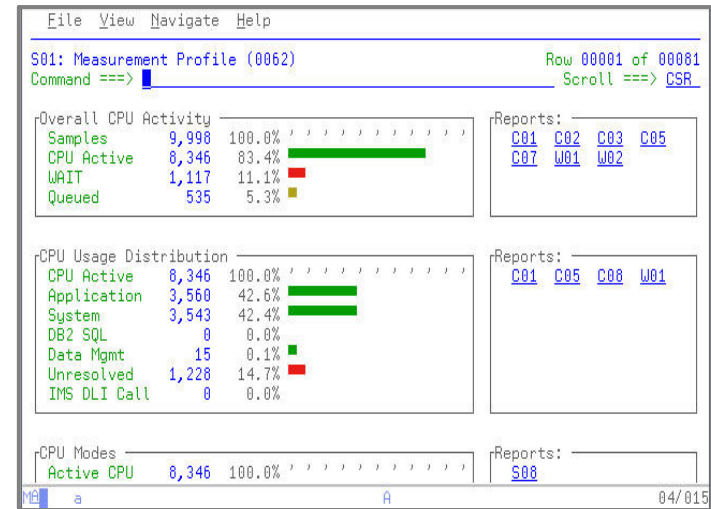
# IBM Application Performance Analyzer Version 13 (Ann: OCT 1, GA: OCT 18)



- **IBM Application Performance Analyzer** helps maximize the performance of your applications and improve the response time of your online transactions and batch turnaround.
- Identify constraints and improve the entire application's performance no matter where the problem resides (CICS/ IMS/DB2/MQ/COBOL/PLI/ASM/JAVA)
- Proven 3270-based interface and free graphical user interface.

## What new?

- Enhanced support for WebSphere and Java
- Sampling enhancements to improve accuracy of reports
- WAS Phase 2 to support simultaneous sampling of servant regions, CICS and DB2 activity
- Support for DB2 V11, IMS V13, CICS TS V5.1, z/OS 2.1, WASz V8.5, COBOL V5.1, PL/I V4.4, Java V7
- A range of key customer requirements



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# IBM HourGlass V7.1 (Announce: October 1, GA: November 6)



IBM® HourGlass is a leading z/OS® clock simulator for testing mainframe applications. The features and flexibility of HourGlass promote more accurate and reliable application testing with the ability to coordinate full functionality across time zones. HourGlass can simulate past, present or future dates and times without changing application code or computing environments.

- **IBM HourGlass** allows testing of time-sensitive application programs without dedicated individual LPARs or costly IPLs
- Provides support for popular middleware elements such as DB2, IMS, CICS, and COBOL, on the z/OS platform.
- Proven 3270-based interface and batch interface options.

```
----- IBM HourGlass: Control Overview -----1 of 1000
Command ==>
-----
```

Cmd	Se1/Stat/Disp	Type	Name	Owner	Job/name	User-ID	Date	Time
---	DISA	DB2	CEDB001	AGGUSR	PLAN1	USRDEV	2006-01-01	M0100
---	ENAB	DB2	CEDB002	AGGUSR	PLAN2	TSOAM	2006-02-01	M0100
---	ENAB	IMS	CEIM001	AGGUSR	REG1	USRDEV1	2006-01-01	P0100
---	DISA	IMS	CEIM002	AGGUSR	REG2	USRDEV2	2006-02-01	M0200
---	DISA	JSCD	CEJS001	AGGUSR			2006-01-01	M0400
---	DISA	JSCD	CEJS002	AGGUSR			2006-02-01	A1600
---	ENAB	MBAT	CEMB001	AGGUSR	USRJOB1		2007-01-01	M0100
---	ENAB	MBAT	CEMB002	AGGUSR	USRJOB2		2007-02-01	P0100
---	ENAB	MBAT	CEMB003	AGGUSR	USRJOB3		2007-03-01	M0300
---	ENAB	MBAT	CEMB004	AGGUSR	USRJOB4		2007-04-01	P0200
---	ENAB	MBAT	CEMB005	AGGUSR	USRJOB5		2007-05-01	M0500
---	ENAB	MBAT	CEMB006	AGGUSR	USRJOB6		2007-06-01	M0100
---	ENAB	TSOI	CETI001	AGGUSR		USRDEV	2005-11-30	M0100
---	DISA	TSOI	CETI002	AGGUSR		USRHRQ	2005-05-01	M0400

```
----- IBM HOURGLASS CICS CONTROL: SPECIFY GLOBAL DATE/TIME VALUE -----
SPECIFY THE HOURGLASS GLOBAL DATE WITH TIME OFFSET. THE DATE APPLIES
TO THE ENTIRE CICS REGION AND TIME VALUES (PLUS OR MINUS) OFFSET THE
CURRENT TIME FOR ALL ELIGIBLE TRANSACTIONS.

HGCC GLOBAL DATE ==> 2011-12-14
                                     FORMAT IS ccyymm-dd, WHERE:
                                     ccyymm = FULL 4 DIGIT YEAR
                                     mm = 2 DIGIT MONTH
                                     dd = 2 DIGIT DAY

HGCC GLOBAL TIME ==> P3000
                                     FORMAT IS dhhmm, WHERE:
                                     d = "P" OR "E" FOR PLUS OFFSET
                                     d = "M" OR "W" FOR MINUS OFFSET
                                     d = "A" FOR ABSOLUTE TIME VALUE
                                     hh = HOURS (00-23)
                                     mm = MINUTES (00-59)
```

## What's new?

- Support for SYSPLEX synchronization
- Additional CICS, IMS invocation command options supported
- Dynamic update of repository
- JES exit to ensure time options are valid



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# Data Set Commander V8.1 (Announce: October 1, GA: November 6)



- **IBM Data Set Commander** provides efficient tools and shortcuts to improve handling of PDS and PDSE.
- Fully automated facility to manage caching of PDS and PDSE members.
- Fully compatible replacement for IEBCOPY, enhancing capability to manage and manipulate PDS and PDSE.
- Manage PDSE member generations (versions)
- Integrated front end to ISPF. It enhances ISPF functions, including browse, edit, TSO shell, and DSLIST, UNDELETE, and provides many additional capabilities

## What's new?

- Automated PDS/PDSE caching (LLA)
- Manage PDSE member generations (versions)

```

-DSC-                               LLA Monitor Options Menu
Command ==>

Monitor State: ACTIVE  Timer: UNIT=1s DELAY=2s AUTO=10m POLL=5m PAUSE=0s
Authorization: FULL

==>  _ Enter selected option as follows:

      1_ Display defined LLA library groups
      2_ Display monitored LLA libraries
      3_ Display monitored load modules
      4_ Display SYSPLEX LLA Monitors
      5_ LLA Monitor started task control
      X_ Exit LLA Monitor control application

Press ENTER key to select or point and shoot at option number
Press END key to exit
-DSC-                               LLA Monitored Libraries          Row 1 to 14 of 59
Command ==>                                                                Scroll ==> CSR

Monitor State: ACTIVE
Authorization: FULL

Main commands: S Sort list  X Exit to main menu
Line commands: A Activate  D Deactivate  R Refresh  M Members  B Browse

Sta Data Set Name                Group  Last Refresh  MemNum
- ACT LNKLST.FAULTANL.V12R1.SIDIMOD1  00    13/09/11 13:20    10
- ACT BOOKMAN.SEOYLOAD              00                                13
- ACT CBC.SCCNCMP                    00                                21
- ACT CBC.SCLBDLL                    00                                 7
- ACT CBC.SCLBDLL2                   00                                 5
- ACT CEE.SCEERUN                    00                               3574
- ACT CEE.SCEERUN2                   00                               1208
- ACT CENTER.ISPMLIB                 00                                 9
- ACT CENTER.ISPPLIB                 00                                247
- ACT CENTER.ISPSLIB                 00                                 10
- ACT CENTER.ISPTLIB                 00                                 3
- ACT CENTER.LINKLIB                 00                                147
- ACT DFSORT.SICELINK                00                                 49
- ACT DITTO.SDITMOD1                 00                                 20
    
```



# IBM Workload Simulator



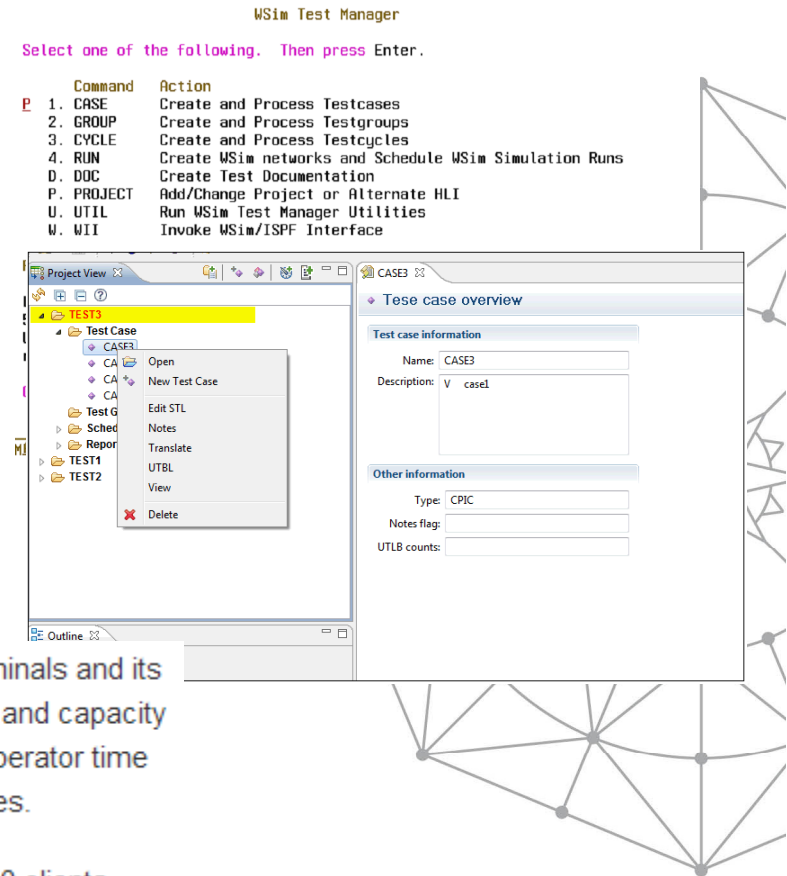
- **IBM Workload Simulator** helps eliminate the need for large amounts of terminal hardware and terminal operator time for testing.
- Ideal for stress, performance, regression, function, and capacity planning tests.
- Proven 3270-based interface and new free graphical user interface.

## What's new?

- Graphical user interface (GUI) that help you manage testing scripts and testing buckets

IBM® Workload Simulator for z/OS® and OS/390® can simulate a network of terminals and its associated messages. This solution for stress, performance, regression, function and capacity planning testing eliminates the need for large amounts of terminal hardware and operator time by providing a powerful analysis with log list, log compare and response time utilities.

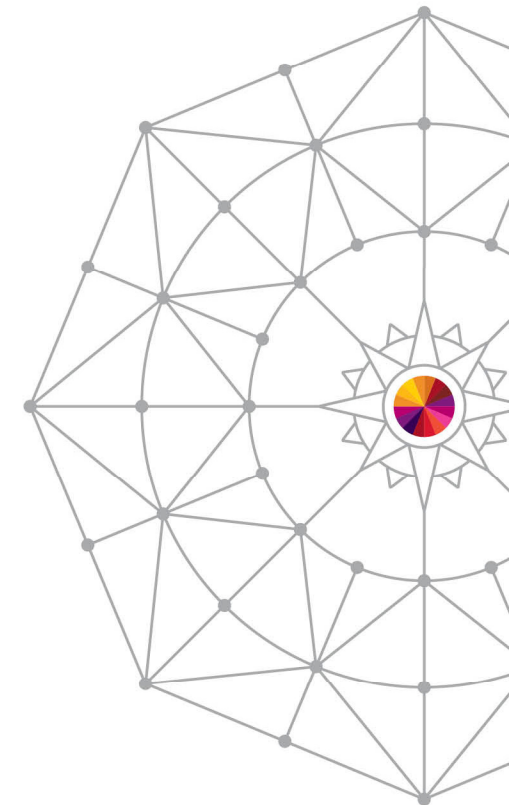
- Provides support for SNA, CPI-C (LU 6.2), TCP/IP, Telnet 3270, 3270E and 5250 clients, Telnet line mode network virtual terminal clients, simple TCP and UDP clients, FTP clients and multiple client applications that run on top of TCP/IP.



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# CICS Tools, PD Tools and z/OS Explorer Functional Alignment



## Eclipse-based integration platform for z/OS tools

IBM® Explorer for z/OS® (z/OS Explorer) is an Eclipse-based integration platform for z/OS users that enables the integration of a wide variety of solutions using IBM, vendors, or customer plug-ins. z/OS Explorer is extendable via the IBM repository of compatible products to fulfill each user's roles and responsibilities. For example, z/OS Explorer, powered by IBM product plug-ins from the repository can provide a single workbench with the ability to develop, and test CICS, DB2, WebSphere MQ, IMS, and batch applications and manage related sub-systems.

IBM Explorer for z/OS delivers extensible workstation connectivity to key z/OS functions with:

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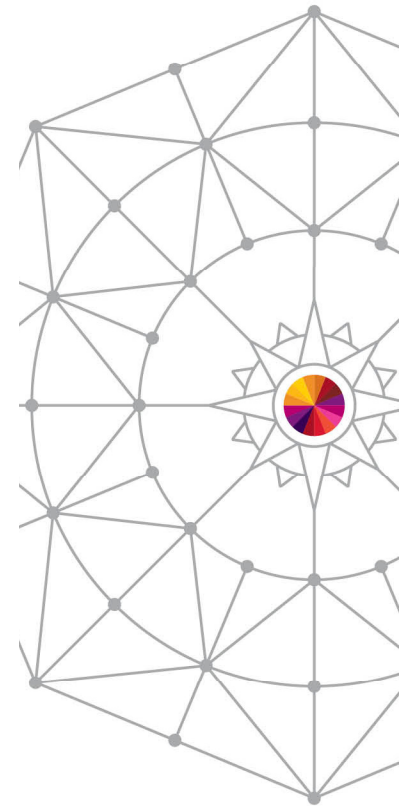


# Problem Determination Tools V13 GUIs To Meet Your Needs



- The GUIs are available with Rational Developer for z, for a full blown application development environment, or in conjunction in a systems environment as part of the PD Tools Studio, CICS Explorer, IMS Explorer on top of a z/OS Explorer base/technology
- Rational Developer for System z

CICS Explorer, IMS Explorer  
or PD Tools Studio  
with z/OS Explorer



# Solution Packs

## Four New Tools Solution Packs



### CICS Optimization Solution Pack for z/OS V5.1

Quickly optimize performance of CICS systems and applications with CICS

Interdependency Analyzer, CICS Deployment Assistant, CICS Performance Analyzer, CICS Configuration Manager

### CICS Modernization Solution Pack for z/OS V5.1

Understand deployed CICS application and system resources, connect from non-mainframe devices, and create CICS infrastructure to support the increased workload

with CICS Interdependency Analyzer, CICS Deployment Assistant, CICS Transaction Gateway for z/OS

### IBM Problem Determination Solution Pack for z/OS V1.1

Cost effective problem analysis for z/OS sub-systems and languages with both GUI & 3270 interface with File Manager for z/OS, Fault Analyzer for z/OS, Debug Tool for z/OS, Workload Simulator for z/OS and OS/390, Hour Glass, Data Set Commander

### IBM Problem Determination Testing Solution Pack for z/OS V1.1

Reduce testing time, improve application reliability and user diagnosis capabilities, and improving user's ability to regulate and monitor testing activities with Debug Tool for z/OS , Workload Simulator for z/OS and OS/390, Hour Glass



Upgrade from standalone products using trade-ups

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# Problem Determination Tools for Multi-platforms V1.0 Technical Preview

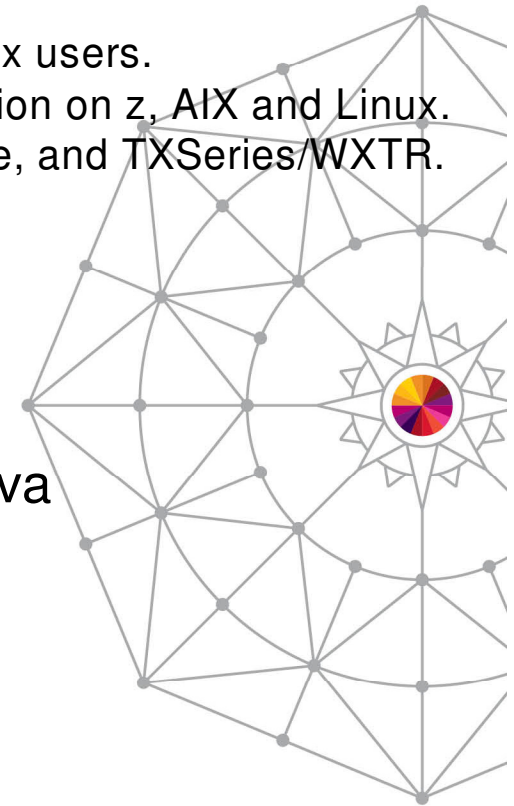
## Why PD Tools for Multiplatforms?

- We have customers beyond z platform - AIX and Linux users.
- Provide a consistent user experience for customers running application on z, AIX and Linux.
- Targeting customers using WebSphere MQ, Java/WAS/Liberty Profile, and TXSeries/WXTR.
  - A differentiation from the competition.

PD Tools for Multi-platforms features are available as a technical preview

- Managing data on distributed platforms and analyzing Java dumps
- Features are subject to change at our own discretion.
- Available following this link:

<http://www-01.ibm.com/support/docview.wss?uid=swg27040206>



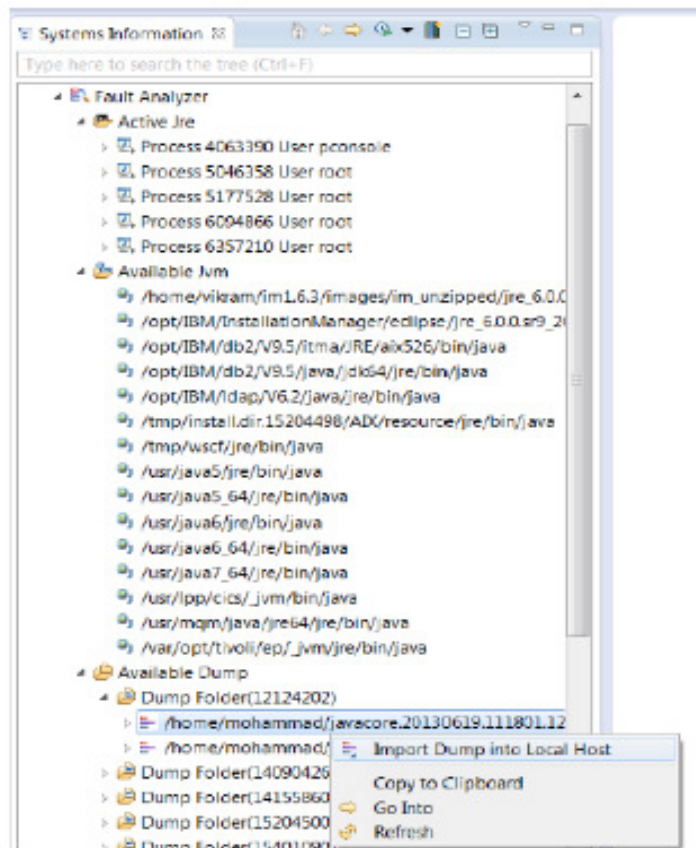


# Fault Analyzer for Multi-platforms features

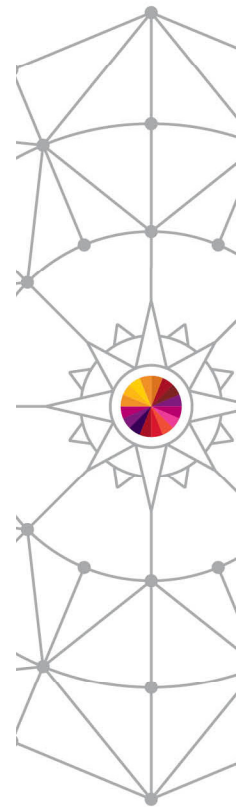
## Fault Analyzer for Multiplatforms overview (Java dump analysis)

- Support AIX and Red Hat operating systems on System p.
- Analysis of Java dump files on a local file system.
- Supports analysis of Java dumps from IBM's Java virtual machines. While we only provide support for AIX and Red Hat, Java dumps from any supported platforms should work. Just import Java dumps to your local system.
- Some key features:
  - Importing Java dumps to your local workspace for analysis.
  - Display of Java threads in the dump and stack trace of executing program in each thread.
  - Display of general information about Java dumps (command to start the Java program, environmental values, and system information).
  - Source line display.
  - Discovery of Java run-time environments installed on your system.
  - Discovery of Java dumps on your system.
  - Discovery of Java processes running on your system and instructing to take a dump.

# Fault Analyzer for Multi-platforms Overview



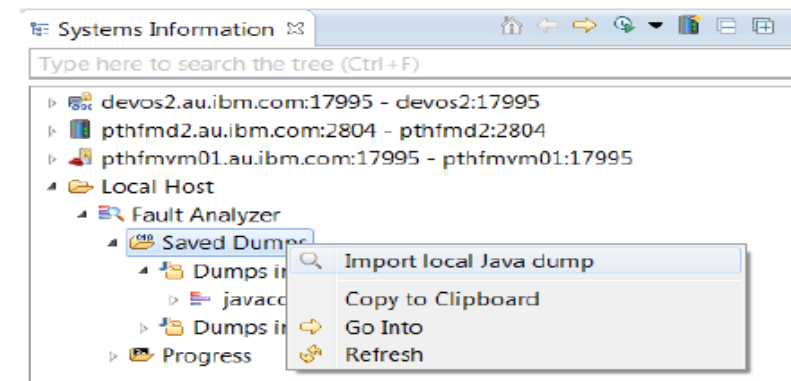
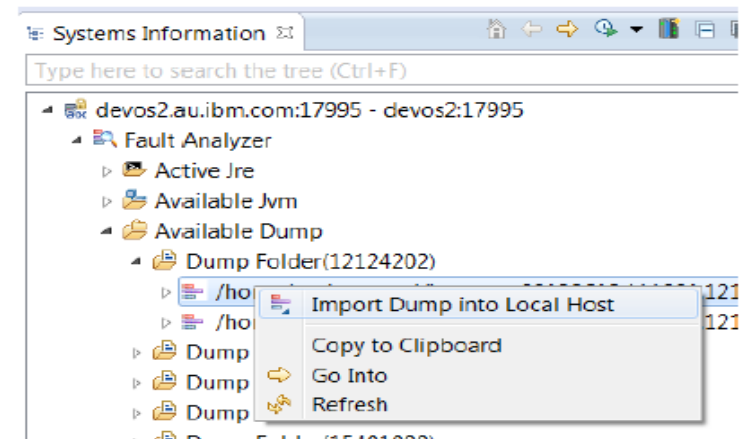
- Discovers running Java processes on your machine:
  - Instruct to take a dump.
  - Browse JAR files associated with the process and let you browse classes.
- Discover JVMs available on your system.
- Discover Java dumps on your machine.
  - Allows you to import Java dumps to your desktop for analysis.



# Fault Analyzer for Multi-platforms Overview

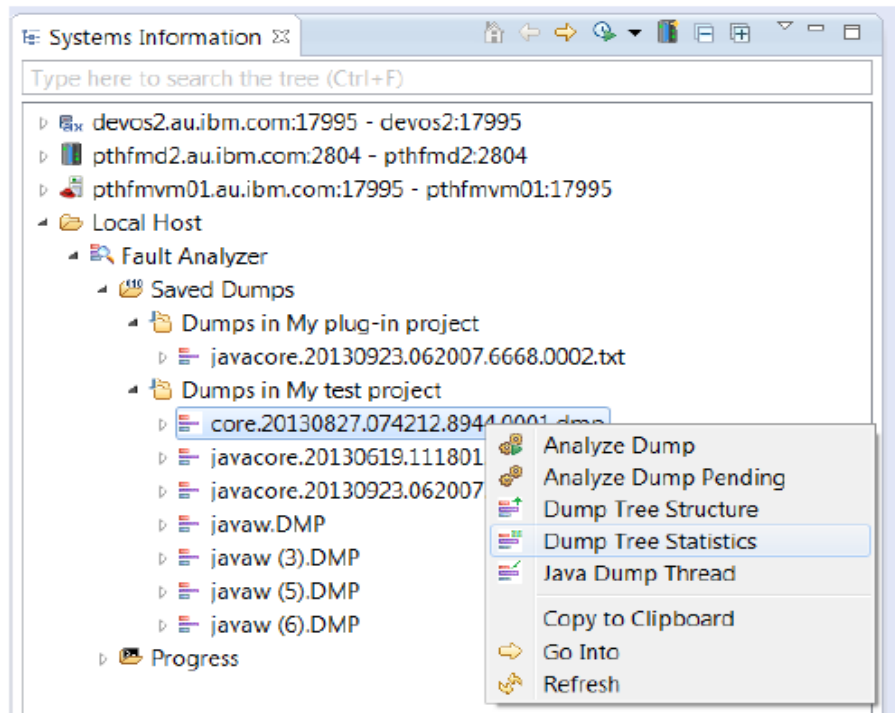
## Java dump analysis overview

- Java projects in Eclipse knows everything about your Java applications:
  - Source files.
  - JAR files for dependent libraries.
  - Dependencies on other Java projects.
- We place Java dumps into your local Java project and utilize the information available during the analysis process (eg. Source display).
- The plug-in provides method for importing dumps from a remote system (AIX and Red Hat) to your Java project.
- The plug-in provides method for importing a local dump into your Java project.
- Once imported, you can kick off the analysis of Java dumps.



# Fault Analyzer for Multi-platforms Overview

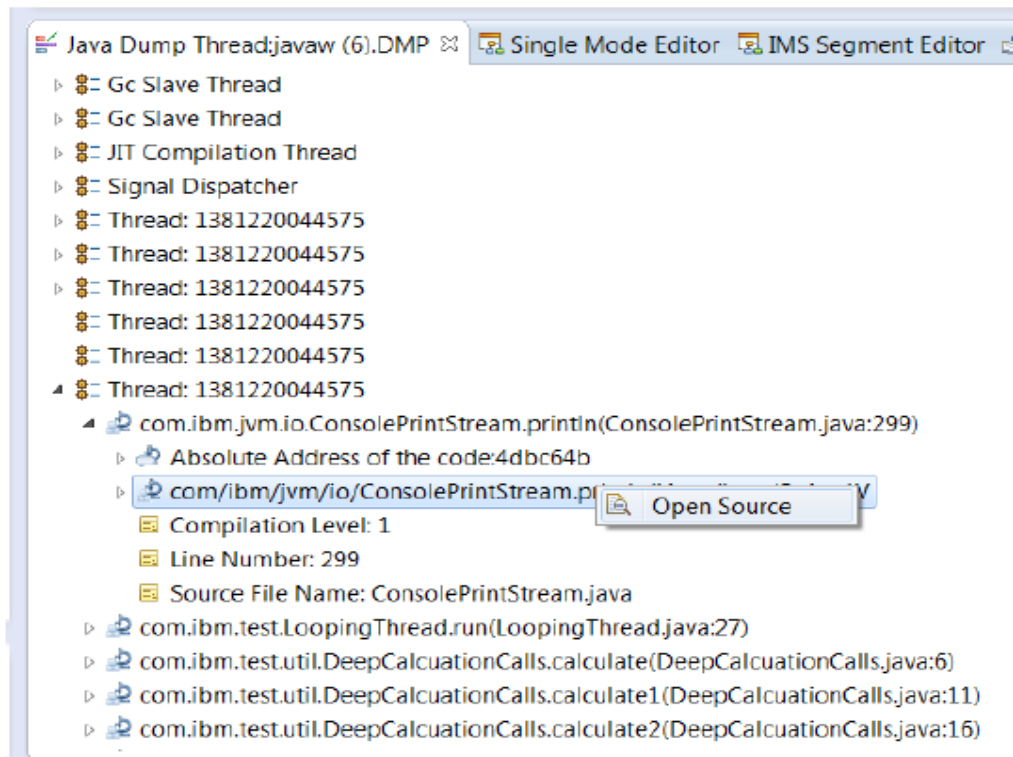
## Java dump analysis overview - continue



- From a list of imported Java dumps, you can kick off various analysis function.
- **Java Dump Thread:** looking at currently active threads and the stack trace of threads at the time when the dump was taken.
- **Dump Tree Structure:** a graphical navigator for looking around everything you can discover in the dump (eg. Environmental variables).
- **Analyze Dump:** starts analysis of Java dump and allows you invoke various DTFJ commands.

# Fault Analyzer for Multi-platforms Overview

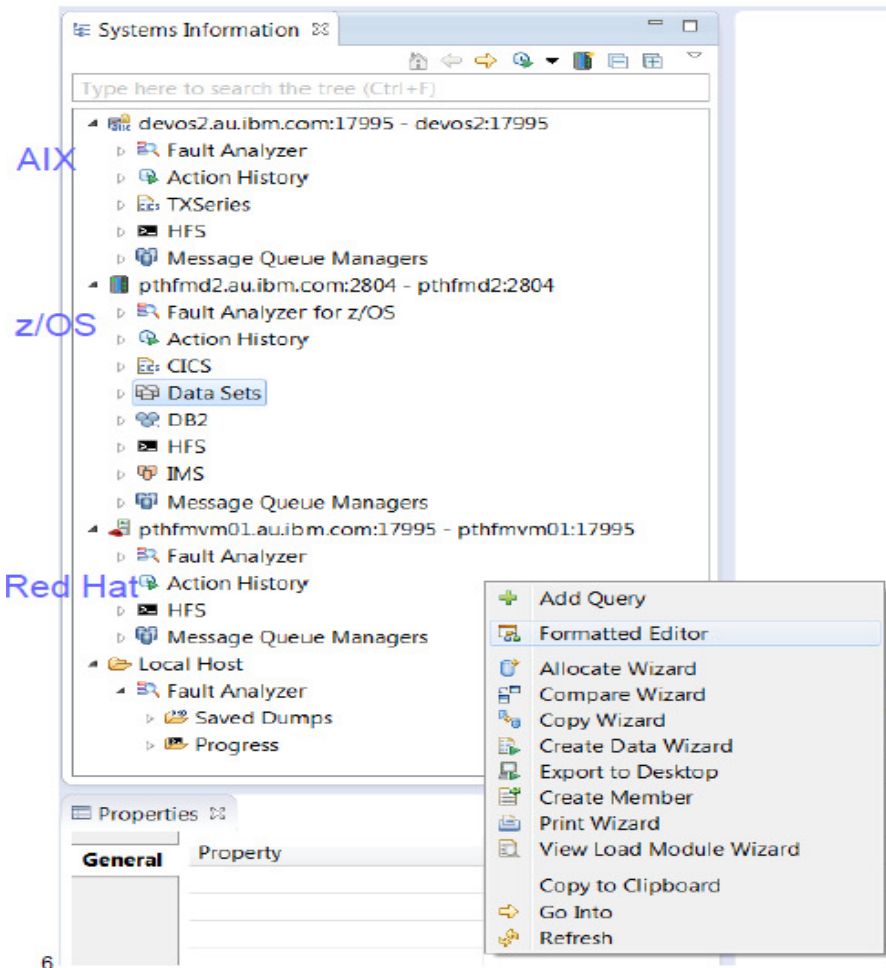
## Dump Thread Analysis



- You can see all threads which were running at the time when a dump was taken.
- You can expand each thread and examine the current execution stack. You will see the source line number (if the information is available in the dump).
- You can select *Open Source* to look at the source information.

# File Manager for Multi-platforms Overview

## File Manager for Multiplatforms overview



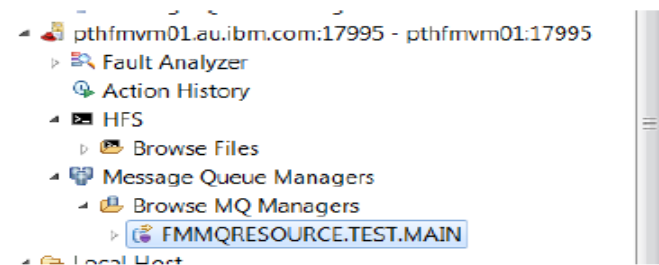
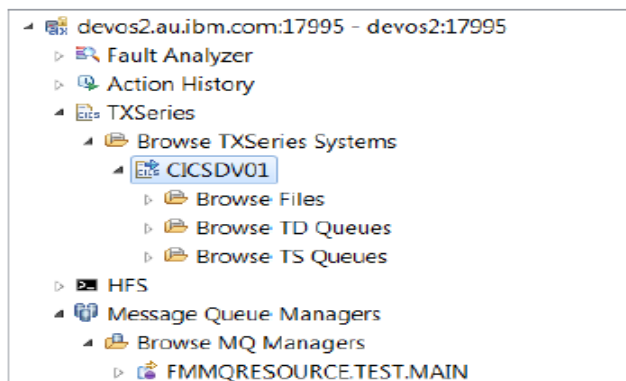
- Supports AIX and Red Hat operating systems on System p.
- Editing of hierarchical file system files, WebSphere MQ queues, and TXSeries resources (on AIX platform only).
- Formatted editing enabled using dynamic templates.
- Use the same navigation and look & feel of FM plug-in functions from z/OS platform.

Familiar FM functionality provided for distributed platforms

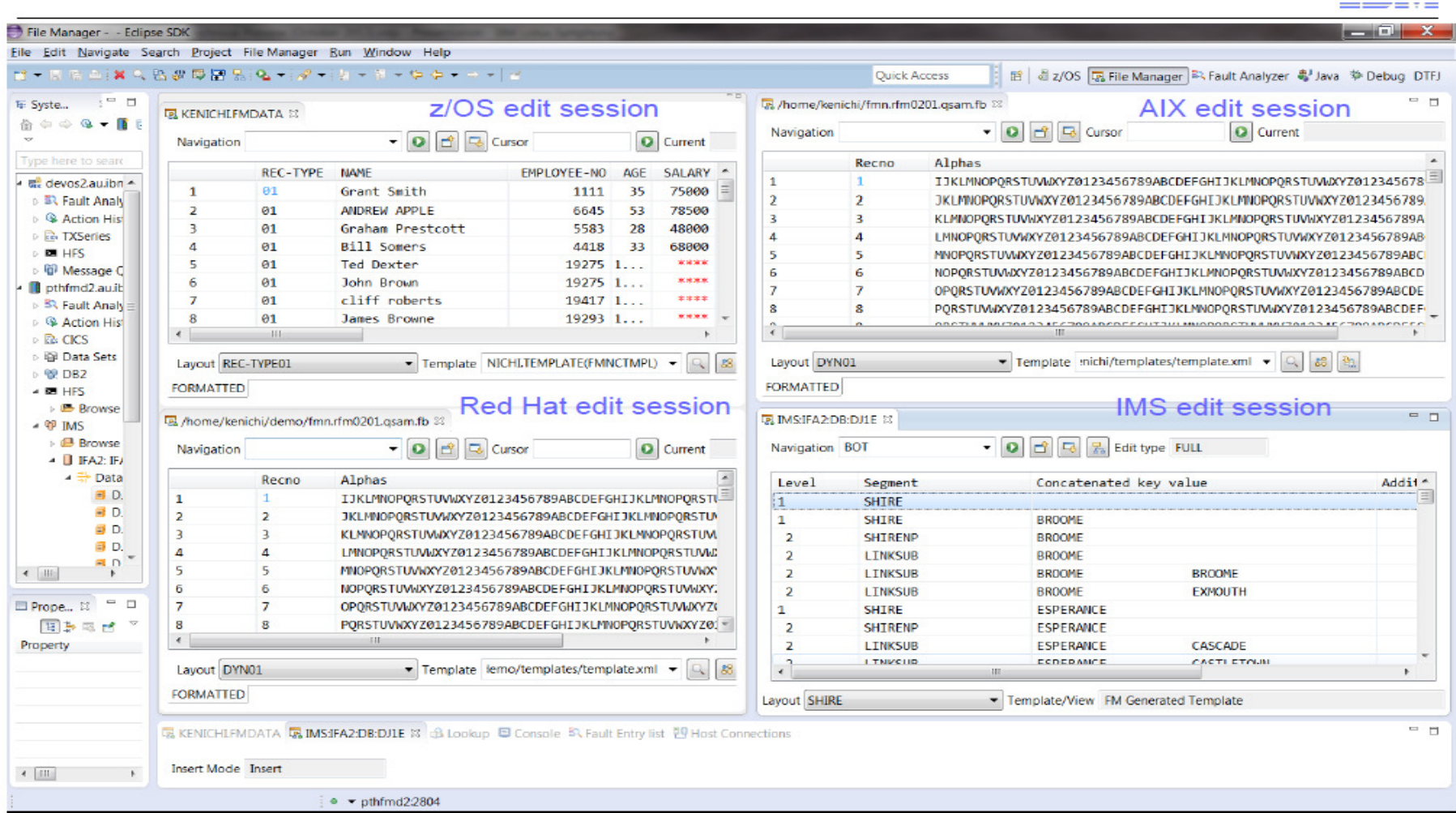
# File Manager for Multi-platforms Overview

## What features are available?

- Only dynamic templates are supported on distributed platforms. No criteria expression support (layouts are mapped to record based on record length + first come first serve basis).
- Editing in character mode.
- Editing in formatted mode using dynamic templates.
- Works with Hierarchical File System files, WebSphere MQ queues and TXSeries resources (CICS files, TD queues and TS queues).



# File Manager for Multi-platforms Overview



The screenshot displays the Eclipse SDK File Manager interface with four active edit sessions:

- z/OS edit session:** Shows a table with columns REC-TYPE, NAME, EMPLOYEE-NO, AGE, and SALARY. Data includes employees like Grant Smith, Andrew Apple, and James Browne.
- AIX edit session:** Shows a table with columns Recno and Alphas, displaying alphanumeric data.
- Red Hat edit session:** Shows a table with columns Recno and Alphas, displaying alphanumeric data.
- IMS edit session:** Shows a table with columns Level, Segment, Concatenated key value, and Addit, displaying hierarchical data.



# New Debug Tool Code Coverage

- Not a replacement for integrated Code Coverage in RD/z
- Designed to provide quick Code Coverage statistics
- Designed to be use in conjunction with debugging sessions
- Allows flexibility in the reporting of Code Coverage results
- XML is use as mechanism to provide program selection, selection criteria, and final report
  - You can create your own facility to create XML for input into Code Coverage facility or to read results and present according to your needs.
- Help you isolate specifics statements of interest for the developer
- A complement for Unit Test verification but can also be use for integration testing and other types of testing scenarios
- Only support compilers that provides the SEPARATE compile option to create SYSDEBUG files.
- Not yet supported for C, C++, COBOL V5, and Assembler
- Can be run in batch
- It support CICS applications as well.



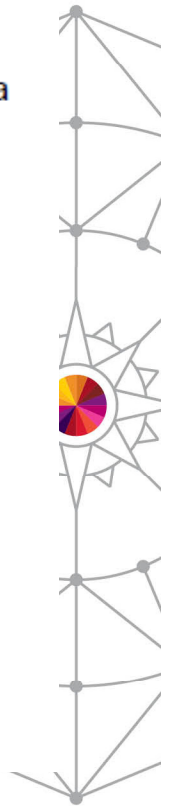
# Code Coverage: Setup

- A TEST(ALL,\*,PROMPT,MFI:\*) runtime parm is used to tell Debug Tool to run. An LE Environment Variable ENVAR("EQA\_STARTUP\_KEY=CC") is used to tell Debug Tool to collect code coverage via the MFI debugger engine (vs RD/z for example, which writes its information out a different way).

```

/*
//EQA_OPTS DD *
            EQAXOPT  CCOUTPUTDSN, '&&USERID.DBGTOOL.CCOUTPUT'
            EQAXOPT  CCOUTPUTDSNALLOC, 'MGMTCLAS( STANDARD)          +
                        STORCLAS( DEFAULT) LRECL(255) BLKSIZE(0) RECFM(V,B)  +
                        DSORG( PS) SPACE(2,2) CYL'
            EQAXOPT  CCPRGSELECTDSN, '&&USERID.DBGTOOL.CCPRGSEL'
            EQAXOPT  END
//CEE_OPTS DD *
TEST( ALL, *, PROMPT, MFI: * ), ENVAR( "EQA_STARTUP_KEY=CC" )
/*

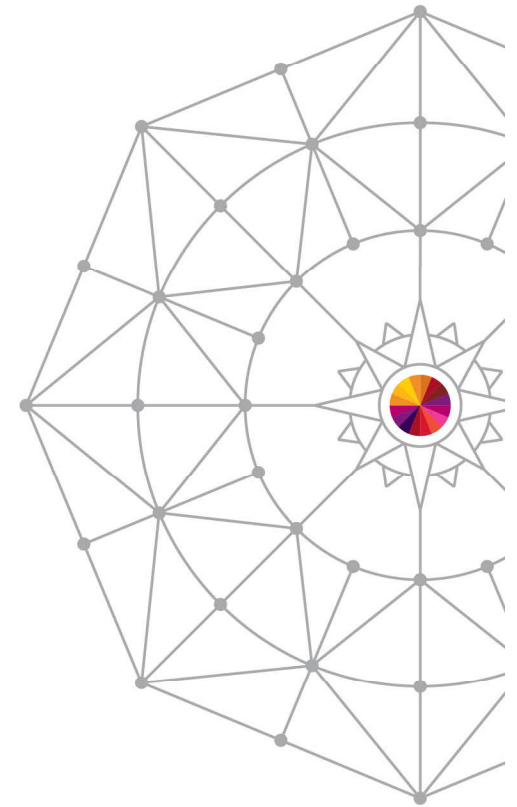
```



# Code Coverage: Setup Debug Tool Utilities (ISPF)



```
----- Debug Tool Code Coverage -----  
Option ==> 1  
  
1 Observation viewer  
  Browse code coverage observations.  
  
2 Debug Tool options  
  Create or modify the Debug Tool code coverage options.  
  
3 Observation selection criteria  
  Create or modify the observation selection criteria and source markers.  
  
4 Observation extraction  
  Extract code coverage observations using selection criteria.  
  
5 Report generation  
  Create report.
```



# Code Coverage: Viewer

```

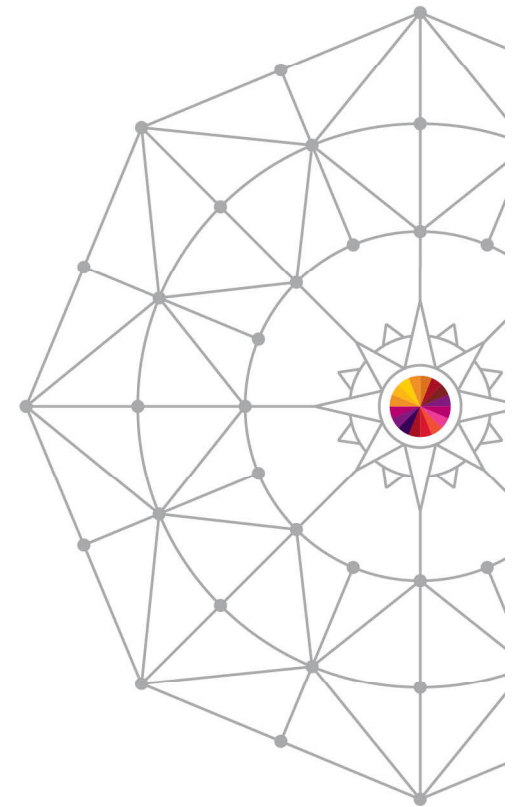
----- Debug Tool - Code Coverage Observation Viewer Row 1 to 4 of 7
Command ---->                               Scroll ----> PAGE

Enter / to sort the table entries.

Enter (V)iew table entry command to view source listing.

b Run Date : 2013/10/02      Run Time: 17:08:44
  Group ID 1: COST          Group ID 2: BENEFIT      ISO ID:  GMYOUN2
  Load Name: COB01         Prog Name: COB01A
  Comp Date: 2013/10/01    Comp Time: 12:32:00    Debug override: N
  Tot Stmt: 17             Exec Stmt: 15           Percent:  88.23%
-----
  Run Date : 2013/10/02      Run Time: 17:08:44
  Group ID 1: COST          Group ID 2: BENEFIT      ISO ID:  GMYOUN2
  Load Name: COB01         Prog Name: COB01B
  Comp Date: 2013/10/01    Comp Time: 12:32:00    Debug override: N
  Tot Stmt: 10             Exec Stmt: 9            Percent:  90.00%
-----
  Run Date : 2013/10/02      Run Time: 17:08:44
  Group ID 1: COST          Group ID 2: BENEFIT      ISO ID:  GMYOUN2
  Load Name: COB01         Prog Name: COB01C
  Comp Date: 2013/10/01    Comp Time: 12:32:00    Debug override: N
  Tot Stmt: 14             Exec Stmt: 12           Percent:  85.71%
-----
  Run Date : 2013/10/02      Run Time: 17:08:50
  Group ID 1: COST          Group ID 2: BENEFIT      ISO ID:  GMYOUN2
  Load Name: FLI01         Prog Name: FLI01A
  Comp Date: 2013/10/02    Comp Time: 17:08:14    Debug override: N
  Tot Stmt: 12             Exec Stmt: 9            Percent:  75.00%

```



Shows all observations in repository

# Code Coverage: Browsing observations using the viewer



You will then see something like this. The same statistical information as shown above is listed, and then an annotated listing is shown (extracted from the SYSDEBUG file and then annotated with coverage information).

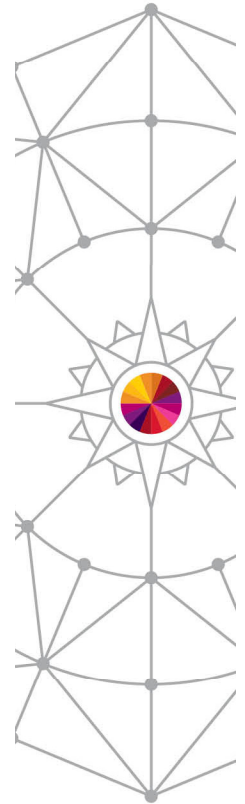
```
BROWSE  GMYOUN2.DTCCTEMP.D13276.T075437.EQAR0621  Line 00000000 Col 001 060
Command ---->                               Scroll ----> PAGE
***** Top of Data *****
Rpt Date : 2013/10/03      Rpt Time: 07:54:37

Run Date : 2013/10/02      Run Time: 17:08:44
Group ID 1: COST           Group ID 2: BENEFIT      TSO ID:  GMYOUN2
Load Name: COE01          Prog Name: COB01A
Comp Date: 2013/10/01     Comp Time: 12:32:00    Debug override: N
Tot SMTs: 17              Exec SMTs: 15           Percent: 88.23%
```

Rollup History:

Observation is not part of rollup

```
-----+*A-1-B-+-----2-----3-----4-----5-----6-----
1          * COB01A - COBOL EXAMPLE FOR DTCU
2
3          IDENTIFICATION DIVISION.
4          PROGRAM-ID. COB01A.
5          *****
6          * Licensed Materials - Property of IBM
7          *
8          * 5655-M18: Debug Tool for z/OS
9          * 5655-M19: Debug Tool Utilities and Advanced Functions fo
10         * (C) Copyright IBM Corp. 1997, 2004 All Rights Reserved
11         *
12         * US Government Users Restricted Rights - Use, duplication
```

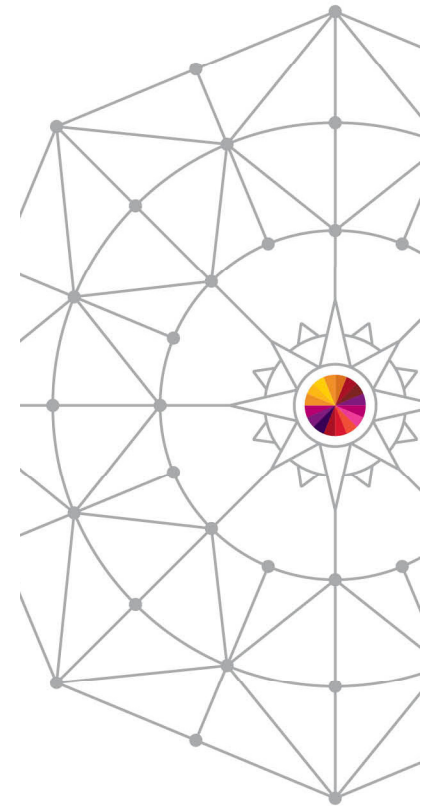


# Code Coverage: Browsing observations using the viewer....

- Scroll down to see the annotation. > means executed, < means not executed.

```

BROWSE      GMYOUN2.DTCCTEMP.D13276.T075437.EQAR0821   Line 00000062 Col 061 080
Command ---->                                         Scroll ----> CSR
 49          * ACCESS BY LOW LEVEL QUALIFIERS
 50 >         MOVE 'KY' TO STATE
 51 >         MOVE 'LEK' TO CITY
 52 >         MOVE 'VM ' TO OP-SYS
 53          .
 54
 55          PROGA.
 56 >         PERFORM LOOP1 UNTIL IAPARM1 = 0
 57
 58 >         IF IAPARM2 = 0 THEN
 59 *          PROCA NOT EXECUTED
 60 <         PERFORM PROCA.
 61
 62
 63 >         PERFORM LOOP2 UNTIL IAPARM2 = 0
 64          .
 65 >         STOP RUN
 66          .
 67
 68          PROCA.
 69 *          PROCA NOT EXECUTED
 70 <         MOVE 10 TO PLEARM1
 71          .
 72          LOOP1.
 73 >         IF IAPARM1 > 0 THEN
 74 >         SUBTRACT 1 FROM IAPARM1.
  
```



# Code Coverage: Observation Criteria

- We are going to use this to generate a report from the coverage collected above. Our report will only show information that has the GROUP ID1 and 2 COST BENEFIT, was run by your TSO ID, and has one of the COB01 COBOL testcases.
- In addition, various source markers can be specified, which are then marked (if found) in the the report generated in a subsequent step and (and which also have statistics calculated for the lines that are marked). You may have to scroll down to see the marker section.

```

----- Debug Tool - Edit Code Coverage Selection Criteria -----
Command ==>
Specify code coverage observation selection criteria                               More:  +

Enter attribute value and comparison operator. Comparison operators
are (E)equal, (G)reater, (L)ess, (GE) greater than or equal,
(LE) less than or equal, and (NE) not equal.

Attribute name      Value      Operator      Rollup
Run date (YYYY/MM/DD)      (E,G,L,GE,LE,NE)
Run time (HH:MM:SS)      (E,G,L,GE,LE,NE)
Group ID 1      COST      E (E,NE)      N (Y/N)
Group ID 2      BENEFIT   E (E,NE)      N (Y/N)
TSO ID      GMYOON2  E (E,NE)      N (Y/N)
Load module name      (E,NE)
Program name      COB01*   E (E,NE)
Compile date (YYYY/MM/DD)  (E,G,L,GE,LE,NE)
Compile time (HH:MM:SS)  (E,G,L,GE,LE,NE)
Debug override      (E,NE)      (Y/N)
Total statements      (E,G,L,GE,LE,NE)
Executed statements      (E,G,L,GE,LE,NE)

Specify source markers for code coverage percentage analysis

Marker type: SINGLE/SECTIONBEGIN/SECTIONEND
Selection:  INCLUDE/EXCLUDE

Marker type  Selection  Column  Column  String
Selection:  INCLUDE/EXCLUDE

Marker type  Selection  Column  Column  String
                Start  End
SINGLE        INCLUDE   73      75      PMR
SINGLE        EXCLUDE   73      80      PMR11114
SECTIONBEGIN INCLUDE    7       80      DEFECT123BEGIN
SECTIONEND   INCLUDE    7       80      DEFECT123END

```



# Code Coverage: Observation Extraction

- Now specify the names of the output data set from the debugger, the selection criteria data set, and a new data set to hold the extracted output, and press enter.

```
----- Debug Tool - Code Coverage Observation Extraction -----  
Command ==>
```

```
The observation selection function extracts observations that meet the  
selection criteria from the observation data set. It writes the result  
to the observation output data set.
```

```
Specify the name of a code coverage observation data set.
```

```
Data Set Name . . . 'GMYOUN2.DBGTOOL.CCOUTPUT'
```

```
Specify the name of a code coverage selection criteria data set.
```

```
Data Set Name . . . 'GMYOUN2.DBGTOOL.CCDBSEL.COB01'
```

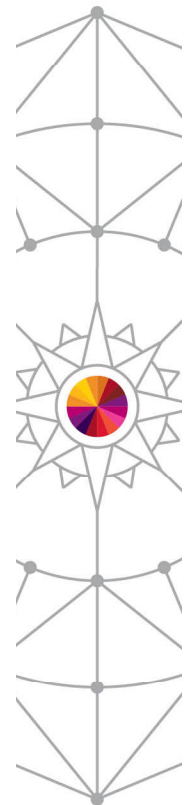
```
Specify the name of a code coverage observation output data set.
```

```
Data Set Name . . . 'gmyoun2.dbgtool.ccoutput.extract'
```

```
Press Enter to continue.  
Press Exit or Cancel to exit.
```

You will see a message at the top of the screen indicating that the extraction was done.

```
----- Debug Tool - Code Coverage Observation  
Extract observations OK
```





# Code Coverage: Report Generation

- Specify option 3, and the extracted observation data set from above, the selection criteria data set from above and a new report data set.

```
----- Debug Tool - Code Coverage Report Generation -----  
Command --->
```

```
The report generator adds marked source statements and code coverage  
statistics to the extracted observations. It writes the result  
to the report output data set along with the selection criteria.
```

```
Select a report action.
```

- ```
3 1. Create report in XML format  
   2. Create report in Presentation format  
   3. Create and browse report in Presentation format
```

```
Specify the name of a code coverage extracted observation data set.
```

```
Data Set Name . . . 'GMYOUN2.DBGTOOL.CCOUTPUT.EXTRACT'
```

```
Specify the name of a code coverage selection criteria data set.
```

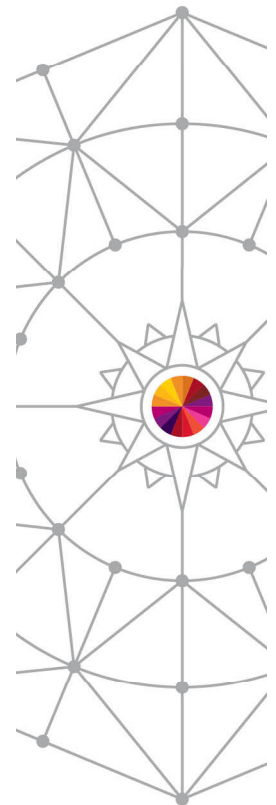
```
Data Set Name . . . 'GMYOUN2.DBGTOOL.CCOBSSEL.COB01'
```

```
Specify the name of a code coverage report data set.
```

```
Data Set Name . . . 'gmyoun2.dbgtool.ccoutput.report'
```

```
Press Enter to continue.  
Press Exit or Cancel to exit.
```

Press enter to see the report.



# Code Coverage Report

```

BRONSE  GMYOUN2.DBGTOOL.CCOUTPUT.REPORT      Line 00000000 Col 001 080
Command ==>                                Scroll ==> CSR
***** Top of Data *****
Rpt Date : 2013/10/03      Rpt Time:  12:20:33

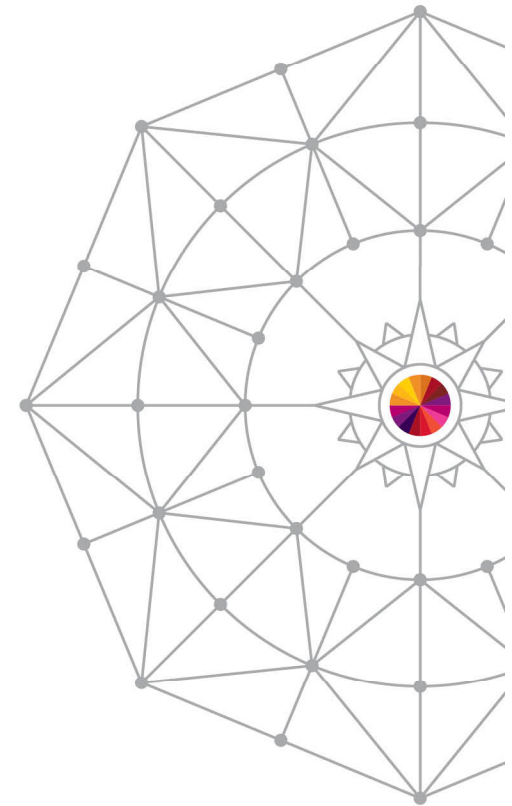
Run Date : 2013/10/02      Run Time:  17:08:44
Group ID 1: COST           Group ID 2: BENEFIT      User ID:  GMYOUN2
Load Name: COB01          Prog Name: COB01A
Comp Date: 2013/10/01     Comp Time: 12:32:00     Debug override: N
Tot Stmt: 17              Exec Stmt: 15           Percent:  88.23%
  
```

**Rollup History:**

Observation is not part of rollup

```

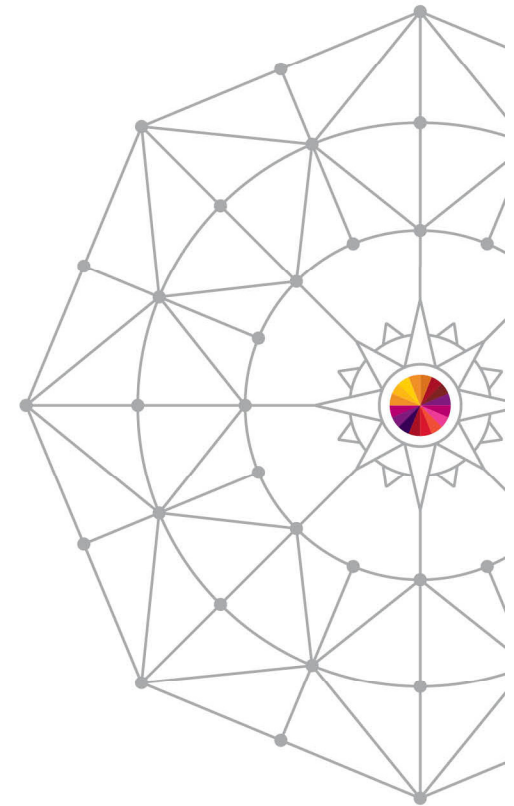
-----*A-1-B-----2-----3-----4-----5-----6-----+
1          * COB01A - COBOL EXAMPLE FOR DTCU
2
3          IDENTIFICATION DIVISION.
4          PROGRAM-ID. COB01A.
5          *****
6          * Licensed Materials - Property of IBM
7          *
8          * 5655-M18: Debug Tool for z/OS
9          * 5655-M19: Debug Tool Utilities and Advanced Functions for
10         * (C) Copyright IBM Corp. 1997, 2004 All Rights Reserved
11         *
12         * US Government Users Restricted Rights - Use, duplication
  
```



# Code Coverage Report .....

Scroll down to see the annotation and markers (I Include, E Exclude, B Both):

```
BROWSE      GMYOUN2.DBGTOOL.CCOUTPUT.REPORT      Line 00000052 Col 001 080
Command ==>      Scroll ==> CSR
39          * Defect456Begin
40
41          PROG.
42          * ACCESS BY TOP LEVEL QUALIFIER
43 I>         MOVE 'ILCHIMVS' TO IASTRUCT
44
45          * ACCESS BY MID LEVEL QUALIFIERS
46 I>         MOVE 'ILSPR' TO LOC-ID
47 I>         MOVE 'AIX' TO OP-SYS
48
49          * ACCESS BY LOW LEVEL QUALIFIERS
50 B>         MOVE 'KY' TO STATE
51 B>         MOVE 'LEX' TO CITY
52 B>         MOVE 'VM ' TO OP-SYS
53          .
54
55          PROGA.
56 >         PERFORM LOOP1 UNTIL IAPARM1 = 0
57
58 >         IF IAPARM2 = 0 THEN
59          *   PROCA NOT EXECUTED
60 I<         PERFORM PROCA.
61
62
63 I>         PERFORM LOOP2 UNTIL IAPARM2 = 0
64          .
```



# Code Coverage Report .....

- Scroll to the right (RIGHT 30) to see the source markers

```
BROWSE      GMYOUN2.DBGTOOL.CCOUTPUT.REPORT      Line 00000052 Col 031 110
Command ==>      Scroll ==> CSR
56Begin
```

```

BY TOP LEVEL QUALIFIER
'ILCHIMVS' TO TASTRUCT      FMRI11112
                             FMRI11112
                             FMRI11112

BY MID LEVEL QUALIFIERS
'ILSPR' TO LOC-ID          FMRI11113
'AIK' TO OP-SYS           FMRI11113
                             FMRI11113

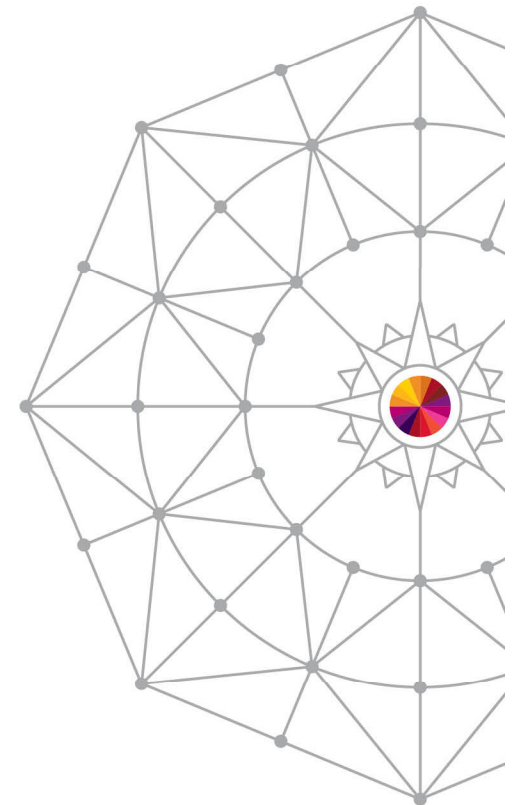
BY LOW LEVEL QUALIFIERS
'KY' TO STATE              FMRI11114
'LEX' TO CITY              FMRI11114
'VM ' TO OP-SYS           FMRI11114
                             FMRI11114
                             FMRI11114
```

scroll left and down some more to see the source marker info and some statistics based on them.

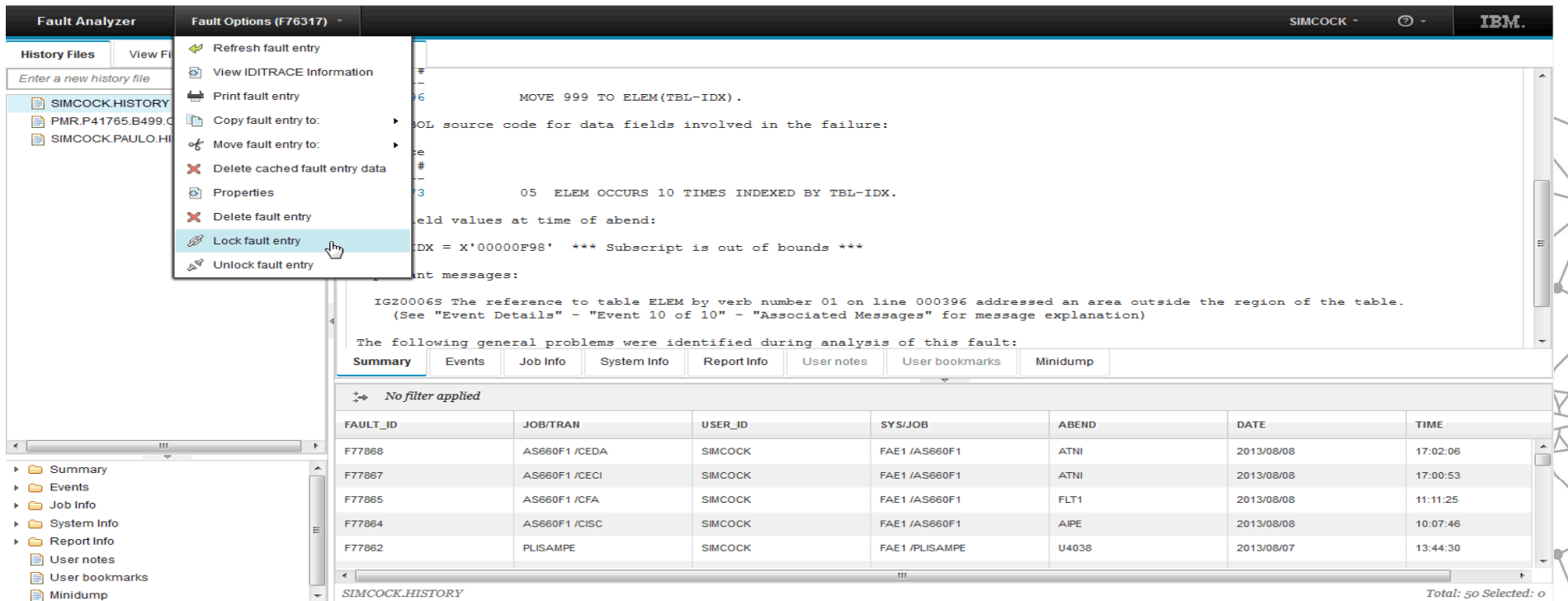
```
BROWSE      GMYOUN2.DBGTOOL.CCOUTPUT.REPORT      Line 00000096 Col 001 080
Command --->      Scroll ---> CSR
```

| Marker type  | Selection | Start Column | End Column | String         |
|--------------|-----------|--------------|------------|----------------|
| SINGLE       | INCLUDE   | 73           | 75         | PMR            |
| SINGLE       | EXCLUDE   | 73           | 80         | PMRI11114      |
| SECTIONBEGIN | INCLUDE   | 7            | 80         | DEFECT123BEGIN |
| SECTIONEND   | INCLUDE   | 7            | 80         | DEFECT123END   |

|           | Statements | Executed | Percentage |
|-----------|------------|----------|------------|
| Total     | 17         | 15       | 88.23      |
| Included  | 8          | 6        | 75.00      |
| Excluded  | 0          | 0        | 0.00       |
| Incl/Excl | 3          | 3        | 100.00     |



# Fault Analyzer new WEB interface



The screenshot shows the Fault Analyzer web interface. A context menu is open over a table of fault entries, with the 'Lock fault entry' option selected. The table displays the following data:

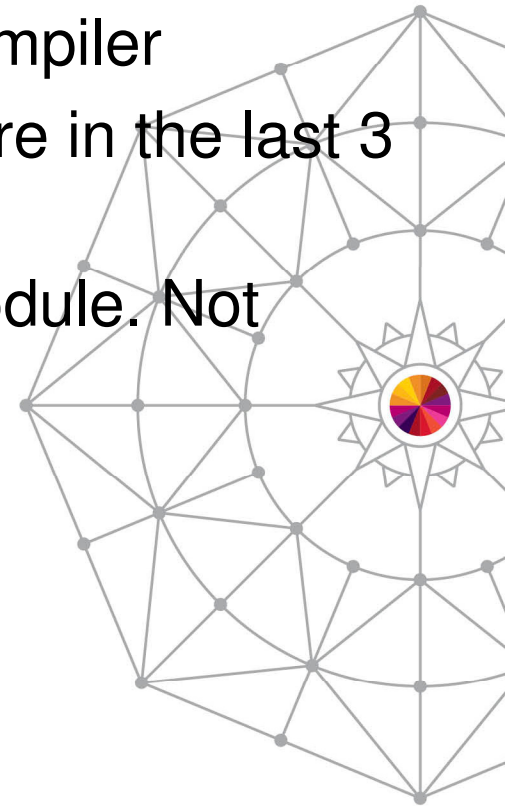
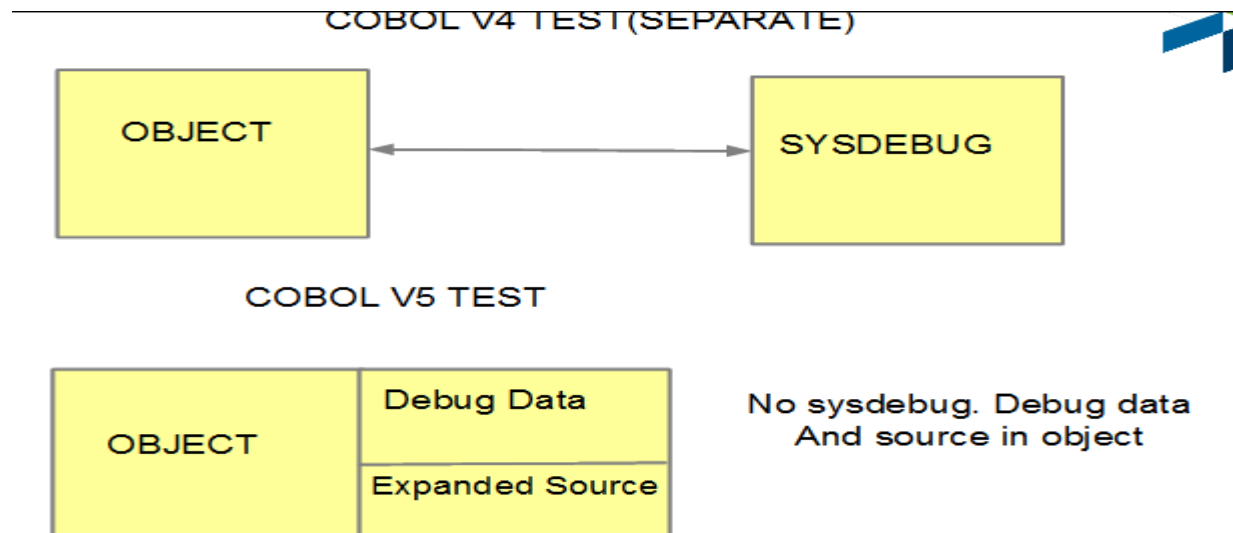
| FAULT_ID | JOB/TRAN      | USER_ID | SYSJOB         | ABEND | DATE       | TIME     |
|----------|---------------|---------|----------------|-------|------------|----------|
| F77868   | AS660F1 /CEDA | SIMCOCK | FAE1 /AS660F1  | ATNI  | 2013/08/08 | 17:02:06 |
| F77867   | AS660F1 /CECI | SIMCOCK | FAE1 /AS660F1  | ATNI  | 2013/08/08 | 17:00:53 |
| F77865   | AS660F1 /CFA  | SIMCOCK | FAE1 /AS660F1  | FLT1  | 2013/08/08 | 11:11:25 |
| F77864   | AS660F1 /CISC | SIMCOCK | FAE1 /AS660F1  | AIPE  | 2013/08/08 | 10:07:46 |
| F77862   | PLISAMPE      | SIMCOCK | FAE1 /PLISAMPE | U4038 | 2013/08/07 | 13:44:30 |

- Modern Dojo-based Web 2.0 interface using AJAX for seamless data loading and presentation
- IBM One UI theme (IDX)
- Enhanced functionality, at parity with Eclipse-based plug-in interface, including
  - Fault entry refresh capability
  - Fault Entry management (MOVE/COPY/DELETE)
  - Sidefile (source) display
  - Ability to bookmark/annotate minidump
  - Print capability
- Simplified installation and management requirements
- Very fast and responsive

Complete your session evaluations online at [www.SHARE.org/Anaheim-Eval](http://www.SHARE.org/Anaheim-Eval)

# Support for COBOL V5

- All PD Tools support the new COBOL V5 compiler
- Major change in COBOL compiler architecture in the last 3 decades.
- Debug information embedded in the load module. **Not** need for a SYSDEBUG file



# Debug Tool Enhancements for COBOL V5

DESCRIBE ATTRIBUTES, MOVE and IF commands



The PIC string shown in Debug Tool appears as it is specified in the source and not normalized as it was prior to Enterprise COBOL Version 5.

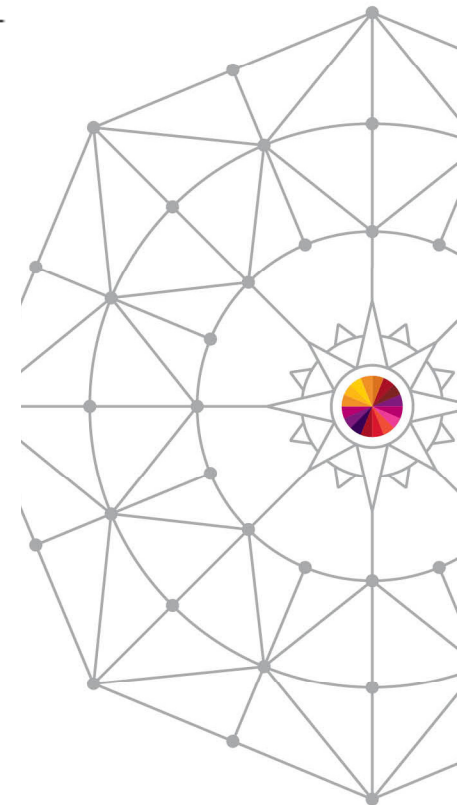
Level members are shown as written in the source code and not normalized as they were prior to Enterprise COBOL Version 5.

There are clearer data descriptions. For example, you could now see:

S9(5) SIGN LEAD SEP DISP  
instead of  
S9(5) DSLS

The MOVE and COMPUTE commands in Debug Tool have expanded to allow the same data types as the compiler for receivers and senders. This enhancement removes previous restrictions on the use of those commands.

The IF command has been expanded. Allowable comparisons for relational conditions are expanded in Debug Tool with Enterprise COBOL V5. The allowable comparison for relational conditions (involving data items, literals, and figurative constants) are implemented according to the Enterprise COBOL Language Reference.



# Debug Tool Enhancements for COBOL V5



## STEP command

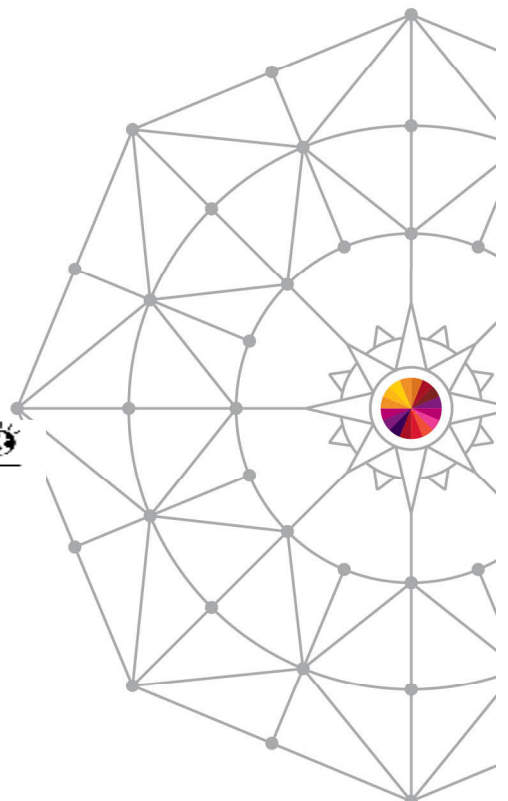
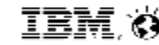
You can STEP and set breakpoints for the WHEN phrase of EVALUATE.  
STEP OVER with PERFORM is now supported.

## Support for COBOL types

Debug Tool now supports the correct maximum value in all binary data types.  
For example, an 8-byte, unsigned COMP-5 data item can contain a maximum value of 18,446,744,073,709,551,615, which is 20 digits.

Better debugging support at all OPT levels

## Load Module Analyzer : AMODE/RMODE



```
1 5655-Q10  Debug Tool Version 13 Release 1.2  Load Module Analyzer  2
          Load Module  TSFLNT2.TEST.LOAD(BKMEB11)  AMODE(31),RMODE(ANY)
```

## Load Module Analyzer : COBOL V5

```
Trn-Date  Program-Description
2013/10/21  Enterprise COBOL for z/OS Version 5
```

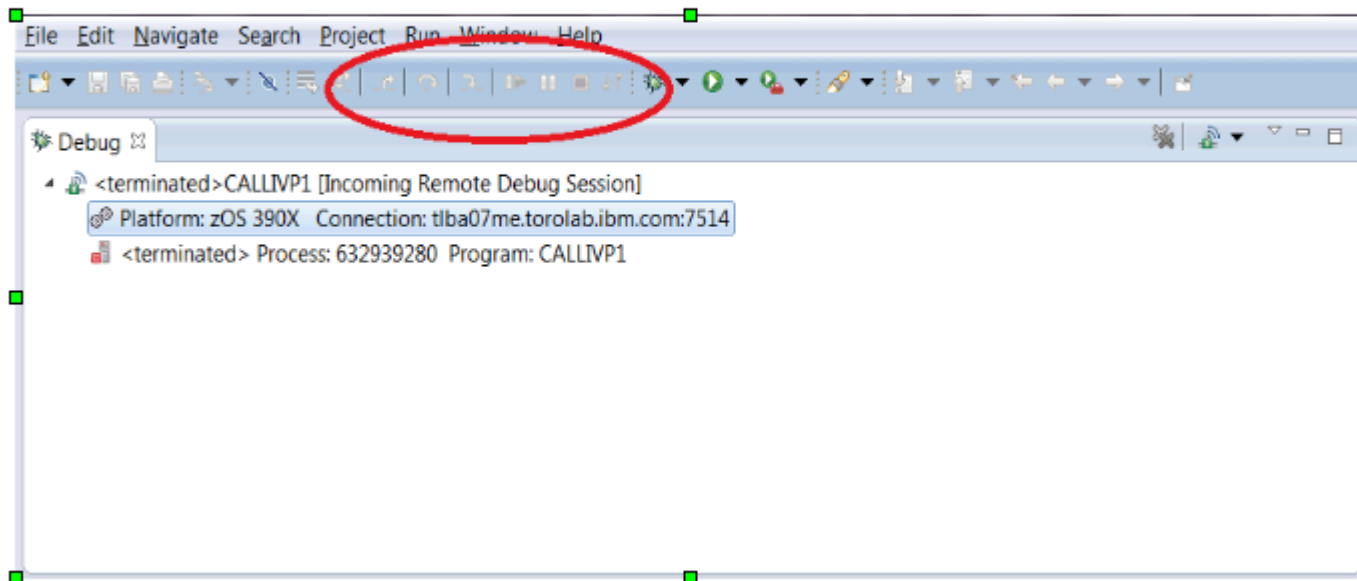
Complete your session evaluations online at [www.SHARE.org/Anaheim-Eval](http://www.SHARE.org/Anaheim-Eval)



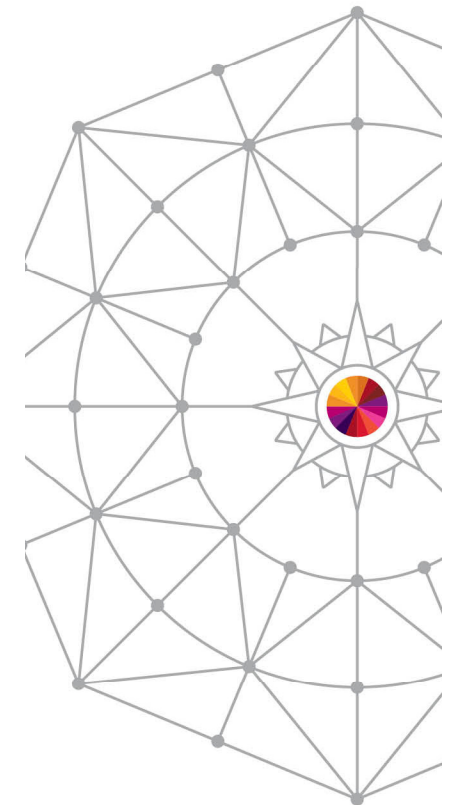


# Playback for Remote debugging

- Works with RD/z 9.0, PD Tools Studio 12.1.1.2 , CICS Explorer 5.1.1.1
- Only NODATA is supported ( variables are not restored)

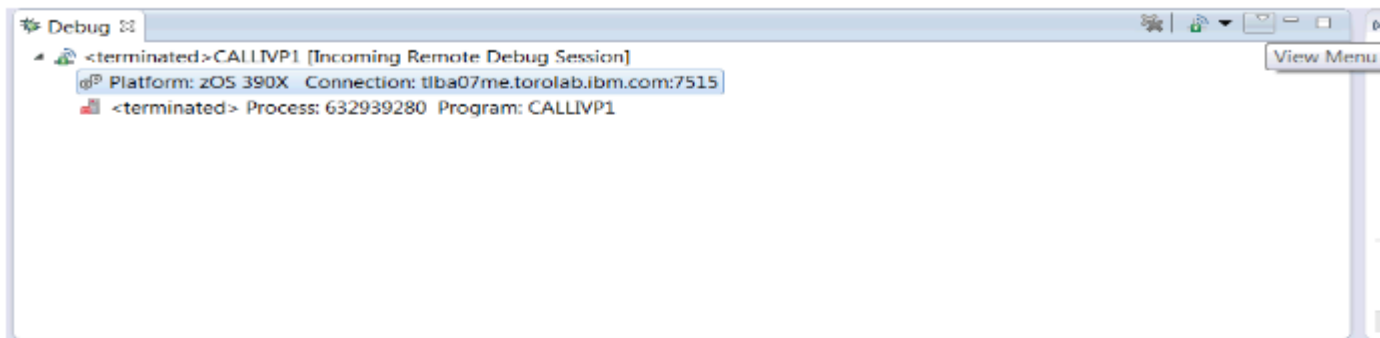


You may notice the Debug buttons (resume, step, etc...) are no longer visible in the Debug pane. They have been moved into the main task bar. This is eclipse 4.2 behavior

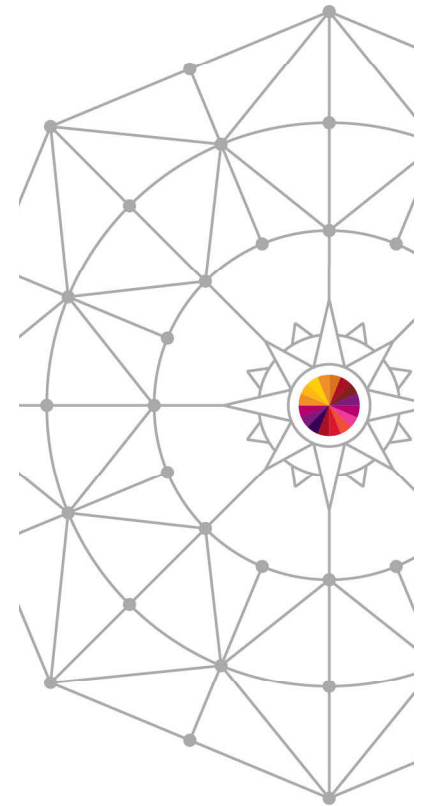
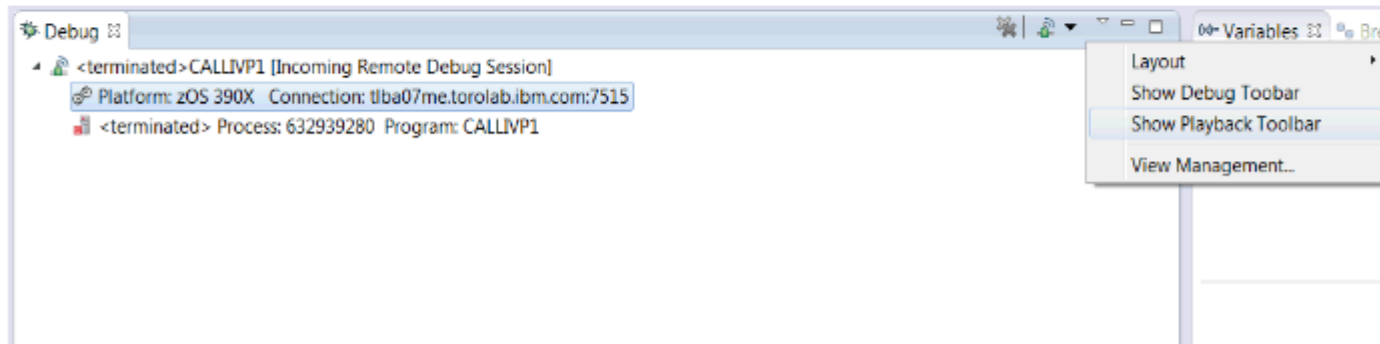


# Playback for Remote debugging

First, we need to show the playback toolbar. Open the menu in the Debug pane.

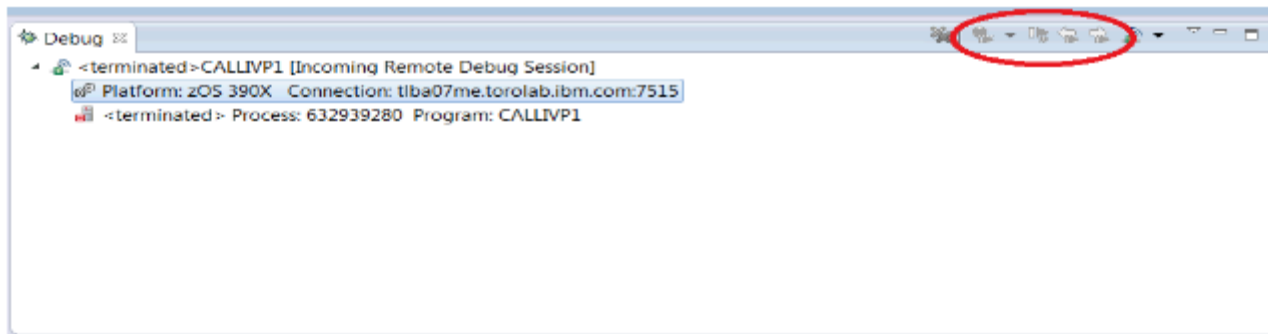


And select 'Show Playback Toolbar'. (You can also select 'Show Debug Toolbar' if you want to add resume/step/terminate/etc.)

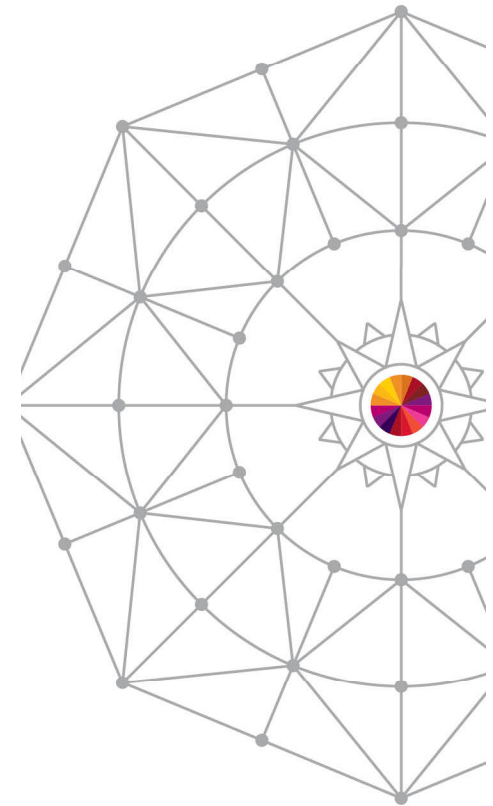
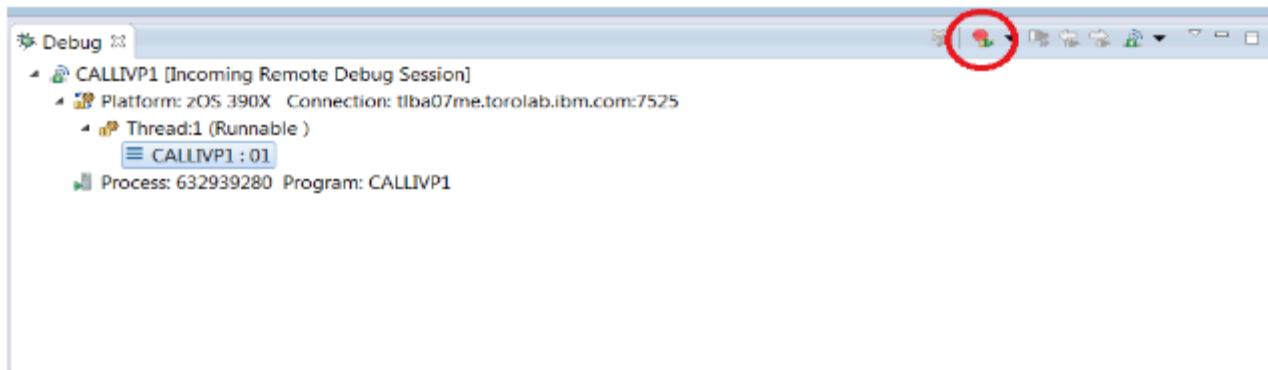


# Playback for Remote debugging

There should now be four new buttons visible. 'Start Playback Recording', 'Resume Debugging', 'Move Back', and 'Move Forward'.

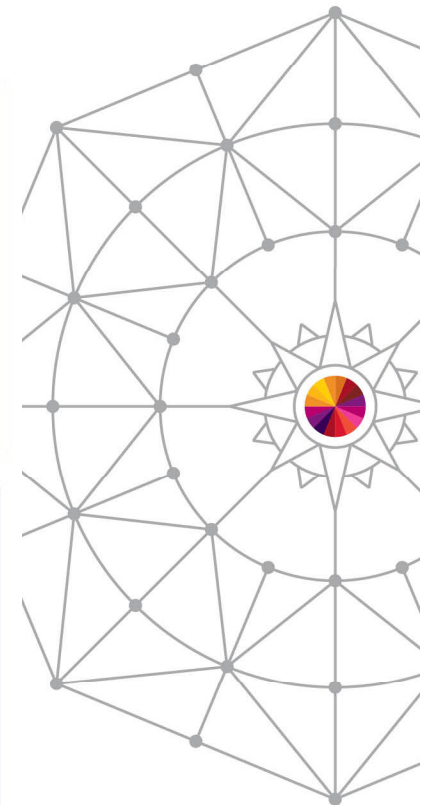
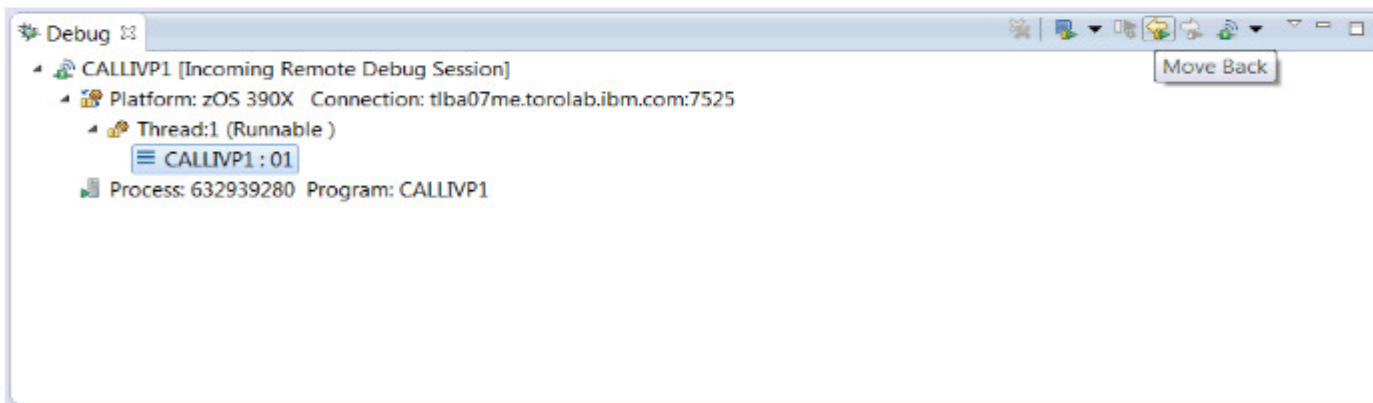


Once you start a debug session, the 'Start Playback Recording' will become available.

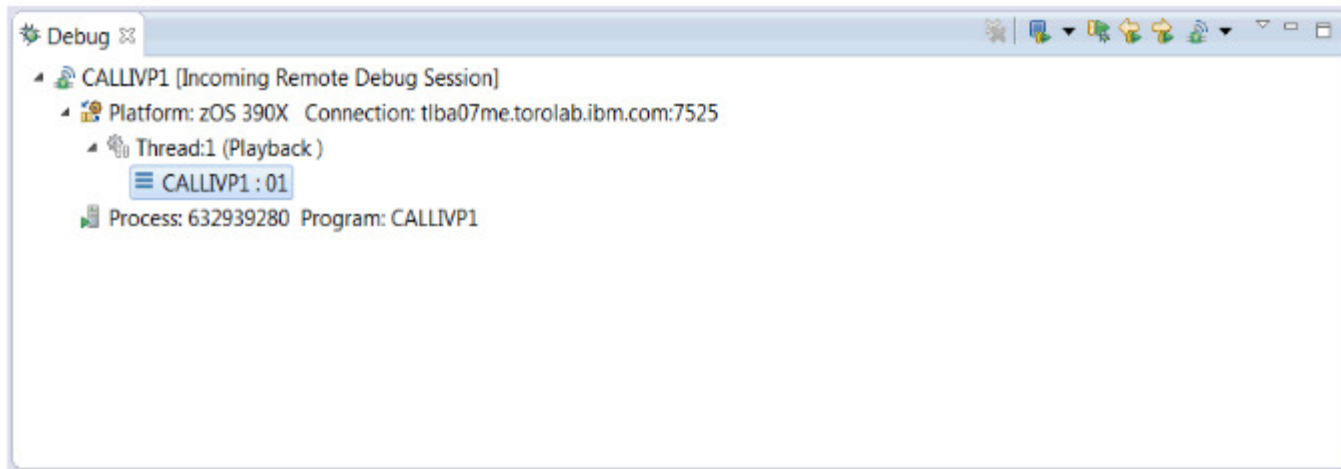


# Playback for Remote debugging

Click 'Start Playback Recording' - this is equivalent to executing a 'PLAYBACK ENABLE' command in MFI. The icon will change to indicate recording has started, and the button will change to 'Stop Playback Recording' (equivalent to 'PLAYBACK DISABLE').



# Playback for Remote debugging

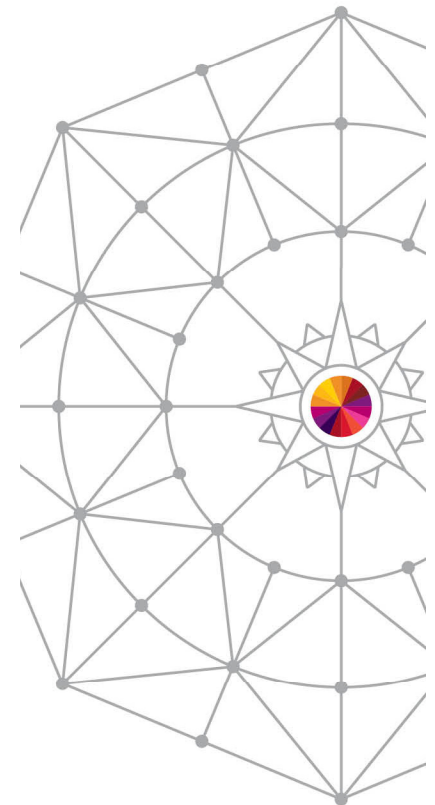


We are now in playback mode. The thread state has changed from 'Runnable' to 'Playback'. Step and resume buttons are disabled. Any monitored expressions are 'frozen' from immediately before we entered playback and cannot be modified. The registers view will update as we move backwards and forwards in playback mode. The 'Resume Debugging' and 'Move Forward' buttons are also now available.

'Resume Debugging' is equivalent to the 'PLAYBACK STOP' command in MFI. We will return to the current point of execution and leave playback mode.

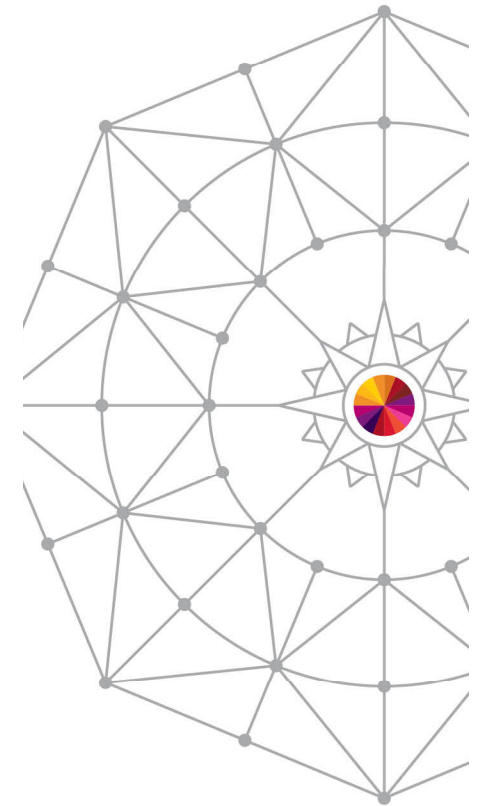
There are no 'PLAYBACK BACKWARD' or 'PLAYBACK FORWARD' command equivalents because there is no playback direction in remote. Forward and backward stepping have discrete buttons.

There is no 'PLAYBACK START' command equivalent. Playback mode is entered automatically when the 'Move Back' button is used.



# JCL instrumentation plug-in: Overview

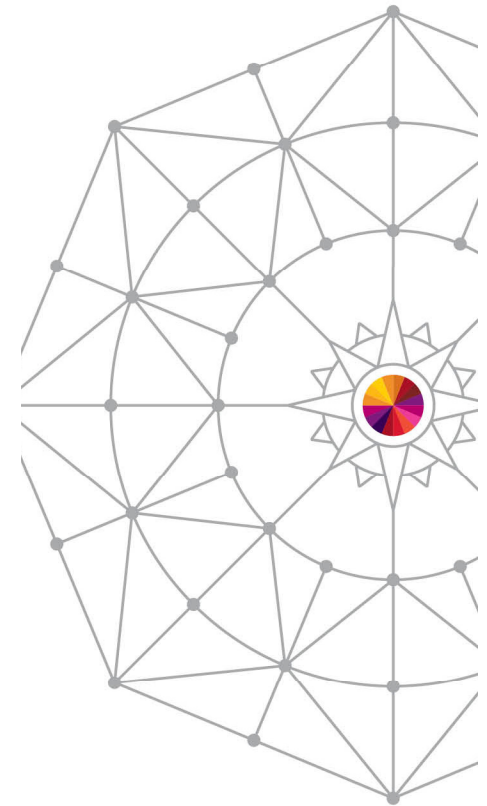
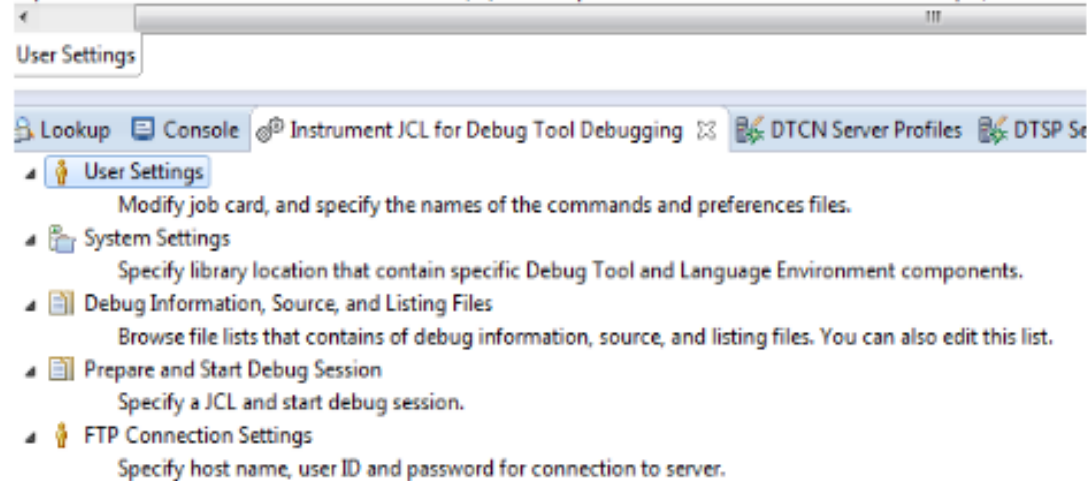
- Provides a UI that includes a wizard that help you instrument your JCL to start Debug Tool for batch jobs.
- It is based on DTU Option 8. JCL for Batch Debugging
- Includes a wizard that takes you thru the steps necessary to instrument the JCL
- Uses ftp to connect to z/OS. (Not common component for this version)
- Uses DT User Exits
- Plugin can be installed in RD/z, z/OS Explorer, and prepackage with PD Tools Studio
- Updates to JCL are temporary but option to save is provided
- Allows you to browse JCL after updates
- Updates clearly delimited in the JCL



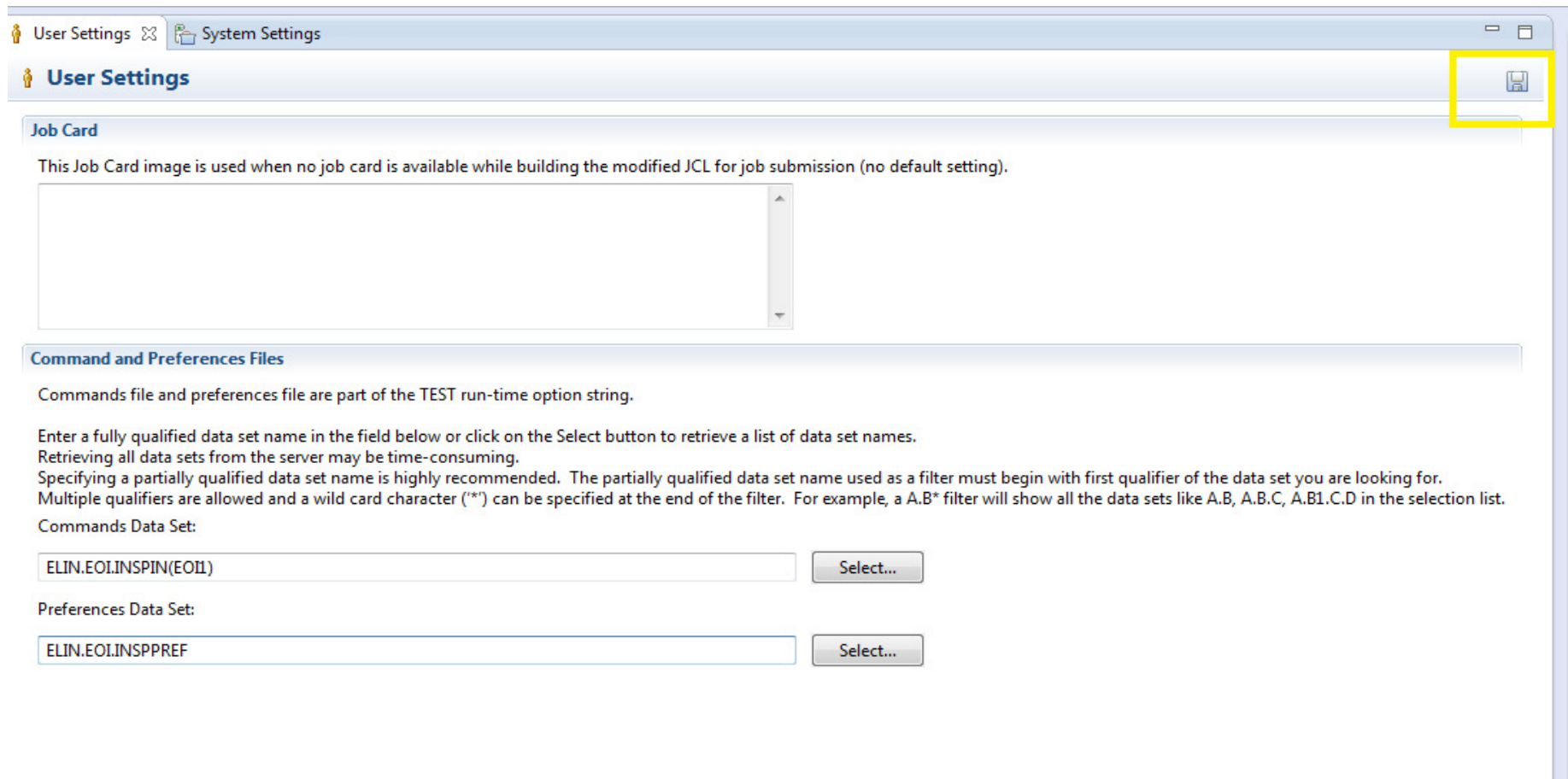
# JCL instrumentation plug-in: Overview

Click Window → Show view → Other  
Find “Instrument JCL for Debug Tool Debugging”

qualifiers are allowed and a wild card character (“\*”) can be specified at the end of the filter. For example, a A.B\* filter



# JCL instrumentation: User Settings



User Settings System Settings

## User Settings

### Job Card

This Job Card image is used when no job card is available while building the modified JCL for job submission (no default setting).

Command and Preferences Files

Commands file and preferences file are part of the TEST run-time option string.

Enter a fully qualified data set name in the field below or click on the Select button to retrieve a list of data set names. Retrieving all data sets from the server may be time-consuming. Specifying a partially qualified data set name is highly recommended. The partially qualified data set name used as a filter must begin with first qualifier of the data set you are looking for. Multiple qualifiers are allowed and a wild card character ("\*") can be specified at the end of the filter. For example, a A.B\* filter will show all the data sets like A.B, A.B.C, A.B1.C.D in the selection list.

Commands Data Set:

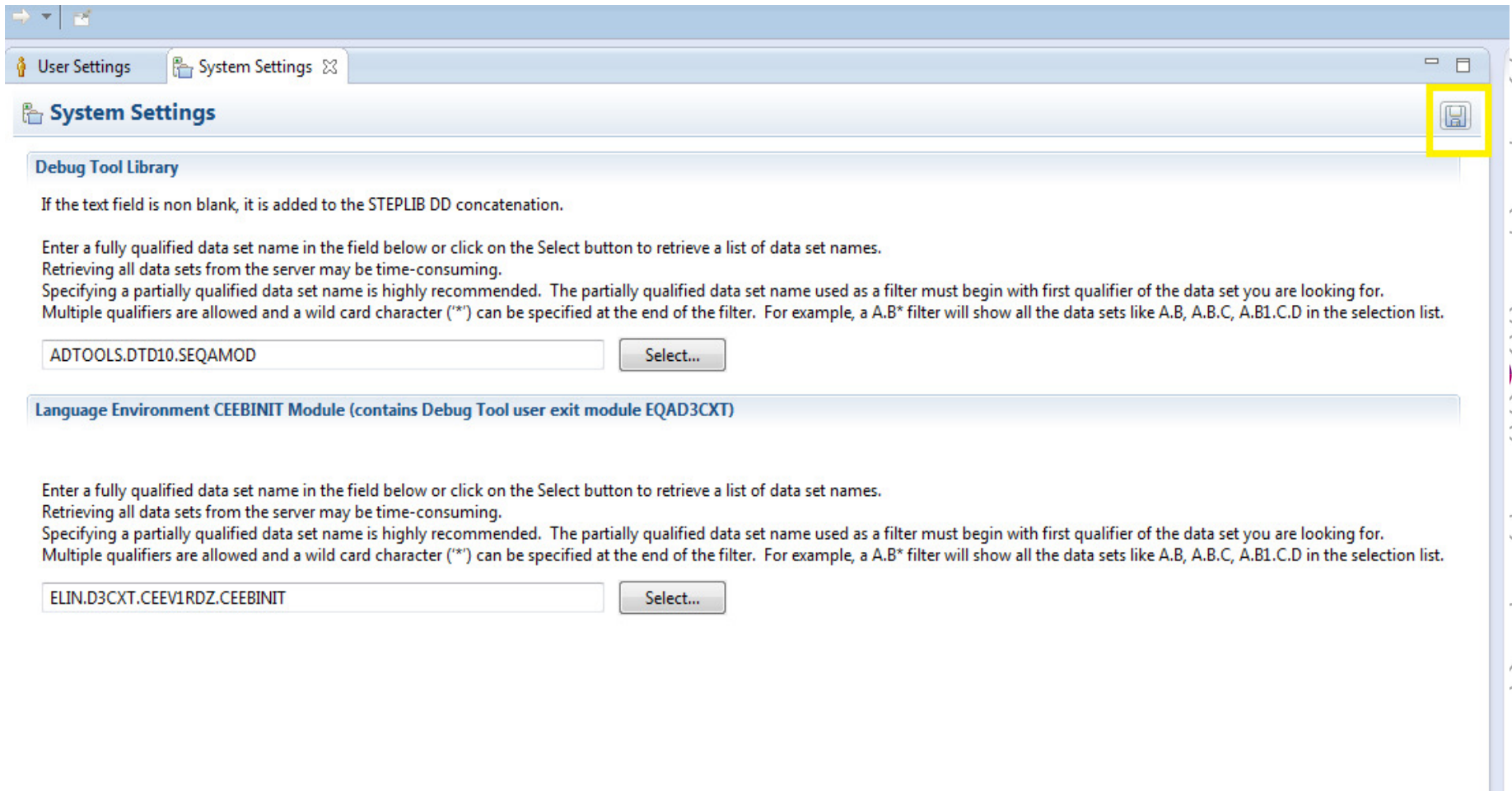
ELIN.EOI.INSPIIN(EOI1) Select...

Preferences Data Set:

ELIN.EOI.INSPPREF Select...



# JCL instrumentation: System Settings



User Settings System Settings

## System Settings

### Debug Tool Library

If the text field is non blank, it is added to the STEPLIB DD concatenation.

Enter a fully qualified data set name in the field below or click on the Select button to retrieve a list of data set names. Retrieving all data sets from the server may be time-consuming. Specifying a partially qualified data set name is highly recommended. The partially qualified data set name used as a filter must begin with first qualifier of the data set you are looking for. Multiple qualifiers are allowed and a wild card character (\*) can be specified at the end of the filter. For example, a A.B\* filter will show all the data sets like A.B, A.B.C, A.B1.C.D in the selection list.

ADTOOLS.DTD10.SEQAMOD Select...

### Language Environment CEEBINIT Module (contains Debug Tool user exit module EQAD3CXT)

Enter a fully qualified data set name in the field below or click on the Select button to retrieve a list of data set names. Retrieving all data sets from the server may be time-consuming. Specifying a partially qualified data set name is highly recommended. The partially qualified data set name used as a filter must begin with first qualifier of the data set you are looking for. Multiple qualifiers are allowed and a wild card character (\*) can be specified at the end of the filter. For example, a A.B\* filter will show all the data sets like A.B, A.B.C, A.B1.C.D in the selection list.

ELIN.D3CXT.CEEV1RDZ.CEEBINIT Select...

# JCL instrumentation: Debug Information, Source and Listing Files



User Settings System Settings Debug Information, Source, and Listing Files

## Debug Information, Source, and Listing Files

### User Level File List

User level file list is added to the top of the EQADEBUG DD concatenation.

Enter a fully qualified data set name in the field below or click on the Select button to retrieve a list of data set names. Retrieving all data sets from the server may be time-consuming. Specifying a partially qualified data set name is highly recommended. The partially qualified data set name used as a filter must begin with first qualifier of the data set you are looking for. Multiple qualifiers are allowed and a wild card character (\*) can be specified at the end of the filter. For example, a A.B\* filter will show all the data sets like A.B, A.B.C, A.B1.C.D in the selection list.

### Installation File List

Installation file list is added to the bottom of the EQADEBUG DD concatenation.

Enter a fully qualified data set name in the field below or click on the Select button to retrieve a list of data set names. Retrieving all data sets from the server may be time-consuming. Specifying a partially qualified data set name is highly recommended. The partially qualified data set name used as a filter must begin with first qualifier of the data set you are looking for. Multiple qualifiers are allowed and a wild card character (\*) can be specified at the end of the filter. For example, a A.B\* filter will show all the data sets like A.B, A.B.C, A.B1.C.D in the selection list.



# JCL instrumentation: System Settings

Prepare and Start Debug Session

**Prepare and Start Debug Session**  
JCL data set selection

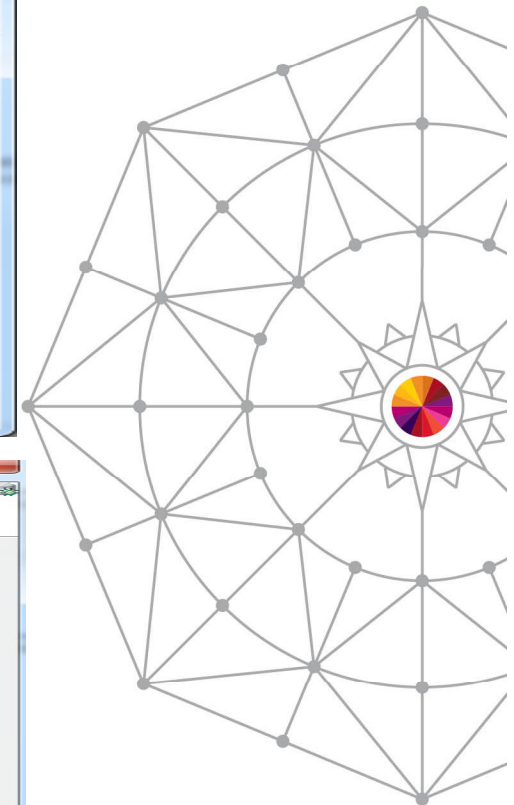
Partitioned or Sequential Data Set name

Data set name:

Prepare and Start Debug Session

**Prepare and Start Debug Session**  
JCL data set selection

| Name            | Prompt | Size | Created           | Changed           | ID |
|-----------------|--------|------|-------------------|-------------------|----|
| SSSETJIM        |        |      | 02/25/2008        | 02/25/2008        |    |
| BTSRRC00        |        |      | 09/17/2009        | 09/17/2009        |    |
| DFSRRRC00       |        |      | 09/17/2009        | 09/17/2009        |    |
| ECOB420G        |        |      | 08/05/2013        | 08/05/2013        |    |
| ECOB420L        |        |      | 09/18/2013        | 09/18/2013        |    |
| ECOB420T        |        |      | 09/18/2013        | 09/18/2013        |    |
| FCOR420X        |        |      | 09/18/2013        | 09/18/2013        |    |
| <b>ECOB420Y</b> |        |      | <b>09/18/2013</b> | <b>09/18/2013</b> |    |
| EO11            |        |      | 03/24/2008        | 03/24/2008        |    |
| EO111           |        |      | 04/16/2008        | 04/16/2008        |    |
| EO112           |        |      | 04/16/2008        | 04/16/2008        |    |
| EO113           |        |      | 06/13/2008        | 06/13/2008        |    |
| EO12            |        |      | 03/18/2008        | 03/18/2008        |    |
| EO13            |        |      | 02/08/2008        | 02/08/2008        |    |
| EO14            |        |      | 03/24/2008        | 03/24/2008        |    |
| EO15            |        |      | 03/26/2008        | 03/26/2008        |    |
| EO16            |        |      | 04/03/2008        | 04/03/2008        |    |
| EO17            |        |      | 04/13/2008        | 04/13/2008        |    |



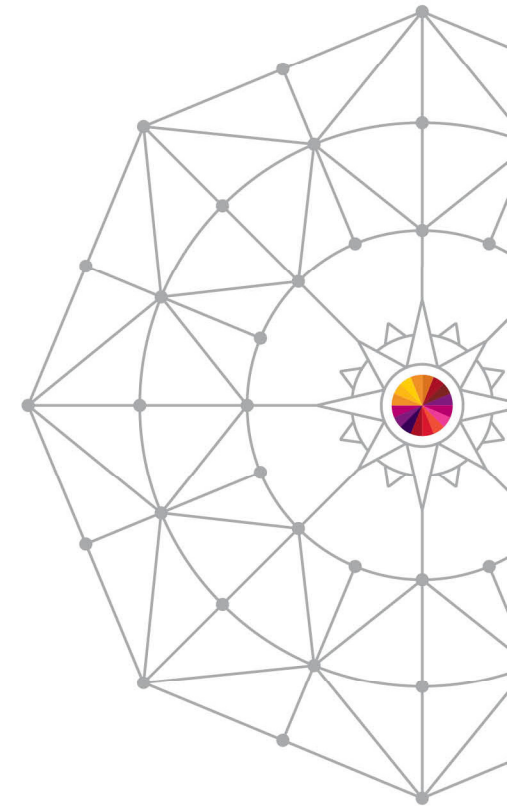
# JCL instrumentation: JCL with updates

## Prepare and Start Debug Session

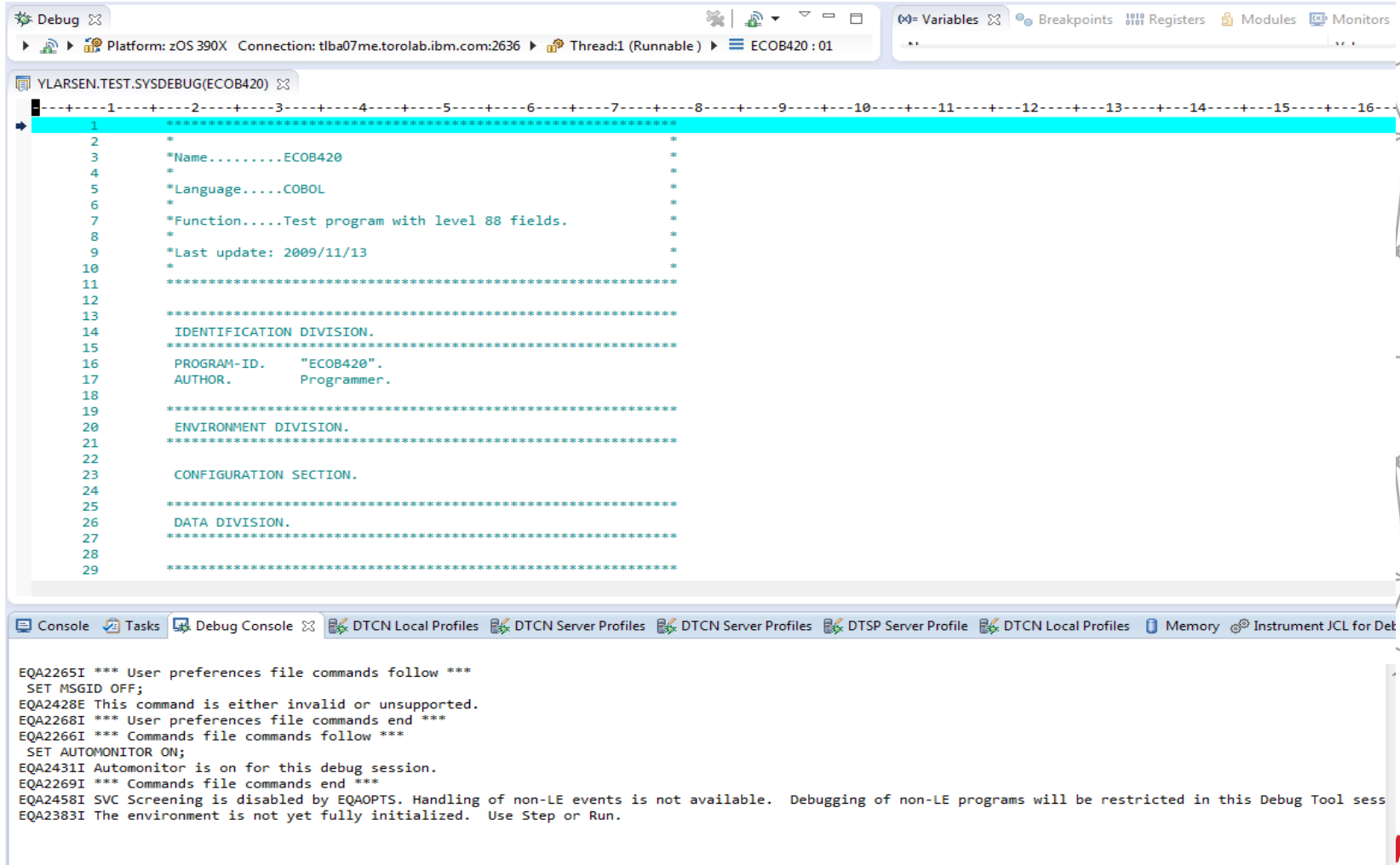
Data set created. Press Next button to execute the job and start the debug session.

Data set GO

```
//SYSPRINT DD SYSOUT=*
//SYSLIN DD DSNNAME=&&LOADSET,DISP=(OLD,DELETE)
// DD DDNAME=SYSIN
//SYSLMOD DD DISP=SHR,DSN=YLARSEN.TEST.LOAD(ECOB420)
//SYSUT1 DD UNIT=SYSDA,SPACE=(TRK,(10,10))
/*
/*****GO
//GO EXEC PGM=ECOB420
//STEPLIB DD DISP=SHR,DSN=YLARSEN.TEST.LOAD
/* >>> The JCL lines below were inserted by Debug Tool.<<<
// DD DSN=CODEFVT.PGUTEST.DTDEBUG.VDR1.SEQAMOD,DISP=(SHR,,)
/* >>> The JCL lines above were inserted by Debug Tool.<<<
// DD DISP=SHR,DSN=ESFLINT.CEEV1RDZ.SCEERUN
// DD DISP=SHR,DSN=ESFLINT.CEEV1RDZ.SCEERUN2
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD DUMMY
//SYSOUT DD SYSOUT=*
/*
/* >>> The JCL lines below were inserted by Debug Tool.<<<
//CEEOPTS DD *,DLM='/*'
TEST(ALL,'-ELIN.EOI.INSPIIN(EOIL)',PROMPT,
TCP/IP&9.55.176.191%8001:-ELIN.EOI.INSPPREF)
//INSPLOG DD SYSOUT=*
/* >>> The JCL lines above were inserted by Debug Tool.<<<
```



# JCL instrumentation: Debug session up!



Platform: zOS 390X Connection: tlba07me.torolab.ibm.com:2636 Thread:1 (Runnable) ECOB420:01

```

1  *-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10-----11-----12-----13-----14-----15-----16-----
2  *
3  *Name.....ECOB420
4  *
5  *Language....COBOL
6  *
7  *Function....Test program with level 88 fields.
8  *
9  *Last update: 2009/11/13
10 *
11 *****
12
13 *****
14 IDENTIFICATION DIVISION.
15 *****
16 PROGRAM-ID. "ECOB420".
17 AUTHOR. Programmer.
18
19 *****
20 ENVIRONMENT DIVISION.
21 *****
22
23 CONFIGURATION SECTION.
24
25 *****
26 DATA DIVISION.
27 *****
28
29 *****

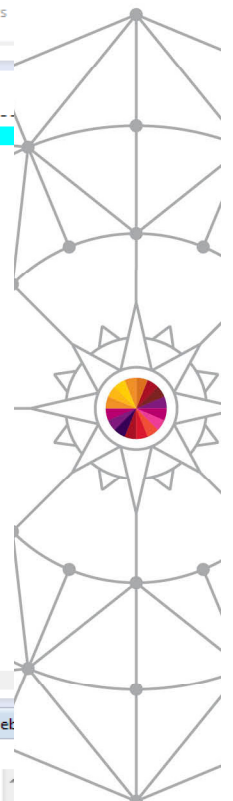
```

Console: Tasks Debug Console DTCN Local Profiles DTCN Server Profiles DTSP Server Profile Memory Instrument JCL for Det

```

EQA2265I *** User preferences file commands follow ***
SET MSGID OFF;
EQA2428E This command is either invalid or unsupported.
EQA2268I *** User preferences file commands end ***
EQA2266I *** Commands file commands follow ***
SET AUTOMONITOR ON;
EQA2431I Automonitor is on for this debug session.
EQA2269I *** Commands file commands end ***
EQA2458I SVC Screening is disabled by EQAOPTS. Handling of non-LE events is not available. Debugging of non-LE programs will be restricted in this Debug Tool sess
EQA2383I The environment is not yet fully initialized. Use Step or Run.

```



Complete your session evaluations online at [www.SHARE.org/Anaheim-Eval](http://www.SHARE.org/Anaheim-Eval)

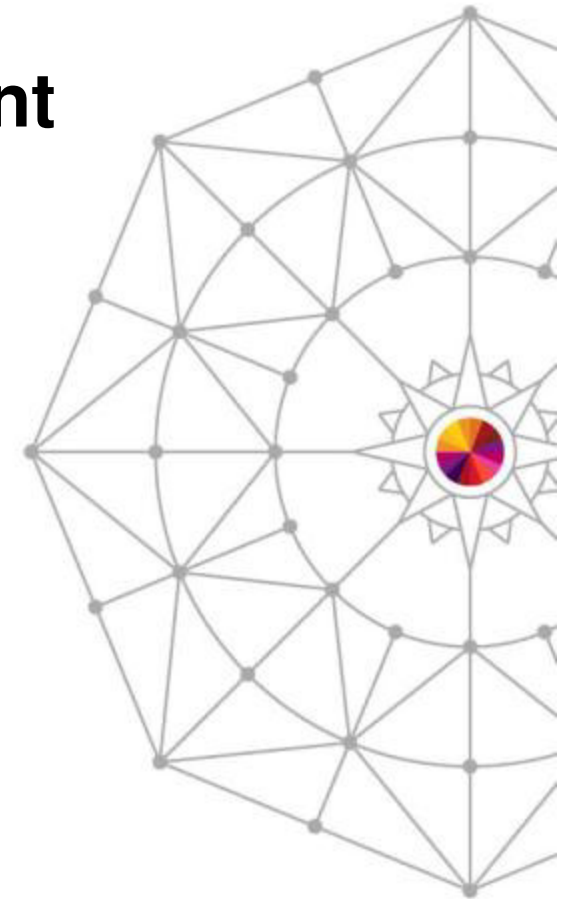


# Debug Tool IMS Private Message Region Enhancement

Randy Campbell  
IBM

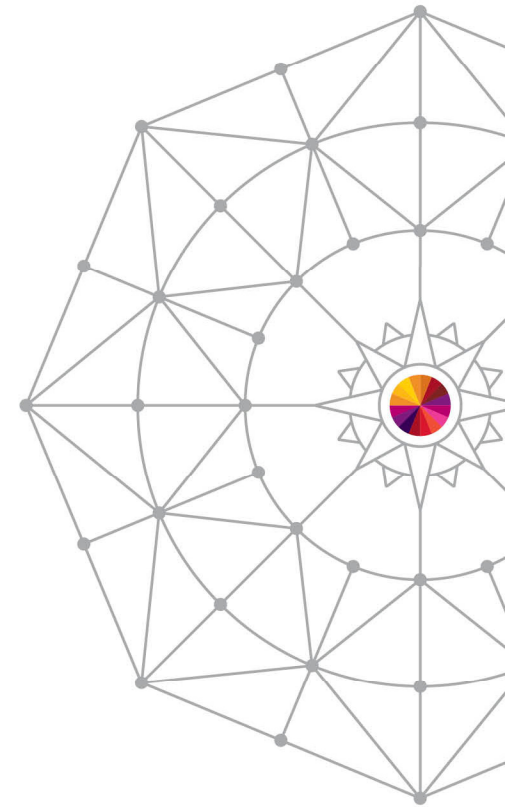
March 10, 2014  
Session 14621

Insert  
Custom  
Session  
QR if  
Desired.



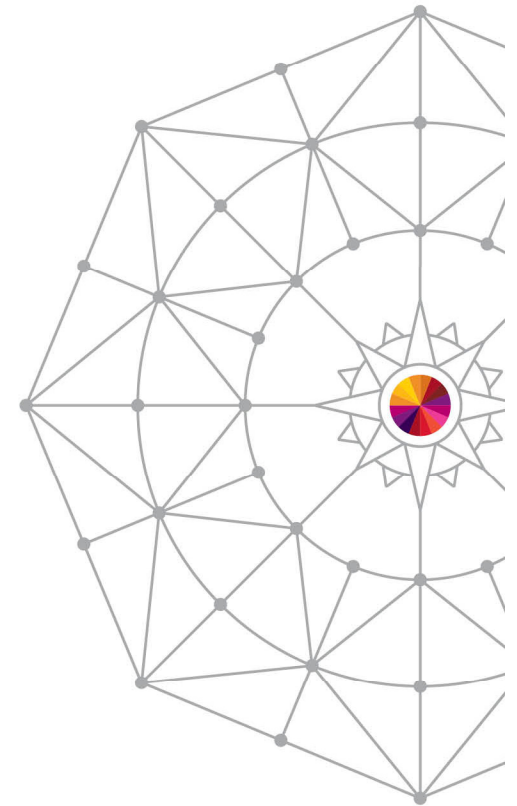
# Agenda

- IMS private message region enhancement
  - Customer requirement
  - Proposed solution
  - Demo



# Customer Requirement

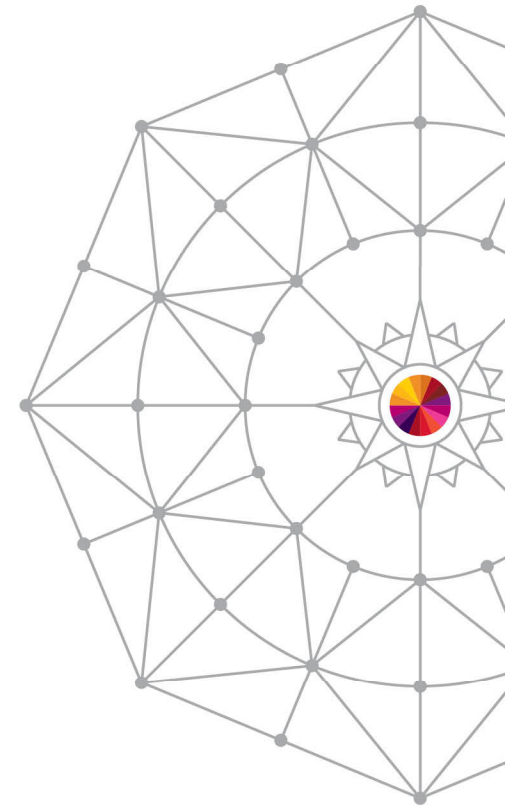
- In IMS online environments, one or more users debugging transactions in Debug Tool can monopolize the scheduling environment for a given message class.
- Customers would like a way to isolate debug users in private message regions, serving a class dedicated to Debug Tool. This will allow the normal class to continue scheduling non-debug transactions.





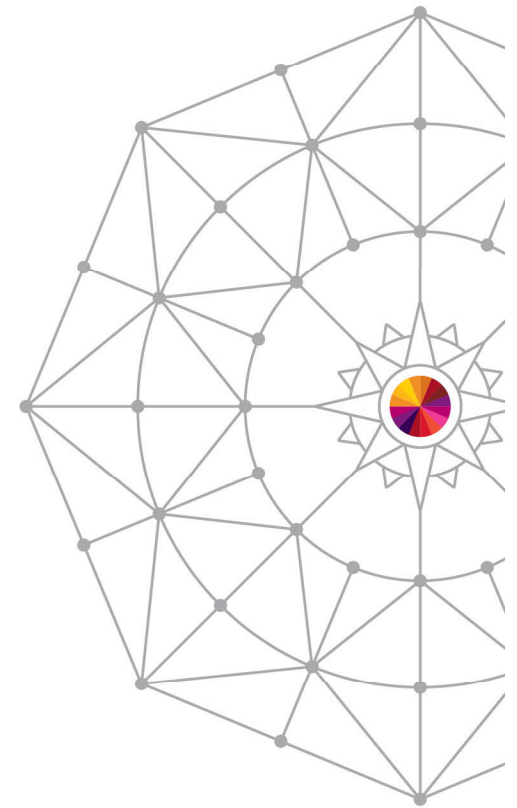
# Solution

- Debug Tool will add panels to Debug Tool Utilities to facilitate the following:
  - Allow administrators to create Message Region Templates, with dedicated message classes.
  - Allow debug users to select a Message Region Template to launch as a private message region.
  - Also, allow debug users to specify a transaction to schedule in their private message region and debug.



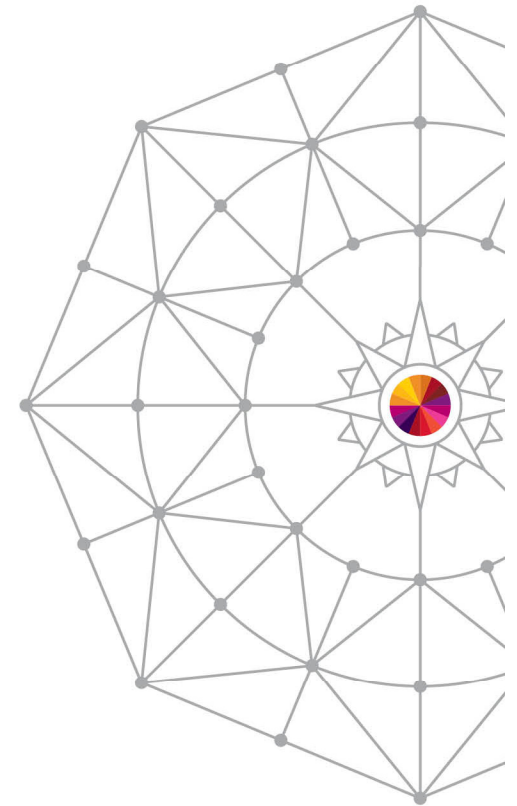
# Installer Actions

- The Debug Tool installer will need to perform some customization of DTU and RACF.
  - Set defaults in EQAZDFLT for the default message region template data set, and the default job names for private message regions.
  - Give authority to the EQANBSWT BMP AOI to issue the /START, /STOP, /ASSIGN and /DISPLAY IMS commands.
  - Authorize administrators to the EQADTOOL.IMSTEMPCREATE FACILITY.



# Administrator Use Case

- Administrator needs to create a new message region template.
- Use DTU option 4, sub-option 4.
- Copy from the JCL of an existing IMS message region.



# Administrator panel

- This is the panel the administrator sees after selecting DTU option 4.4.
- The administrator may overtype the name of the template data set.
- To create a new template, the administrator enters “I” in the table.

```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
Create IMS MPR Templates for dynamic transaction swapping      Row 1 to 2 of 2
Command ==> _____ Scroll ==> PAGE

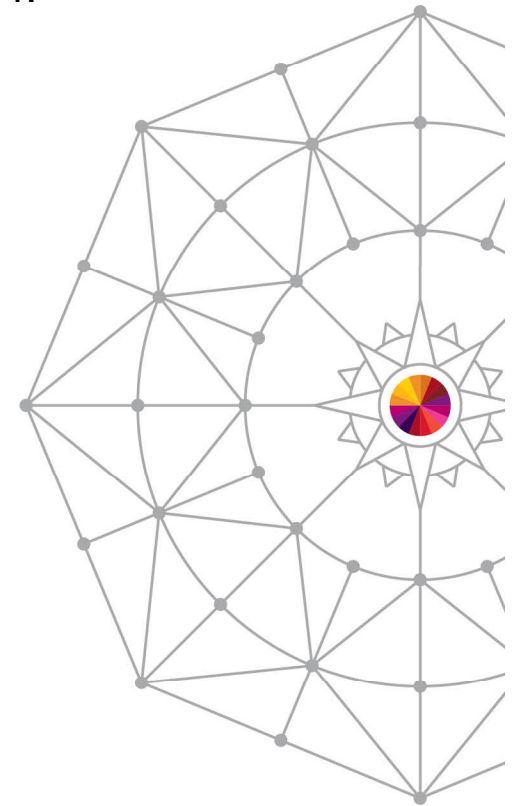
Template Data Set . . . 'RANCAM.SHARED.IMSTEST.DTSU'

To create a new template, type I in the Sel field on any line and press Enter.
To edit a template, type E in the Sel field on the appropriate line and press
Enter.
To delete a template, type D in the Sel field on the appropriate line and press
Enter.

Sel  Member  Cls  Comment
I   *****  ***  ***** TOP OF DATA *****
   MPRCI10X  020  MPRCI10X region
   *****  ***** Bottom of data *****

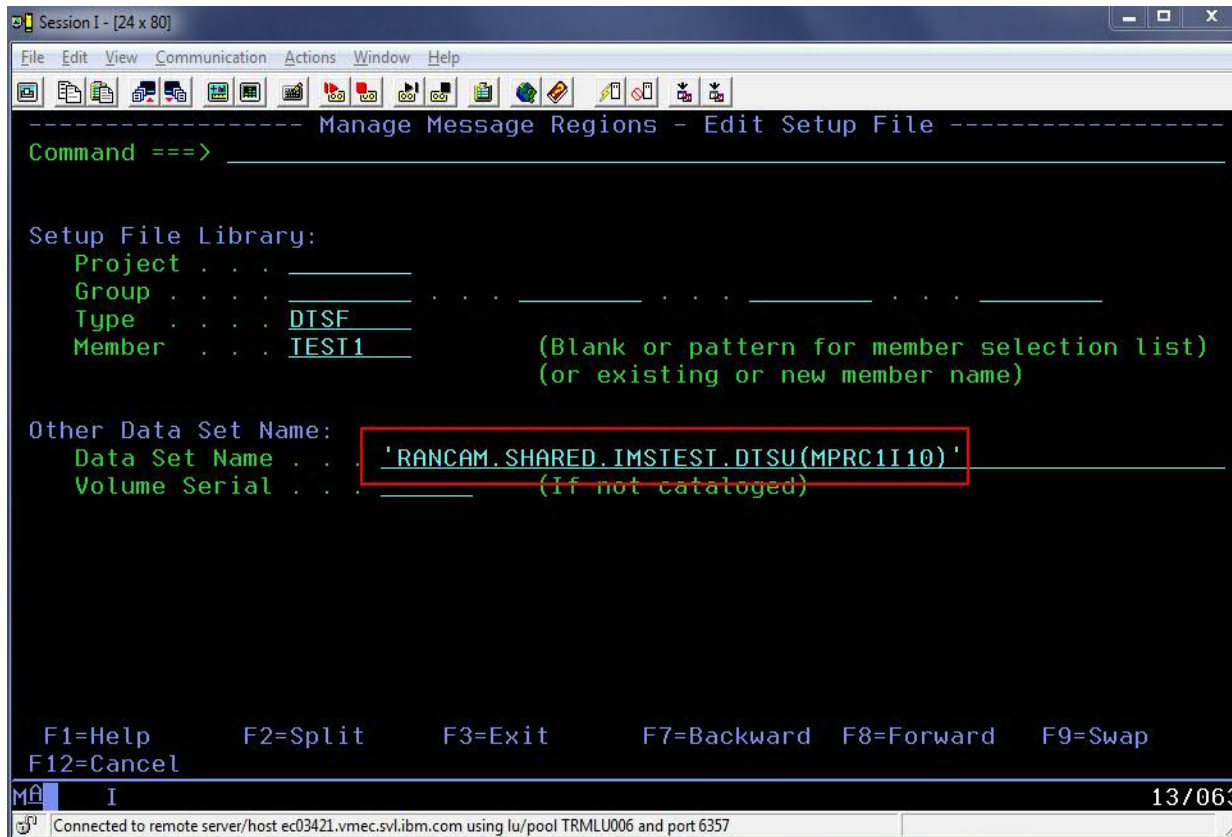
F1=Help      F3=Exit      F7=Backward  F8=Forward  F12=Cancel
MA  I                                               15/004
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357

```



# Supply data set name for template

- The data set name will be pre-filled with the template name. The administrator adds a member name and presses Enter.



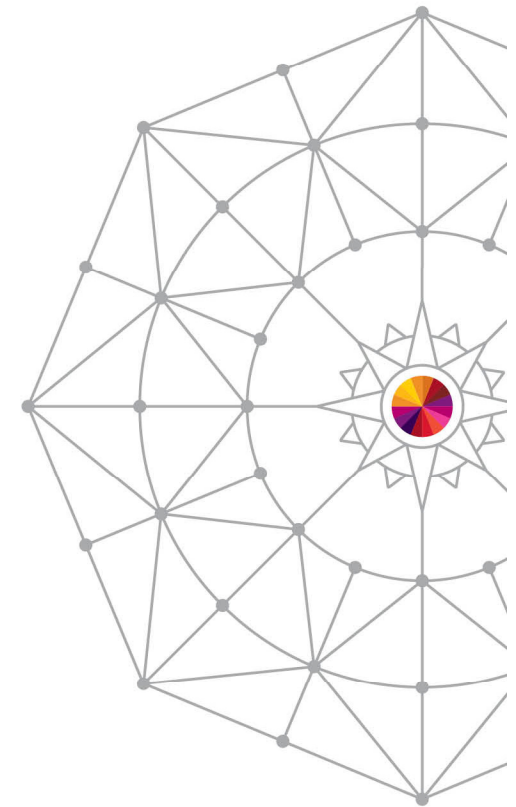
```
----- Manage Message Regions - Edit Setup File -----
Command ==> _____

Setup File Library:
Project . . . _____
Group . . . _____
Type . . . DTSF
Member . . . TEST1          (Blank or pattern for member selection list
                          (or existing or new member name)

Other Data Set Name:
Data Set Name . . . 'RANCAM.SHARED.IMSTEST.DTSU(MPRC1I10)'
Volume Serial . . . _____ (If not cataloged)

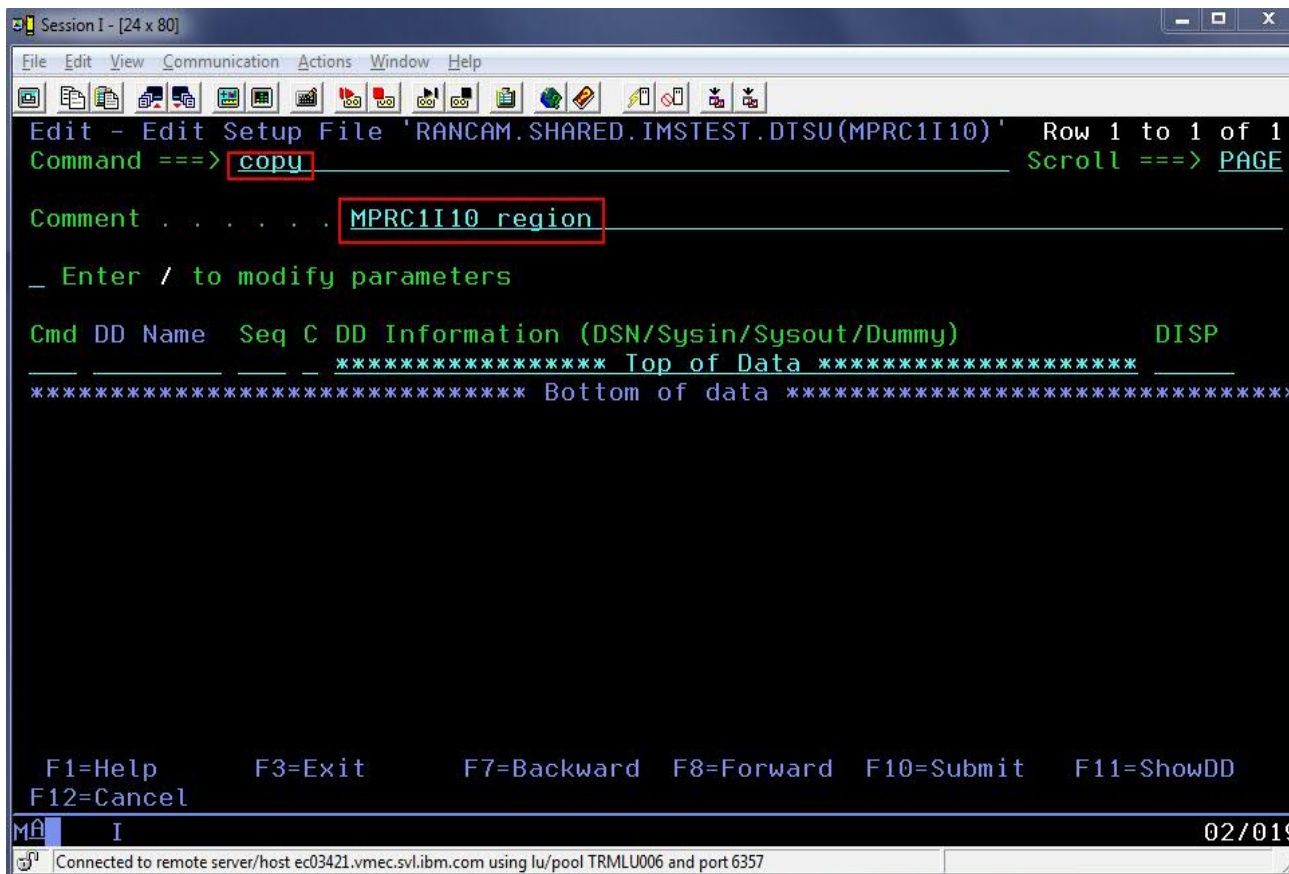
F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F12=Cancel

M I 13/063
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
```



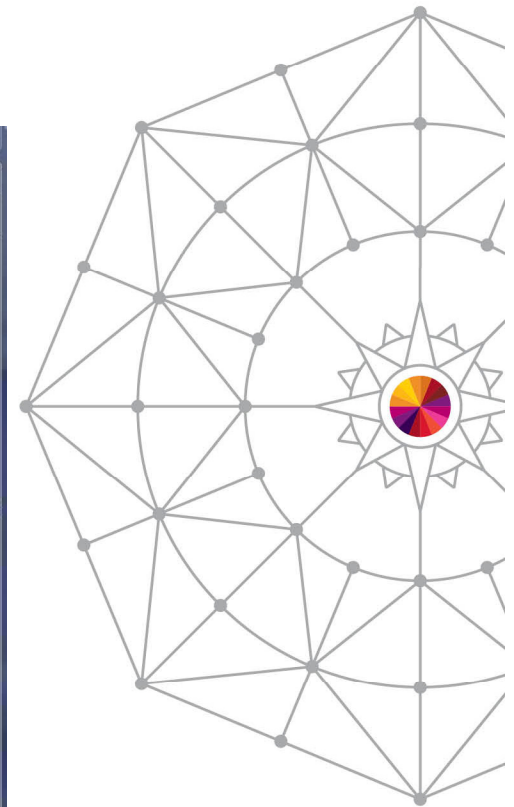
# Enter the COPY command

- The administrator types in a region comment, and then enters the “copy” command and presses Enter.



```
Session I - [24 x 80]
File Edit View Communication Actions Window Help
Edit - Edit Setup File 'RANCAM.SHARED.IMSTEST.DTSU(MPRC1I10)' Row 1 to 1 of 1
Command ==> copy Scroll ==> PAGE
Comment . . . . . MPRC1I10 region
_ Enter / to modify parameters
Cmd DD Name Seq C DD Information (DSN/Sysin/Sysout/Dummy) DISP
***** Top of Data *****
***** Bottom of data *****

F1=Help F3=Exit F7=Backward F8=Forward F10=Submit F11=ShowDD
F12=Cancel
M I 02/019
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
```



# Supply JCL data set name

- The administrator will type the name of a data set which contains IMS MPR JCLs and press Enter.

```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
----- Debug Tool Foreground - Copy from Setup File or JCL -----
Command ==>
Select data to copy into 'RANCAM.SHARED.IMSTEST.DTSU(MPRC1I10)'

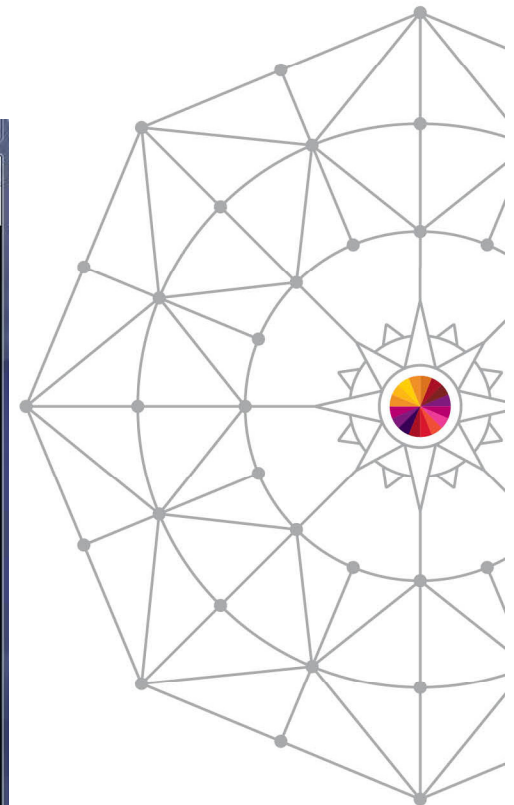
Setup File or JCL Library:
Project . . .
Group . . .
Type . . . DTSF
Member . . . (Blank or pattern for member selection list
              (or existing or new member name)

Other Data Set Name:
Data Set Name . . . 'RANCAM.SHARED.IMSTEST.MPR.JCL'
Volume Serial . . . (If not cataloged)

Note: When you copy from another setup file the entire contents are copied.
      When copying from JCL you can select the information you want to copy.

F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F12=Cancel

M I 02/015
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
  
```



# Select member from JCL data set

- The administrator selects the member to copy and presses Enter.

```

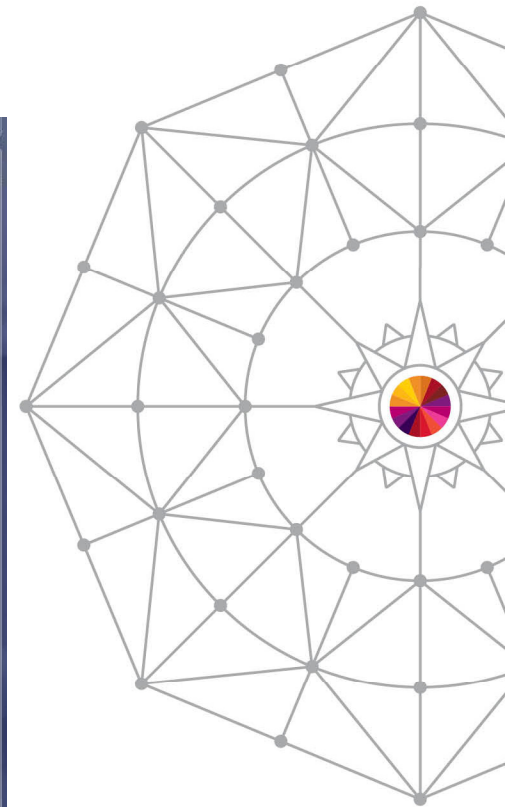
Session I - [24 x 80]
File Edit View Communication Actions Window Help
Menu Functions Confirm Utilities Help

LIBRARY          RANCAM.SHARED.IMSTEST.MPR.JCL          Row 0000001 of 0000009
Command ===>          Scroll ===> PAGE

  Name      Prompt      Size      Created      Changed      ID
- MPR1RTC   65      2009/08/18  2013/07/29  12:35:01    USRT001
- MPR1RT2   63      2011/07/07  2013/06/26  12:46:03    USRT001
- MPR1RT3   69      2012/12/06  2013/05/31  09:34:37    USRT001
- MPR1RT4   64      2013/05/31  2013/05/31  12:47:56    USRT001
- MPRCI10X  49      2013/08/07  2013/08/30  02:53:34    USRT001
- MPRC1IBA  73      2013/01/25  2013/02/01  13:38:38    USRT001
s MPRC1I10  53      2013/08/07  2013/08/08  11:55:16    USRT002
- MPRC5IBA  65      2013/04/09  2013/04/09  13:58:16    USRT001
- MPR56378  70      2009/03/13  2009/03/18  12:52:26    USRT001
**End**

F1=Help      F2=Split     F3=Exit      F4=REFRESH   F5=Rfind     F7=Up
F8=Down      F9=Swap      F10=Left     F11=Right    F12=Cancel

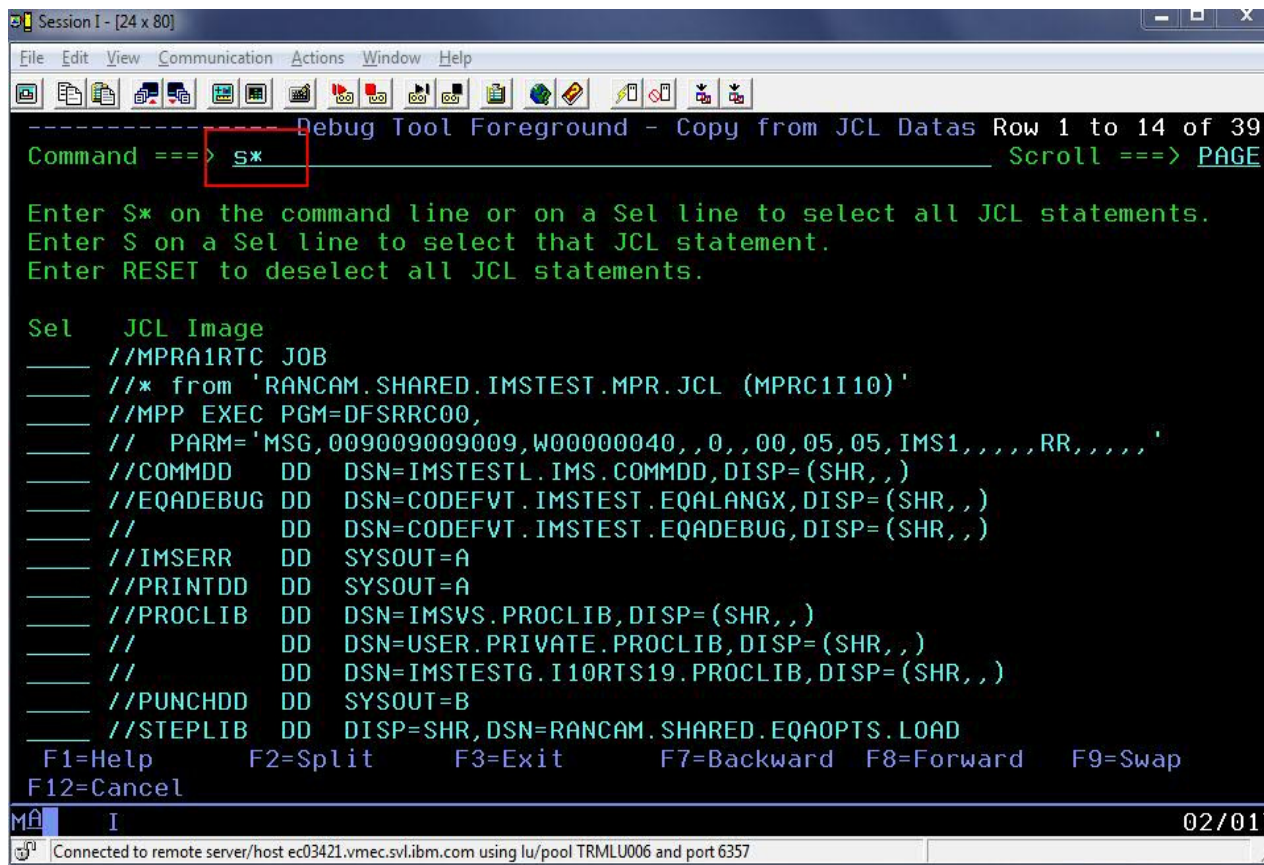
Mâ I 12/013
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
  
```





# Select JCL cards to import to template

- This will present a panel with the JCL cards for the MPR.
- To select the entire job, the administrator types the command S\* and hits Enter, and then presses PF3 to populate the template from the JCL.



```

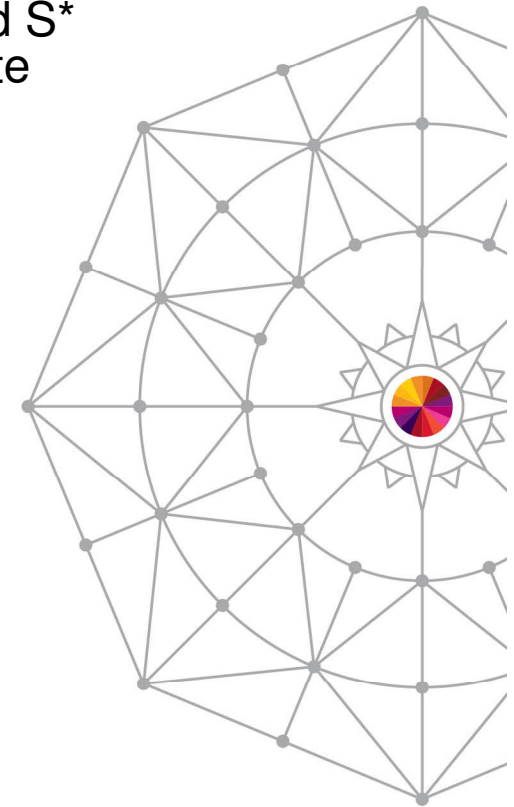
Session I - [24 x 80]
File Edit View Communication Actions Window Help
Debug Tool Foreground - Copy from JCL Datas Row 1 to 14 of 39
Command ==> S* Scroll ==> PAGE

Enter S* on the command line or on a Sel line to select all JCL statements.
Enter S on a Sel line to select that JCL statement.
Enter RESET to deselect all JCL statements.

Sel  JCL Image
____ //MPRA1RTC JOB
____ //* from 'RANCAM.SHARED.IMSTEST.MPR.JCL (MPRC1I10)'
____ //MPP EXEC PGM=DFSRRRC00,
____ //  PARM='MSG,009009009009,W00000040,,0,,00,05,05,IMS1,,,,,RR,,,,,'
____ //COMMDD DD DSN=IMSTESTL.IMS.COMMDD,DISP=(SHR,,)
____ //EQADEBUG DD DSN=CODEFVT.IMSTEST.EQALANGX,DISP=(SHR,,)
____ // DD DSN=CODEFVT.IMSTEST.EQADEBUG,DISP=(SHR,,)
____ //IMSERR DD SYSOUT=A
____ //PRINTDD DD SYSOUT=A
____ //PROCLIB DD DSN=IMSVS.PROCLIB,DISP=(SHR,,)
____ // DD DSN=USER.PRIVATE.PROCLIB,DISP=(SHR,,)
____ // DD DSN=IMSTESTG.I10RTS19.PROCLIB,DISP=(SHR,,)
____ //PUNCHDD DD SYSOUT=B
____ //STEPLIB DD DISP=SHR,DSN=RANCAM.SHARED.EQAOPTS.LOAD

F1=Help      F2=Split    F3=Exit     F7=Backward F8=Forward  F9=Swap
F12=Cancel

M I 02/017
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
  
```

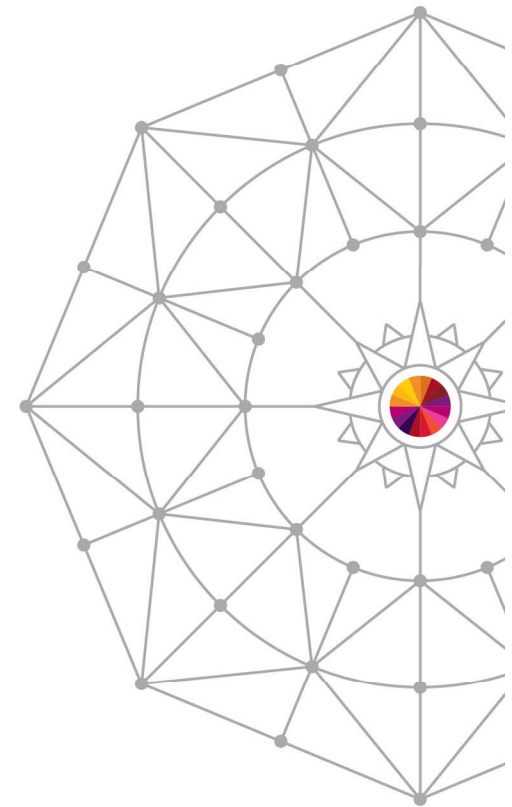


# Modify parameters to set message class

- The administrator types a forward slash (/) to modify the parameters. This allows the administrator to assign a message class to the template.

```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
Edit - Edit Setup File 'RANCAM.SHARED.IMSTEST.DTSU(MPRC1I10) Row 1 to 14 of 36
Command ==> _____ Scroll ==> PAGE
Comment . . . . . MPRC1I10 region
/ Enter / to modify parameters
Cmd DD Name Seq C DD Information (DSN/Sysin/Sysout/Dummy) DISP
-----
CEEMSG 1 SYSOUT=A
CEEOPST 1 SYSIN
COMMDD 1 'IMSTESTL.IMS.COMMDD' SHR
DFSESL 1 'IMSBLD.I10RTS19.CRESLIB' SHR
2 'MQS.V7R1M0.SCSQAUTH' SHR
EQADEBUG 1 'CODEFVT.IMSTEST.EQALANGX' SHR
2 'CODEFVT.IMSTEST.EQADEBUG' SHR
IMSERR 1 SYSOUT=A
INSPLOG 1 SYSOUT=*
PRINTDD 1 SYSOUT=A
PROCLIB 1 'IMSVS.PROCLIB' SHR
2 'USER.PRIVATE.PROCLIB' SHR
3 'IMSTESTG.I10RTS19.PROCLIB' SHR
F1=Help F3=Exit F7=Backward F8=Forward F10=Submit F11=ShowDD
F12=Cancel
M A I 06/004
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
  
```



# “Classes” field will contain new message class.

- The administrator changes the message classes.
- Also, note that APPLFE of EQANIAFE is required and will be forced on if not specified.

```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
----- Parameters for Message Processing Region -----
Command ==> _____

Key parameters for message processing region.

  IMSID . . . IMS1           specify a 1-4 character IMS subsystem ID

  CLASSES . . . 020 020 020 020 specify 4 3-digit decimal numbers indicating
                                     classes of messages to be served

  APPLFE . . . EQANIAFE      specify a 1-8 character name of an appli-
                                     cation front-end routine that is called
                                     whenever a message processing program is
                                     scheduled. (Front-end routine is required
                                     to debug non-LE Assembler program)

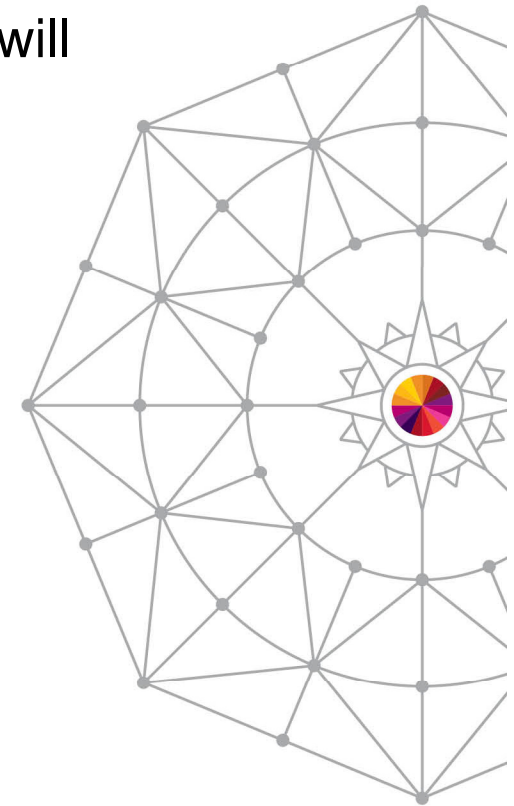
  STIMER . . . 0             specify a process time statistics code (0,1,
                                     2). 0 means no statistics are gathered.

Other parameters for message processing region.

  AGN . . . . . _____      ALTID . . . . . _____      More:      +
  F1=Help      F2=Split      F3=Exit      F7=Backward      F8=Forward      F9=Swap
  F12=Cancel

Mâ I
08/035
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357

```



# New template is now in the list

- Once the administrator presses PF3 to back all the way out, the new template will appear in the list.

```

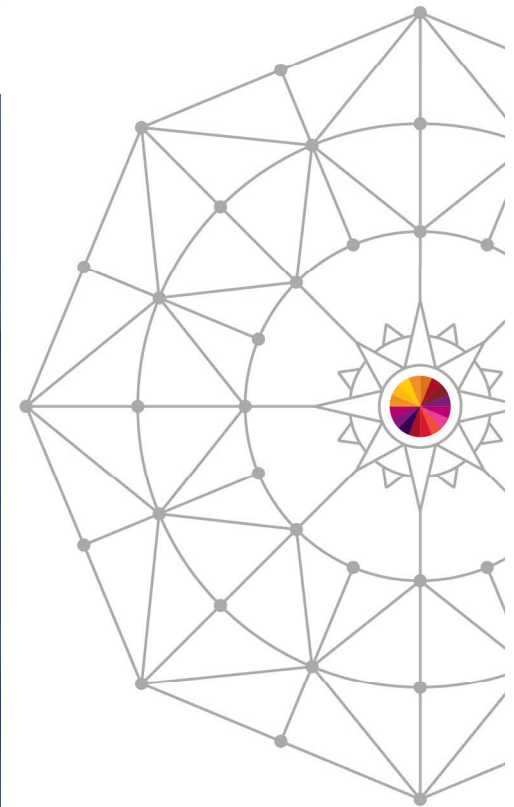
Session I - [24 x 80]
File Edit View Communication Actions Window Help
Create IMS MPR Templates for dynamic transaction swapping Row 1 to 3 of 3
Command ==> _____ Scroll ==> PAGE

Template Data Set . . . 'RANCAM.SHARED.IMSTEST.DTSU'

To create a new template, type I in the Sel field on any line and press Enter.
To edit a template, type E in the Sel field on the appropriate line and press
Enter.
To delete a template, type D in the Sel field on the appropriate line and press
Enter.

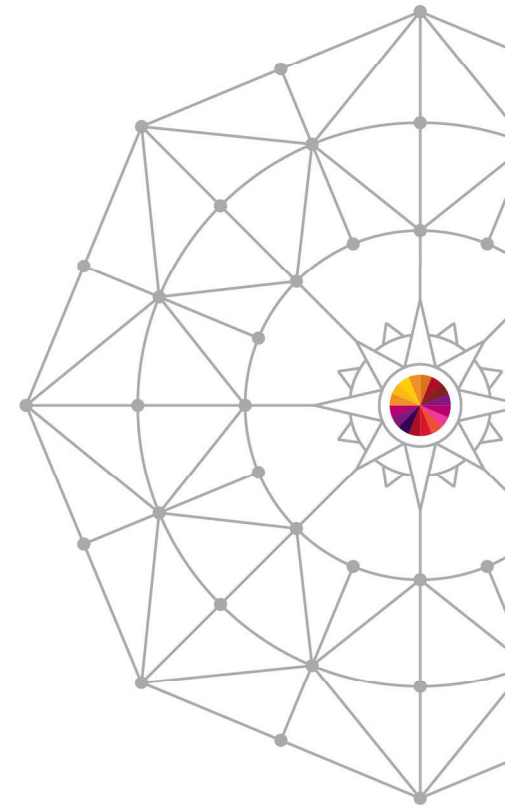
Sel Member CIs Comment
***** *** ***** TOP OF DATA *****
- MPRCI10X 020 MPRCI10X region
- MPRCI110 020 MPRCI110 region
***** Bottom of data *****

F1=Help F3=Exit F7=Backward F8=Forward F12=Cancel
MA I 02/015
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
  
```



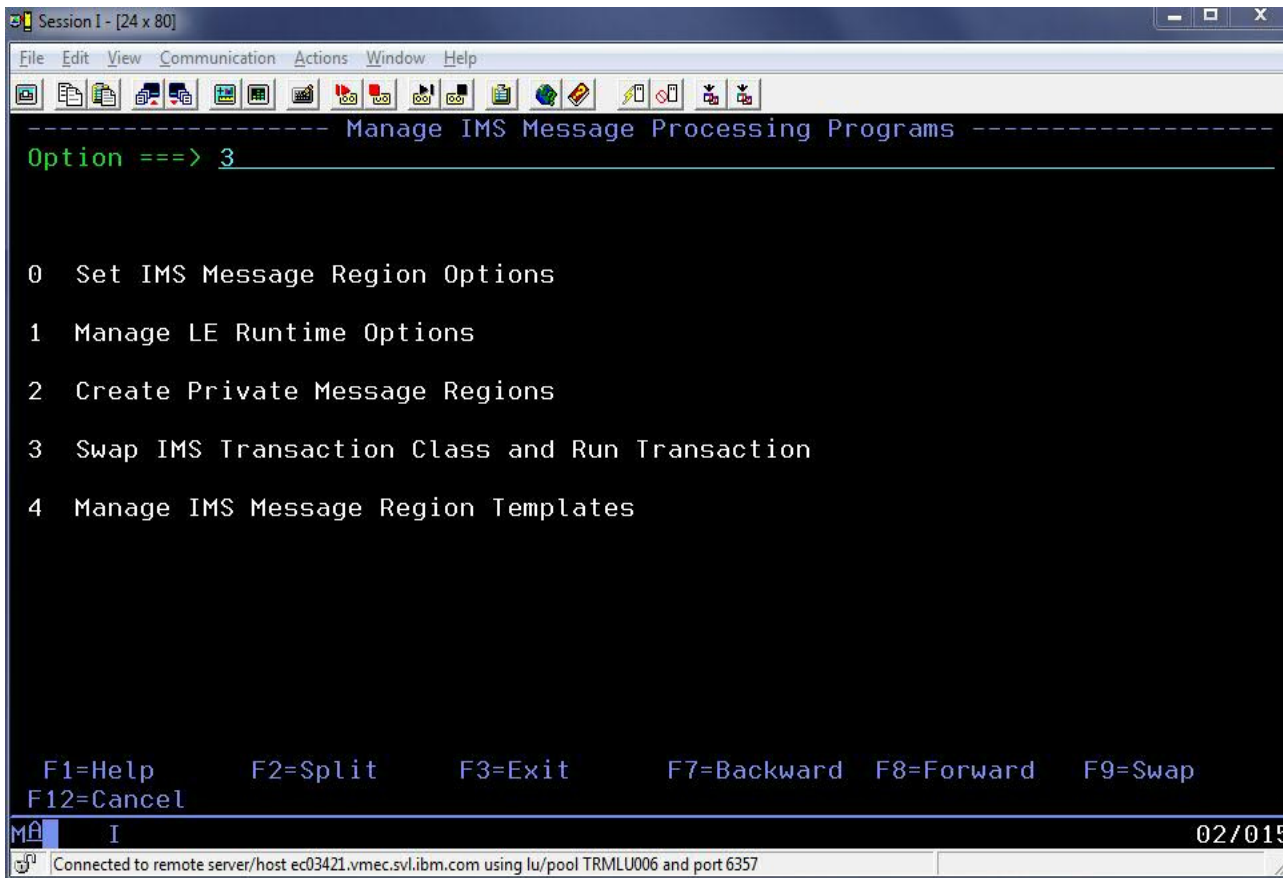
# Developer Use Case

- A developer knows that a certain transaction has a problem.
- The developer would like to debug to determine the location & cause of the failure, in a private message region.
- After debugging, the developer codes a fix and would like to test it without affecting other users.
- The developer would use a private message region template to accomplish these tasks.



## Select DTU option 4, sub-option 3

- User selects sub-option 3 to test with a private message region template.

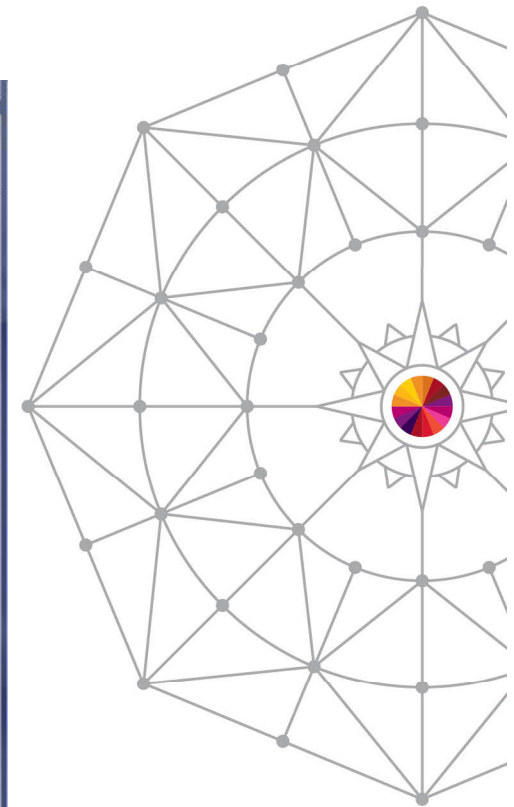


```
Session I - [24 x 80]
File Edit View Communication Actions Window Help
----- Manage IMS Message Processing Programs -----
Option ==> 3

0 Set IMS Message Region Options
1 Manage LE Runtime Options
2 Create Private Message Regions
3 Swap IMS Transaction Class and Run Transaction
4 Manage IMS Message Region Templates

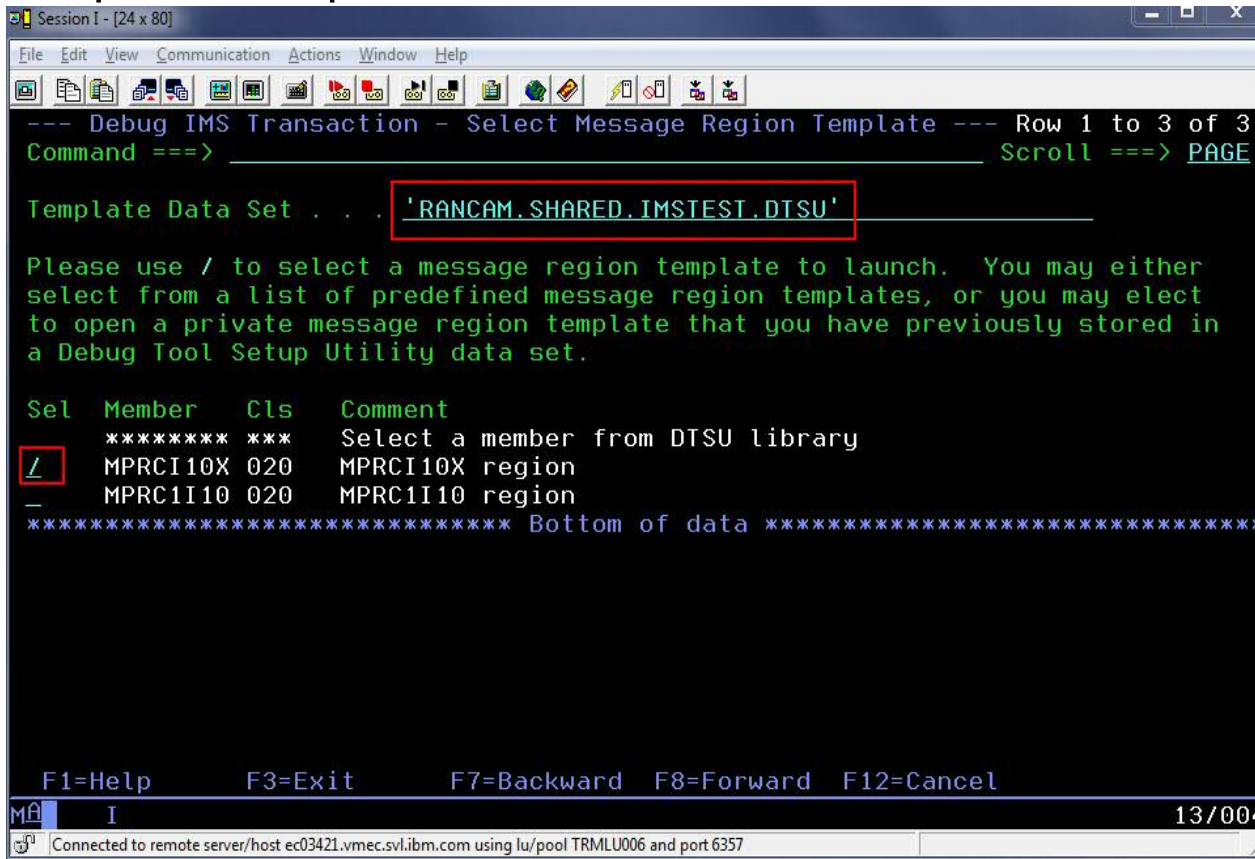
F1=Help      F2=Split    F3=Exit     F7=Backward F8=Forward  F9=Swap
F12=Cancel

M I 02/015
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357
```



# Select a pre-defined IMS region template

- User can overtype the template data set name, if desired. Then, user enters forward slash (/) next to the desired template and presses Enter.



```

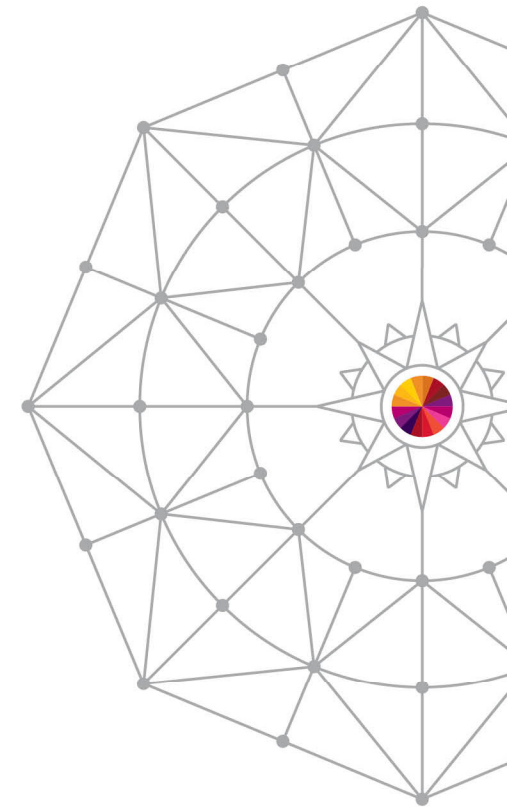
--- Debug IMS Transaction - Select Message Region Template --- Row 1 to 3 of 3
Command ==>
Template Data Set . . . 'RANCAM.SHARED.IMSTEST.DTSU'

Please use / to select a message region template to launch. You may either
select from a list of predefined message region templates, or you may elect
to open a private message region template that you have previously stored in
a Debug Tool Setup Utility data set.

Sel  Member  Cls  Comment
***** ***  Select a member from DTSU library
/   MPRCI10X 020  MPRCI10X region
_   MPRCI110 020  MPRCI110 region
***** Bottom of data *****

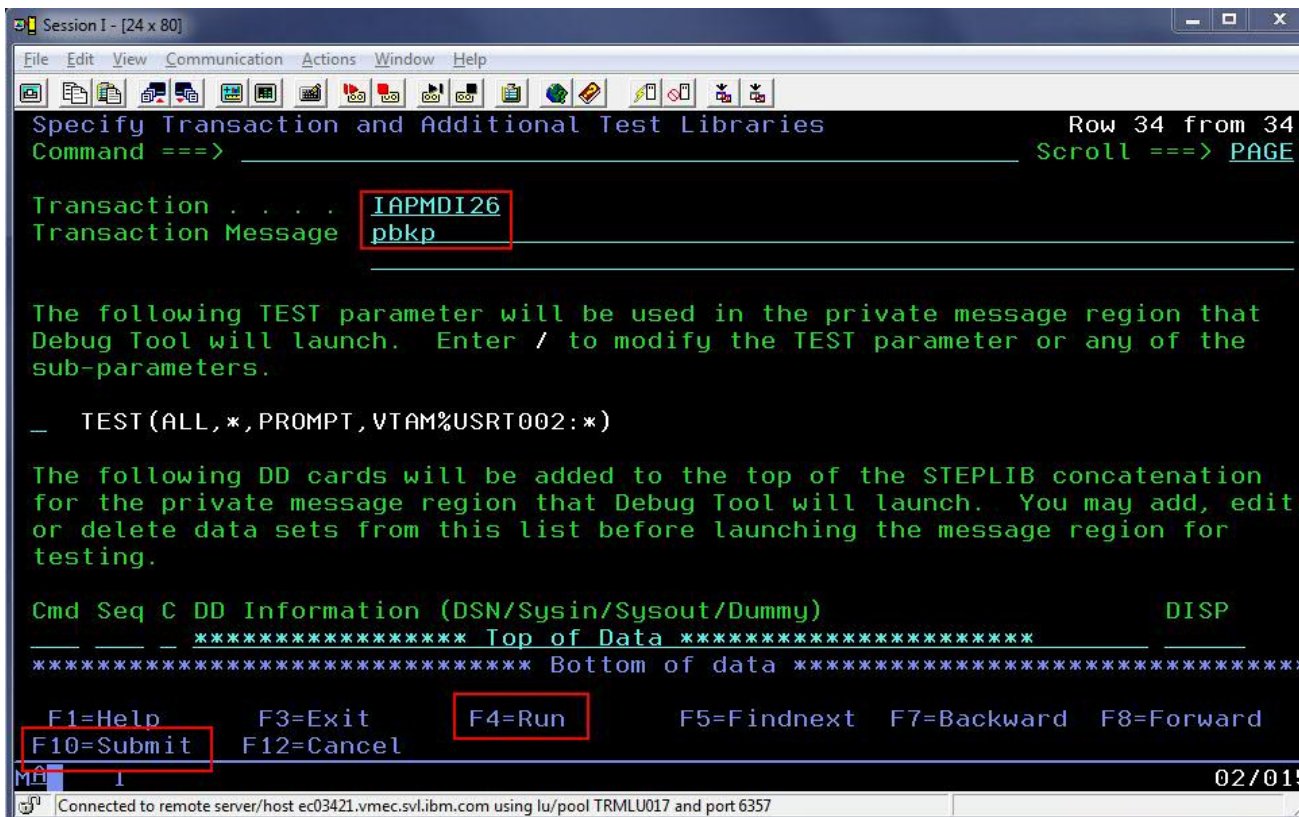
F1=Help      F3=Exit      F7=Backward  F8=Forward  F12=Cancel
M I                                               13/004
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357

```



# Supply a transaction name and message

- To debug with the template, the user will fill in the transaction and any message for the transaction, then hit PF4 to “Run” or PF10 to “Submit”.



```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
Specify Transaction and Additional Test Libraries Row 34 from 34
Command ==> Scroll ==> PAGE

Transaction . . . . IAPMDI26
Transaction Message pbkp

The following TEST parameter will be used in the private message region that
Debug Tool will launch. Enter / to modify the TEST parameter or any of the
sub-parameters.

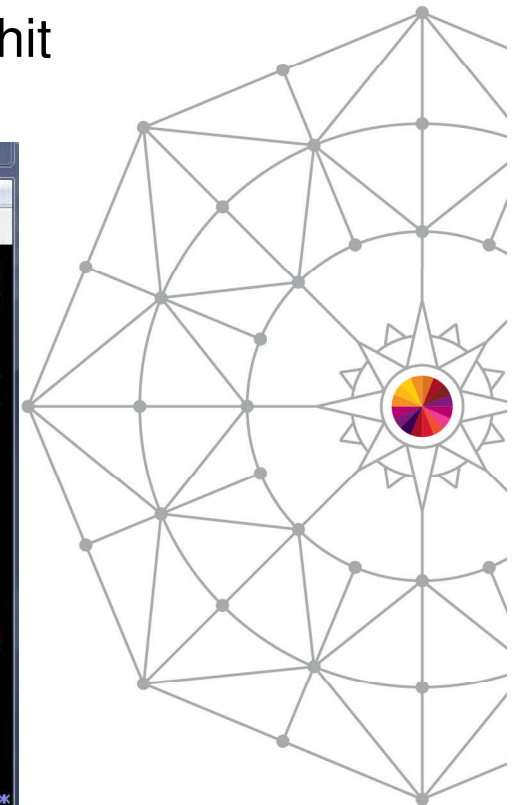
_ TEST (ALL,*,PROMPT,VTAM%USRT002:*)

The following DD cards will be added to the top of the STEPLIB concatenation
for the private message region that Debug Tool will launch. You may add, edit
or delete data sets from this list before launching the message region for
testing.

Cmd Seq C DD Information (DSN/Sysin/Sysout/Dummy) DISP
_ _ _ _ _ ***** Top of Data *****
***** Bottom of data *****

F1=Help F3=Exit F4=Run F5=Findnext F7=Backward F8=Forward
F10=Submit F12=Cancel

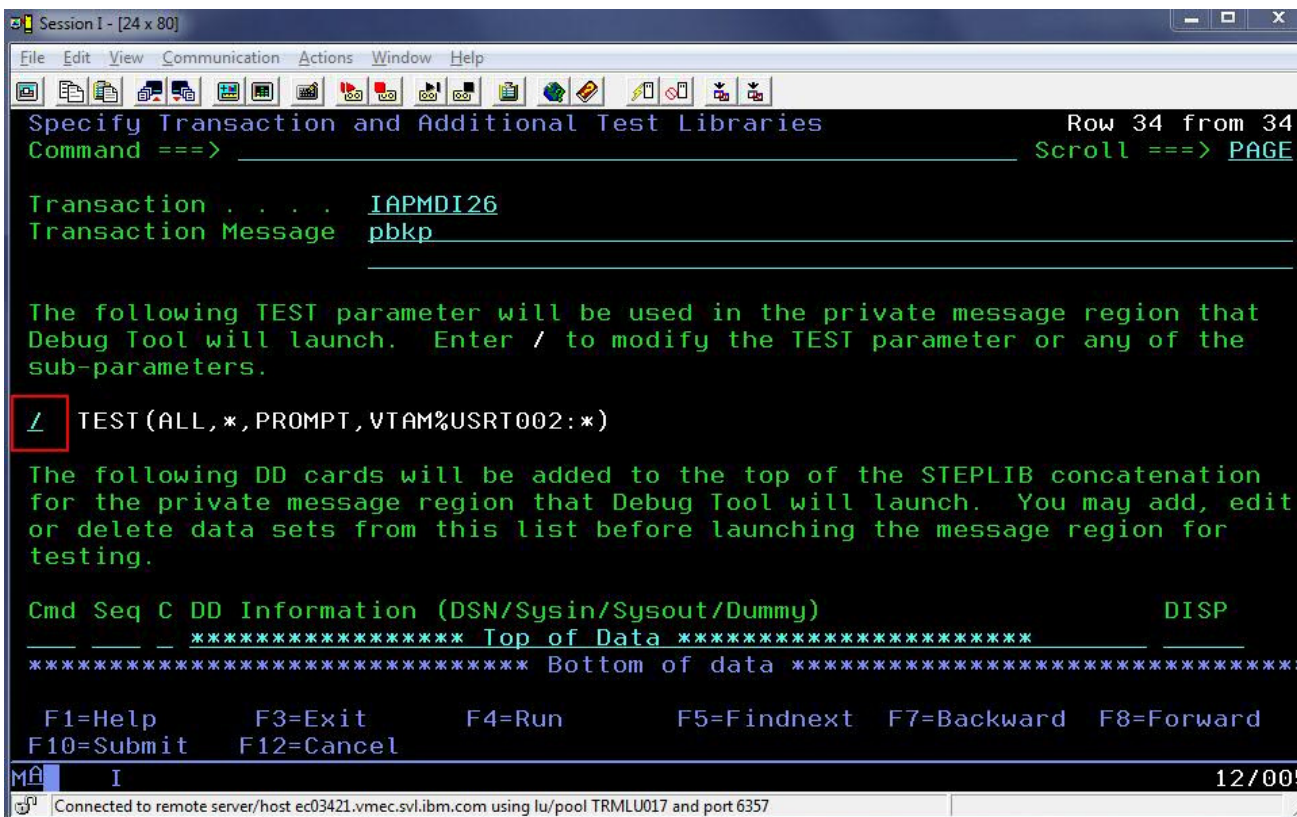
02/015
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU017 and port 6357
  
```





# Edit the TEST parameter string

- The user can modify the TEST parameter by placing a forward slash (/) next to the existing parameter and pressing Enter.



```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
Specify Transaction and Additional Test Libraries Row 34 from 34
Command ==> Scroll ==> PAGE

Transaction . . . . . IAPMDI26
Transaction Message pbkp

The following TEST parameter will be used in the private message region that
Debug Tool will launch. Enter / to modify the TEST parameter or any of the
sub-parameters.

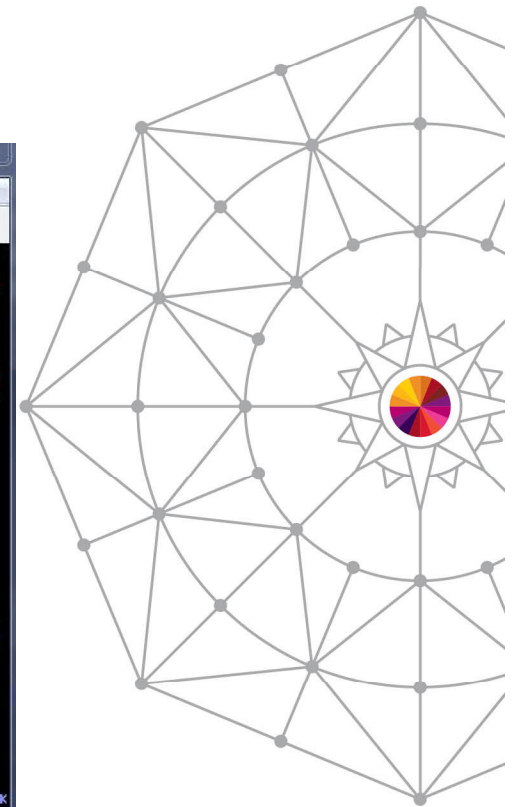
/ TEST (ALL, *, PROMPT, VTAM%USRT002:*)

The following DD cards will be added to the top of the STEPLIB concatenation
for the private message region that Debug Tool will launch. You may add, edit
or delete data sets from this list before launching the message region for
testing.

Cmd Seq C DD Information (DSN/Sysin/Sysout/Dummy) DISP
***** Top of Data *****
***** Bottom of data *****

F1=Help F3=Exit F4=Run F5=Findnext F7=Backward F8=Forward
F10=Submit F12=Cancel

MA I 12/005
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU017 and port 6357
  
```



# Panel to modify the parameter string

- On this panel, the user can change the TEST string to specify a commands or preference file, and also change the “session type” (VTAM or via the remote plugin).

```

Session 1 - [24 x 80]
File Edit View Communication Actions Window Help
----- Debug Tool Foreground - Modify Parameter String -----
Command ==> _____ More: -
Test Option    ==> TEST          Test/Notest
Test Level     ==> ALL           All/Error/None
Commands File  ==> *                *, DDname, or Data Set Name
Prompt Level   ==> PROMPT       Prompt/NoPrompt/"cmd"
Preference File ==> *
Select (/) a session type and provide parameters:
_ Full-screen mode using the Debug Tool Terminal Interface Manager
  User ID      ==> _____ User ID
/ Remote debug mode
  Address      ==> 9.51.70.141
  Port        ==> 8001
F1=Help      F2=Split    F3=Exit    F7=Backward F8=Forward  F9=Swap
F12=Cancel
M& I 02/015
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU017 and port 6357
  
```



# TEST parameter has been modified

- Note that the TEST parameter will now direct debug sessions to the remote plugin at the specified IP address and port.

```

Session 1 - [24 x 80]
File Edit View Communication Actions Window Help
Specify Transaction and Additional Test Libraries Row 34 from 34
Command ==> Scroll ==> PAGE

Transaction . . . . IAPMDI26
Transaction Message pbkp

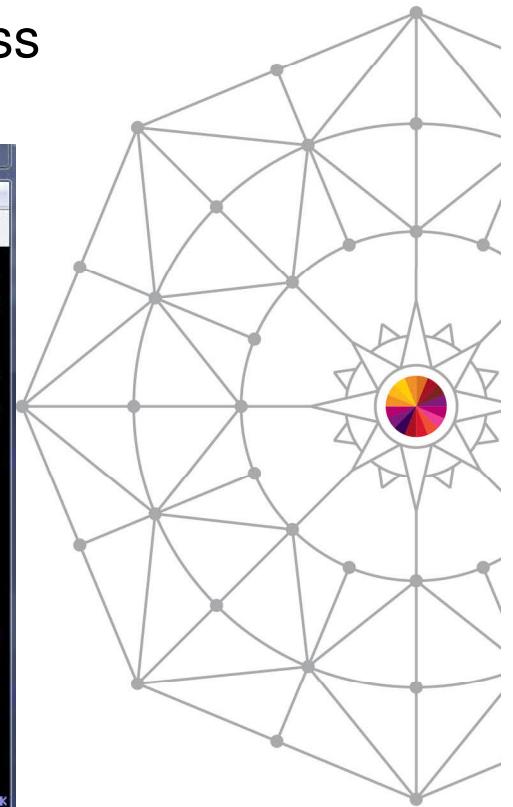
The following TEST parameter will be used in the private message region that
Debug Tool will launch. Enter / to modify the TEST parameter or any of the
sub-parameters.

- TEST (ALL, *, PROMPT, TCPIP&9.51.70.141%8001:*)

The following DD cards will be added to the top of the STEPLIB concatenation
for the private message region that Debug Tool will launch. You may add, edit
or delete data sets from this list before launching the message region for
testing.

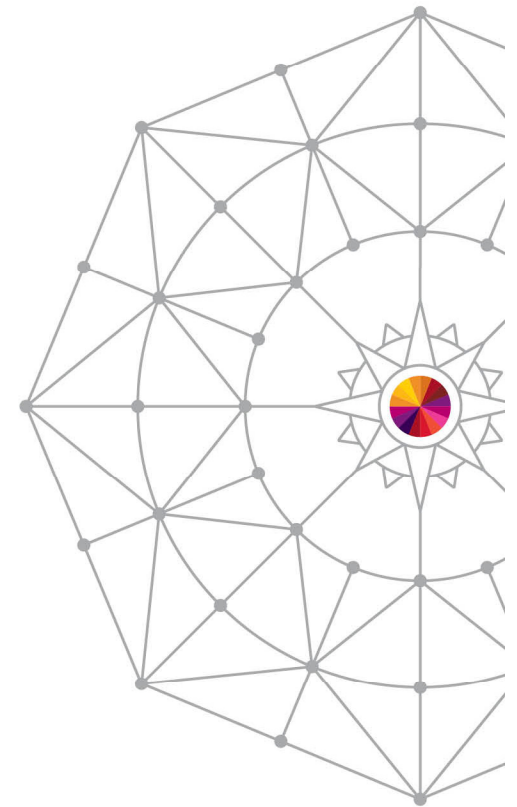
Cmd Seq C DD Information (DSN/Sysin/Sysout/Dummy) DISP
***** Top of Data *****
***** Bottom of data *****

F1=Help F3=Exit F4=Run F5=Findnext F7=Backward F8=Forward
F10=Submit F12=Cancel
M I 12/005
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU017 and port 6357
  
```



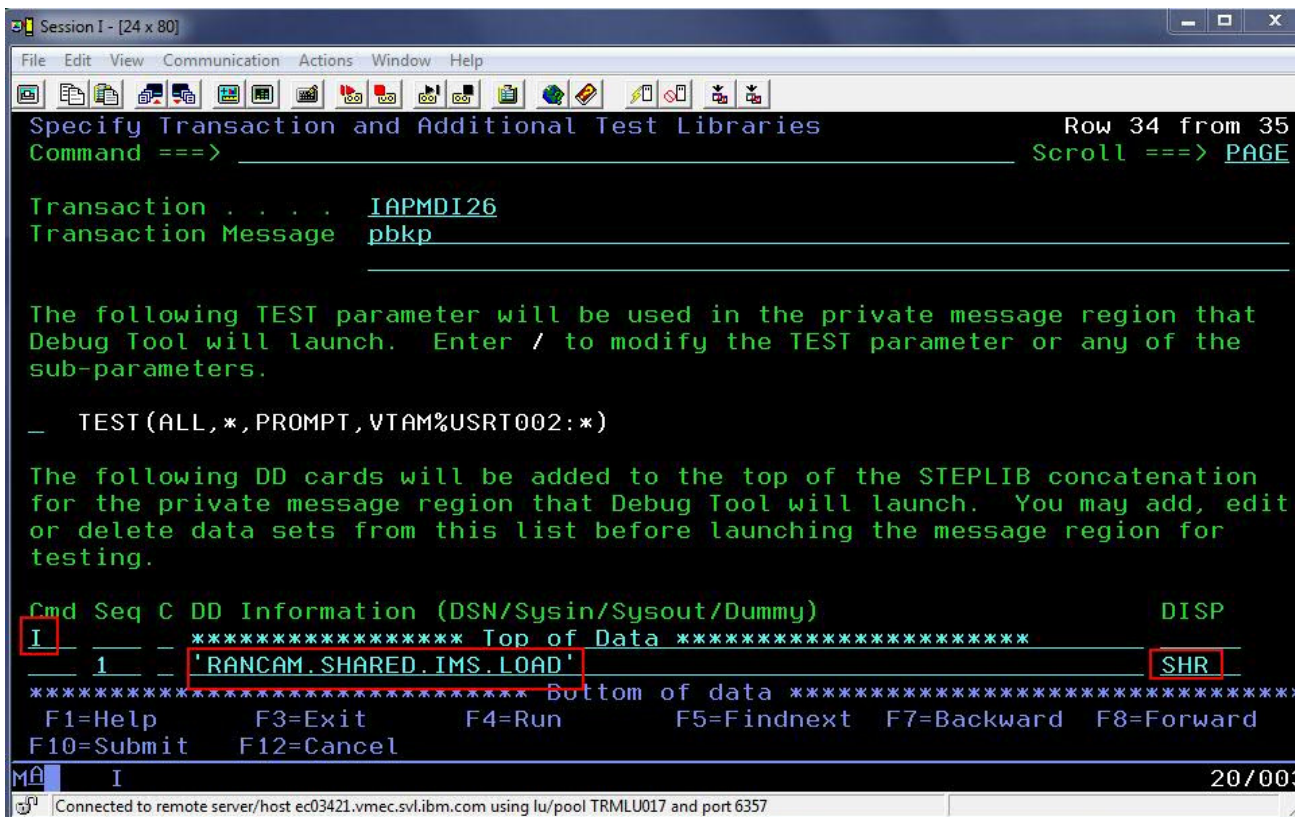
## Notes on “Run” and “Submit”

- Both options run an IMS BMP called EQANBSWT.
- EQANBSWT will launch two message regions based on the selected template, will assign the selected transaction to the new message class, and will send a message to the transaction.
- The first region will hard code the TEST parameter selected by the user.
- The second region will hard code NOTEST.
- “Run” executes EQANBSWT in the foreground.
- “Submit” shows JCL to run EQANBSWT, which the user can SUBMIT to JES.



# Adding a personal library to template JCL

- The user determines the cause of the failure and codes a fix. To test the fix, the user may use a private message region template with an additional test library. The user accesses the same panel as before, but now uses “I” to insert a library at the top of the STEPLIB concatenation, and then presses PF4 or PF10.



```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
Specify Transaction and Additional Test Libraries Row 34 from 35
Command ==> _____ Scroll ==> PAGE

Transaction . . . . . IAPMDI26
Transaction Message pbkp

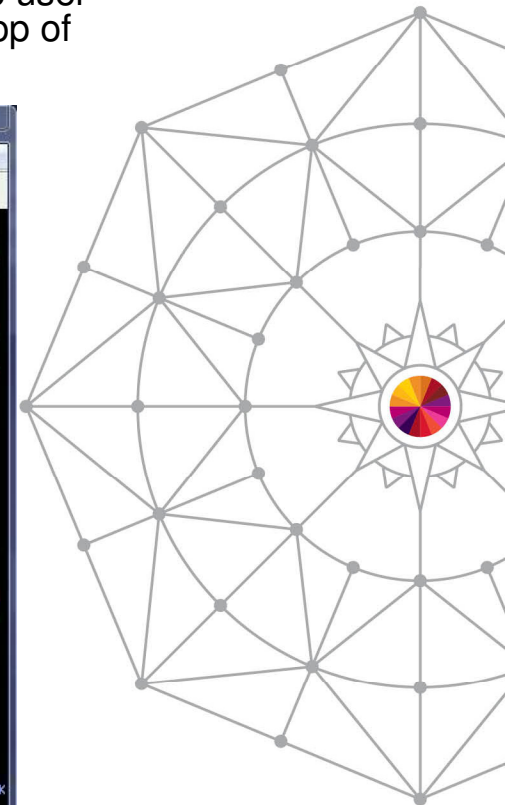
The following TEST parameter will be used in the private message region that
Debug Tool will launch. Enter / to modify the TEST parameter or any of the
sub-parameters.

_ TEST (ALL, *, PROMPT, VTAM%USRT002:*)

The following DD cards will be added to the top of the STEPLIB concatenation
for the private message region that Debug Tool will launch. You may add, edit
or delete data sets from this list before launching the message region for
testing.

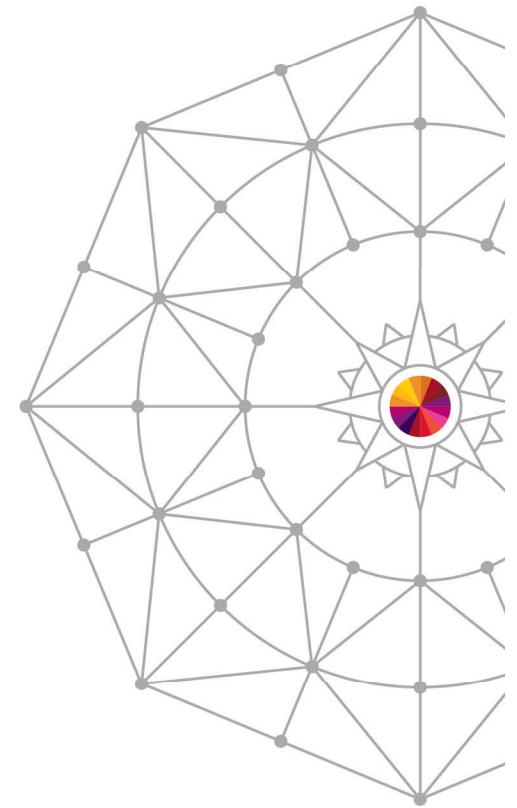
Cmd Seq C DD Information (DSN/Sysin/Sysout/Dummy) DISP
I _____ ***** Top of Data *****
1 _____ 'RANCAM.SHARED.IMS.LOAD' SHR
***** Bottom of data *****
F1=Help F3=Exit F4=Run F5=Findnext F7=Backward F8=Forward
F10=Submit F12=Cancel
M I 20/003
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU017 and port 6357

```



## Saving a test case

- After successful completion of testing, the user may wish to save a test case for later.
- To do this, the user may use the “SAVE AS” command.
- If the user attempts to exit without saving, he/she will be prompted.
- To use the test case later, the user may choose “Select a member from DTSU library” on the “Select Message Region Template” panel.



# SAVE AS

- After testing, the user can enter SAVE AS or simply press F3 to exit. If the changes are not saved, a prompt will be shown.

```

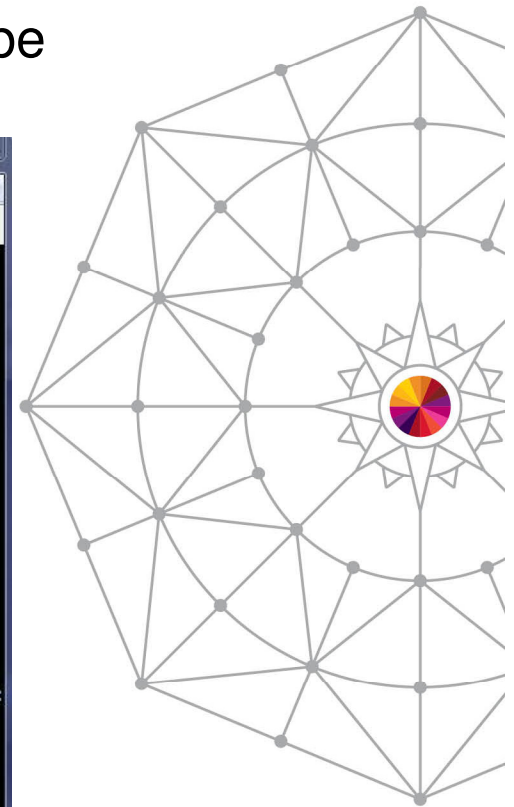
Session I - [24 x 80]
File Edit View Communication Actions Window Help
----- Exit confirmation for MPRCI10X -----
Command ==> _____
More: +
Your changes to the pre-defined template
MPRCI10X will not be saved.
If you wish to save your changes as a private
message region template, you may use the SAVE
AS command.
Instructions:
Press ENTER key to SAVE AS. You will be
prompted for a data set name where you may
store a private copy of the message region
template.
Press PF3 to EXIT without saving your
changes.
F1=Help      F3=Exit      F7=Backward
F8=Forward   F12=Cancel

TEPLIB concatenation
ch. You may add, edit
message region for

DISP
*****
SHR
*****

Backward F8=Forward
Row 34 from 35
Scroll ==> PAGE
03/020
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357

```



# SAVE AS Step 2

- The user can type the name of a DTSU data set and a member name to store the private template. If a member is not specified, a member list will be shown.

```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
----- Debug Tool Foreground - Edit Setup File -----
Command ==>

Setup File Library:
Project . . .
Group . . .
Type . . . DTSF
Member . . . (Blank or pattern for member selection list
              (or existing or new member name)

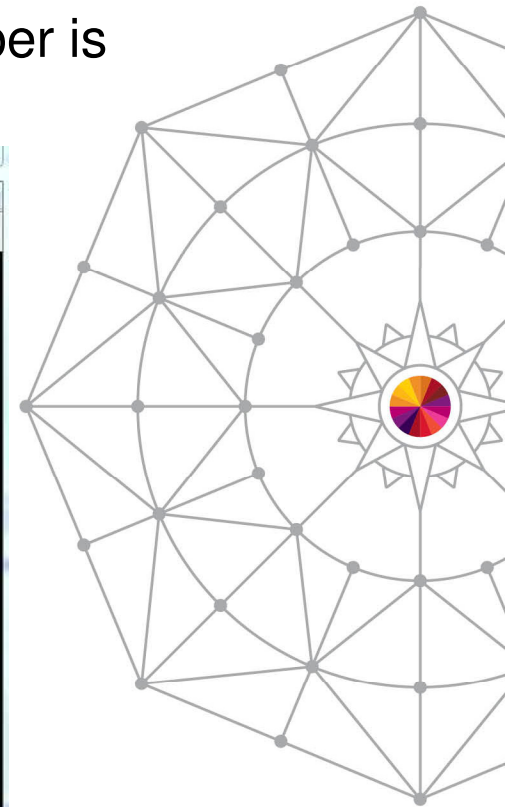
Other Data Set Name:
Data Set Name . . . 'RANCAM.SHARED.IMS.PRIVATE.DTSU(IAPMDI26)'
Volume Serial . . . (If not cataloged)

_ Initialize New setup file for DB2 (/)

F1=Help      F2=Split    F3=Exit     F7=Backward F8=Forward  F9=Swap
F12=Cancel

M I 13/067
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357

```





# Using a saved test case

- To use the template later, the user will choose “Select a member from DTSU library” and press Enter. This will allow the user to browse a DTSU data set and choose a specific member.

```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
--- Debug IMS Transaction - Select Message Region Tem----- Saved
Command ==> _____ Scroll ==> PAGE

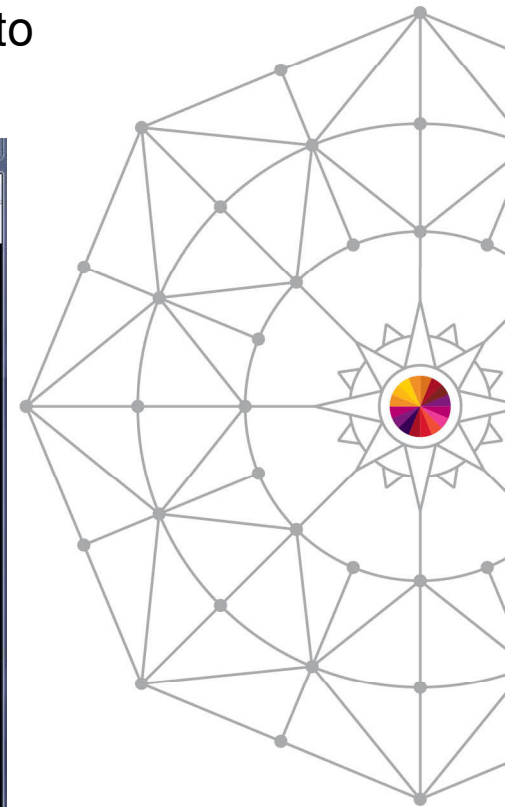
Template Data Set . . . 'RANCAM.SHARED.IMSTEST.DTSU'

Please use / to select a message region template to launch. You may either
select from a list of predefined message region templates, or you may elect
to open a private message region template that you have previously stored in
a Debug Tool Setup Utility data set.

Sel Member Cls Comment
/ ***** *** Select a member from DTSU library
- MPRCI10X 020 MPRCI10X region
- MPRCI110 020 MPRCI110 region
***** Bottom of data *****

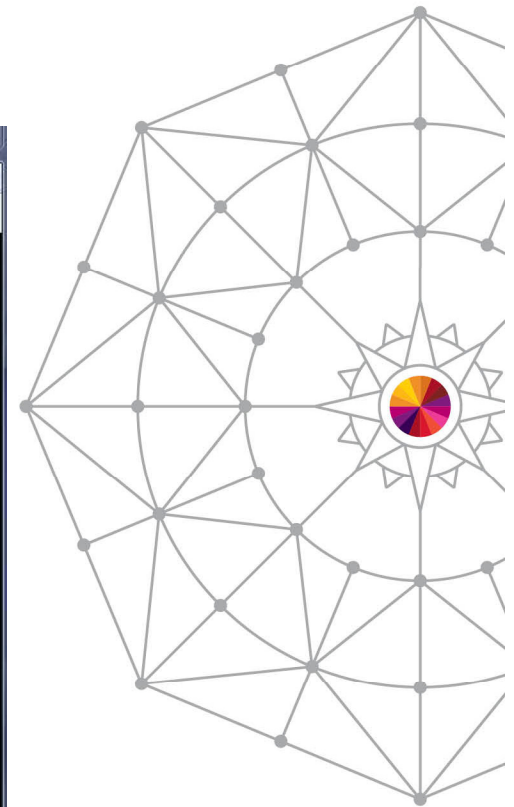
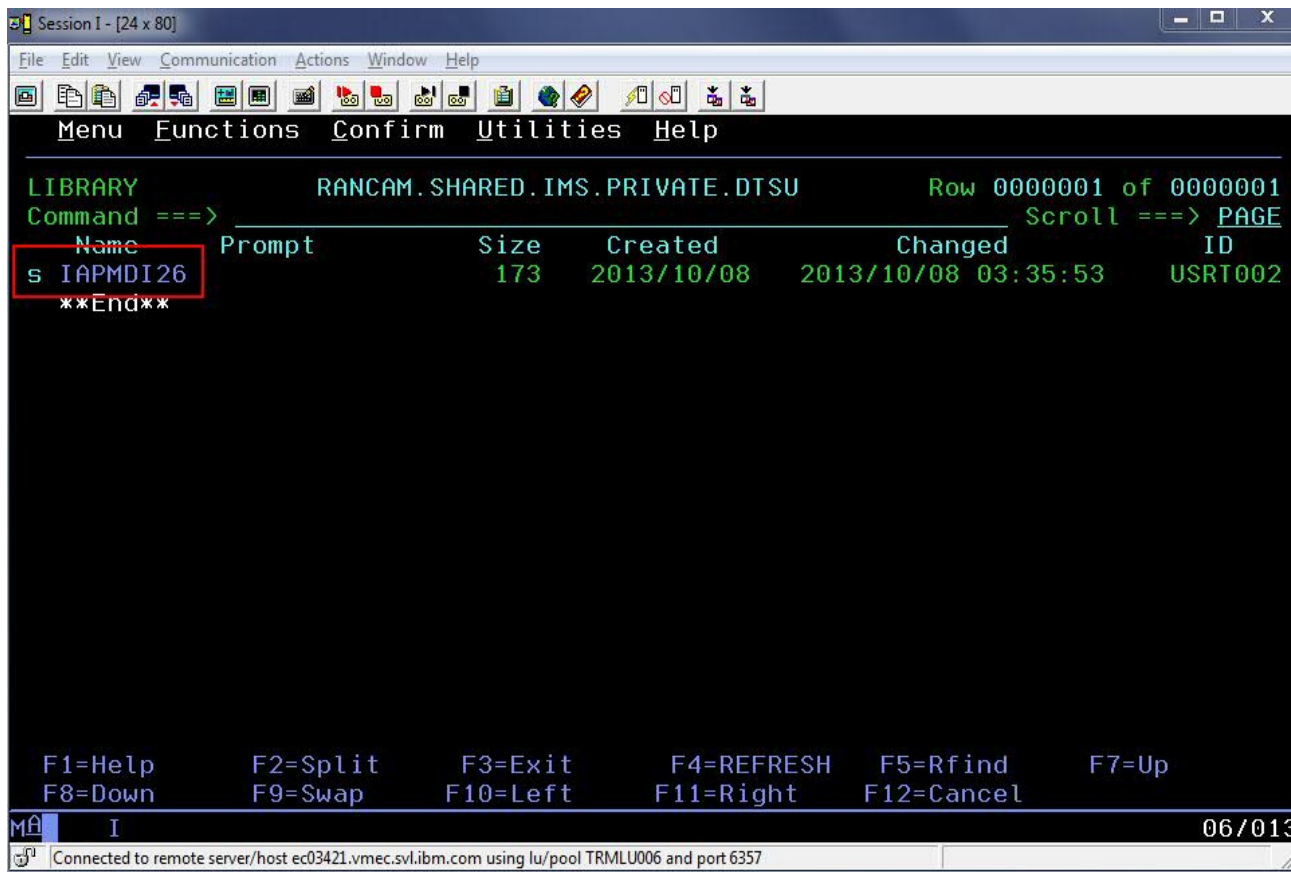
F1=Help F3=Exit F7=Backward F8=Forward F12=Cancel
M I 12/004
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU006 and port 6357

```



# Select test case member

- The user selects the member to use for testing.



# Running the saved test case

- The saved template will be shown. Note that the Transaction, Transaction Message and additional libraries have been saved.

```

Session I - [24 x 80]
File Edit View Communication Actions Window Help
Specify Transaction and Additional Test Libraries          Row 34 from 35
Command ==>                                           Scroll ==> PAGE

Transaction . . . . IAPMDI26
Transaction Message pbkp

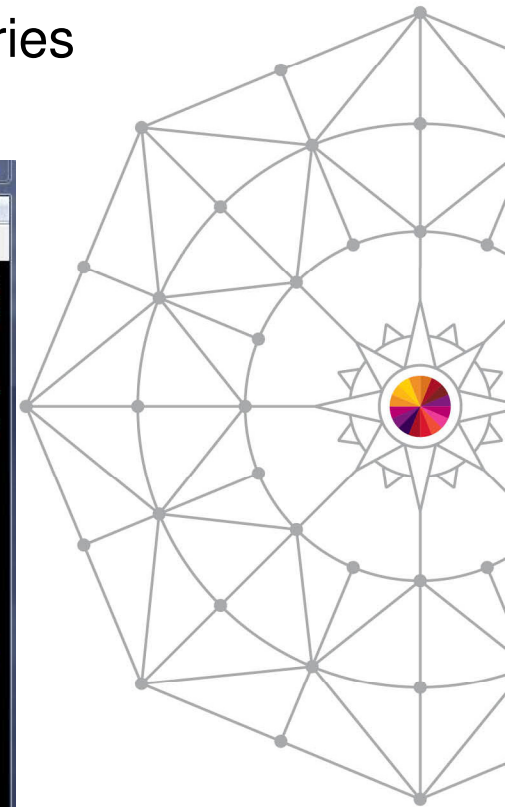
The following TEST parameter will be used in the private message region that
Debug Tool will launch. Enter / to modify the TEST parameter or any of the
sub-parameters.

_ TEST (ALL, *, PROMPT, VTAM%USRT002: *)

The following DD cards will be added to the top of the STEPLIB concatenation
for the private message region that Debug Tool will launch. You may add, edit
or delete data sets from this list before launching the message region for
testing.

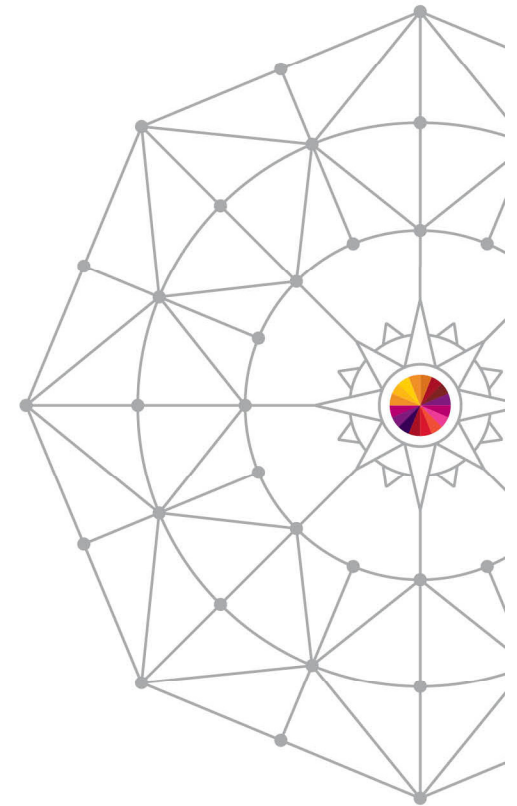
Cmd Seq C DD Information (DSN/Sysin/Sysout/Dummy)      DISP
-----
1 1  'RANCAM.SHARED.IMS.LOAD'                          SHR
***** Top of Data *****
***** Bottom of data *****
F1=Help      F3=Exit      F4=Run      F5=Findnext  F7=Backward  F8=Forward
F10=Submit   F12=Cancel

M I
02/015
Connected to remote server/host ec03421.vmec.svl.ibm.com using lu/pool TRMLU017 and port 6357
  
```



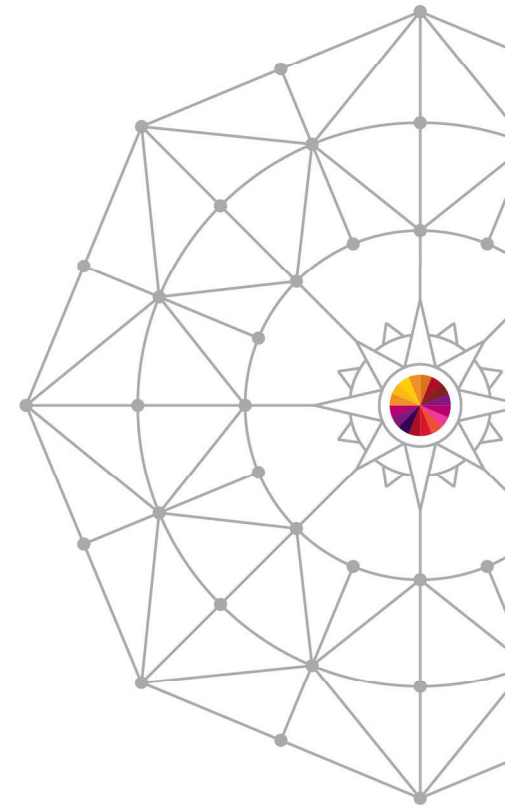
## Future Enhancements

- Add support for non-LE transactions
- Add support for conversational transactions
- Allow user to customize behavior of EQANBSWT (e.g., only launch regions & assign transaction, but don't send message).
- Create an Eclipse plugin with same functionality as ISPF panels.



## Two-Column Slide (Type Size=28)

- Topic A (Type Size=24)
  - Subtopic 1 (Type Size=22)
  - Subtopic 2 (Type Size=22)
  - Subtopic 3 (Type Size=22)
  - Subtopic 4 (Type Size=22)
- Topic B (Type Size=24)



# Slide with Table

