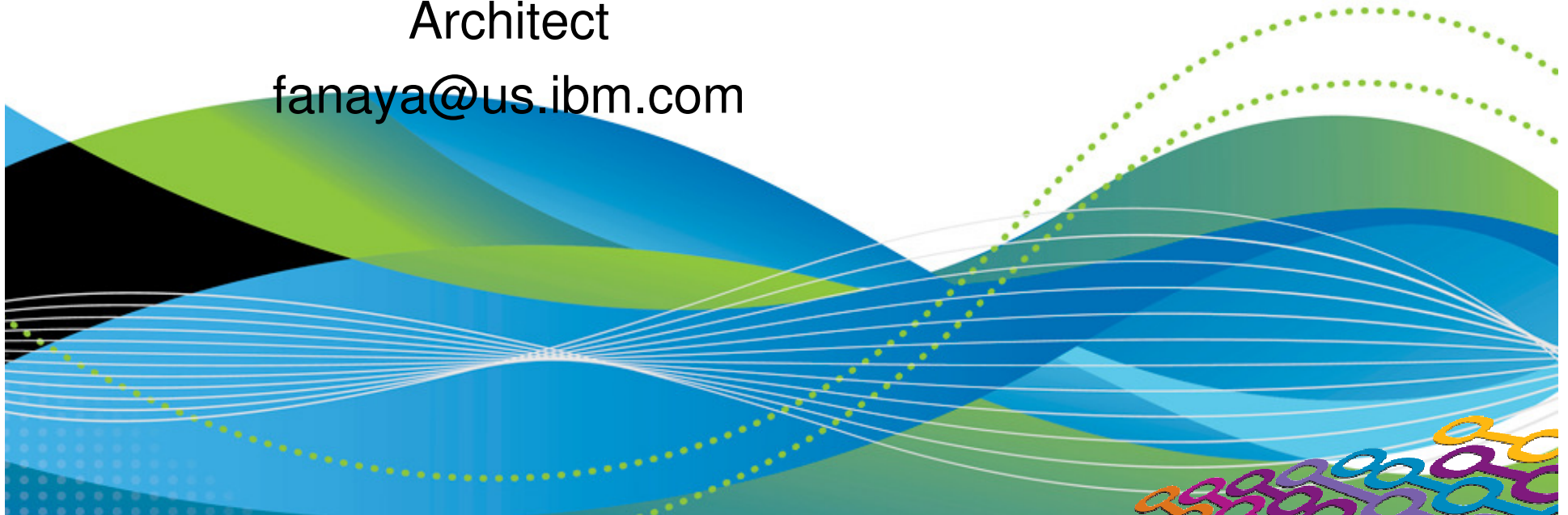


10758: IBM Problem Determination Tools for a Smarter Development Environment

Tools for Building Traditional and Composite Applications

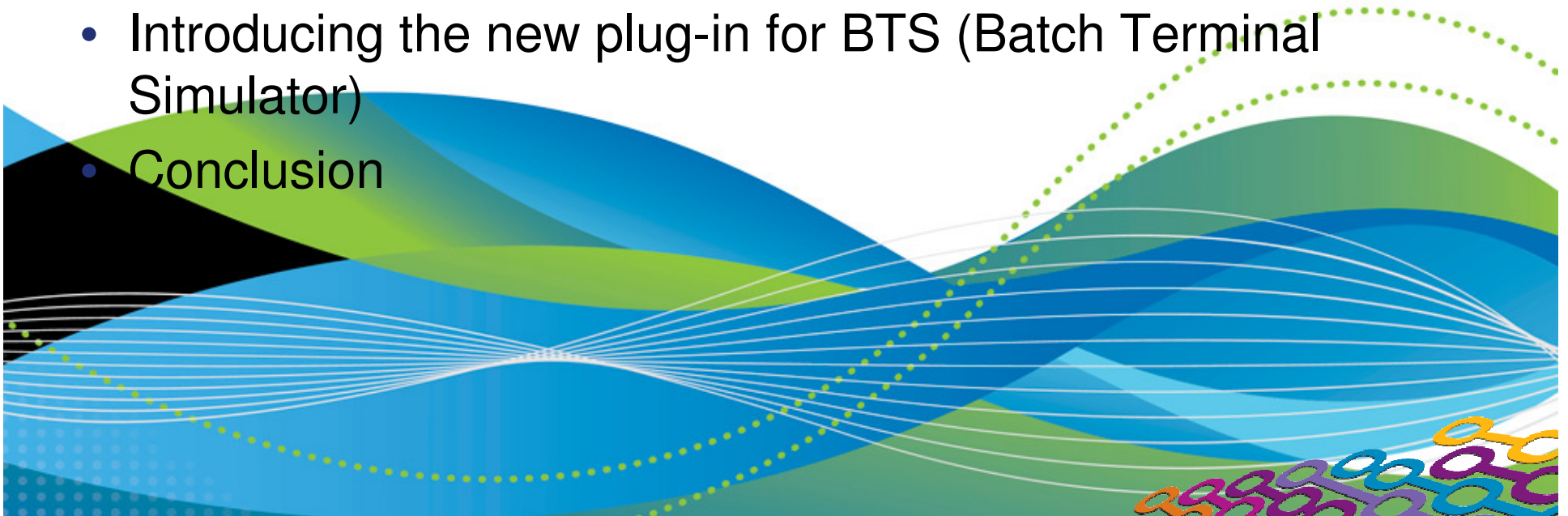
Francisco Anaya, zSeries PD Tools
Architect

fanaya@us.ibm.com



Agenda

- Development challenges
- Introduction to the IBM Problem Determination Tools
- The new GUI face of the IBM PD Tools
 - Eclipse plug-ins with RDz or CICS Explorer
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- Introducing the new plug-in for BTS (Batch Terminal Simulator)
- Conclusion



Business drivers for development teams



- **Do more with less**
 - Pressure to reduce or contain costs, and that means:
 - leverage existing investments and infrastructure
 - reduce staff or cut back on other expense categories
 - But NO letting up on incoming requests



- **Velocity**
 - Market dynamics are changing - and that means:
 - delivering finished results more quickly, *while*
 - providing "more modern" devices and systems



- **Service Quality**
 - Keep key systems up and running, *and*
 - Meet new demands, requirements, and regulations

Challenges facing development teams



Complexity

- Systems -
- Software -
- Process -



Time

TTM - TTR

- **Increased complexity**

- More devices, richer user interaction, more integration
- Requirements for more streamlined processes, while
- Meeting increased governance requirements

- **Reduced time**

- Time can impact the business in terms of loss of revenue for:
 - Meeting Time to Market demands for new functionality
 - Meeting Time to Repair situations with mission critical systems

Challenges facing development teams

- **Resources**



Resources

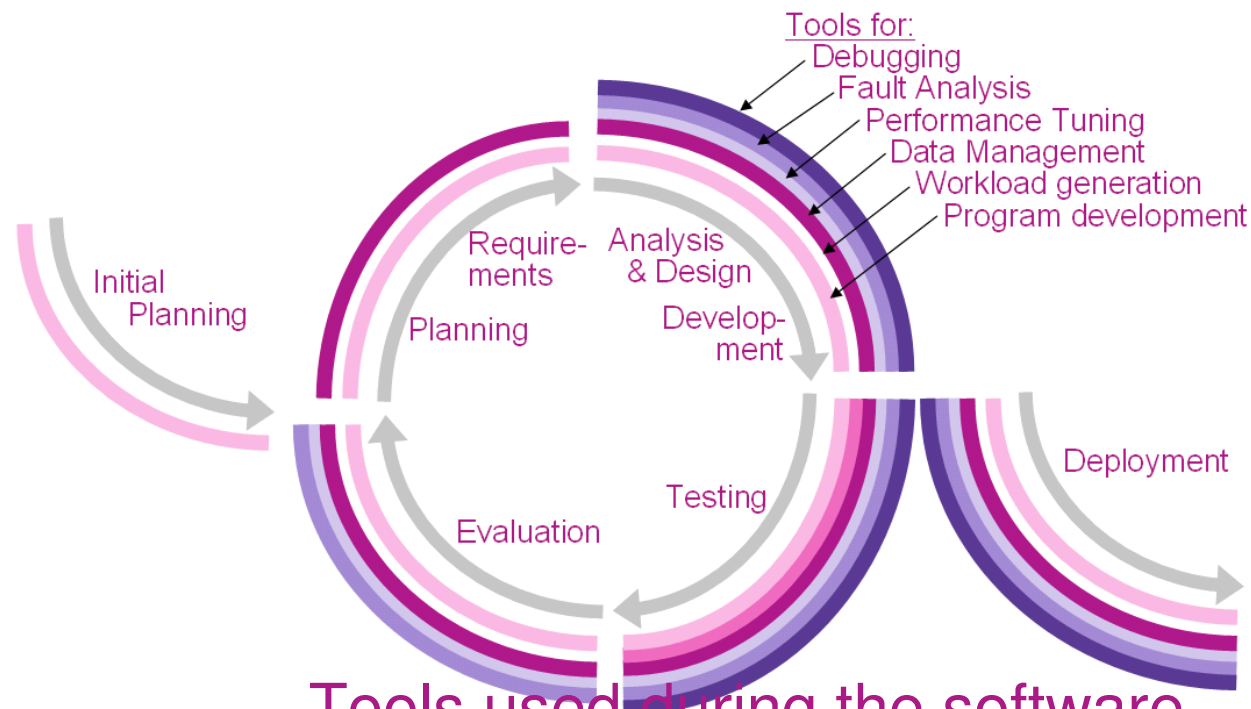
Skills - Tools

- Do your developers have the right skills not only develop new systems but also keep the existing systems running?
- Do they have the tools they need?
 - To work with the broad range of technologies deployed
 - To quickly work with multiple systems in a Sysplex / CICSplex?
- Are different teams using different tools?
 - Do different tools create integration issues or even gaps in the development process?

Development processes can only be as good as development tools



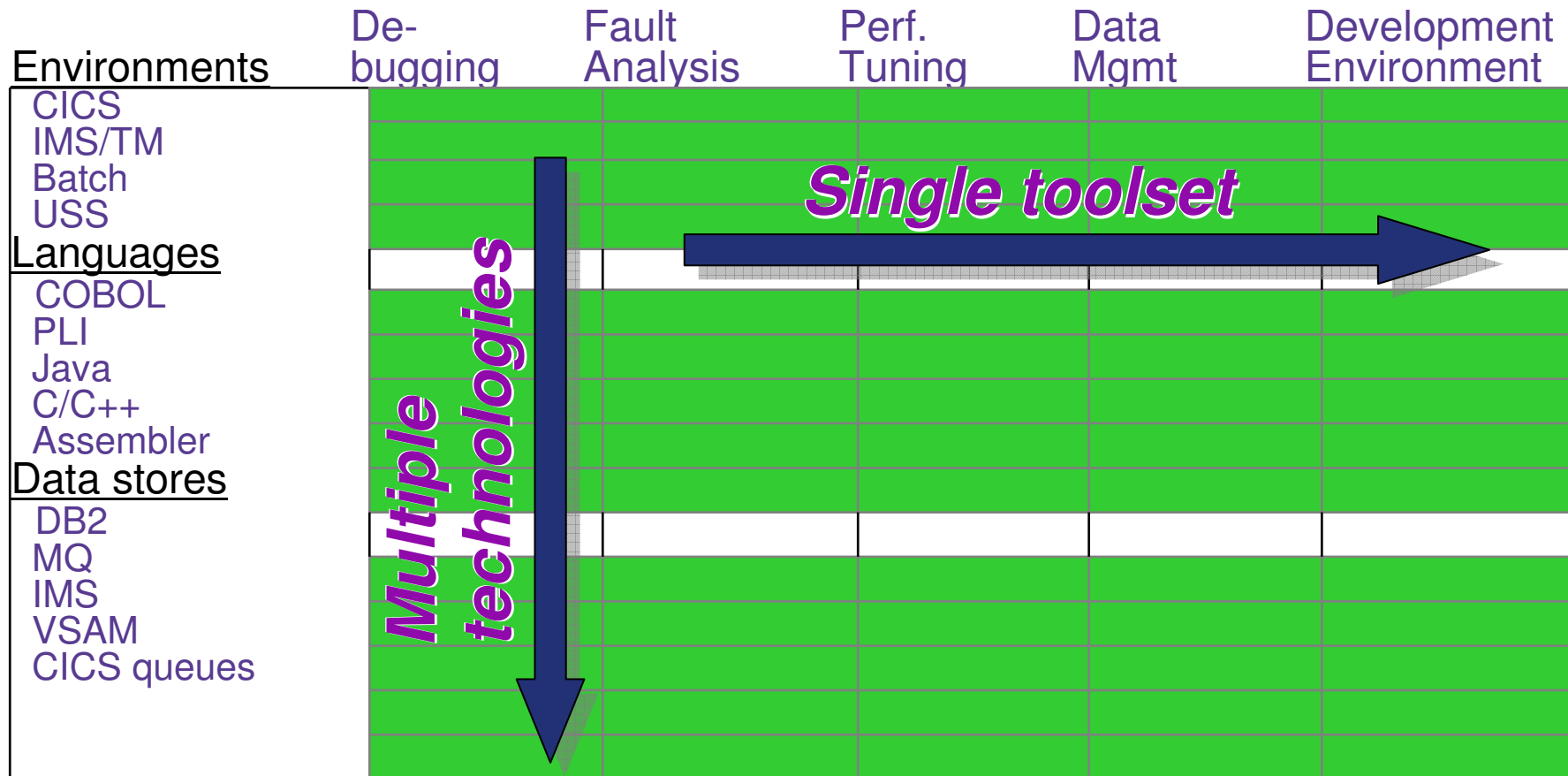
- The right tools optimize productivity, and minimize time and cost
- Processes are impeded by inadequate tools that are not integrated, or do not support your technology spectrum



Tools used during the software development lifecycle

The IBM zOS development toolset approach

- A single integrated toolset with support across a broad zOS technology spectrum



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What are the IBM zSeries problem determination tools?



- **A suite of products that provide essential capabilities needed by zOS development, testing, and operations support teams**
 - Interactive program debugging
 - Program abnormal termination failure analysis
 - File and database management for test and production
 - Application performance monitoring
 - Testing support

The IBM Problem Determination Tools Suite for z/OS



IBM Problem Determination Tools

IBM 2010 Offerings



www.ibm.com/software/awdtools/deployment

Debug Tool for zOS

- Interactive program debugging
- Multiple languages and zOS environments
- Code coverage reporting
- COBOL modernization

Fault Analyzer for zOS

- Automatic program abend capture and reporting
- Program source-level reporting
- Multiple languages and zOS environments

The IBM Problem Determination Tools Suite for z/OS



IBM Problem Determination Tools

IBM 2010 Offerings



www.ibm.com/software/awdtools/deployment

File Manager for zOS

- Edit and view files and databases of any size
- VSAM, sequential, and PDS(e) files, DB2 and IMS databases
- Extensive file and data utilities

Application Performance Analyzer for zOS

- Monitor and report application performance
- Source level reporting
- Multiple languages and zOS environments

The IBM Problem Determination Tools Suite for z/OS



IBM Problem Determination Tools

IBM 2010 Offerings



www.ibm.com/software/awdtools/deployment

Workload Simulator for z/OS and OS/390

- Drive regression, performance, stress, function, and capacity testing
- Simulate on-line users with smart scripts

Hourglass

- Alter the date and time returned to an application when a time request is made

The IBM Problem Determination Tools Suite for z/OS



IBM Problem Determination Tools

IBM 2010 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault Analyzer
for z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Rational Functional Tester Ext
Rational Performance Tester z/OS

ISPF
Productivity Tool

Hourglass

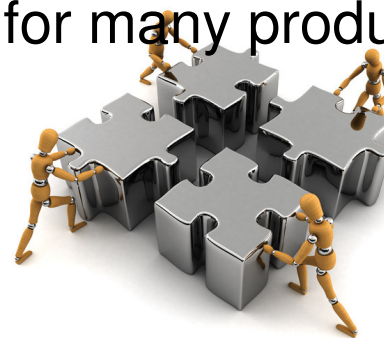
www.ibm.com/software/awdtools/deployment

ISPF Productivity Tool

- Turbo-charge the productivity of your ISPF users
- Turn IBM ISPF into a centralized, object-oriented development center

Support a variety of application developer skills

- Reusing mainframe application assets requires expertise in both traditional and new zOS technologies
- To maximize productivity:
 - Some developers may do best with traditional interfaces
 - Others may be more productive with GUI interfaces
- **The IBM Problem Determination Tools provide the best of both worlds:**
 - Proven traditional 3270-based interfaces
 - Eclipse-based GUI interfaces for many products



The tools provide excellent, traditional 3270-based interfaces



The screenshot displays four overlapping windows from a 3270-based interface:

- Debug Tool:** Shows COBOL source code with line numbers (0001-0005) and a 'SOURCE:' section with line numbers (312-317). It includes a 'Data file' section with 'BALANCE' and 'CUST-AC'.
- Fault Analyzer:** Shows a 'Process Options Help' window with a table of data fields.
- Application Performance Analyzer:** Shows a 'Process Options Help' window with a table of data fields.
- File Manager:** Shows a 'File View Navigate Help' window with a table of data fields.

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

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In addition, many of the tools provide GUI interfaces



The screenshot shows the IBM Rational Developer GUI with several tool windows open. Callouts identify the following tools:

- Debug Tool**: Points to the 'Debug' window showing thread and process information.
- Fault Analyzer**: Points to the 'Fault Summary' window showing a list of faults.
- Application Performance Analyzer**: Points to the 'TSS09.ADLAB.CUST1' window displaying a table of customer data.
- File Manager**: Points to the 'Remote System Details' window showing file system mapping.

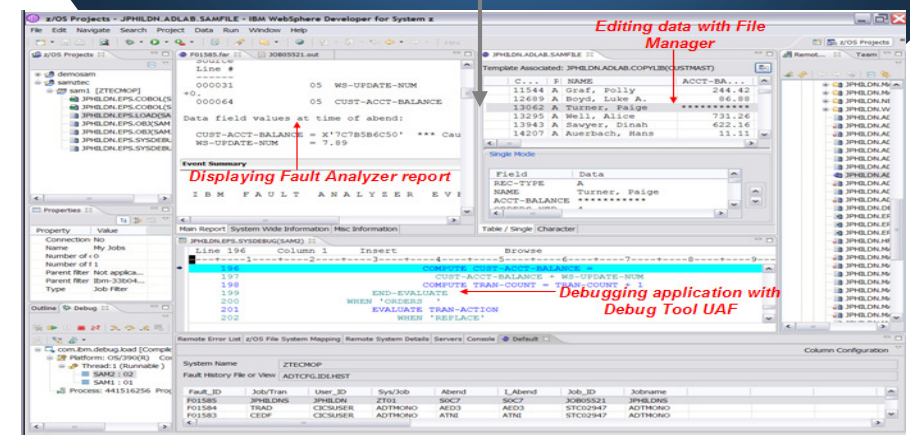
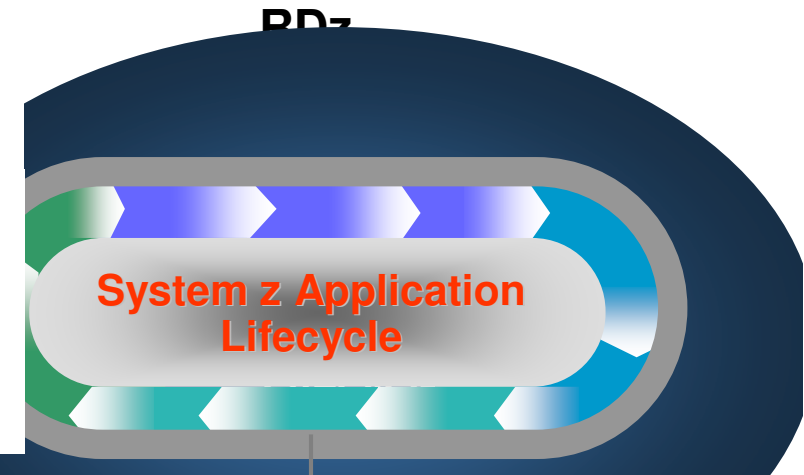
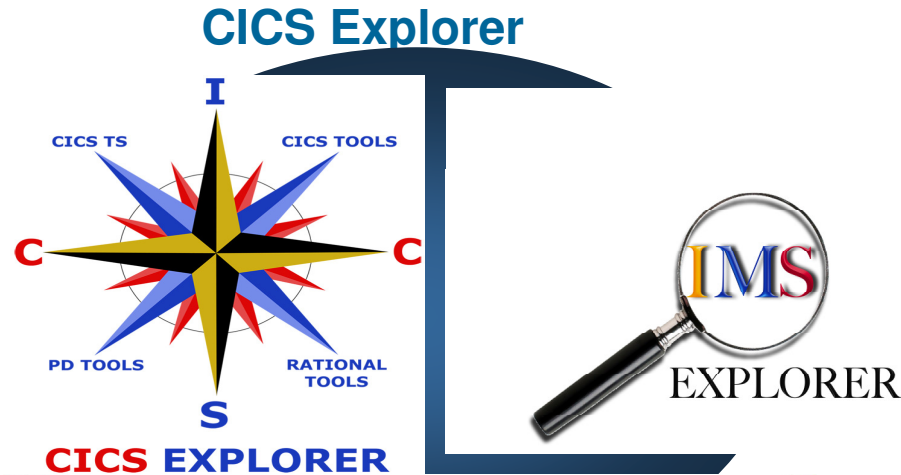
CUST-ID	NAME	ACCT-BALANCE	ORDERS-YTD	ADDR
01001	Lynn, Amanda	67.68	9	119 North Lake Road
02200	Graham, Anna	610.05	10	89 Clay Springs Rd
02202	Major, Art	1234.56	5	1512 Pine Bluff
03003	Prentice, Anna	0.00	7	33 Renshaw
03390	Deeds, Darren	74.00	3	649 Brown Street
05570	Parker, Ford	233.27	12	3039 Manning St.
06101	Early, Brighton	311.08	10	9662 Summit Road
06106	Lander, Annette	489.84	7	6127 Cedar Street
06711	Dubree, Dustin	192.98	11	9229 Delegate's Row

Field	Picture	Type	Start	Length	Data
CUST-ID	X (5)	AN	1	5	01001
NAME	X (17)	AN	6	17	Lynn, Amanda
ACCT-BALANCE	S9 (7) V99	PD	23	5	67.68
ORDERS-YTD	S9 (4)	BI	28	2	9
ADDR	X (20)	AN	30	20	119 North Lake Road

Eclipse plug-ins for the IBM Problem Determination Tools



- Graphical interfaces are provided as plug-ins for Eclipse platforms, such as Rational Developer for System z, CICS Explorer, and IMS Explorer



Debug Tool, Fault Analyzer, Application Performance Analyzer, and File Manager plug-ins

Problem Determination Tools plug-ins in CICS Explorer



The screenshot displays the IBM CICS Explorer interface with several tool views open:

- Debug Tool Views:** Shows the SAM1 [Remote Compiled Application] tree with SAM2: 02 selected. The main window displays the source code for ADTOOLS.ADLAB.SYSDEBUG(SAM2) at line 89, which is highlighted in blue. The code includes comments and instructions for calculating balance statistics.
- Variables:** A table showing the values of BALANCE-TOTAL (+00000000.00) and CUST-ACCT-BALANCE (+00000067.68).
- Breakpoints:** A list of breakpoints for Entry [SAM2], including statements at lines 315, 319, and 92.
- Fault Analyzer Analysis:** Shows a fault summary for module SAM2, program SAM2, source line # 89, indicating an abend S0C7 (Data Exception). The synopsis states: "A system abend 0C7 occurred in module SAM2 program SAM2 at offset X'39A. A program-interruption code 0007 (Data Exception) is associated with the and indicates that: A decimal digit or sign was invalid."
- APA Reports:** A list of reports including S - Statistics/Storage, S01 - Measurement Profile, S02 - Load Module Attributes, S03 - Load Module Summary, S04 - TCB Summary, and S05 - Memory Usage Timeline. The S01 - Measurement Profile (5193/SAM1RUN) report is expanded, showing overall CPU activity: Samples 778, CPU Active 728 (93.5%), WAIT 40 (5.1%), and Queued 10 (1.2%).

New!

IBM CICS Explorer™

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

PA

Daemon & Connection Status & Test

TG

Configuration Status Control, Test

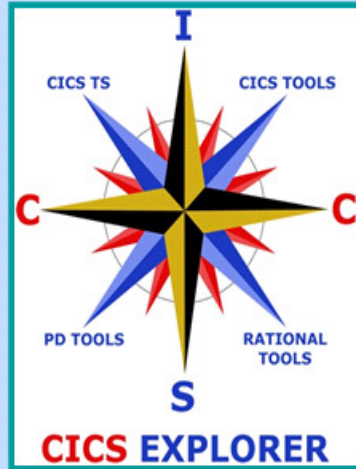
MQ

Status Situations Topology

XE

VSAM and PDS File Management Access Ability

FM



Develop Test Etc

RDz

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

FA

Execution Tree Dependencies Queries Command Flow

IA

Deployment Discovery, Visualization, Automation & Control

DA

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

DT

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

APA

CRUD/Install History, Audit Backout Search, Compare

CM

CRUD/Install Control, Filter Topology Events, ATOM

SM

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

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

CICS TS

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





address <http://www-01.ibm.com/software/htp/cics/explorer/> Go

links [IBM Business Transformation Homepage](#) [IBM Standard Software Installer](#) [IT Help Central](#) [Join World Community Grid](#) Snagit

IBM United States [change] Search

Home Solutions Services Products Support & downloads My IBM Welcome [IBM Sign in] [Register]

Software > Host Transaction Processing > CICS family > CICS Transaction Server >

CICS Explorer

CICS Explorer

- Features and benefits
- System requirements
- Library
- News

Related links

- Warranty info
- Product Accessibility Information

The new face of CICS

Continuous Innovation Creates Success

Overview

IBM CICS Explorer - New Face of CICS. Integration point for CICS tooling with rich CICS views, data, methods.

Looking for new ways to accelerate the transfer of knowledge, skills, and best practice to the next generation of technical staff/experts? Need to maintain productivity and protect service-levels? CICS Explorer and System z lead the way to platform simplification.

- Common, intuitive, Eclipse-based environment for architects, developers, administrators, system programmers, and operators

Learn more

- Features & benefits
- System requirements

Downloads

- Demo (ZIP, 31.4MB)
- CICS Explorer
- Podcast series

We're here to help

Easy ways to get the answers you need.

- Request a quote
- E-mail IBM

Or call us at:
877-426-3774
Priority code:
109HH03W

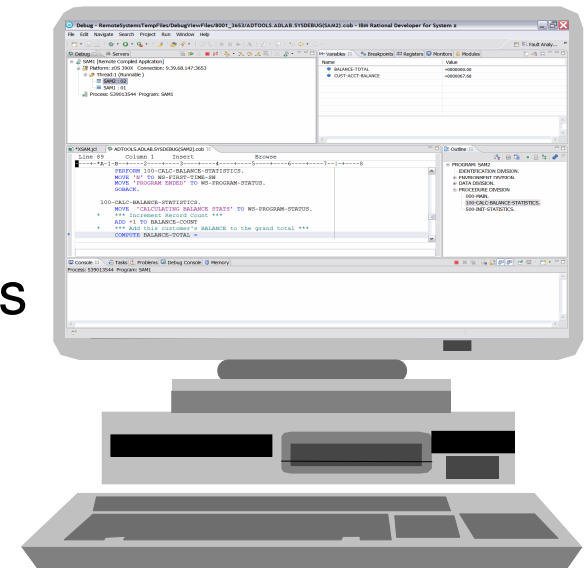
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Rational Developer for System z (RDz)



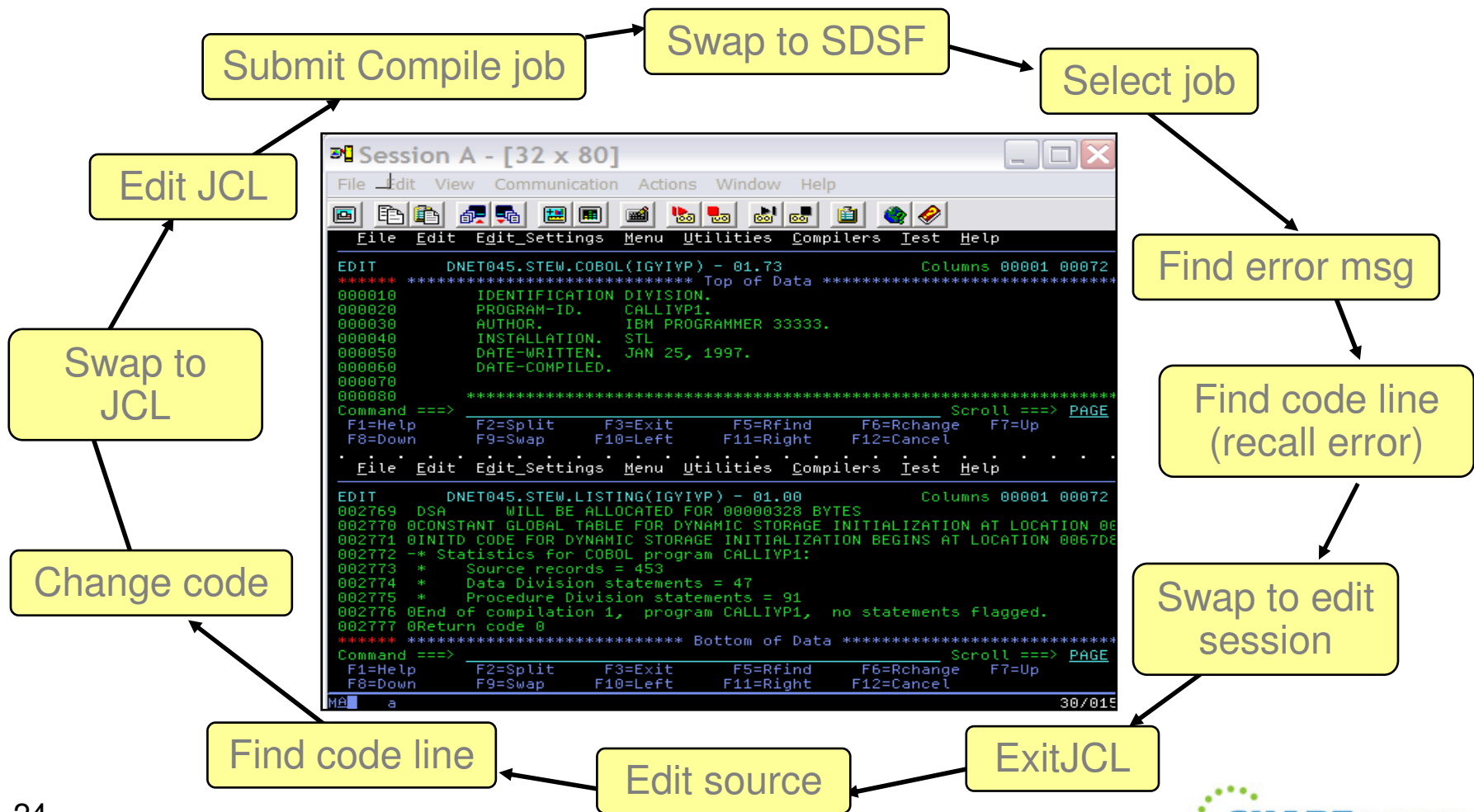
- **An eclipse-based Integrated Development Environment (IDE) for System z applications**
 - Common IDE for COBOL, PL/I, C, C++, HLASM, Java, EGL and web services
- **Supports Enterprise Modernization and SOA**
 - Interactive access to z/OS for development, job generation, submission, monitoring, debugging
 - Enables CICS and IMS applications for web services and SOA
 - Supports for J2EE, JCA, XML, web services



ISPF-based development



- Multiple screens / sessions and varied tools
- Limited screen height and width



RDz-based development



- Simplified development with more information at your fingertips

The screenshot displays the IBM Rational Software Development Platform interface for editing a COBOL program named REGIOA.cbl. The main editor window shows the following code:

```
Line 35      Column 1      Insert
-----*A-1-B-----2-----3-----4-----5-----
000035      DISPLAY "Program REGIOA STARTING "
000036      MOVE 2 TO BRANCHFLAG.
000037      MOVE 'AAAAAA' TO FIELD-A.
000038      MOVE 'BBBBBB' TO FIELD-B.
000039      MOVE 'CCCCCC' TO FIELD-C.
```

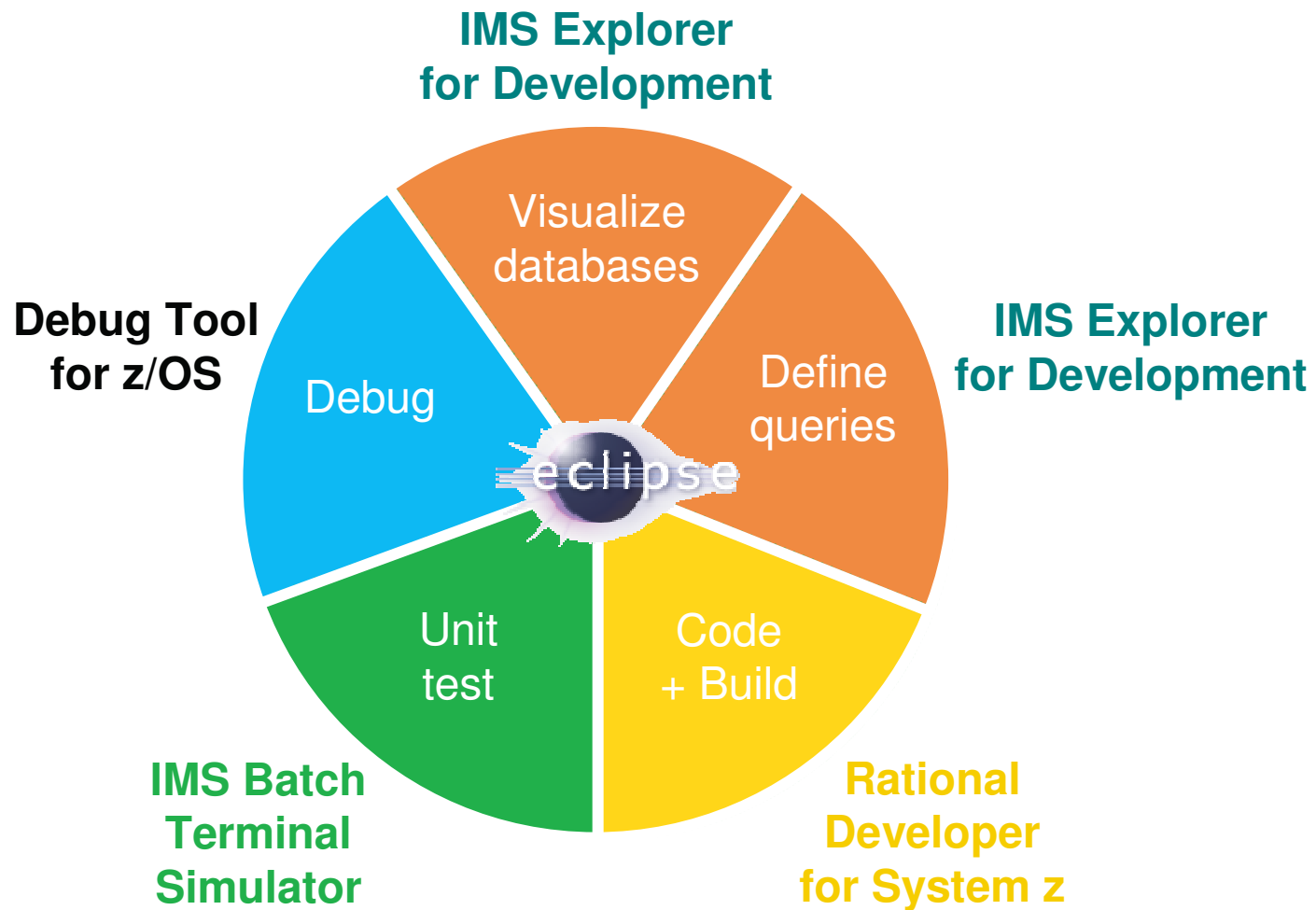
The interface includes several key components highlighted by callouts:

- Submit jobs, view output, open source members:** A callout points to the top toolbar area.
- Source and JCL are selectable tabs:** A callout points to the tab labeled "REGIOA.cbl" in the editor window.
- Syntax Check:** A callout points to the "Problems" tab, which displays a list of errors.
- Error description:** A callout points to the first error entry in the Problems list: "IGYPS2072-S 'DISPLAI' was invalid. Skipped to the next verb, period or procedure-name d".
- Outline view:** A callout points to the "Outline" view in the left-hand pane, which shows a hierarchical structure of the program's sections, including "010-INITIALIZATION.", "020-LOGIC.", "030-SEEYA.", and "040-GOODBYE."

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Integrated Eclipse Environment for IMS Development, Testing, and Debugging



IMS Explorer for Development

- Visualize and change IMS database (DBDs) and program definition sources (PSBs)
 - View IMS database hierarchical structures
 - View, create, and edit PSBs
 - Change/add fields in DBDs
 - Import COBOL copybooks and PL/I structures to a database segment
 - Generate DBD source and PSB source
- Access IMS data using SQL statements
 - Leverage IMS V11 Universal JDBC driver
- Connect to the z/OS system
 - Browse data sets
 - Submit JCL and inspect the output in JES
 - Import and export DBD and PSB source files from a data set to the IMS Explorer, and vice-versa

IMS Explorer for Development

View physical IMS database structure



The screenshot displays the IMS Explorer interface for the AUTODB database. The main area shows a hierarchical diagram of segments and fields. A callout box points to a logical relationship between the DEALER and EMPDB2 databases. The Properties window at the bottom shows details for a segment statement.

Logical relationship between databases

Additional properties of a segment or field

Property	Value
.Segment statement	
Length (BYTES):	61
Parent segment (PARENT):	0
Segment name (NAME):	DEALER
Source segment (SOURCE):	
List of fields	

IMS Explorer for Development

View logical IMS database structure



IMS Explorer - dealer/DBD/AUTOLDB.dbd - IMS Enterprise Suite Explorer

Project: dealer Database name: AUTOLDB Database access type: LOGICAL

DBD name: AUTOLDB

View: [Icons]

DEALER
Length: 61 bytes
AUTODB.DEALER
DLRNO
DLRNAME
CITY
ZIP
PHONE

MODEL
Length: 37 bytes
AUTODB.MODEL
/SX1
MODTYPE
MODKEY
MAKE
MODEL
YEAR
MSRP
COUNT

SALESPER
Length: 62 bytes
AUTODB.SALESPER EMPDB2.EMPL
EMPNO EMPNO
LASTNAME LASTNAME
FIRSTNAME FIRSTNAME

ORDER
Length: 74 bytes
AUTODB.ORDER
ORDNBR
LASTNAME
FIRSTNAME
DATE
TIME

SALES
Length: 131 bytes
AUTODB.SALES AUTODB.STOCK
SALENUM STKVIN
SALDATE COLOR
LASTNAME PRICE
LOT
WRNTY

STOCK
Length: 46 bytes
AUTODB.STOCK
STKVIN
COLOR
PRICE
LOT
WRNTY

SALESINF
Length: 15 bytes
AUTODB.SALESINF
QUOTA
SALESYTD
COMSSION

EMPLINFO
Length: 61 bytes
EMPDB2.EMPLINFO
ADDRESS
STREET
CITY
STATE
ZIP

A concatenated segment and its underlying source segments

Property	Value
1 - Segment (SEGM)	
Alias	
Parent segment (PARENT)	DEALER
Segment name (NAME)	SALESPER
Source segment (SOURCE)	((SALESPER_DATA,AUTODB),(EMPL_DATA,EMPDB2))

Properties Error Log Problems SQL Results

Property Value

1 - Segment (SEGM)

 Alias

 Parent segment (PARENT) DEALER

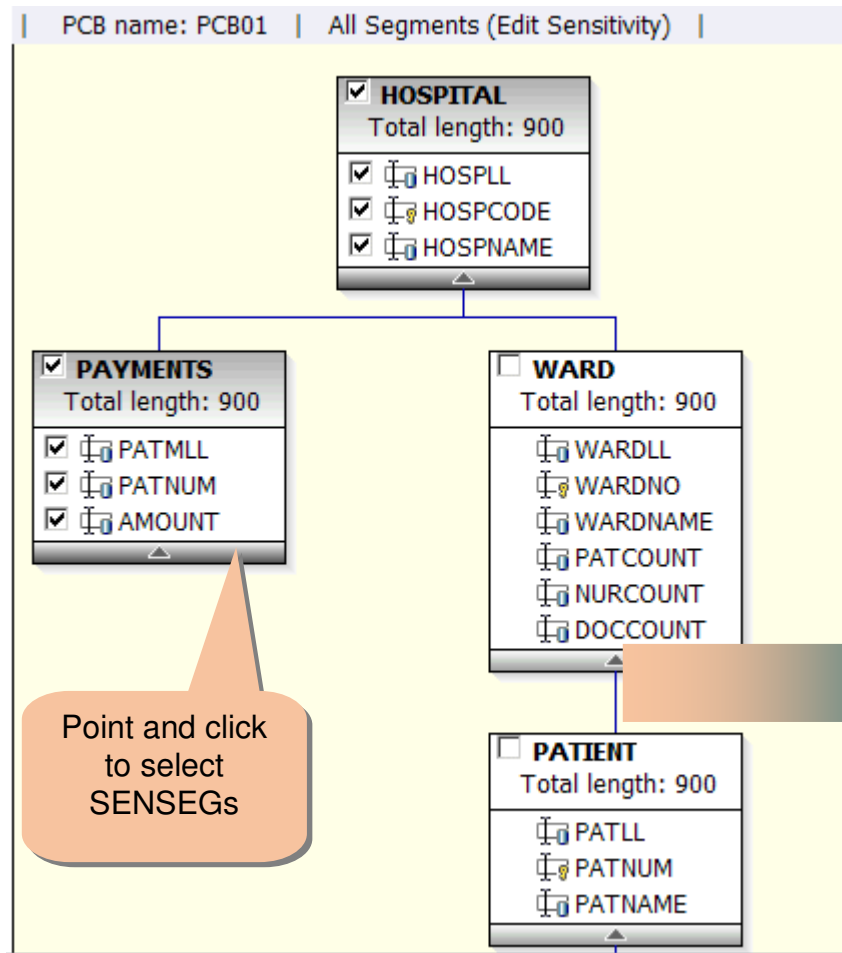
 Segment name (NAME) SALESPER

 Source segment (SOURCE) ((SALESPER_DATA,AUTODB),(EMPL_DATA,EMPDB2))

Fetching children of DDS0698. *

IMS Explorer for Development

Build PCB definition



```

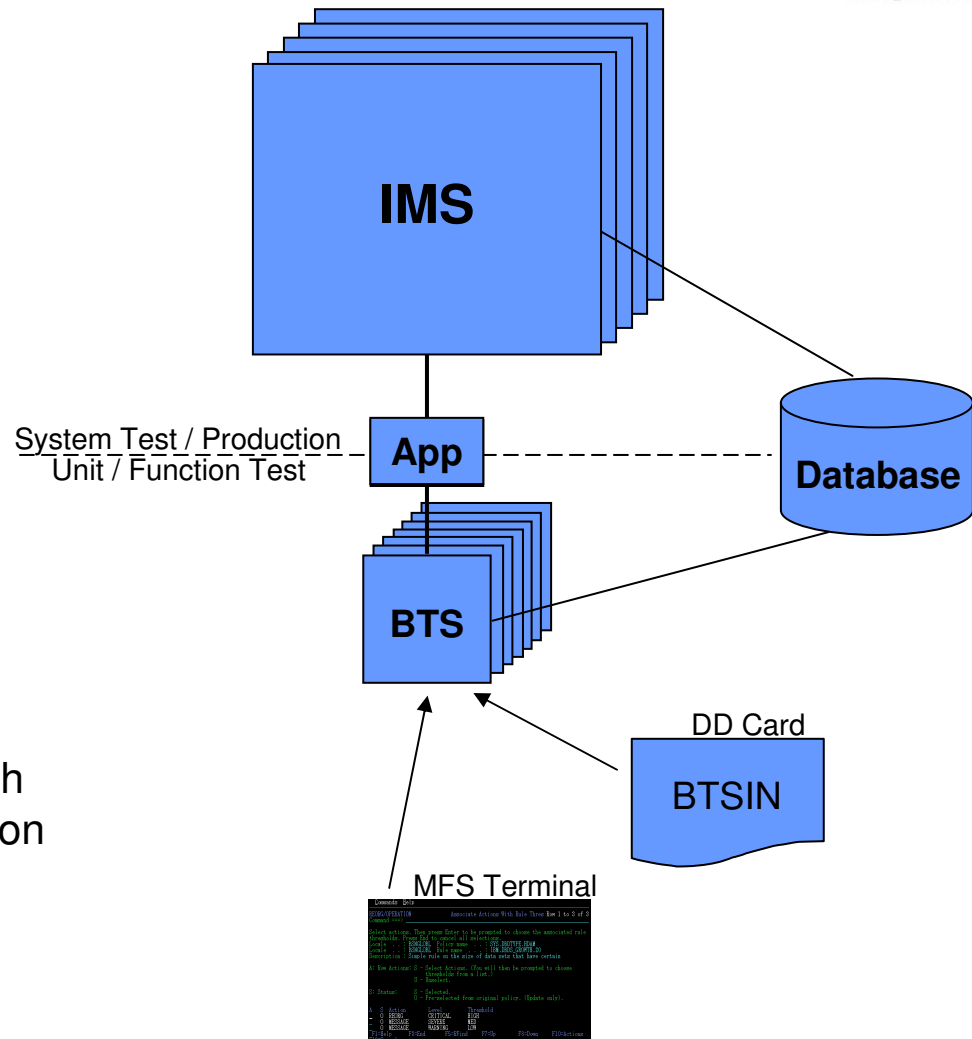
*****
PCB NUMBER 5      DB      DEDBJN21
*****
PCB      TYPE=DB, DBDNAME=DEDBJN21, POS=M, PROCOPT=A, KEYLEI
          PCBNAME=PCB01
SENSEG  NAME=HOSPITAL, PARENT=0
SENSEG  NAME=PAYMENTS, PARENT=HOSPITAL
SENSEG  NAME=WARD, PARENT=HOSPITAL
SENSEG  NAME=PATIENT, PARENT=WARD
SENSEG  NAME=ILLNESS, PARENT=PATIENT
SENSEG  NAME=TREATMNT, PARENT=ILLNESS
SENSEG  NAME=DOCTOR, PARENT=TREATMNT
SENSEG  NAME=BILLING, PARENT=PATIENT
*****
*      PCB NUMBER 6      DB      IVPDB1
*****
  
```

Generated PSB source

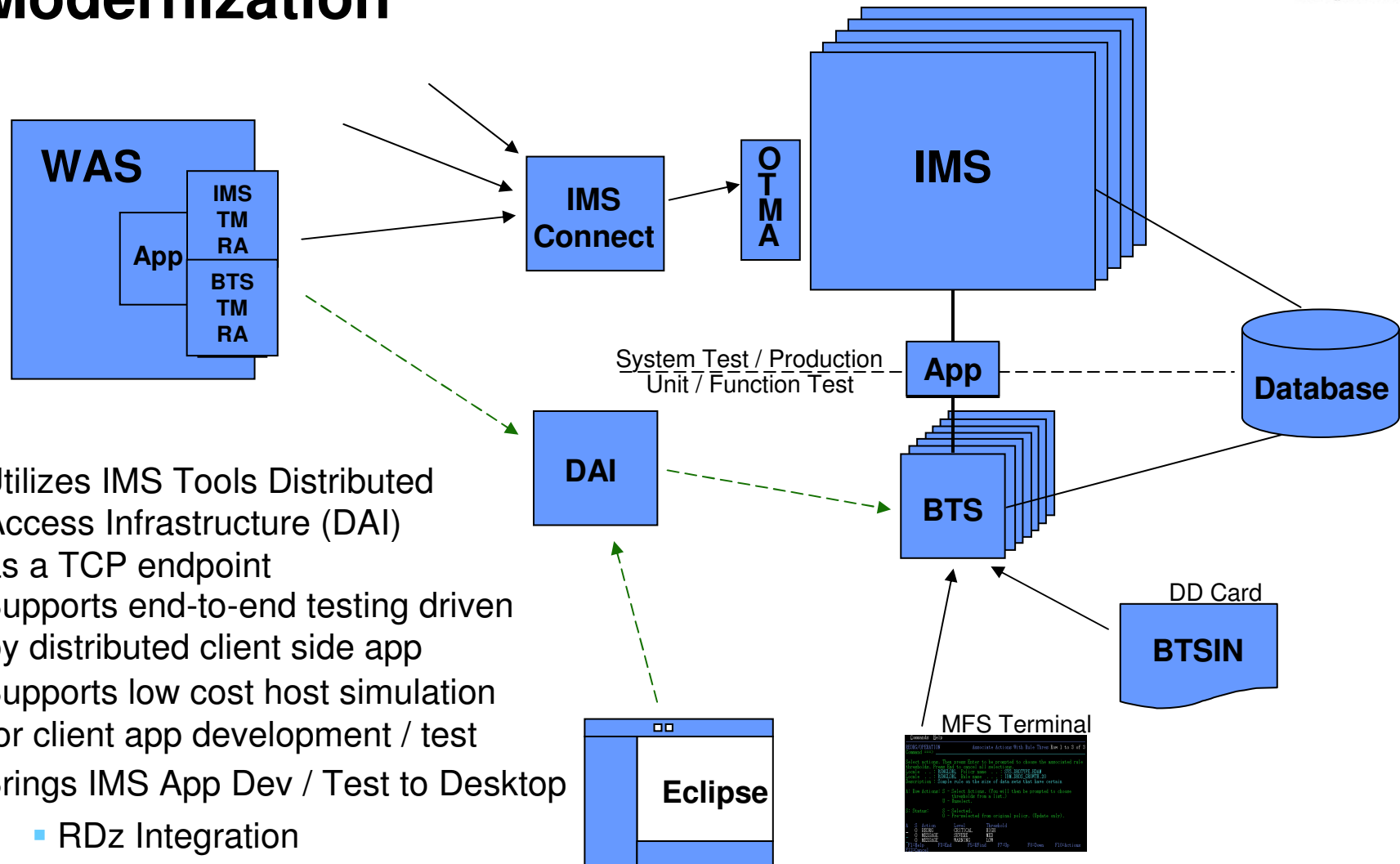
IMS Batch Terminal Simulator Modernization



- Tool for Unit Testing and Debugging IMS applications
 - Runs in TSO, IMS Batch (DL/I DBB) or IMS Online (BMP/JBP)
 - Simulates IMS DC calls
- Driven through BTSIN control statements or interactive full screen TSO simulation
- Playback utility
 - Generates BTSIN with the corresponding MFS associated with the MOD name from IMS transaction log records ('01'X, '03'X).
 - Prints containing screen images of transactions including data, USER/LTERM identification, time by extracting from BTSOUT

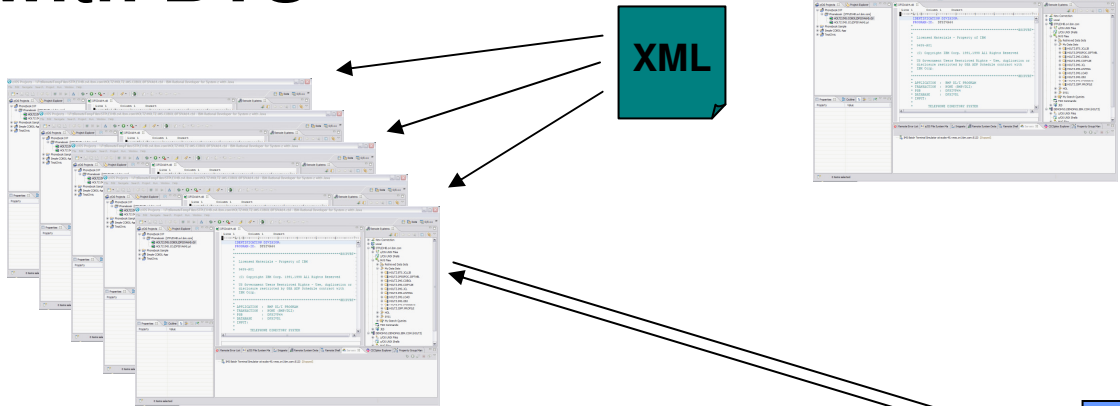


IMS Batch Terminal Simulator Modernization



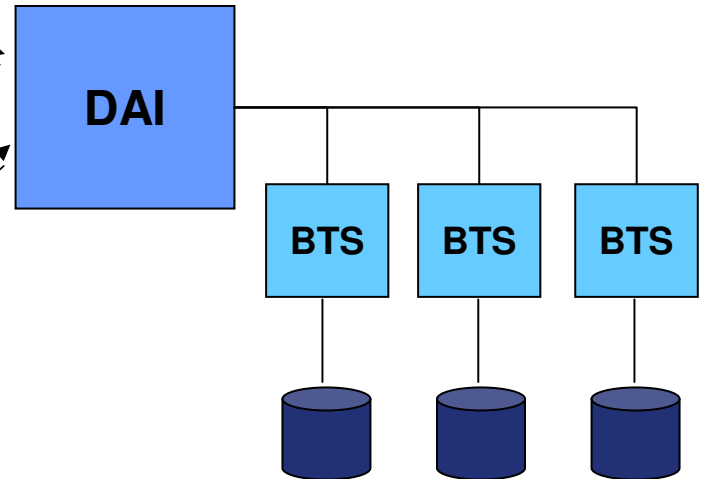
- Utilizes IMS Tools Distributed Access Infrastructure (DAI) as a TCP endpoint
- Supports end-to-end testing driven by distributed client side app
- Supports low cost host simulation for client app development / test
- Brings IMS App Dev / Test to Desktop
 - RDz Integration
 - Debug Tool Integration

Application Development Modernization with BTS

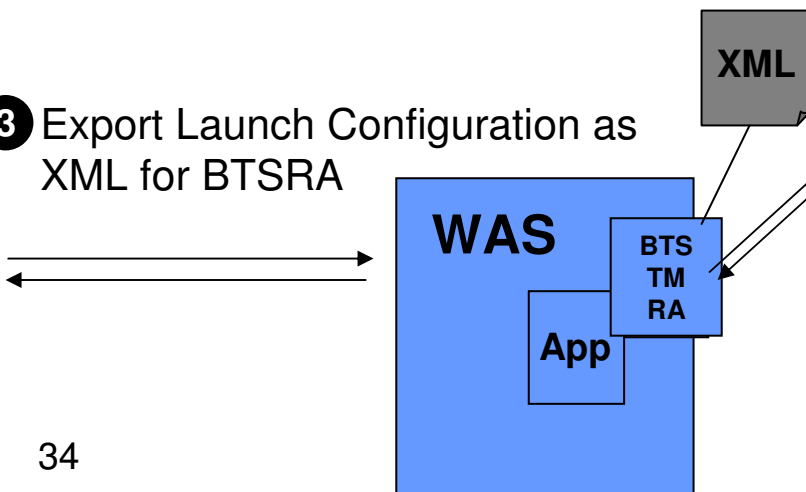


1 System Programmer defines common datasets, attributes, etc (similar to PROC) and exports as XML

2 Developers import XML and use to create Launch Configuration... to test applications

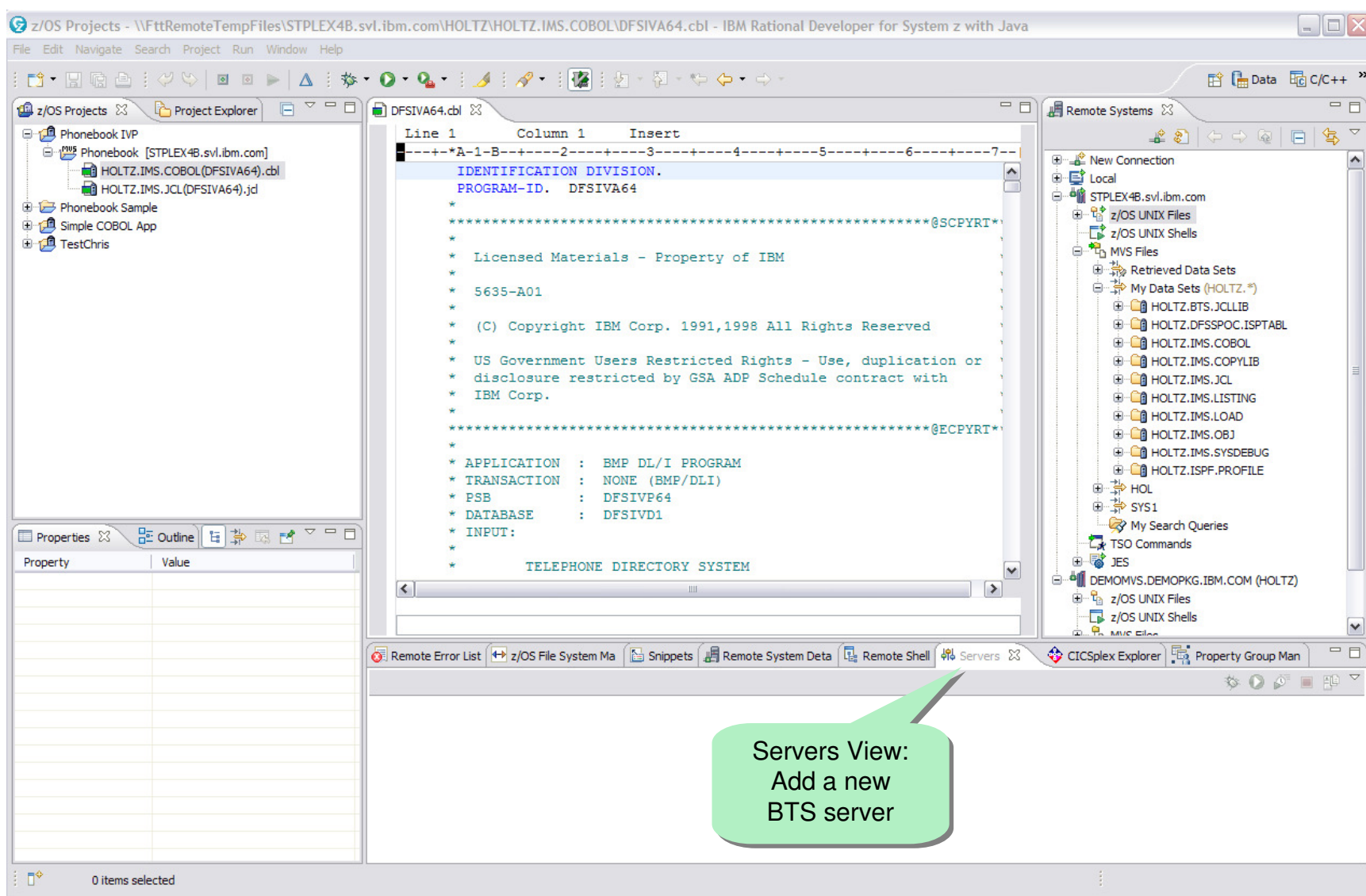


3 Export Launch Configuration as XML for BTSRA



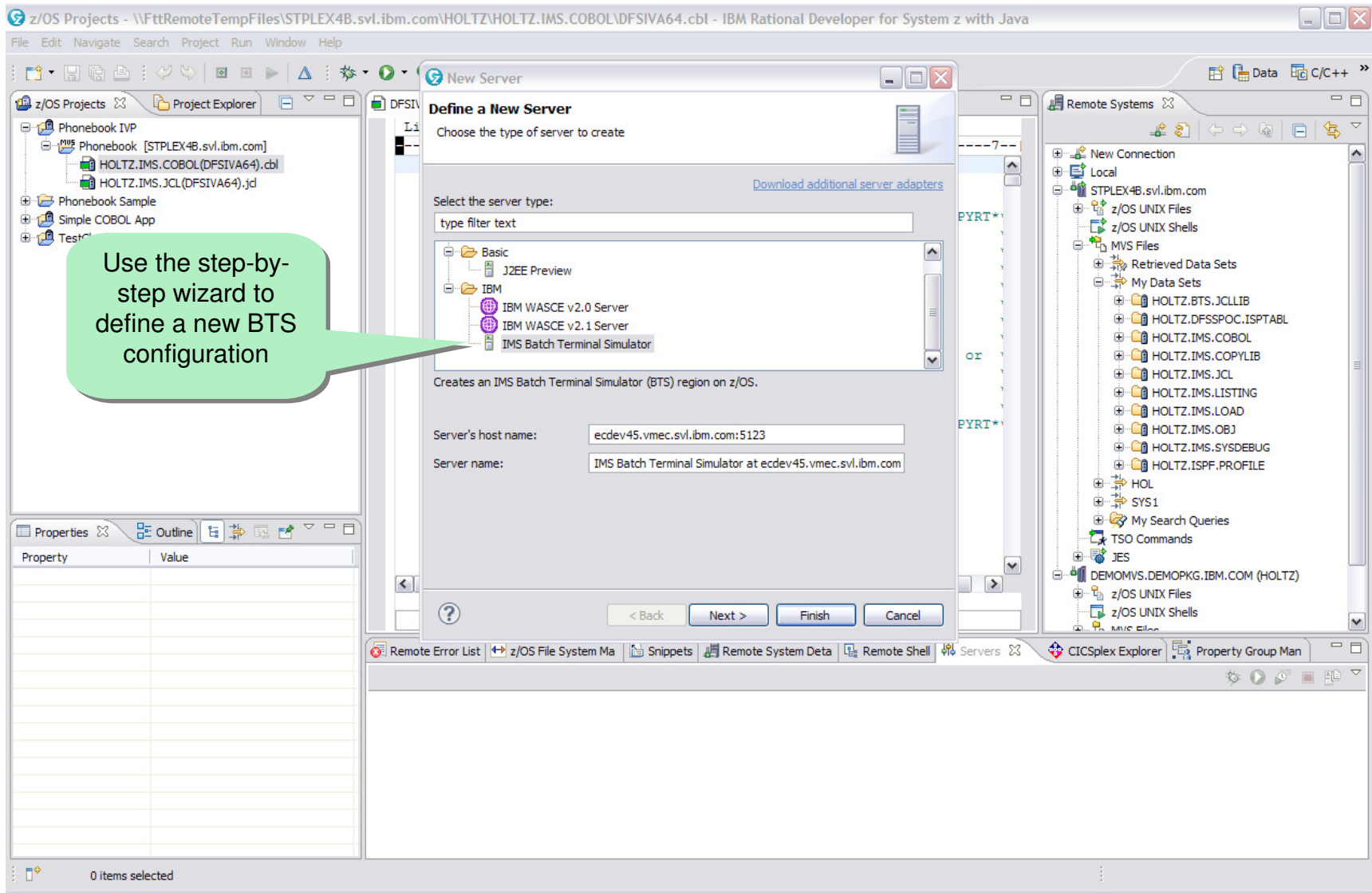
IMS Batch Terminal Simulator

Add BTS server



The screenshot shows the IBM Rational Developer for System z with Java interface. The main editor window displays the contents of a COBOL file named DFSIVA64.cbl. The terminal output includes a header line with column markers (A-1-B-...), followed by an identification section and a program ID of DFSIVA64. It contains copyright information for IBM and the text 'TELEPHONE DIRECTORY SYSTEM'. The 'Remote Systems' view on the right shows a tree structure of files and shells. A green callout bubble points to the 'Servers' view at the bottom, containing the text 'Servers View: Add a new BTS server'.

Define BTS server using the step-by-step wizard



Use the step-by-step wizard to define a new BTS configuration

Define a New Server

Choose the type of server to create

Select the server type:

type filter text

- Basic
 - J2EE Preview
- IBM
 - IBM WASCE v2.0 Server
 - IBM WASCE v2.1 Server
 - IMS Batch Terminal Simulator

Creates an IMS Batch Terminal Simulator (BTS) region on z/OS.

Server's host name: ecdev45.vmec.svl.ibm.com:5123

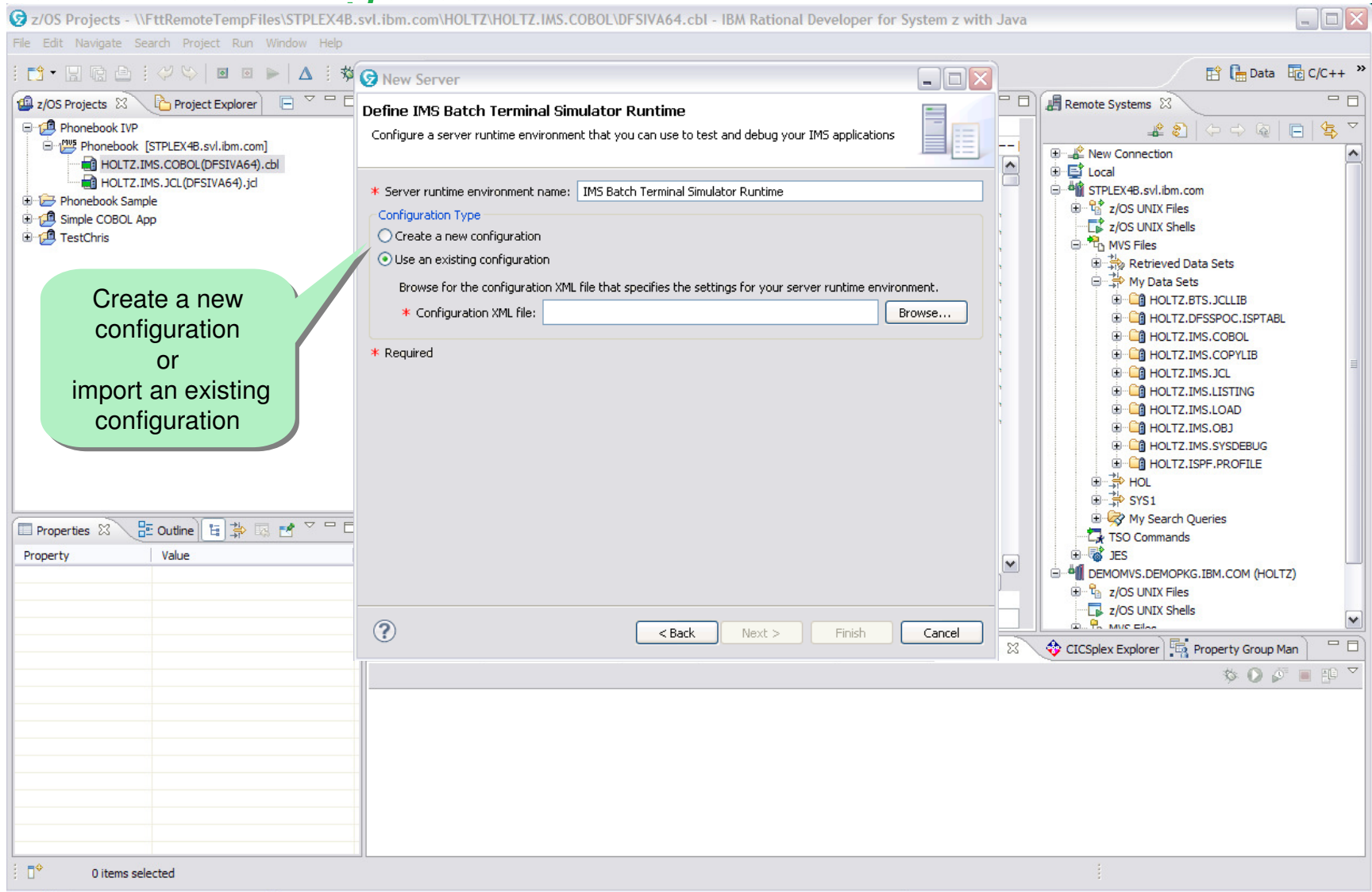
Server name: IMS Batch Terminal Simulator at ecdev45.vmec.svl.ibm.com

< Back Next > Finish Cancel

Remote Systems

- New Connection
- Local
- STPLEX4B.svl.ibm.com
 - z/OS UNIX Files
 - z/OS UNIX Shells
 - MVS Files
 - Retrieved Data Sets
 - My Data Sets
 - HOLTZ.BTS.JCLLIB
 - HOLTZ.DFSSPOC.ISPTABL
 - HOLTZ.IMS.COBOLE
 - HOLTZ.IMS.COPYLIB
 - HOLTZ.IMS.JCL
 - HOLTZ.IMS.LISTING
 - HOLTZ.IMS.LOAD
 - HOLTZ.IMS.OBJ
 - HOLTZ.IMS.SYSDEBUG
 - HOLTZ.ISPF.PROFILE
 - HOL
 - SYS1
 - My Search Queries
 - TSO Commands
 - JES
 - DEMOMVS.DEMOPKG.IBM.COM (HOLTZ)
 - z/OS UNIX Files
 - z/OS UNIX Shells
 - MVS Files

Create new or import existing server runtime configuration



The screenshot shows the 'New Server' dialog box in IBM Rational Developer for System z with Java. The dialog is titled 'Define IMS Batch Terminal Simulator Runtime' and contains the following elements:

- Title Bar:** 'New Server'
- Instruction:** 'Configure a server runtime environment that you can use to test and debug your IMS applications'
- Server runtime environment name:** 'IMS Batch Terminal Simulator Runtime'
- Configuration Type:**
 - Create a new configuration
 - Use an existing configuration
- Browse for the configuration XML file that specifies the settings for your server runtime environment.**
 - Configuration XML file:** [Empty text field] [Browse...]
- * Required**
- Buttons:** '< Back', 'Next >', 'Finish', 'Cancel'

The background shows the 'Remote Systems' view with a tree structure for 'STPLEX4B.svl.ibm.com' containing various files like 'HOLTZ.BTS.JCLLIB', 'HOLTZ.DFSSPOC.ISPTABL', 'HOLTZ.IMS.COBOL', etc. A green callout bubble on the left side of the dialog contains the text: 'Create a new configuration or import an existing configuration'.

Specify BTS options



Define IMS Batch Terminal Simulator Runtime

Configure a server runtime environment that you can use to test and debug your IMS applications

Runtime Parameters | Library Definitions | More Data Definitions | Debug Tool Data Definitions

Specify the region type. Click Show Advanced to edit advanced parameters.

* Region type (KW): DLI

Hide Advanced <<

Region Control and Performance

Dependent region start action (OPT): Select one

Size of DIRCA (DIRCA): (0 or 1 - 999)

DFSMPxxx suffix (PRLD):

Library search order (SRCH): Standard (0)

Execution time limit (CPUTIME): (0 or 1 - 1440 min.)

Processor time statistics (STIMER): Select one

Parallel DL/I (PARDLI): Select one

Dump output type (FMTO): T [About FMTO](#)

IMS subsystem ID (IMSID):

Access to DB2® for z/OS® subsystems (SSM):

Swappable address space (SWAP): Select one

Enable internal resource lock manager (IRLM):

Dynamic backout (BKO): Disable

DFSINTxx suffix (PRFINIT):

* Required

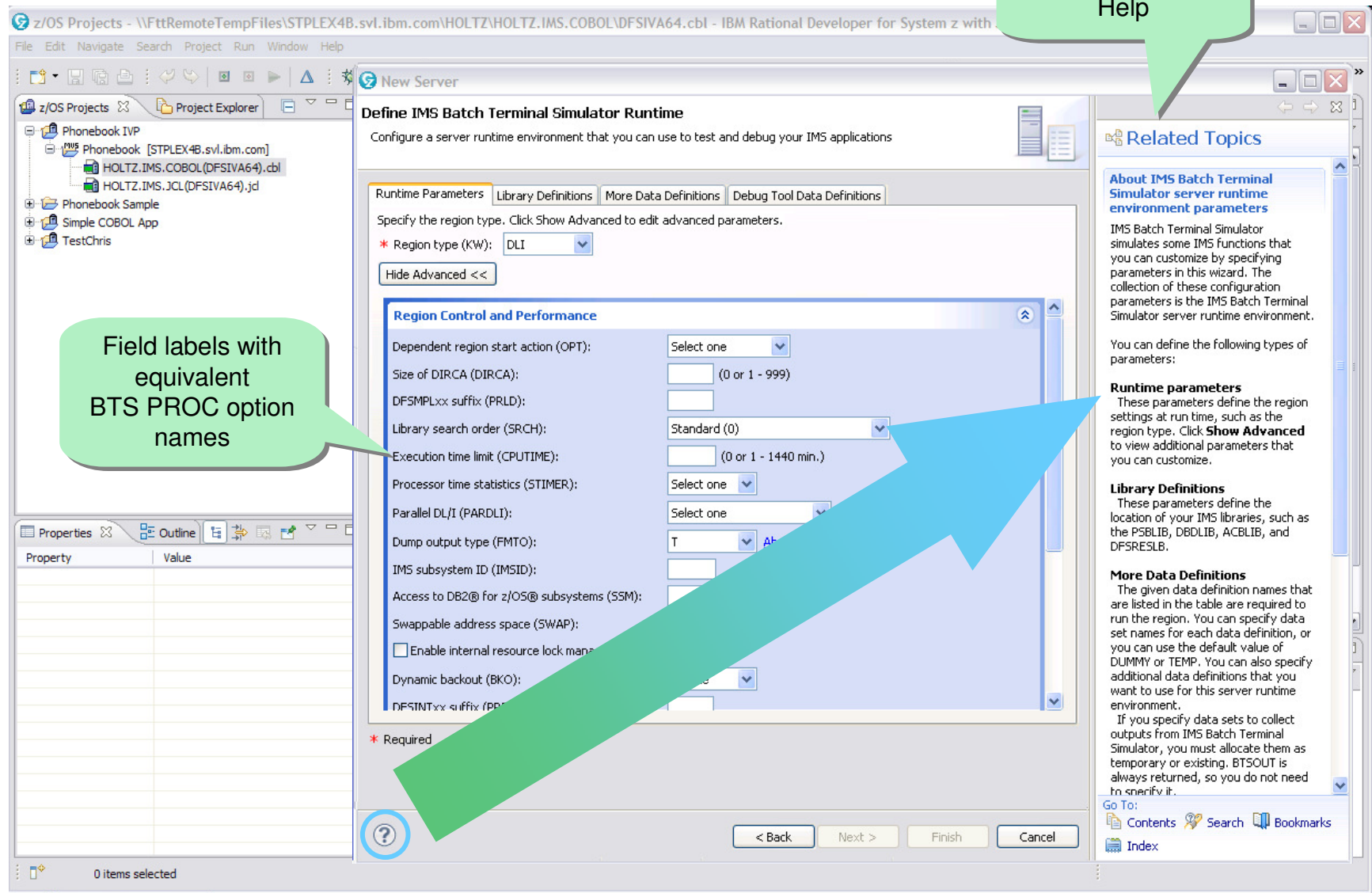
< Back Next > Finish Cancel

Specify BTS options for DLI, DBB, BMP, or JBP

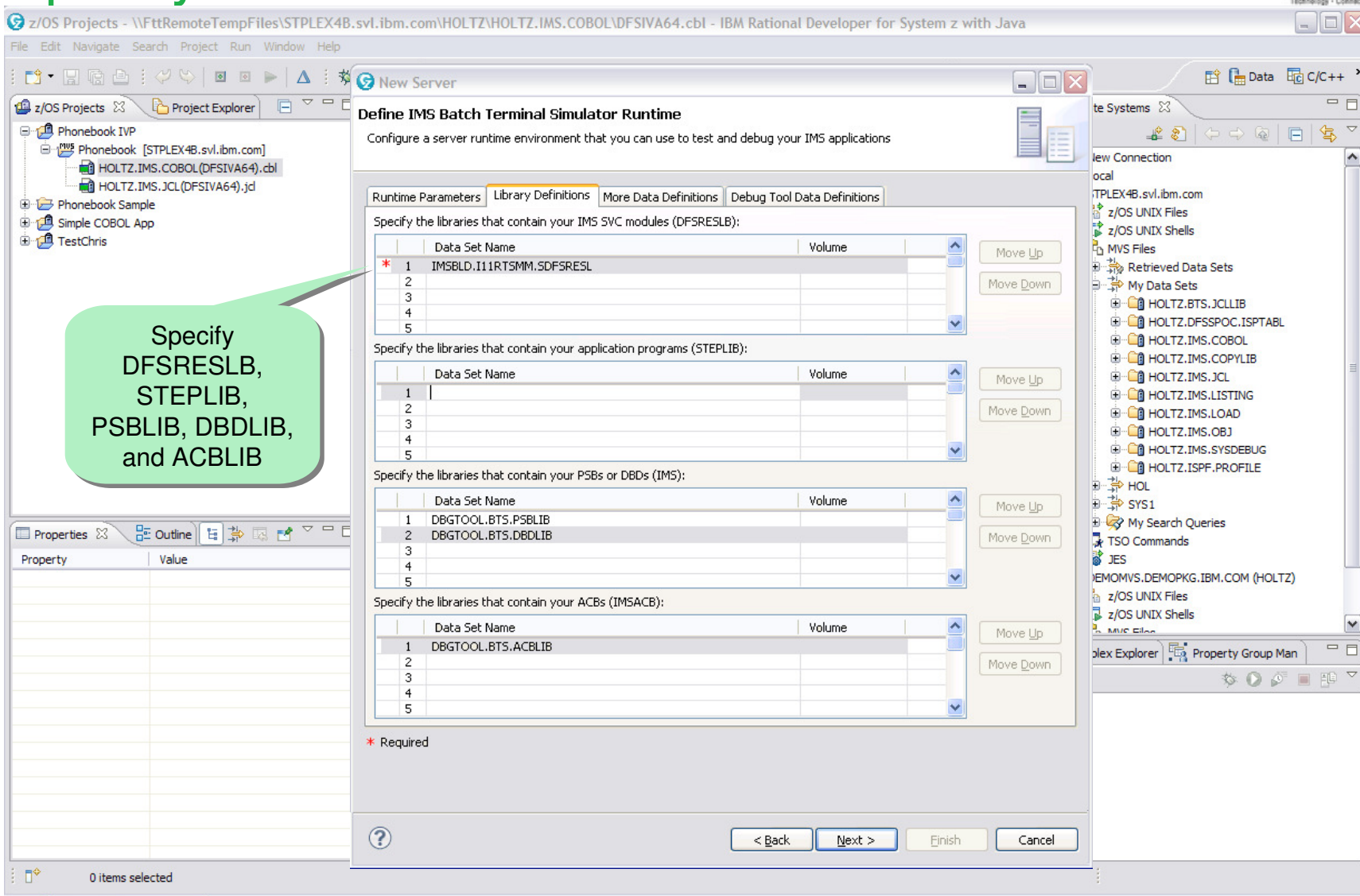
Use embedded assistance

Context-sensitive Help

Field labels with equivalent BTS PROC option names



Specify libraries



Define IMS Batch Terminal Simulator Runtime
Configure a server runtime environment that you can use to test and debug your IMS applications

Runtime Parameters | **Library Definitions** | More Data Definitions | Debug Tool Data Definitions

Specify the libraries that contain your IMS SVC modules (DFSRESLB):

	Data Set Name	Volume
* 1	IMSBLD.I11RTSMM.SDFSRESL	
2		
3		
4		
5		

Specify the libraries that contain your application programs (STEPLIB):

	Data Set Name	Volume
1		
2		
3		
4		
5		

Specify the libraries that contain your PSBs or DBDs (IMS):

	Data Set Name	Volume
1	DBGTOOL.BTS.PSBLIB	
2	DBGTOOL.BTS.DBDLIB	
3		
4		
5		

Specify the libraries that contain your ACBs (IMSACB):

	Data Set Name	Volume
1	DBGTOOL.BTS.ACBLIB	
2		
3		
4		
5		

* Required

< Back | Next > | Finish | Cancel

Specify
DFSRESLB,
STEPLIB,
PSBLIB, DBDLIB,
and ACBLIB

Specify additional data sets



z/OS Projects - \\ftrRemoteTempFiles\STPLEX4B.svl.ibm.com\HOLTZ\HOLTZ.IMS.COBOLE\DFSIVA64.cbl - IBM Rational Developer for System z with Java

File Edit Navigate Search Project Run Window Help

z/OS Projects

- Phonebook IVP
 - Phonebook [STPLEX4B.svl.ibm.com]
 - HOLTZ.IMS.COBOLE\DFSIVA64.cbl
 - HOLTZ.IMS.JCL(DFSIVA64).jcl
 - Phonebook Sample
 - Simple COBOL App
 - TestChris

Define IMS Batch Terminal Simulator Runtime

Configure a server runtime environment that you can use to test and debug your IMS applications

Runtime Parameters | Library Definitions | **More Data Definitions** | Debug Tool Data Definitions

Specify additional data definitions for all applications that will use this server runtime environment (for example, DDs for your IMS Batch Terminal Simulator procedure):

DD Name	DD Type	Data Set Name	Volume	Member	
IEFRDER	DUMMY				Add...
SYSUDUMP	DUMMY				Edit...
QIOPCB	TEMP				Remove
QALTRAN	TEMP				
QALTPCB	TEMP				

In-stream data set:

* Required

< Back Next > Finish Cancel

0 items selected

My Data Sets

- HOLTZ.BTS.JCLLIB
- HOLTZ.DFSSPOC.ISPTABL
- HOLTZ.IMS.COBOLE
- HOLTZ.IMS.COPYLIB
- HOLTZ.IMS.JCL
- HOLTZ.IMS.LISTING
- HOLTZ.IMS.LOAD
- HOLTZ.IMS.OBJ
- HOLTZ.IMS.SYSDEBUG
- HOLTZ.ISPF.PROFILE

Specify additional data sets

Create launch configuration



The screenshot shows the IBM Rational Developer for System z with Java interface. The main editor displays a COBOL program named DFSIVA64.cbl. The code includes a header section with the following text:

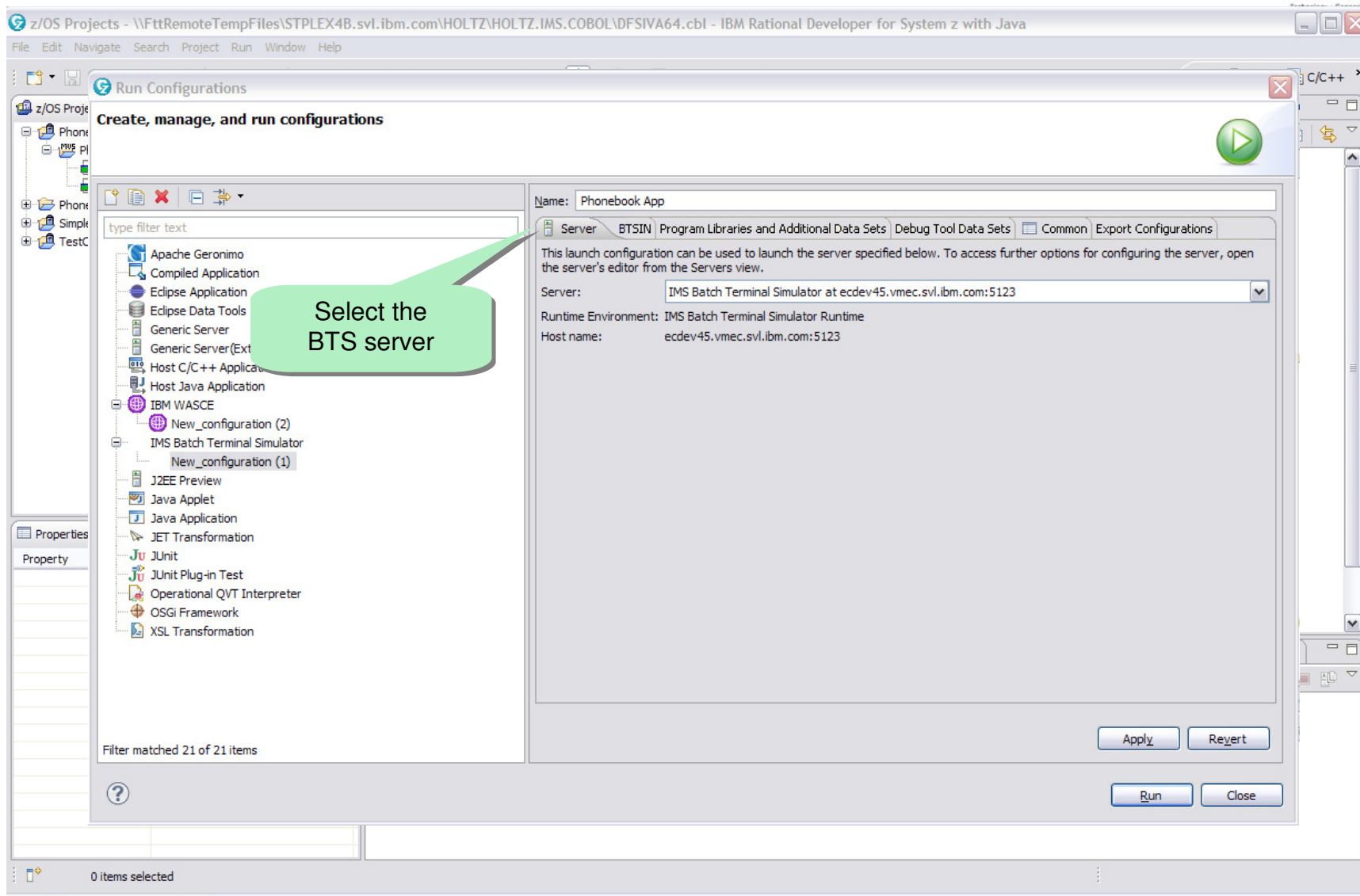
```
Line 1      Column 1      Insert
-----*-----*-----*-----*-----*-----*-----*-----*-----*-----*
  * IDENTIFICATION DIVISION.
  * PROGRAM ID.    DFSIVA64
  *
  * *****@SCPVRT*****
  *
  * Licensed Material - Property of IBM
  *
  * 5635-A01
  *
  * (C) Copyright ...
  *
  * US Government ...
  * disclosure res ...
  * IBM Corp.
  *
  * *****@ECPVRT*****
  *
  * APPLICATION :
  * TRANSACTION : NUNB (BMT,BSL)
  * PSB         : DFSIVP64
  * DATABASE   : DFSIVD1
  * INPUT:
  *
  * TELEPHONE DIRECTORY SYSTEM
```

Two callout boxes are present:

- A green callout box on the left points to the 'Remote Systems' view and contains the text: "IMS Batch Terminal Simulator server".
- A green callout box in the center points to the code and contains the text: "Next: Create a launch configuration for your program".

The 'Remote Systems' view on the right shows a tree structure of remote systems, including 'STPLEX4B.svl.ibm.com' and 'DEMOMVS.DEMOPKG.IBM.COM (HOLTZ)'. The 'Remote Error List' at the bottom shows a message: "IMS Batch Terminal Simulator at ecdev45.vmec.svl.ibm.com:5123 [Stopped]".

Select BTS server



The screenshot shows the 'Run Configurations' dialog in IBM Rational Developer for System z with Java. The 'Name' field is 'Phonebook App'. The 'Server' dropdown is set to 'IMS Batch Terminal Simulator at ecdev45.vmec.svl.ibm.com:5123'. The 'Runtime Environment' is 'IMS Batch Terminal Simulator Runtime' and the 'Host name' is 'ecdev45.vmec.svl.ibm.com:5123'. A green callout bubble with the text 'Select the BTS server' points to the 'IMS Batch Terminal Simulator' option in the list of servers. The list also includes 'New_configuration (1)'. The 'Filter matched 21 of 21 items' is shown at the bottom of the list.

Specify BTSIN

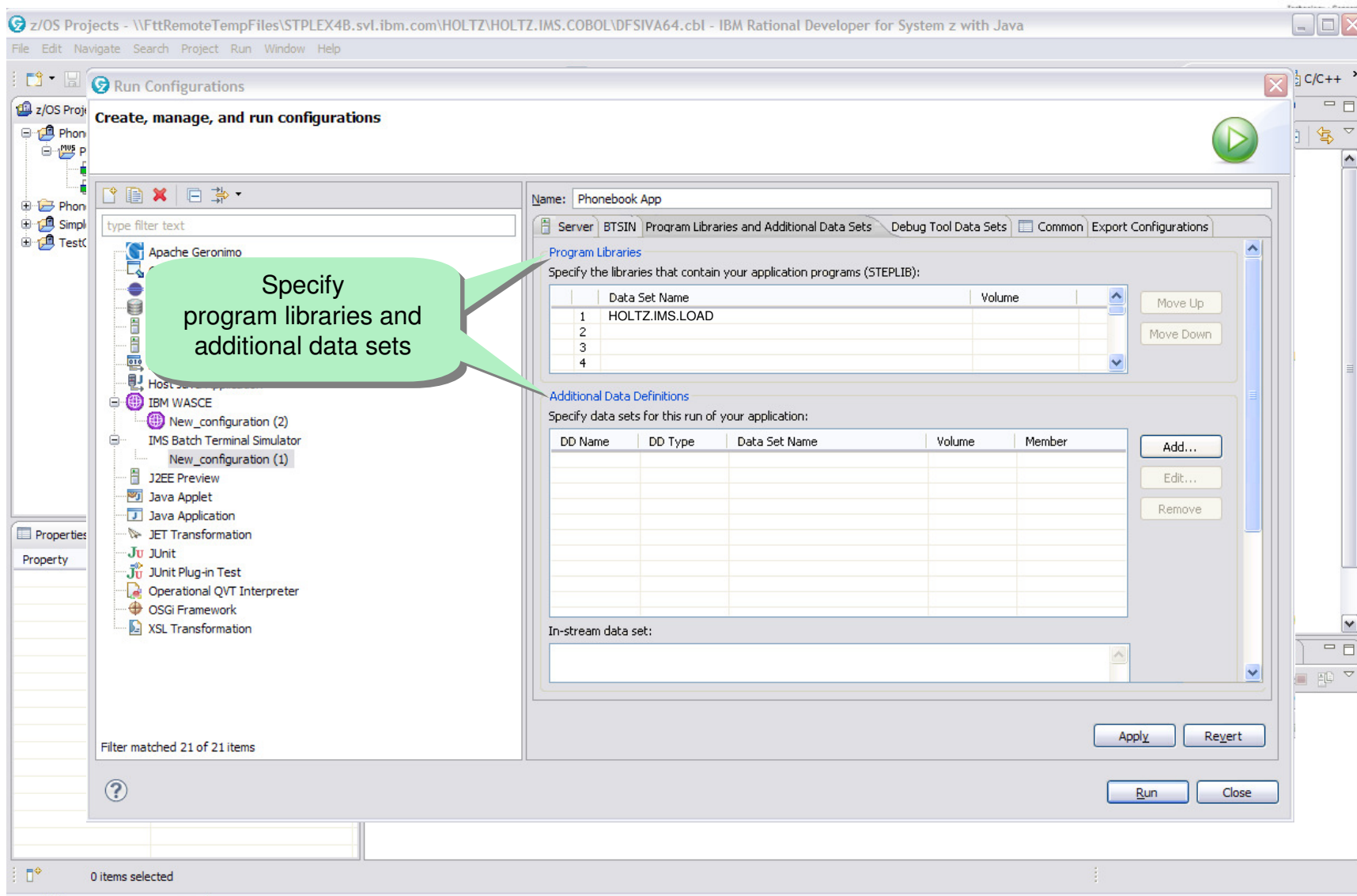


The screenshot shows the 'Run Configurations' dialog for a project named 'Phonebook App'. The 'Server' tab is selected, and the 'BTSIN' sub-tab is active. A green callout bubble points to the 'BTSIN' sub-tab with the text 'Specify BTSIN'. The main text area contains the following JCL code:

```
Specify the BTSIN JCL for your application:  
./T TC=PART MBR=DFSSAM02 LANG=CBL  
./T TC=DSPINV MBR=DFSSAM03 LANG=CBL  
./T TC=ADDPART MBR=DFSSAM04 LANG=CBL  
./T TC=ADDINV MBR=DFSSAM04 LANG=CBL  
./T TC=DLETINV MBR=DFSSAM04 LANG=CBL  
./T TC=DLETPART MBR=DFSSAM04 LANG=CBL  
./T TC=CLOSE MBR=DFSSAM05 LANG=CBL  
./T TC=DISBURSE MBR=DFSSAM06 LANG=CBL  
./T TC=DSPALLI MBR=DFSSAM07 LANG=CBL  
PART AN960C10$  
DSPALLI AN960C10$  
DSPINV AN960C10,28009126$  
ADDPART AB960C10,RIVET,74$  
ADDINV AB960C10,8009126A$  
DSPINV AB960C10,8009126A$  
DLETINV AB960C10,8009126A$  
DLETPART AB960C10$
```

Buttons for 'Apply', 'Revert', 'Run', and 'Close' are visible at the bottom of the dialog.

Specify program libraries



z/OS Projects - \\FttRemoteTempFiles\STPLEX4B.svl.ibm.com\HOLTZ\HOLTZ.IMS.COBOL\DFSIVA64.cbl - IBM Rational Developer for System z with Java

File Edit Navigate Search Project Run Window Help

Run Configurations

Create, manage, and run configurations

Name: Phonebook App

Server | BTSIN | Program Libraries and Additional Data Sets | Debug Tool Data Sets | Common | Export Configurations

Program Libraries

Specify the libraries that contain your application programs (STEPLIB):

	Data Set Name	Volume	
1	HOLTZ.IMS.LOAD		
2			
3			
4			

Additional Data Definitions

Specify data sets for this run of your application:

DD Name	DD Type	Data Set Name	Volume	Member

In-stream data set:

Apply Revert

Run Close

Filter matched 21 of 21 items

0 items selected

Specify program libraries and additional data sets

Debug Tool for z/OS

Debug runtime configuration



z/OS Projects - \\ftrRemoteTempFiles\STPLEX4B.svl.ibm.com\HOLTZ\HOLTZ.IMS.COBOLE\DFSIVA64.cbl - IBM Rational Developer for System z with Java

File Edit Navigate Search Project Run Window Help

z/OS Projects Phonebook IVP Phonebook [STPLEX4B.svl.ibm.com] HOLTZ.IMS.COBOLE(DFSIVA64).cbl HOLTZ.IMS.JCL(DFSIVA64).jcl Phonebook Sample Simple COBOL App TestChris

New Server

Define IMS Batch Terminal Simulator Runtime

Configure a server runtime environment that you can use to test and debug your IMS applications

Runtime Parameters Library Definitions More Data Definitions **Debug Tool Data Definitions**

Specify Debug Tool libraries (STEPLIB: SEQAMOD, SCEERUN, SCEERUN2, EQAOPTS, CEEBINIT):

	Data Set Name	Volume
1		
2		
3		
4		

Specify Debug Tool in-stream data sets (CEEOPTS):

DD Name	DD Type	Data Set Name	Volume	Member
IEFRDER	DUMMY			
SYSUDUMP	DUMMY			
QIOPCB	TEMP			
QALTRAN	TEMP			
QALTPCB	TEMP			

In-stream data set:

* Required

< Back Next > Finish Cancel

0 items selected

Specify Debug Tool data sets

My Data Sets

- HOLTZ.BTS.JCLLIB
- HOLTZ.DFSSPOC.ISPTABL
- HOLTZ.IMS.COBOLE
- HOLTZ.IMS.COPYLIB
- HOLTZ.IMS.JCL
- HOLTZ.IMS.LISTING
- HOLTZ.IMS.LOAD
- HOLTZ.IMS.OBJ
- HOLTZ.IMS.SYSDEBUG
- HOLTZ.ISPF.PROFILE

Debug Tool for z/OS

Debug runtime configuration



The screenshot shows the 'Run Configurations' dialog for a project named 'Phonebook App'. The 'Program Libraries and Additional Data Sets' tab is selected. A blue callout bubble points to the 'Program Libraries' section, containing the text: 'Specify Debug Tool program libraries and additional data sets'. The 'Program Libraries' section has a table with 4 rows and 2 columns: 'Data Set Name' and 'Volume'. The 'Additional Data Definitions' section has a table with 5 columns: 'DD Name', 'DD Type', 'Data Set Name', 'Volume', and 'Member'. At the bottom right, there are 'Apply', 'Revert', 'Run', and 'Close' buttons.

Data Set Name	Volume
1	
2	
3	
4	

DD Name	DD Type	Data Set Name	Volume	Member

Run program

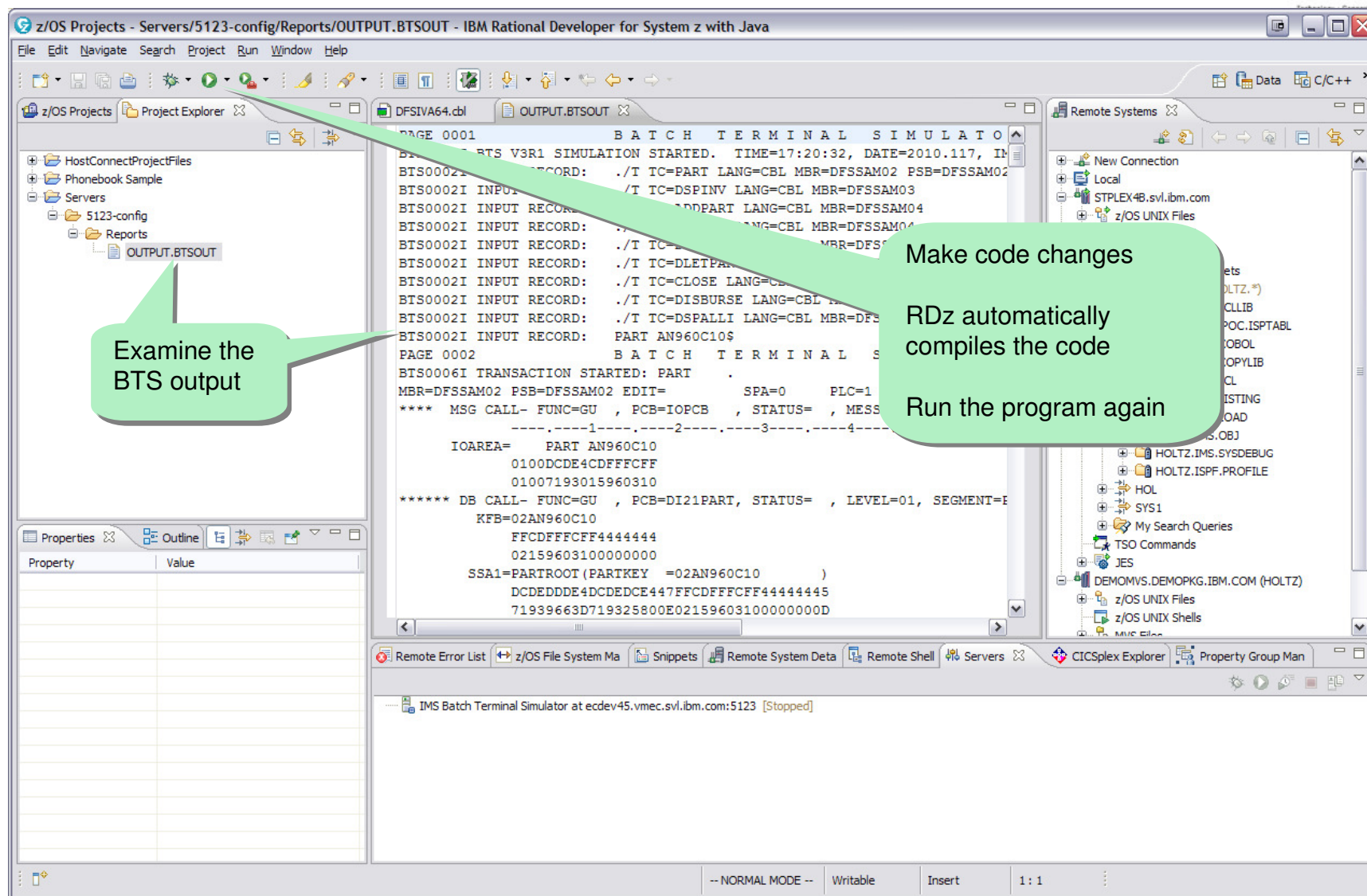


The screenshot shows the IBM Rational Developer for System z with Java interface. The main editor displays the COBOL source code for program DFSIVA64. The code includes an identification section, copyright information, and program details. A green callout bubble points to the 'Run program' button in the toolbar, with the text 'Run program'. Another green callout bubble points to the 'IMS Batch Terminal Simulator' window at the bottom, which shows the program has started, with the text 'The program now runs on z/OS in the BTS region'. A third green callout bubble points to the 'Remote Systems' tree on the right, which shows the 'BTS' server is started, with the text 'The BTS server has started'. The 'Remote Systems' tree also shows various data sets and files.

```
Line 1      Column 1      Insert
-----*A-1-B-----2-----3-----4-----5-----6-----7-----
IDENTIFICATION DIVISION.
PROGRAM-ID.  DFSIVA64
*****@SCPYRT*****
*
* Licensed Materials - Property of IBM
*
* 5635-A01
*
* (C) Copyright IBM Corp. 1991,1998 All Rights Reserved
*
* US Government Users Restricted Rights - Use, duplication or
* disclosure restricted by GSA ADP Schedule contract with
* IBM Corp.
*****@ECPYRT*****
*
* APPLICATION :  BMP DL/I PROGRAM
* TRANSACTION :  NONE (BMP/DLI)
* PSB         :  DFSIVP64
* DATABASE    :  DFSIVD1
* INPUT:
*
* TELEPHONE DIRECTORY SYSTEM
```

40

Examine BTS output



The screenshot shows the IBM Rational Developer for System z interface. The main editor displays the contents of the OUTPUT.BTSOUT file, which contains a batch terminal simulation log. The log includes headers like 'PAGE 0001' and 'BATCH TERMINAL SIMULATOR', followed by simulation start information: 'BATCH TERMINAL SIMULATION STARTED. TIME=17:20:32, DATE=2010.117, IM'. The log then lists several 'INPUT RECORD' entries, each with a transaction code (TC) and language (LANG). For example, 'BTS0002I INPUT RECORD: . /T TC=PART LANG=CBL MBR=DFSSAM02 PSB=DFSSAM02'. Below these, there are transaction details for 'PART AN960C10', including 'IOAREA=' and 'DB CALL- FUNC=GU, PCB=DI21PART, STATUS=, LEVEL=01, SEGMENT='. The log ends with 'PAGE 0002' and 'BATCH TERMINAL SIMULATOR'.

Annotations on the screenshot include:

- A callout bubble pointing to the 'OUTPUT.BTSOUT' file in the Project Explorer: "Examine the BTS output".
- A callout bubble pointing to the log content: "Make code changes", "RDz automatically compiles the code", and "Run the program again".

The interface also shows a 'Remote Systems' panel on the right with a tree view of connections, and a 'Properties' panel at the bottom left. The status bar at the bottom indicates 'IMS Batch Terminal Simulator at ecdev45.vmec.svl.ibm.com:5123 [Stopped]'.

Be positioned to take advantage of the latest technologies



- The changing z development landscape requires modern, more productive and more affordable development tools
- The IBM approach to zSeries tools is an up-to-date toolset that provides:
 - a single set of tools across a broad spectrum of zSeries technologies to support the new generation of complex, composite applications
 - new GUIs and conventional 3270 interfaces
 - Immediate support for new versions of critical software such as DB2, CICS, MQ Series, and IMS

IBM PD Tools for z/OS

- Reduces the time programmers need to perform common development tasks such as debugging, test data creation/management, testing, and performance analysis
- Shortens application development cycles
- Provides diagnostic tools that provide detailed information about production problems, and tools for rapidly correcting data problems
- Results in reduced production down time, shortened problem resolution time, and fewer problem re-works
- Provides an extensive collection of features and utilities to automate file and data management, copying and reformatting, data scrambling, comparison, etc.
- Reduces lost of time and productivity spent writing in-house utilities
- Simplifies programming tasks during the entire development process
- Lets you spend more development time creating value, instead of struggling through mundane tasks without the right tools
- **Increases productivity**

Agenda

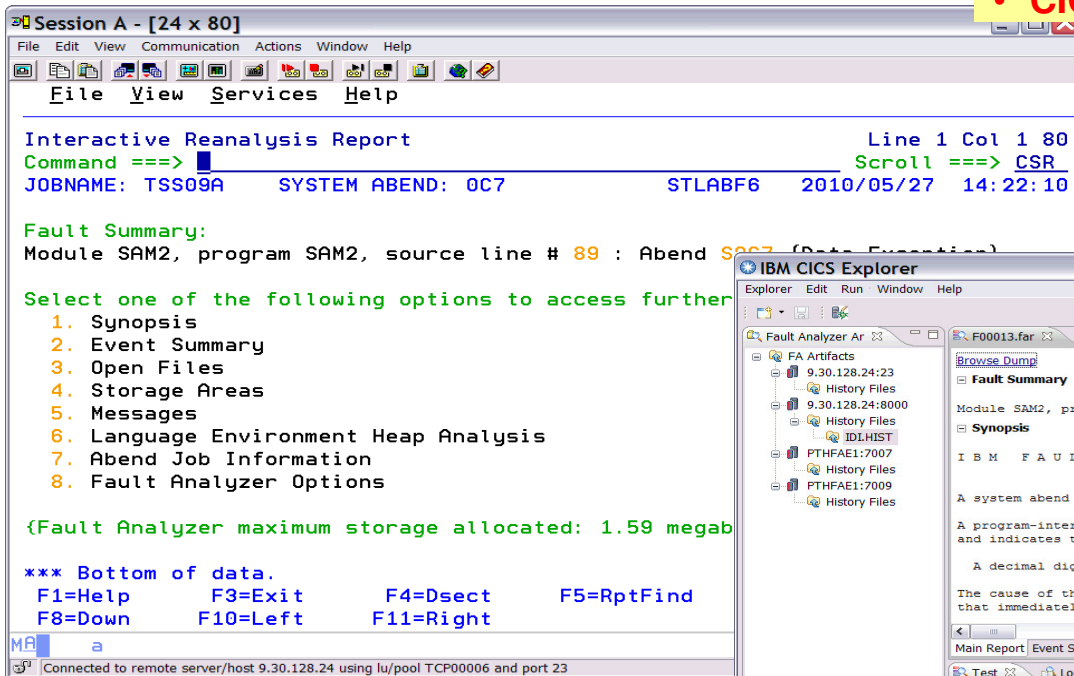
- Fault Analyzer
- Debug Tool
- Application Performance Analyzer
- File Manager
- Introducing the new plug-in for BTS (Batch Terminal Simulator)
- Conclusion



IBM Fault Analyzer

Multiple interfaces and modes of operation

- New in FA 11.1**
- Plug-in for CICS Explorer
 - Java, C/C++, and Enterprise PL/I enhancements
 - CICS support improvements

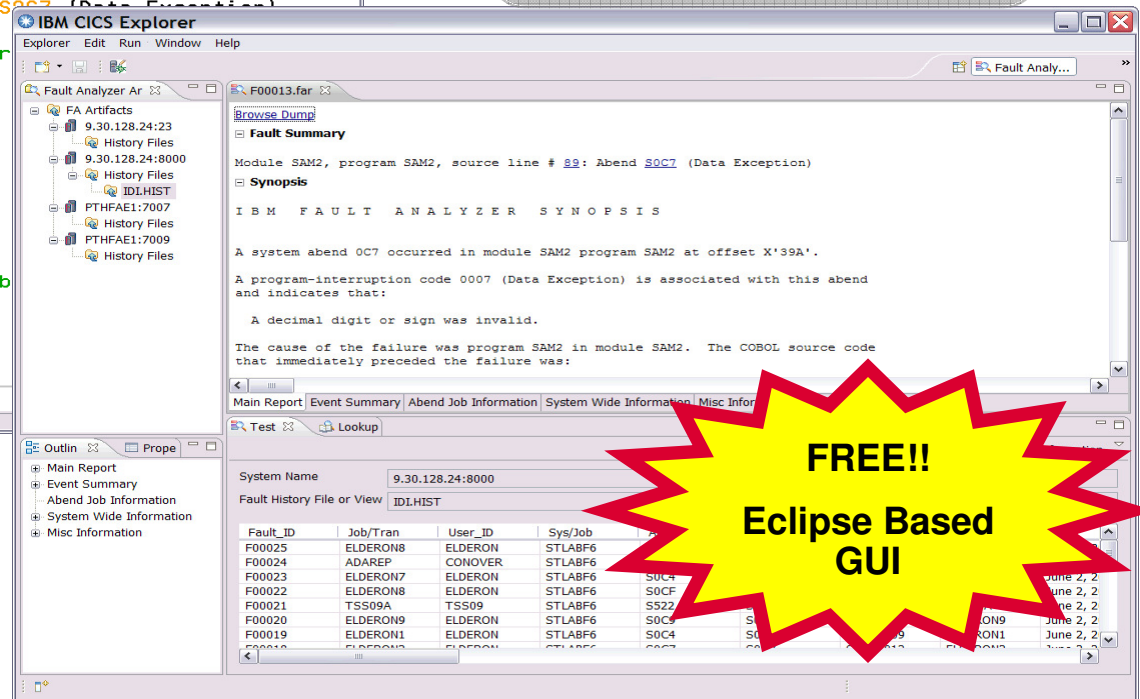


Interfaces

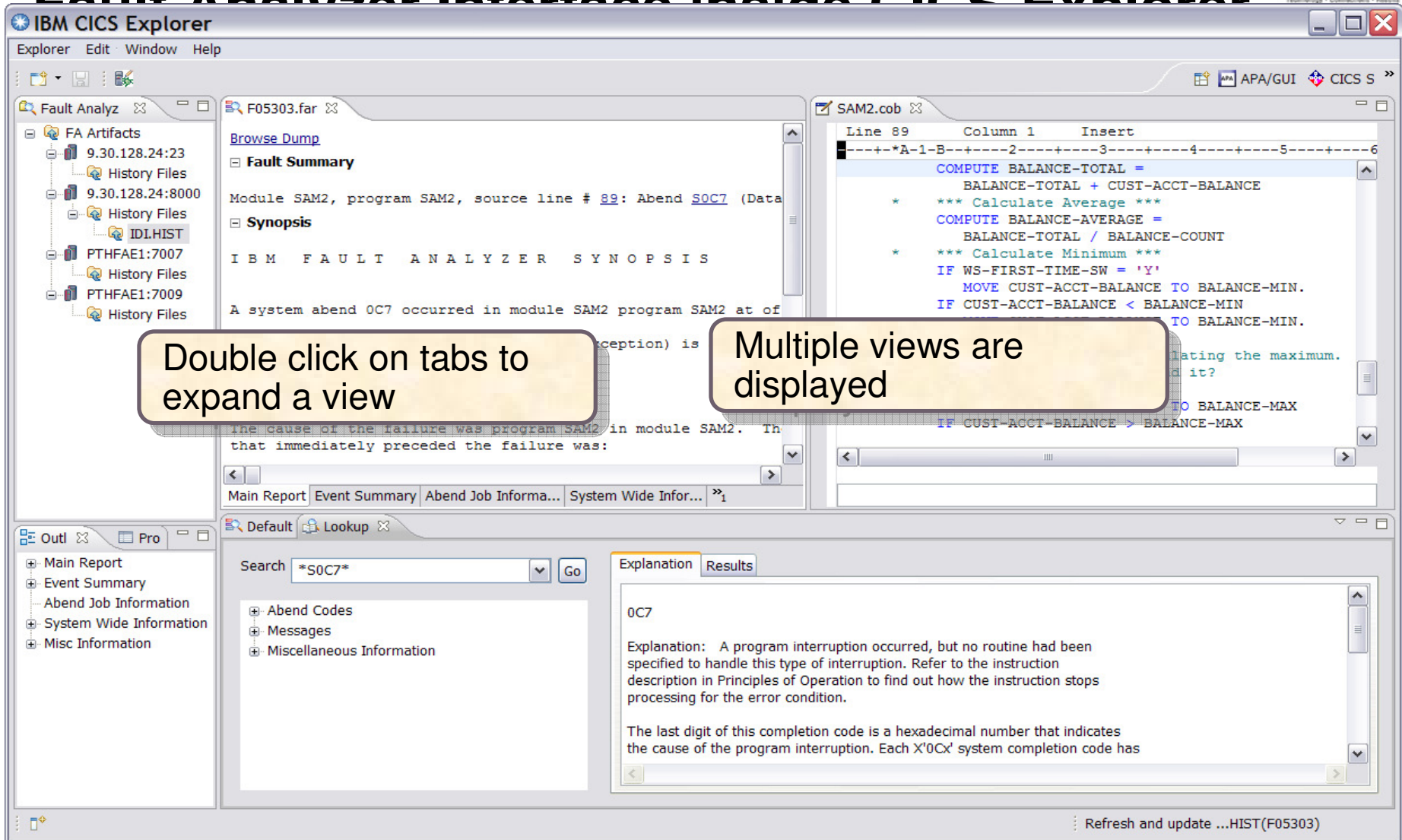
- ISPF
- RDz
- GUI
- CICS
- Web

Modes Of Operation

- Real-time analysis
- Batch dump re-analysis
- Interactive dump re-analysis



Fault Analyzer Interface inside CICS Explorer



Double click on tabs to expand a view

Multiple views are displayed

Search: *S0C7*

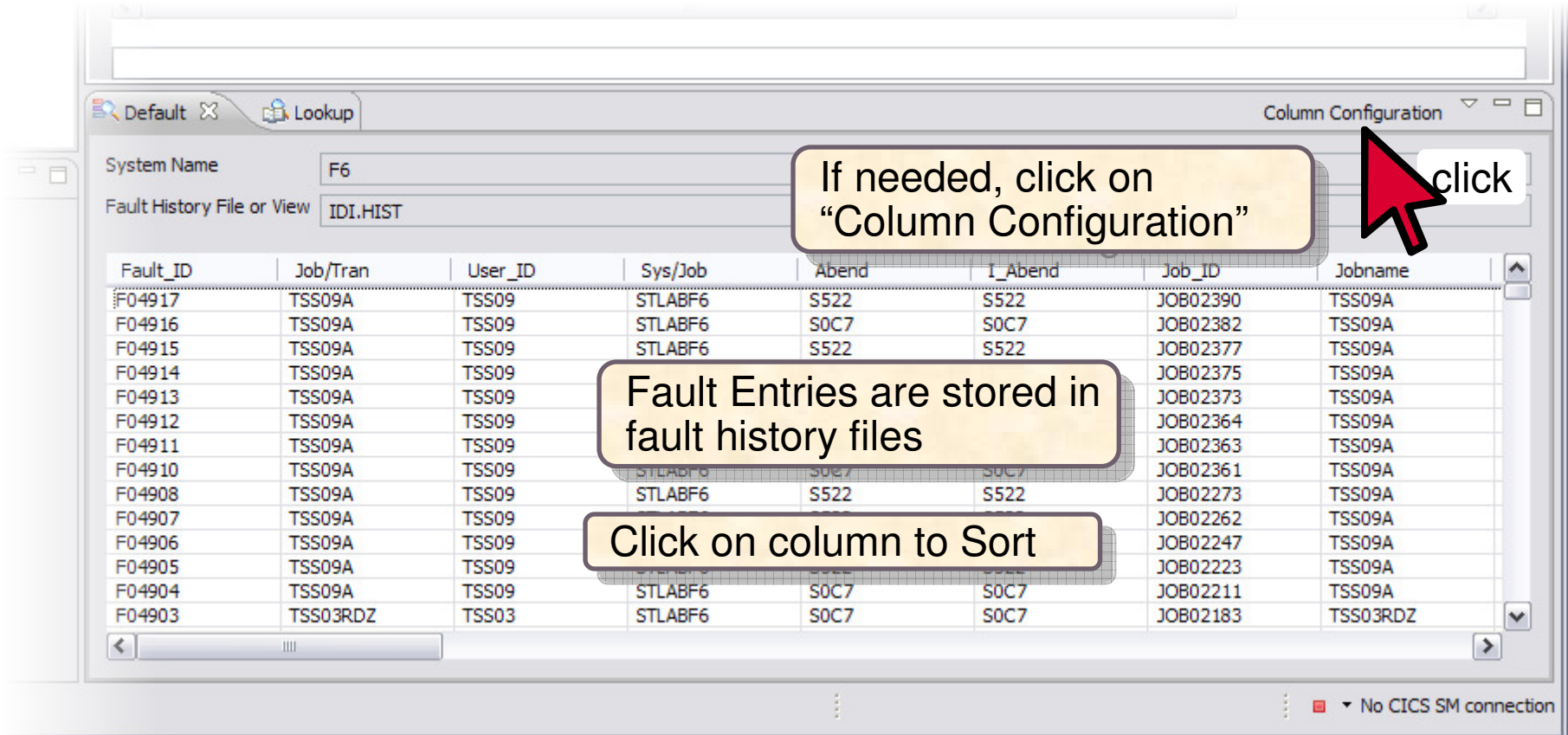
Explanation Results

0C7

Explanation: A program interruption occurred, but no routine had been specified to handle this type of interruption. Refer to the instruction description in Principles of Operation to find out how the instruction stops processing for the error condition.

The last digit of this completion code is a hexadecimal number that indicates the cause of the program interruption. Each X'0Cx' system completion code has

Default Fault History File View



System Name: F6
Fault History File or View: IDI.HIST

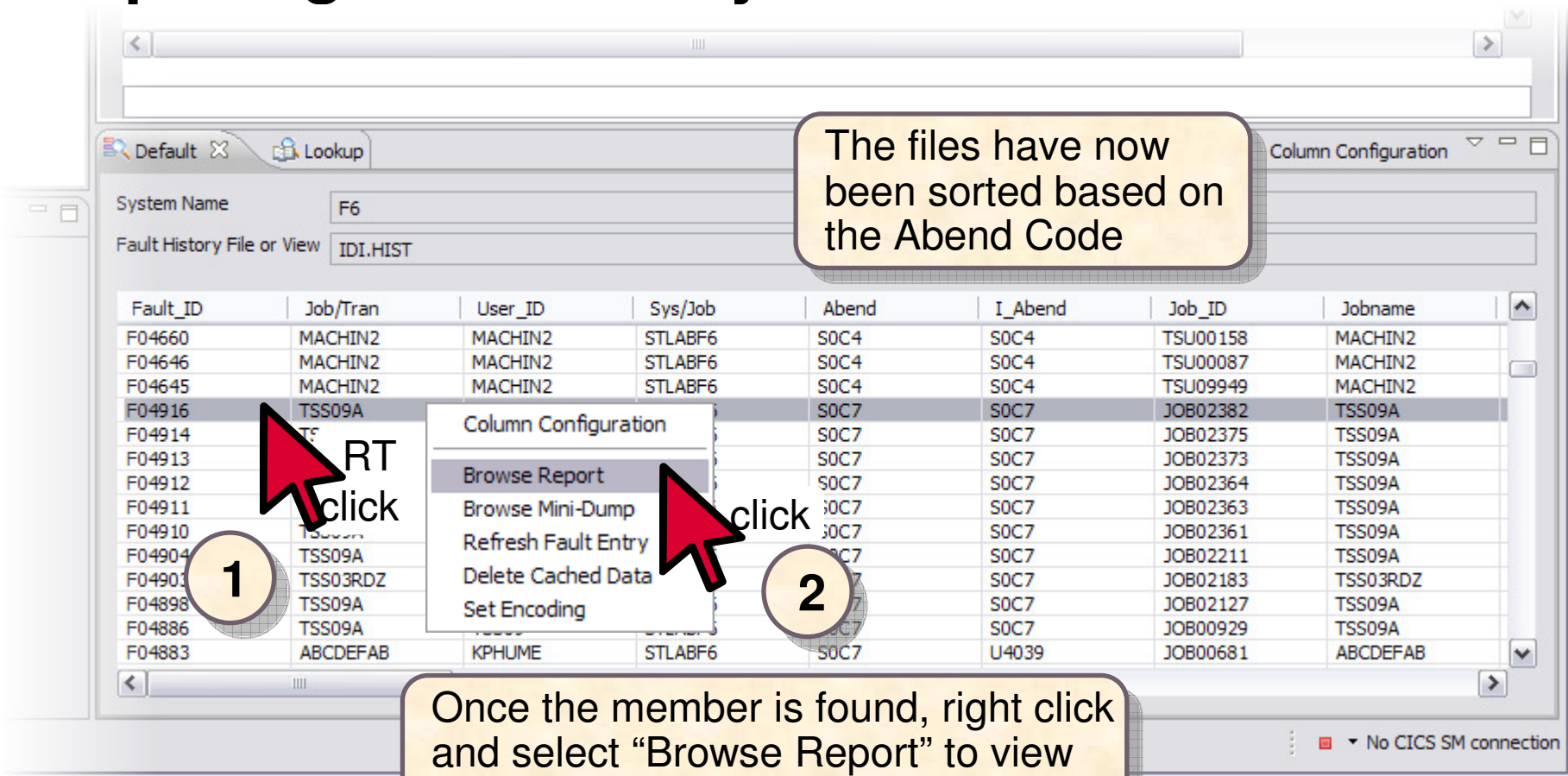
Fault_ID	Job/Tran	User_ID	Sys/Job	Abend	I_Abend	Job_ID	Jobname
F04917	TSS09A	TSS09	STLABF6	S522	S522	JOB02390	TSS09A
F04916	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02382	TSS09A
F04915	TSS09A	TSS09	STLABF6	S522	S522	JOB02377	TSS09A
F04914	TSS09A	TSS09				JOB02375	TSS09A
F04913	TSS09A	TSS09				JOB02373	TSS09A
F04912	TSS09A	TSS09				JOB02364	TSS09A
F04911	TSS09A	TSS09				JOB02363	TSS09A
F04910	TSS09A	TSS09				JOB02361	TSS09A
F04908	TSS09A	TSS09	STLABF6	S522	S522	JOB02273	TSS09A
F04907	TSS09A	TSS09				JOB02262	TSS09A
F04906	TSS09A	TSS09				JOB02247	TSS09A
F04905	TSS09A	TSS09				JOB02223	TSS09A
F04904	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02211	TSS09A
F04903	TSS03RDZ	TSS03	STLABF6	S0C7	S0C7	JOB02183	TSS03RDZ

Annotations:

- If needed, click on "Column Configuration"
- Fault Entries are stored in fault history files
- Click on column to Sort

Opening a Fault Entry

The files have now been sorted based on the Abend Code



System Name: F6
Fault History File or View: IDI.HIST

Fault_ID	Job/Tran	User_ID	Sys/Job	Abend	I_Abend	Job_ID	Jobname
F04660	MACHIN2	MACHIN2	STLABF6	S0C4	S0C4	TSU00158	MACHIN2
F04646	MACHIN2	MACHIN2	STLABF6	S0C4	S0C4	TSU00087	MACHIN2
F04645	MACHIN2	MACHIN2	STLABF6	S0C4	S0C4	TSU09949	MACHIN2
F04916	TSS09A			S0C7	S0C7	JOB02382	TSS09A
F04914	TSS09A			S0C7	S0C7	JOB02375	TSS09A
F04913	TSS09A			S0C7	S0C7	JOB02373	TSS09A
F04912	TSS09A			S0C7	S0C7	JOB02364	TSS09A
F04911	TSS09A			S0C7	S0C7	JOB02363	TSS09A
F04910	TSS09A			S0C7	S0C7	JOB02361	TSS09A
F04904	TSS09A			S0C7	S0C7	JOB02211	TSS09A
F04903	TSS03RDZ			S0C7	S0C7	JOB02183	TSS03RDZ
F04898	TSS09A			S0C7	S0C7	JOB02127	TSS09A
F04886	TSS09A			S0C7	S0C7	JOB00929	TSS09A
F04883	ABCDEFAB	KPHUME	STLABF6	S0C7	U4039	JOB00681	ABCDEFAB

1 RT click
2 click

Column Configuration

- Column Configuration
- Browse Report**
- Browse Mini-Dump
- Refresh Fault Entry
- Delete Cached Data
- Set Encoding

Once the member is found, right click and select "Browse Report" to view the Fault Analyzer Report

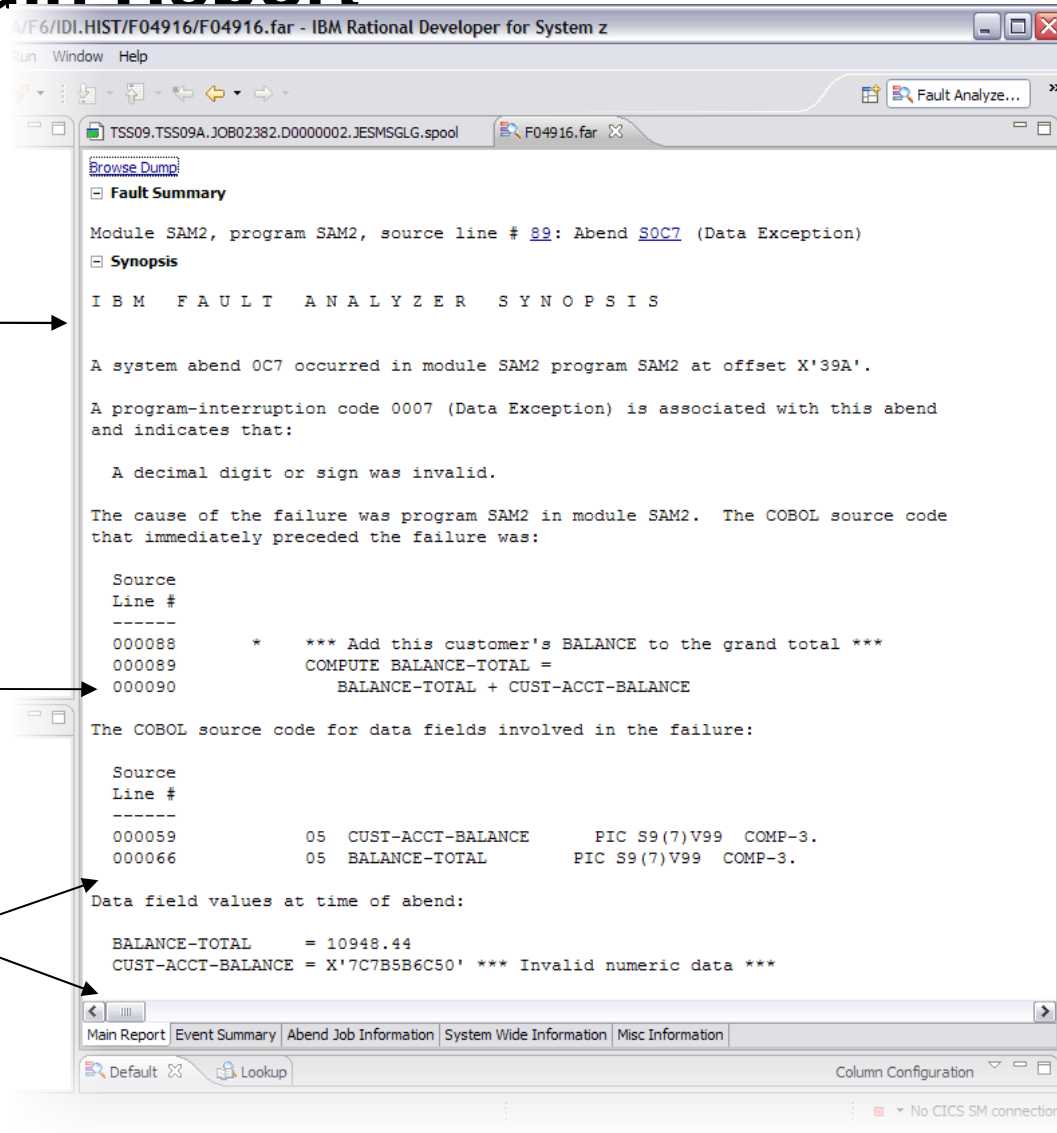
No CICS SM connection

Fault Analyzer Main Report

Fault Analyzer Synopsis

Source code that preceded the ABEND

Data Field Information



The screenshot shows the 'Fault Analyzer Main Report' window in IBM Rational Developer for System z. The report content is as follows:

```

Browse Dump
Fault Summary
Module SAM2, program SAM2, source line # 89: Abend SOC7 (Data Exception)
Synopsis
IBM FAULT ANALYZER SYNOPSIS

A system abend 0C7 occurred in module SAM2 program SAM2 at offset X'39A'.

A program-interruption code 0007 (Data Exception) is associated with this abend
and indicates that:

A decimal digit or sign was invalid.

The cause of the failure was program SAM2 in module SAM2. The COBOL source code
that immediately preceded the failure was:

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:

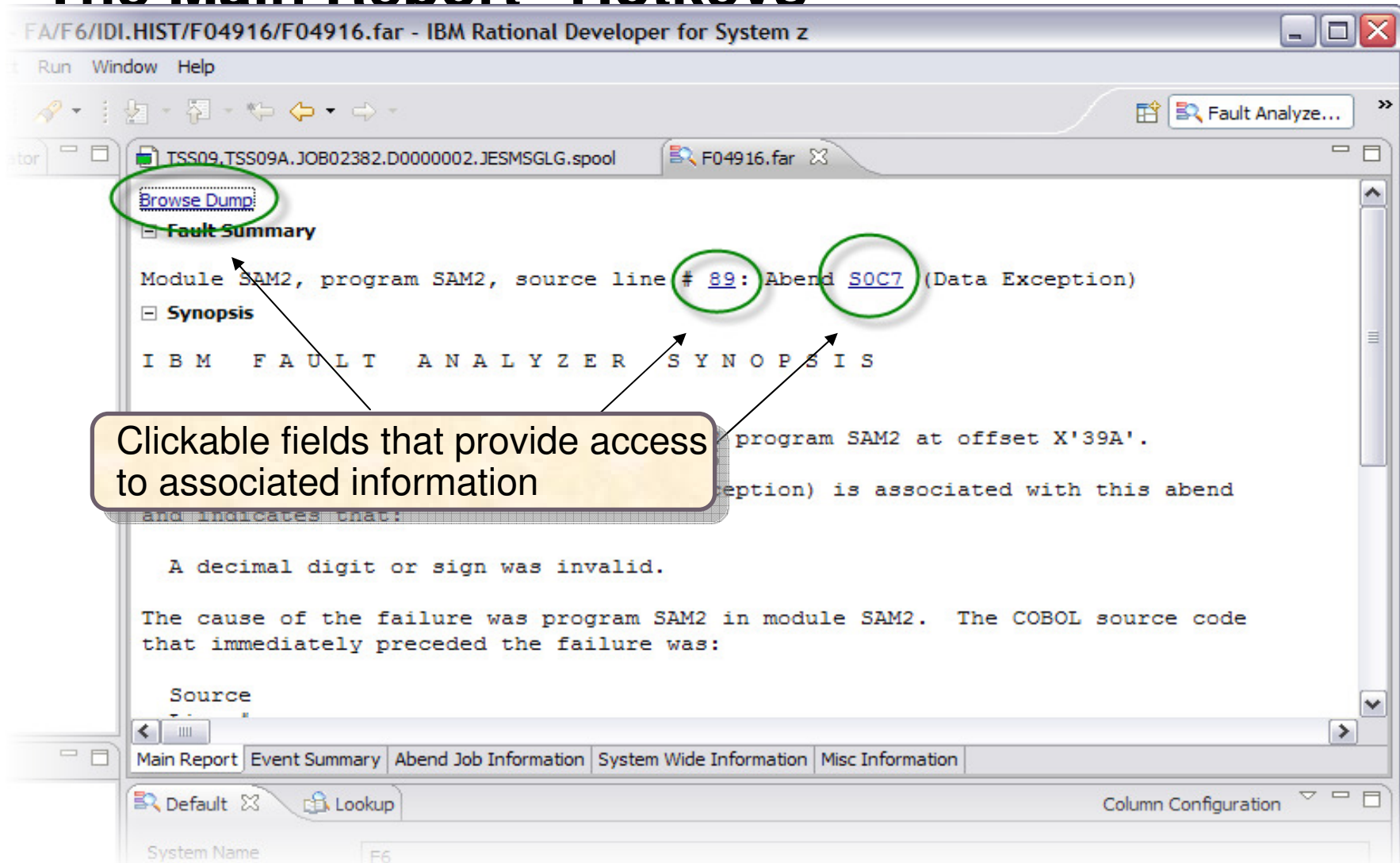
Source
Line #
-----
000059      05 CUST-ACCT-BALANCE      PIC S9(7)V99  COMP-3.
000066      05 BALANCE-TOTAL          PIC S9(7)V99  COMP-3.

Data field values at time of abend:

BALANCE-TOTAL      = 10948.44
CUST-ACCT-BALANCE = X'7C7B5B6C50' *** Invalid numeric data ***
    
```

The window includes a navigation bar at the bottom with tabs for 'Main Report', 'Event Summary', 'Abend Job Information', 'System Wide Information', and 'Misc Information'. It also features a 'Default' button, a 'Lookup' button, and a 'Column Configuration' dropdown menu.

The Main Report “Hotkeys”



The screenshot shows the IBM Rational Developer for System z interface. The main report window displays the following content:

- Browse Dump** (highlighted with a green circle)
- Fault Summary**
 - Module SAM2, program SAM2, source line # **89**: Abend **SOC7** (Data Exception) (highlighted with green circles)
- Synopsis**

```

IBM FAULT ANALYZER SYNOPSIS

program SAM2 at offset X'39A'.
(exception) is associated with this abend
and indicates that:

A decimal digit or sign was invalid.

The cause of the failure was program SAM2 in module SAM2. The COBOL source code
that immediately preceded the failure was:

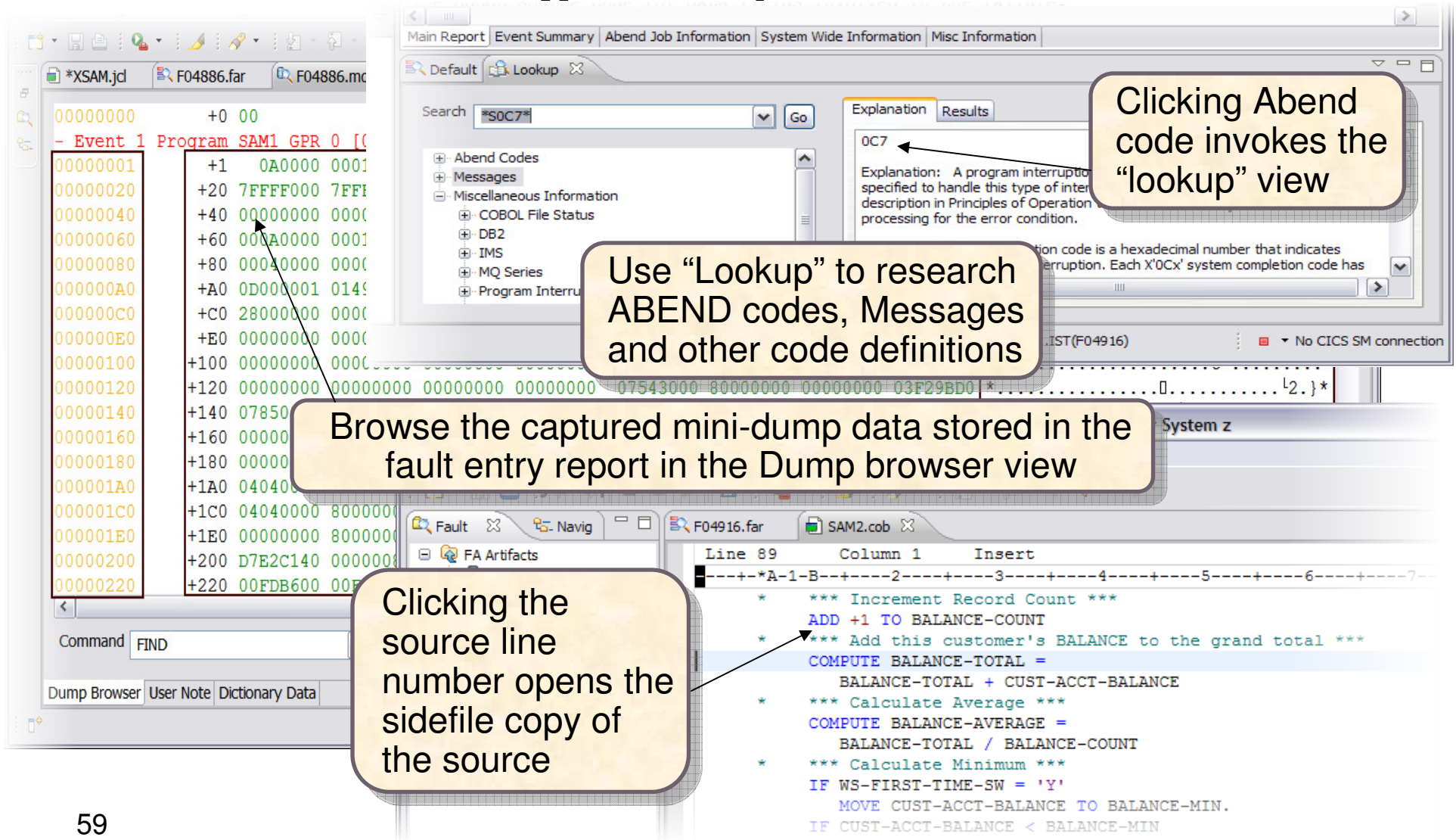
Source

```

A callout box with a yellow background and black border contains the text: "Clickable fields that provide access to associated information". Arrows point from this box to the "Browse Dump" link, the "# 89" field, and the "SOC7" field.

At the bottom of the window, there are tabs for "Main Report", "Event Summary", "Abend Job Information", "System Wide Information", and "Misc Information". Below the tabs are "Default" and "Lookup" buttons, and a "System Name" field containing "F6".

Results of clicking Hotkeys



Clicking Abend code invokes the "lookup" view

Use "Lookup" to research ABEND codes, Messages and other code definitions

Browse the captured mini-dump data stored in the fault entry report in the Dump browser view

Clicking the source line number opens the sidefile copy of the source

```

00000000      +0 00
- Event 1 Program SAM1 GPR 0 [(
00000001      +1 0A0000 0001
00000020      +20 7FFFF000 7FF
00000040      +40 00000000 000
00000060      +60 000A0000 0001
00000080      +80 000A0000 000
000000A0      +A0 0D000001 014
000000C0      +C0 28000000 000
000000E0      +E0 00000000 000
00000100      +100 00000000 000
00000120      +120 00000000 00000000 00000000 07543000 80000000 00000000 03F29BD0 *
00000140      +140 07850
00000160      +160 00000
00000180      +180 00000
000001A0      +1A0 040400
000001C0      +1C0 04040000 8000000
000001E0      +1E0 00000000 8000000
00000200      +200 D7E2C140 0000000
00000220      +220 00FDB600 00F
  
```

Search: *SOC7*

Abend Codes

Messages

Miscellaneous Information

COBOL File Status

DB2

IMS

MQ Series

Program Interru

Explanation

Results

OC7

Explanation: A program interruption specified to handle this type of interruption. Each 'OCx' system completion code has a description in Principles of Operation...

IST(F04916)

No CICS SM connection

System z

Fault

FA Artifacts

F04916.far

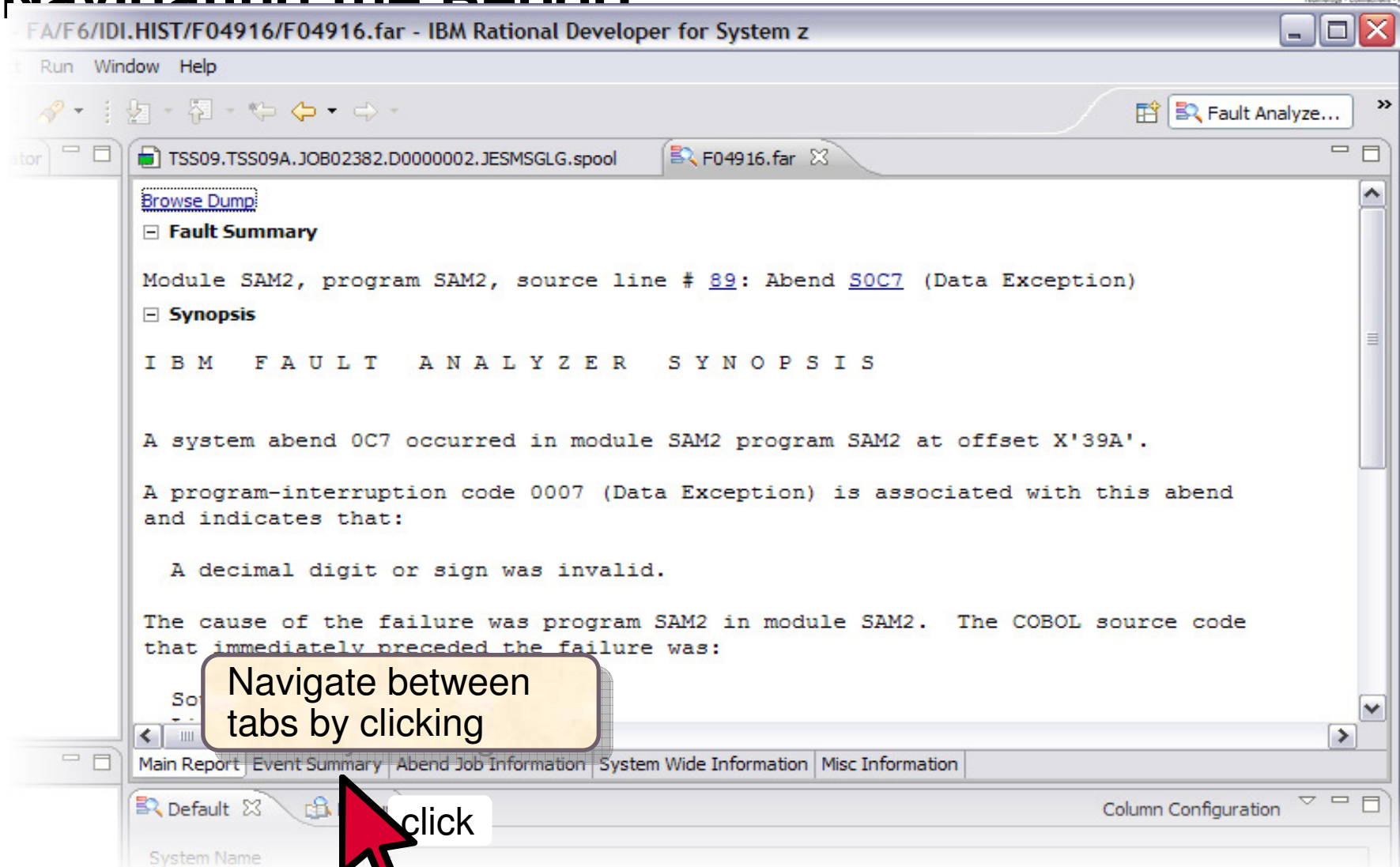
SAM2.cob

Line 89 Column 1 Insert

```

*** Increment Record Count ***
ADD +1 TO BALANCE-COUNT
*** Add this customer's BALANCE to the grand total ***
COMPUTE BALANCE-TOTAL =
  BALANCE-TOTAL + CUST-ACCT-BALANCE
*** Calculate Average ***
COMPUTE BALANCE-AVERAGE =
  BALANCE-TOTAL / BALANCE-COUNT
*** Calculate Minimum ***
IF WS-FIRST-TIME-SW = 'Y'
  MOVE CUST-ACCT-BALANCE TO BALANCE-MIN.
IF CUST-ACCT-BALANCE < BALANCE-MIN
  
```

Navigating the Report



FA/F6/IDI.HIST/F04916/F04916.far - IBM Rational Developer for System z

Run Window Help

TSS09.TSS09A.JOB02382.D0000002.JESMSGLG.spool F04916.far

[Browse Dump](#)

Fault Summary

Module SAM2, program SAM2, source line # [89](#): Abend [SOC7](#) (Data Exception)

Synopsis

I B M F A U L T A N A L Y Z E R S Y N O P S I S

A system abend 0C7 occurred in module SAM2 program SAM2 at offset X'39A'.

A program-interruption code 0007 (Data Exception) is associated with this abend and indicates that:

A decimal digit or sign was invalid.

The cause of the failure was program SAM2 in module SAM2. The COBOL source code that immediately preceded the failure was:

So

Main Report | Event Summary | Abend Job Information | System Wide Information | Misc Information

Default click Column Configuration

System Name

Navigate between tabs by clicking



Event Summary

Chronological order of events

Expandable event details

Highlighted "POINT OF FAILURE" event details

Perspective - FA/F6/IDI.HIST/F04916/F04916.far - IBM Rational Developer for System z

Search Project Run Window Help

F04916.far

Browse Dump

IBM FAULT ANALYZER EVENT SUMMARY

The following events are presented in chronological order.

Event #	Type	Fail Point	Module Name	Program Name	EP Name	Event Location (*)	Loaded From
1	Call		SAM1	SAM1	SAM1	L#312 P+D30 E+D30	TSS09.ADLAB.LOAD
2	Call		IGZCPAC	n/a	IGZCFCC	E+2BE	CEE.SCEERUN
3	Abend SOC7	*****	SAM2	SAM2	SAM2	L#89 P+39A E+39A	TSS09.ADLAB.LOAD

(*) One or more of the following abbreviations might appear in the "Event Location" column:

F#n Source file number (refer to detailed event information for file identification)
L#n Source file line number
S#n Listing file statement number (refer to detailed event information for file identification)
M+x Offset from start of load module
P+x Offset from start of program
E+x Offset from start of entry point

Event 1
Event 2
Event 3

EVENT 3 OF 3: ABEND SOC7

***** POINT OF FAILURE *****

Abend Code. : SOC7
Program-Interruption Code . : 0007 (Data Exception)
A decimal digit or sign was invalid.

Main Report Event Summary Abend Job Information System Wide Information Misc Information

click

Abend Job Information View

ABEND Job details

er Perspective - FA/F6/IDL.HIST/F04916/F04916.far - IBM Rational Developer for System z

Search Project Run Window Help

F04916.far

Browse Dump

IBM FAULT ANALYZER ABEND JOB INFO

IBM Fault Analyzer Abend Job Information:

Abend Date : 2010/01/15
Abend Time : 13:17:13
System Name : STLAF6
Job Type : Batch
Job ID : JOB02382
Job Name : TSS09A
Job Step Name : RUNSAM1
ASID : 34
Abend TCB Address : 00AE6968
Job Execution Class : A
Region Size : 80M
EXEC Program Name : SAM1
User ID : TSS09
Accounting Information . . : TSS09,H244,090,CTKA

Data Sets:

DDname	Data Set or Path Name
STEPLIB	TSS09.ADLAB.LOAD

Event-Related Application Programs:

The following list of event-related application programs is sorted by module link-edit date/time and program compilation date/time in reverse chronological order.

Module Name	Link-Edit Date	Link-Edit Time	Program Name	Compilation Date	Compilation Time
SAM2	2009/09/30	08:24:36	SAM2	2009/09/30	08:24:36
SAM1	2009/09/30	08:24:35	SAM1	2009/09/30	08:24:35

Main Report | Event Summary | **Abend Job Information** | System-Wide Information | Misc Information

Default | Lookup

Search: #0007#

click

IBM Rational Developer for System z 2012

System Wide Information View

Open Files

LE Heap Analysis

Perspective - FA/F6/IDI.HIST/F04916/F04916.far - IBM Rational Developer for System z

Search Project Run Window Help

F04916.far

Browse Dump

Open Files

OPEN FILES

Non-Event-Related Open Files

File Name : CEEDUMP
Data Set Name : TSS09.TSS09A.JOB02382.D0000113.?
File Attributes : ORGANIZATION=SEQUENTIAL, ACCESS MODE=n/a,
RECFM=FIXED BLOCKED ASA
Last I/O Function : WRITE
Open Status : OUTPUT

Current Record. : Record data length 133
Address Offset Hex EBCDIC

13B8BC08 40404040 40404040 40404040 40404040 * *
Lines 13B8BC18-13B8BC78 same as above
13B8BC88 +80 40404040 40 * *

File Name : SYSOUT
Data Set Name : TSS09.TSS09A.JOB02382.D0000109.?
File Attributes : ORGANIZATION=SEQUENTIAL, ACCESS MODE=n/a,
RECFM=FIXED BLOCKED ASA
Last I/O Function : WRITE
Open Status : OUTPUT

Current Record. : Record data length 121
Address Offset Hex EBCDIC

13C480B8 40404040 40404040 40404040 40404040 * *
Lines 13C480C8-13C48118 same as above
13C48128 +70 40404040 40404040 40 * *

Language Environment Heap Analysis

Main Report | Event Summary | Abend Job Information | System Wide Information | Misc Information

click

Misc Information View

Options in effect

Exits

Perspective - FA/F6/IDI.HIST/F04916/F04916.far - IBM Rational Developer for System z

Search Project Run Window Help

F04916.far

Browse Dump

Options in effect

```
IBM FAULT ANALYZER OPTIONS
```

IBM Fault Analyzer Options in Effect:

```
Detail (Medium)
NoErrorHandler
FaultID (F04916)
Language (ENU)
NoLocale
NoPermitLangx
PreferredFormattingWidth (80)
NoPrintInactiveCOBOL
StoragePrintLimit (256K) - not exceeded
SystemWidePreferred (StorageAreas (Hex))
```

Data Sets:

The following Fault Analyzer data set or path names were either preallocated, specified via DataSets options, or provided as defaults.

DDname	Data Set or Path Name
IDIBOOKS	ADTOOLS.FAA10.SIDIBOOK
IDIDOC	ADTOOLS.FAA10.SIDIDOC1
IDIEEXEC	ADTOOLS.STLABF6.SYSEXEC
IDIHIST	IDI.HIST
IDILANGX	TSS09.ADLAB.EQALANGX ADTOOLS.MNA.U6F6.LANGX.PLI ADTOOLS.MNA.S2U1F6.LANGX.PLI
IDILCOB	CHABERT.TRADER.COBLIST
IDIMAPS	ADTOOLS.FAA10.SIDIMAPS
IDIVSENU	IDI.VAR1M0.IDIVSENU

Exits:

Main Report | Event Summary | Abend Job Information | System Wide Information | Misc Information

Default | Lookup

The Fault Analyzer TSO Interface

Using Interactive reanalysis to analyze an abend



```
File Options View Services Help
IBM Fault Analyzer - Fault Entry List
Command ==> _____ Col 1 80
                               ==> PAGE

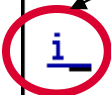
Fault History File or View : 'FAULTANL.V10R1.HIST'

{The following line commands are available: ? (Query), V or S (View saved
report), I (Interactive reanalysis), B (Batch reanalysis), D (Delete), H
(Duplicate history), C (Copy fault entry), M (Move fault entry), X (XMIT fault
entry).}
```

	Fault_ID	Job/Tran	Job_ID	Program	Offset	Dups	User_ID	Sys/Job	Abend
<u>i</u>	F00905	DNET845X	JOB15885	SAM2	39A		DNET845	DEMOMVS	S0C7
—	F00882	DNET845X	JOB15573	SAM2	39A	4	DNET845	DEMOMVS	S0C7
—	F00881	DNET845X	JOB15572	SAM2	39A		DNET845	DEMOMVS	S0C7
—	F00880	DNET845X	JOB15571	SAM2	39A		DNET845	DEMOMVS	S0C7
—	F00878	DNET845X	JOB15535	SAM2	39A		DNET845	DEMOMVS	S0C7
—	F00872	DNET845Y	JOB15410	PSAM2	3DA		DNET845	DEMOMVS	S0C7
—	F00871	DNET845P	JOB15408	PSAMM2	27A		DNET845	DEMOMVS	S0C7
—	F00869	DNET845X	JOB15387	SAM2	39A		DNET845	DEMOMVS	S0C7

** Bottom of data.

The I line command starts an interactive reanalysis session



Analyze an abend

```
File View Services Help
Interactive Reanalysis Report
Command ==>
JOBNAME: DNET845X  SYSTEM ABEND:

Fault Summary:
Module SAM2, program SAM2, source line # 89 : Abend S0C7 (Data Ex

Select one of the following options to access further fault information:
1. Synopsis
2. Event Summary
3. Open Files
4. Storage Areas
5. Messages
6. Language Environment Heap Analysis
7. Abend Job Information
8. Fault Analyzer Options

{Fault Analyzer maximum storage allocated: 1.68 megabytes.}

*** Bottom of data.
```

“Point and shoot” fields are highlighted.

Use **tab** and **Enter** to navigate.

Debug Clues:
✓ Abended in program SAM2 because of a data exception

What is information is in the Synopsis?

select Synopsis

Enter

Analyze an abend (1 of 20)

IBM Fault Analyzer - Fault Entry List

Line 1 Col 1 80

Command ==> _____

==> PAGE

Fault History File or View : 'FAULTANL. _____

The **I** line command starts an interactive reanalysis session

{The following line commands are available: ? (Query), V or S (View saved report), I (Interactive reanalysis), B (Batch reanalysis), D (Delete), H (Duplicate history), C (Copy fault entry), M (Move fault entry), X (XMIT fault entry).}

	Fault_ID	Job/Tran	Job_ID	Program	Offset	Dups	User_ID	Sys/Job	Abend
i	F00905	DNET845X	JOB15885	SAM2	39A		DNET845	DEMOMVS	S0C7
---	F00882	DNET845X	JOB15573	SAM2	39A	4	DNET845	DEMOMVS	S0C7
---	F00881	DNET845X	JOB15572	SAM2	39A		DNET845	DEMOMVS	S0C7
---	F00880	DNET845X	JOB15571	SAM2	39A		DNET845	DEMOMVS	S0C7
---	F00878	DNET845X	JOB15535	SAM2	39A		DNET845	DEMOMVS	S0C7
---	F00872	DNET845Y	JOB15410	PSAM2	3DA		DNET845	DEMOMVS	S0C7
---	F00871	DNET845P	JOB15408	PSAMM2	27A		DNET845	DEMOMVS	S0C7
---	F00869	DNET845X	JOB15387	SAM2	39A		DNET845	DEMOMVS	S0C7

** Bottom of data.

Enter

Analyze an abend (

“Point and shoot” fields are highlighted.

Use **tab** and **Enter** to navigate.

Col 1 8
 ==> HAL
 15:45:0

Debug Clues:

✓ Abended in program SAM2 because of a data exception

What is information is in the Synopsis?

Interactive Reanalysis Report

Command ==>

JOBNAME: DNET845X SYSTEM ABEND: 0C7

Fault Summary:

Module SAM2, program SAM2, source line # 89 : Abend SOC7 (Data Exception).

Select one of the following options to access further fault information:

1. Synopsis
2. Event Summary
3. Open Files
4. Storage Areas
5. Messages
6. Language Environment Heap Analysis
7. Abend Job Information
8. Fault Analyzer Options

select Synopsis

{Fault Analyzer maximum storage allocated: 1.68 megabytes.}

*** Bottom of data.

Enter

Analyze an abend (3 of 20)

Synopsis

Command ==> _____ Line 1 Col 1 8
 Scroll ==> PAG
 JOBNAME: DNET845X SYSTEM ABEND: 0C7 DEMOMVS 2010/02/23 15:45:0

A system abend **0C7** occurred in module SAM2 program SAM2 at offset X'39A'.

A program-interruption code 0007 (Data Exception) is associated with this abend and indicates that:

A decimal digit or sign was invalid.

Here is a clue. What can cause a data exception?

The cause of the failure was program SAM2 in module SAM2. The COBOL source code that immediately preceded the failure was:

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:



Debug Clues:

✓ Abended in program SAM2 while running a **COMPUTE** statement because of a data exception

Page forward to see active variables

Analyze an abend (1 of 2)

What variable contained the bad data?

Synopsis

Command ==>

JOBNAME: DNET845X SYSTEM ABEND: 0C7 DEMOMVS 2010/02/23 15:45:0

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' *** Invalid numeric data ***
```

*** Bottom of data.

Debug Clues:

- ✓ Abended in program SAM2 while running a COMPUTE statement because of a data exception

Go look at the bad variable

Return to menu



Analyze an abend (5 of 20)

```

Interactive Reanalysis Report                               Line 1 Col 1 8
Command ==> 2                                           Scroll ==> PAG
JOBNAME: DNET845X  SYSTEM ABEND: 0C7                    DEMOMVS  2010/02/23  15:45:0

Fault Summary:
Module SAM2, program SAM2, source line # 89 : Abend 50C7 (Data Exception).

Select one of the following options to access further fault information:
 1. Synopsis
 2. Event Summary
 3. Open Files
 4. Storage Areas
 5. Messages
 6. Language Environment Heap Analysis
 7. Abend Job Information
 8. Fault Analyzer Options

{Fault Analyzer maximum storage allocated: 1.68 megabytes.}

*** Bottom of data.
  
```

Select 2 (event summary)
or cursor-select the option

Enter

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE had bad numeric data

Go look at
the bad
variable,
CUST-ACCT-
BALANCE

Analyze an abend (6 of 20)

```

Event Summary
Command ==>
JOBNAME: DNET845X  SYSTEM ABEND: 0C7          DEMOMVS  2010/02/23  15:45:0
  
```

{The following events are presented in chronological order.}

Event #	Type	Fail Point	Module Name	Program Name	EP Name	Event Location (*)	Load
1	Call		SAM1	SAM1	SAM1	L#312 P+D30 E+D30	DNET8
2	Call		IGZCPAC	n/a	IGZCFCC	E+2BE	CEE.S
3	Abend	SOC7	*****	SAM2	SAM2	L#89 P+39A E+39A	DNET8

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE had bad numeric data

Go look at the bad variable, CUST-ACCT-BALANCE

Select detail for program SAM2

What is the relationship between programs SAM1 and SAM2?

(*) One or more of the following abbreviations in the "Event Location" column:

F#n Source file number (refer to detailed event in listing for file identification)

L#n Source file line number

S#n Listing file statement number (refer to detailed event in listing for file identification)

M+x Offset from start of load module

Enter

Analyze an abend (7 of 20)

```

Event 3 of 3: Abend S0C7 *** Point of Failure ***                               Line 1 Col 1 8
Command ==> bottom                                                           Scroll ==> HAL
JOBNAME: DNET845X  SYSTEM ABEND: 0C7          DEMOMVS  2010/02/23  15:45:0
  
```

Previous Event Details

```

Abend Code. . . . . : S0C7
Program-Interruption Code . : 0007 (Data Exception)
  A decimal digit or sign was invalid.
  
```

The source code below was executed via the following sequence of PERFORM statements:

```

Source
Line #
000079          PERFORM 100-CALC-BALANCE-STATISTICS.
  
```

COBOL Source Code:

```

Source
Line #
000088          *      *** Add this customer's BALANCE to the grand total
000089          COMPUTE BALANCE-TOTAL =
  
```



Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE had bad numeric data

Go look at the bad variable, CUST-ACCT-BALANCE

Go to the bottom of the program detail display

Analyze an abend (8 of 20)

```

Event 3 of 3: Abend S0C7 *** Point of Failure ***                               Line 83 Col 1 8
Command ==> _____ Scroll ==> PAC
JOBNAME: DNET845X  SYSTEM ABEND: 0C7          DEMOMVS  2010/02/23  15:45:0
R6: 205910C0 (606016 bytes of storage addressable)
R7: 2050DA20 (1144288 bytes of storage addressable)
R8: 0003F7C8 (Module SAM2 program SAM2 WORKING-STORAGE SECTION BLW=0000 +
      X'0', symbol WS-FIELDS, source line # 36 )
R9: 0003F5D0 (Module SAM2 program SAM2 + X'5D0', source line # 116 )
R10: 0003F11C (Module SAM2 program SAM2 + X'11C')
R11: 0003F29C (Module SAM2 program SAM2 + X'29C')
R12: 0003F0FC (Module SAM2 program SAM2 + X'FC')
R13: 20594458 (592808 bytes of storage addressable)
R14: 8003F392 (Module SAM2 program SAM2 + X'392', source line # 89 )
R15: 8003F224 (Module SAM2 program SAM2 + X'224')
  
```

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE had bad numeric data

Go look at the bad variable, CUST-ACCT-BALANCE

Associated Messages

What is shown here?

CEE3207S The system detected a data exception (System Completion Code=0C7).

Associated Storage Areas

*** Bottom of data.



Analyze an abend (9 of 20)

```

Associated Storage Areas                               Line 1 Col 1 8
Command ==> f cust-acct-balance                      Scroll ==> PAG
JOBNAME: DNET845X SYSTEM ABEND: 0C7                 DEMOMVS  2010/02/23 15:45:0
  
```

Task Global Table (TGT) at address 0003F5D0 for length 376

WORKING-STORAGE SECTION

- Collapse hex

Off	Hex Value	Data Value	Source (Starting
BLW=0000 at address 0003F7C8			
0	C3C1D3C3 E4D3C1E3 C9D5C740 C2C1D3C1	*CALCULATING BALA*	01 WS-FIELDS.
10	D5C3C540 E2E3C1E3 E2404040 4040	*NCE STATS *	05 WS-PROGR
1E	D5	*N *	05 WS-FIRST
1F	0000000C	0	05 WS-WORK-
23	0000000C	0	05 WS-WORK-
27	0000000C	0	05 WS-WORK-
2B	0000000C	0	05 WS-WORK-
2F	0000000C	0	05 WS-WORK-

LINKAGE SECTION

Enter

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE had bad numeric data

Go look at the bad variable, CUST-ACCT-BALANCE

Analyze an abend (10 of 20)

```
Associated Storage Areas                               Line 18 Col 40 11
Command ==> _____ Scroll ==> HAL
JOBNAME: DNET845X  SYSTEM ABEND: 0C7                 DEMOMVS  2010/02/23  15:45:0
```

Here is CUST-ACCT-BALANCE, it is a packed decimal field (COMP-3).

```
ss
_ Data Value      Source (Starting at Line # 000053 )
01 CUST-REC.
05 CUST-KEY.
   10 CUST-ID          PIC X(5) .
   10 CUST-RECORD-TYPE PIC X .
   10 FILLER          PIC X(7) .
05 CUST-NAME          PIC X(17) .
05 CUST-ACCT-BALANCE PIC S9(7)V99 COMP-3.
05 CUST-ORDERS-YTD   PIC S9(4)  COMP.
05 CUST-CITY         PIC X(15) .
05 CUST-OCCUPATION   PIC X(28) .
```

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE had bad numeric data (it is part of CUST-REC)

Here is the bad variable, CUST-ACCT-BALANCE

Scroll right

F11

Analyze an abend (11 of 20)

Associated Storage Areas

Command ==>

JOBNAME: DNET845X SYSTEM ABEND: 0C7 DEMOMVS 2010/02/23 15:45:0

It is part of CUST-REC

Source (Starting at Line # 000053)

```

01 CUST-REC.
   05 CUST-KEY.
*      10 CUST-ID          PIC X(5).
*      10 CUST-RECORD-TYPE PIC X.
*      10 FILLER          PIC X(7).
*      05 CUST-NAME       PIC X(17).
*
*      05 CUST-ACCT-BALANCE PIC S9(7)V99 COMP-3.
*      05 CUST-ORDERS-YTD  PIC S9(4)  COMP.
*      05 CUST-CITY       PIC X(15).
perax*      05 CUST-OCCUPATION PIC X(28).
*
  
```

Debug Clues:

✓ Abended in program SAM2 because:

✓ CUST-ACCT-BALANCE had bad numeric data (it is part of CUST-REC)

Here is the the bad variable, CUST-ACCT-BALANCE

Scroll left

F10

Source (Starting at Line # 000064)

Analyze an abend (12 of 20)

It is in Linkage Section.
What does that indicate?

Associated Storage Areas

Command ==>

JOBNAME: DNET845X SYSTEM ABEND: 0C7

DEMOMVS 2010/02/23 15:45:02

Line 18 Col 1 80

Scroll ==> HALF

LINKAGE SECTION

BLL=0000 has not been assigned an address

Off Hex Value Data Value Source (Starting a

BLL=0001 at address 00023F88

Off	Hex Value	Data Value	Source (Starting a
			01 CUST-REC.
			05 CUST-KEY.
0	F5F4F3F2 F1	*54321	* 10 CUST-
5	C3	*C	* 10 CUST-
6	40404040 404040	*	* 10 FILLE
D	C1A2A385 996B40C4 85A94040 40404040	*Aster, Dez	* 05 CUST-NAME
1D	40	*	*
1E	7C7B5B6C 50	*@#\$\$%&	* 05 CUST-ACCT
23	0002	2	05 CUST-ORDE
25	E2A39699 94A840C6 819393A2 404040	*Stormy Falls	* 05 CUST-CITY
34	C481A381 40C595A3 99A840D6 97859981	*Data Entry Opera*	05 CUST-OCCU
44	A3969940 40404040 40404040	*tor	*

Debug Clues:

✓ Abended in program SAM2 because:

✓ CUST-ACCT-BALANCE had bad numeric data
(it is part of CUST-REC)

Here is the the bad variable, CUST-ACCT-BALANCE

Return to program detail

F3

Analyze an abend (13 of 20)

```

Event 3 of 3: Abend S0C7 *** Point of Failure ***                               Line 83 Col 1 8
Command ==> _____ Scroll ==> HAL
JOBNAME: DNET845X  SYSTEM ABEND: 0C7          DEMOMVS  2010/02/23  15:45:0
R6: 205910C0 (606016 bytes of storage addressable)
R7: 2050DA20 (1144288 bytes of storage addressable)
R8: 0003F7C8 (Module SAM2 program SAM2 WORKING-STORAGE SECTION BLW=0000 +
      X'0', symbol WS-FIELDS, source line # 36 )
R9: 0003F5D0 (Module SAM2 program SAM2 + X'5D0', source line # 116 )
R10: 0003F11C (Module SAM2 program SAM2 + X'11C')
R11: 0003F29C (Module SAM2 program SAM2 + X'29C')
R12: 0003F0FC (Module SAM2 program SAM2 + X'FC')
R13: 20594458 (592808 bytes of storage addressable)
R14: 8003F392 (Module SAM2 program SAM2 + X'392', source line # 89 )
R15: 8003F224 (Module SAM2 program SAM2 + X'224')
  
```

Associated Messages

CEE3207S The system detected a data exception (System Completion Code=0C7).

Associated Storage Areas

*** Bottom of data.

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE has bad numeric data (it is part of CUST-REC), which was passed from a calling program

Go look at the passed data

Return to the events list



Analyze an abend (14 of 20)

```
Event Summary
Command ==>
JOBNAME: DNET845X  SYSTEM ABEND: 0C7          DEMOMVS  2010/02/23  15:45:0
```

{The following events are presented in chronological order.}

Event #	Type	Fail Point	Module Name	Program Name	EP Name	Event Location (*)	Load
1	Call		SAM1	SAM1	SAM1	L#312 P+D30 E+D30	DNET8
2	Call		IGZCPAC	n/a	IGZCFCC	E+2BE	CEE.S
3	Abend	SOC7	*****	SAM2	SAM2	L#89 P+39A E+39A	DNET8

(*) One Loc The bad data was passed from a calling program. SAM1 called SAM2. Next look at details for SAM1. "Event

F#n Source file number (refer to detailed event information for file identification)

L#n Source file line number

S#n Listing file statement number (refer to detailed event information for file identification)

M+x Offset from start of load module

Enter

Debug Clues:

✓ Abended in program SAM2 because:

✓ CUST-ACCT-BALANCE has bad numeric data (it is part of CUST-REC), which was passed from a calling program

Go look at the passed data

Analyze an abend (15 of 20)

```
Event 1 of 3: Call (DSA Address 20594)
Command ==> bottom
JOBNAME: DNET845X SYSTEM ABEND: 0C7
```

What passed variable contained the bad data?

The source code below was executed via the following sequence of PERFORM statements:

```
Source
Line #
000261      PERFORM 100-PROCESS-TRANSACTIONS
000278          PERFORM 200-PROCESS-PRINT-TRAN
000299      PERFORM 210-PROCESS-CUSTFILE-RECORD
```

COBOL Source Code:

```
Source
Line #
000311      *      SUBROUTINE SAM2 WILL COLLECT CUSTOMER STATISTICS
000312          CALL 'SAM2' USING CUST-REC,
000313              CUSTOMER-BALANCE-STATS
```

Data Field Declarations:

Source

This is the CALL statement

Enter

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE has bad numeric data (it is part of CUST-REC), which was passed from a calling program
- ✓ SAM1 called SAM2

Go look at the passed data

Analyze an abend (16 of 20)

```

Event 1 of 3: Call (DSA Address 20594030)                               Line 68 Col 1
Command ==> _____ Scroll ==> p
JOBNAME: DNET845X  SYSTEM ABEND: 0C7                               DEMOMVS  2010/02/23  15:45
R10: 00007124 (Module SAM1 program SAM1 + X'124')
R11: 00007798 (Module SAM1 program SAM1 + X'798')
R12: 000070FC (Module SAM1 program SAM1 + X'FC')
R13: 20594030 (593872 bytes of storage addressable)
R14: 80007D32 (Module SAM1 program SAM1 + X'D32', source line # 312 )
R15: A05142B0 (Module IGZCPAC + X'2B0')
  
```

Associated Open Files

```

File Name . . . . . : CUSTFILE
File Name . . . . . : CUSTRPT
File Name . . . . . : TRANFILE
  
```

Associated Storage Areas

Next Event Details

*** Bottom of data.

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE has bad numeric data, which was passed from a calling program
- ✓ SAM1 called SAM2
- ✓ SAM1 passed bad data in CUST-REC

Look at CUST-REC

Go to variables and storage for this program



Analyze an abend (17 of 20)

```

Associated Storage Areas
Command ==>
JOBNAME: DNET845X  SYSTEM ABEND: 0C7

Task Global Table (TGT) at address 000088

FILE SECTION (File CUSTFILE)
- Collapse hex

Off Hex Value          Data Value          Source (Starting
BLF=0000 at address 00023F88

0 F5F4F3F2 F1          *54321              *
5 C3                   *C                  *
6 40404040 404040      *                   *
D C1A2A385 996B40C4 85A94040 40404040 *Aster, Dez        *
1D 40                  *                   *
1E 7C7B5B6C 50        *@#$$%&            *
23 0002                2                   *
25 E2A39699 94A840C6 819393A2 404040 *Stormy Falls     *
34 C481A381 40C595A3 99A840D6 97859981 *Data Entry Opera*
44 A3969940 40404040 40404040 *tor               *
  
```

It is in File Section. What does that indicate?

What is the file DD name?

FILE SECTION (File CUSTFILE)

The bad data

*@#\$\$%&

F3

Debug Clues:

- ✓ Abended in program SAM2 because:
- ✓ CUST-ACCT-BALANCE has bad numeric data, which was passed from a calling program
- ✓ SAM1 called SAM2
- ✓ SAM1 passed bad data in CUST-REC

Here is CUST-REC

Analyze an abend (18 of 20)

```

Event 1 of 3: Call (DSA Address 20594030)                               Line 68 Col 1 8
Command ==> _____ Scroll ==> PAC
JOBNAME: DNET845X  SYSTEM ABEND: 0C7                                DEMOMVS  2010/02/23  15:45:0
R10: 00007124 (Module SAM1 program SAM1 + X'124')
R11: 00007798 (Module SAM1 program SAM1 + X'798')
R12: 000070FC (Module SAM1 program SAM1 + X'FC')
R13: 20594030 (593872 bytes of storage addressable)
R14: 80007D32 (Module SAM1 program SAM1 + X'D32', source line # 312 )
R15: A05142B0 (Module IGZCPAC + X'2B0')
  
```

Associated Open Files

```

File Name . . . . . CUSTFILE
File Name . . . . . CUSTRPT
File Name . . . . . TRANFILE
  
```

Cursor select the file name

Associated Storage Areas

Next Event Details

*** Bottom of data.

Enter

- Debug Clues:
- ✓ Abended in program SAM2 because:
 - ✓ CUST-ACCT-BALANCE has bad numeric data, which was passed from a calling program
 - ✓ SAM1 called SAM2
 - ✓ SAM1 passed bad data in CUST-REC
 - ✓ The bad data was read from file CUSTFILE

Analyze an abend (19 of 20)

What is the full name of the CUSTFILE file?

```
File Information
Command ==>
JOBNAME: DNET845X  SYSTEM ABEND: 0C7          DEMOMVS  2010/02/23  15:45:00
Line 1 Col 1 8
Scroll ==> PAG
```

```
File Name . . . . . : CUSTFILE
Data Set Name . . . . . : DNET845.ADLAB.FILES(CUST2FA)
File Attributes . . . . . : ORGANIZATION=SEQUENTIAL, ACCESS MODE=SEQUENTIAL
                           RECFM=FIXED
Last I/O Function . . . . . : READ
Open Status . . . . . : INPUT
File Status Code . . . . . : 0
```

CUSTFILE is an input file

```
Previous Record . . . . . : Record data length 80
Address  Offset      Hex                               EBCDIC
00023F38          F2F4F0F9 F0D7D7D6 F0F0F9F4 F5D78981 *24090PP000945Pia*
00023F48      +10  95964040 40404040 40404040 40404040 *no *
00023F58      +20  40404040 4040F2F0 F0F560F0 F760F0F5 * 2005-07-05*
00023F68      +30  0001F2F0 F0F660F1 F260F2F7 40404040 *..2006-12-27 *
00023F78      +40  40404040 40404040 40404040 40404040 * *

Current Record . . . . . : Record data length 80
Address  Offset      Hex                               EBCDIC
```

F8

- Debug Clues:
- ✓ Abended in program SAM2 because:
 - ✓ CUST-ACCT-BALANCE has bad numeric data, which was passed from a calling program
 - ✓ SAM1 called SAM2
 - ✓ SAM1 passed bad data in CUST-REC
 - ✓ The bad data was read from file CUSTFILE

Analyze an abend (20 of 20)

Here is the bad data in the record

```

File Information
Command ==>
JOBNAME: DNET845X  SYSTEM ABEND: 0C7  DEMOMVS  2010/02/23  15:45:
Current Record . . . . . : Record data length 80
Address  Offset      Hex                      EBCDIC
00023F88          F5F4F3F2 F1C34040 40404040 40C1A2A3 *54321C Ast*
00023F98      +10  85996B40 C485A940 40404040 40407C7B *er, Dez @#*
00023FA8      +20  5B6C5000 02E2A396 9994A840 C6819393 *$%&.Stormy Fall*
00023FB8      +30  A2404040 C481A381 40C595A3 99A840D6 *s Data Entry 0*
00023FC8      +40  97859981 A3969940 40404040 40404040 *perator *

Next Record . . . . . : Record data length 80
Address  Offset      Hex                      EBCDIC
00023FD8          F5F5F5F5 F5C34040 40404040 40C485D4 *55555C DeM*
00023FE8      +10  8195956B 40C8A487 88404040 40400001 *ann, Hugh ..*
00023FF8      +20  23400C00 03C68189 99A58985 A6404040 *. ...Fairview *
00024008      +30  40404040 D496A389 A581A389 96958193 * Motivational*
00024018      +40  40E29785 81928599 40404040 40404040 * Speaker *

Associated File Control Blocks

*** Bottom of data.
  
```

- Debug Clues:
- ✓ Abended in program SAM2 because:
 - ✓ CUST-ACCT-BALANCE has bad numeric data, which was passed from a calling program
 - ✓ SAM1 called SAM2
 - ✓ SAM1 passed bad data in CUST-REC
 - ✓ The bad data was read from file CUSTFILE

Fault Analyzer: What's new in version 11?

- The IBM Fault Analyzer Plug-in for Eclipse, when integrated with Fault Analyzer for z/OS and CICS Explorer, provides access to problem reports for diagnosing mainframe application errors and abends. Key features include:
 - An interface to manage views and multiple fault history files
 - The ability to browse fault entries that were created during real-time analysis of abending programs
 - A browser for browsing the dump storage associated with a fault entry
 - A source listing of abending programs using side files
- Java support enhancements:
 - Integration of Java stack trace information into the Fault Analyzer event list
 - Java source support where Java source is included in the abending jar file
- C/C++ Dwarf file support.
- Latest Enterprise PL/I sysdebug file support.
- Fault Entry size management improvements:
 - Fault Analyzer will no longer include un-referenced storage pages in the minidump portion of a Fault Entry.
 - An option to control the size of the CICS trace table included from SDUMP analysis.
 - Support for CICS EXCI calls made from the Fault Analyzer listing exit.
 - CICS Auxiliary trace data set interpretation and viewing.
 - Enhancements to ISPF history file management operations to be similar to IDIUTIL.

Agenda

- Fault Analyzer
- Debug Tool
- Application Performance Analyzer
- File Manager



IBM Debug Tool 3270 and GUI based interfaces

New in DT V11.1

- Plug-in for CICS Explorer
- Explicit debug mode
- New UI for Terminal Interface Manager
- IBM zEnterprise 196 support
- Numerous customer requirements

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
COBOL LOCATION: SAM1 initialization
Command ==>
MONITOR +-----1-----2-----3-----4-----5-----6- LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: SAM1 +-----1-----2-----3-----4-----
1 *****
2 * PROGRAM: SAM1
3 * Sample program for the ENT
4 *
5 * AUTHOR : Doug Stout
6 * IBM PD TOOLS

LOG 0 +-----1-----2-----3-----4-----
0009
0010 EQA1872E An error occurred while opening file: I
0011 exist, or is not accessible.
***** BOTTOM OF LOG *****
PF 1: ? 2: STEP 3: QUIT 4: LIST
PF 7: UP 8: DOWN 9: GO 10: ZOOM

```

IBM CICS Explorer

Platform: zOS 390X Connection: 9.30.128.24:12747

Thread:1 (Runnable)

SAM1 : 01

Process: 328254224 Program: SAM1

Name	Value
CURRENT-TIME	
CURRENT-HOUR	rr
CURRENT-MINUTE	rr
CURRENT-SECOND	rr
CURRENT-HNDSEC	rr

```

F00013.far ADTOOLS.ADLAB.SYSDEBUG(SAM1)
Line 252 Column 1 Insert Browse
251 ACCEPT CURRENT-DATE FROM DATE.
252 ACCEPT CURRENT-TIME FROM TIME.
253 DISPLAY 'SAM1 STARTED DATE = ' CURRENT-MONTH '/'
254 CURRENT-DAY '/' CURRENT-YEAR ' (mm/dd/yy) '.
255 DISPLAY ' TIME = ' CURRENT-HOUR ':'
256 CURRENT-MINUTE ':' CURRENT-SECOND.
257
258 PERFORM 900-OPEN-TRAN-AND-RPT-FILES.
259 PERFORM 800-INIT-REPORT .
260

```

Debug Console

Memory

EQA2458I SVC Screening is disabled by EQAOPTS. Handling of non-LE event

EQA2383I The environment is not yet fully initialized. Use Step or Run.

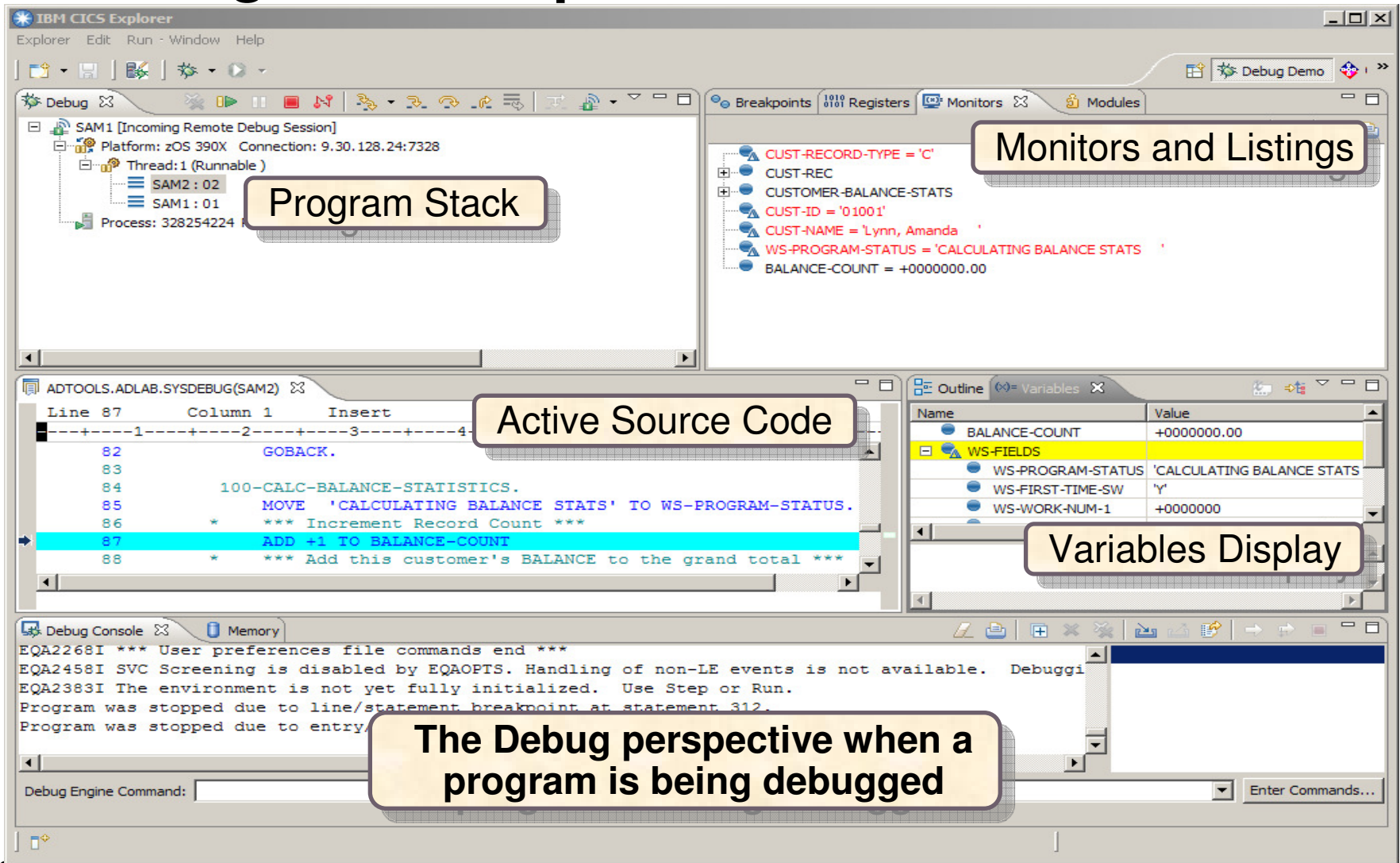
Debug Engine Command:

Sample Features

- 64-bit register support Assembler
- Dynamic patching
- Save and restore sessions settings
- Object level disassembly debugging



The Debug Tool Perspective



Program Stack

- SAM1 [Incoming Remote Debug Session]
 - Platform: zOS 390X Connection: 9.30.128.24:7328
 - Thread: 1 (Runnable)
 - SAM2: 02
 - SAM1: 01
 - Process: 328254224

Monitors and Listings

- CUST-RECORD-TYPE = 'C'
- CUST-REC
- CUSTOMER-BALANCE-STATS
- CUST-ID = '01001'
- CUST-NAME = 'Lynn, Amanda'
- WS-PROGRAM-STATUS = 'CALCULATING BALANCE STATS'
- BALANCE-COUNT = +0000000.00

Active Source Code

```

Line 87      Column 1      Insert
-----1-----2-----3-----4-----
82          GOBACK.
83
84          100-CALC-BALANCE-STATISTICS.
85          MOVE 'CALCULATING BALANCE STATS' TO WS-PROGRAM-STATUS.
86          *   *** Increment Record Count ***
87          ADD +1 TO BALANCE-COUNT
88          *   *** Add this customer's BALANCE to the grand total ***
  
```

Variables Display

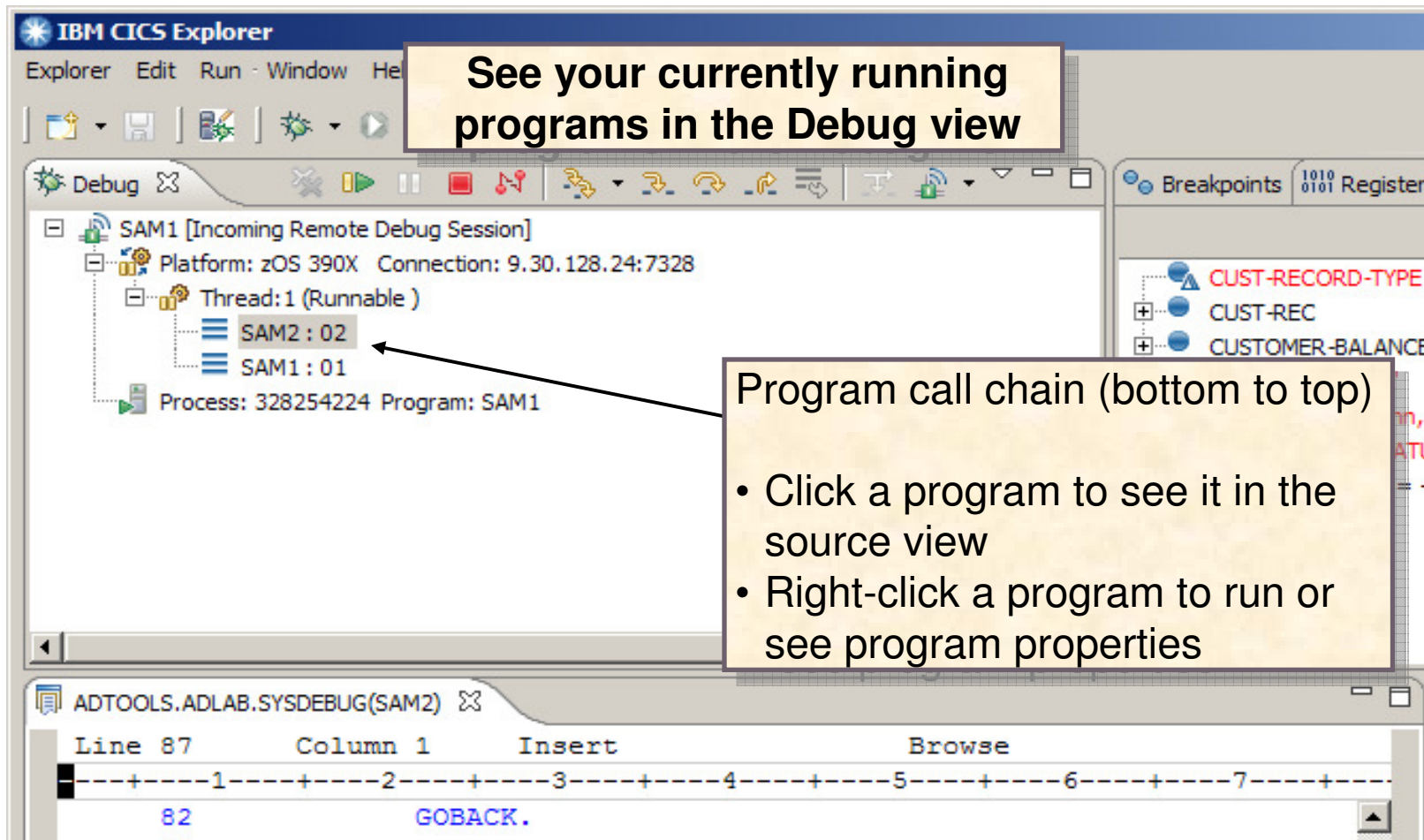
Name	Value
BALANCE-COUNT	+0000000.00
WS-FIELDS	
WS-PROGRAM-STATUS	'CALCULATING BALANCE STATS'
WS-FIRST-TIME-SW	'Y'
WS-WORK-NUM-1	+0000000

The Debug perspective when a program is being debugged

```

EQA2268I *** User preferences file commands end ***
EQA2458I SVC Screening is disabled by EQAOPTS. Handling of non-LE events is not available. Debuggi
EQA2383I The environment is not yet fully initialized. Use Step or Run.
Program was stopped due to line/statement breakpoint at statement 312.
Program was stopped due to entry
  
```

The Debug view



See your currently running programs in the Debug view

Program call chain (bottom to top)

- Click a program to see it in the source view
- Right-click a program to run or see program properties

ADTOOLS.ADLAB.SYSDEBUG(SAM2)

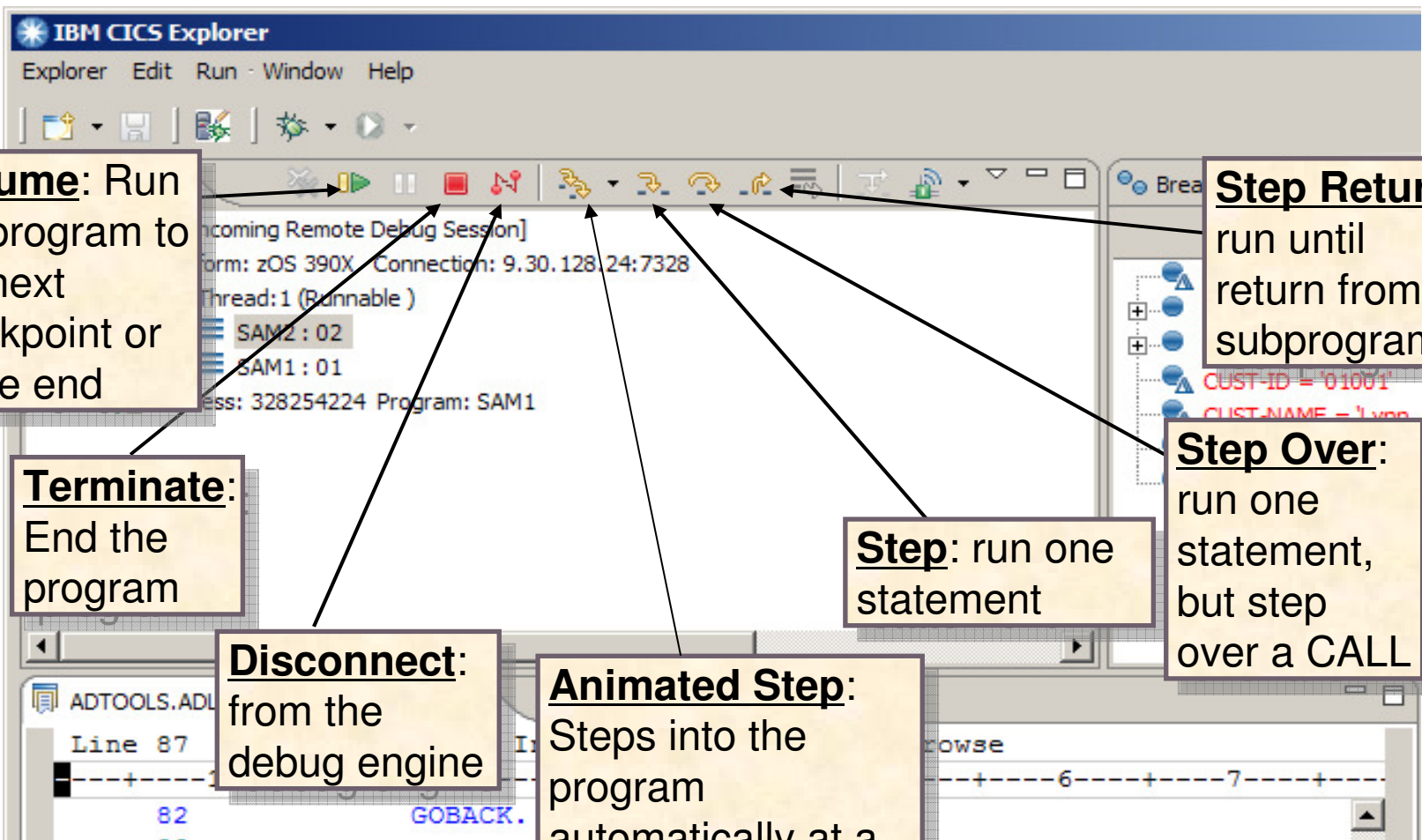
Line 87 Column 1 Insert Browse

```

-----1-----2-----3-----4-----5-----6-----7-----
82                    GOBACK.

```

Action bar buttons perform program actions....



Resume: Run the program to the next breakpoint or to the end

Terminate: End the program

Disconnect: Disconnect from the debug engine

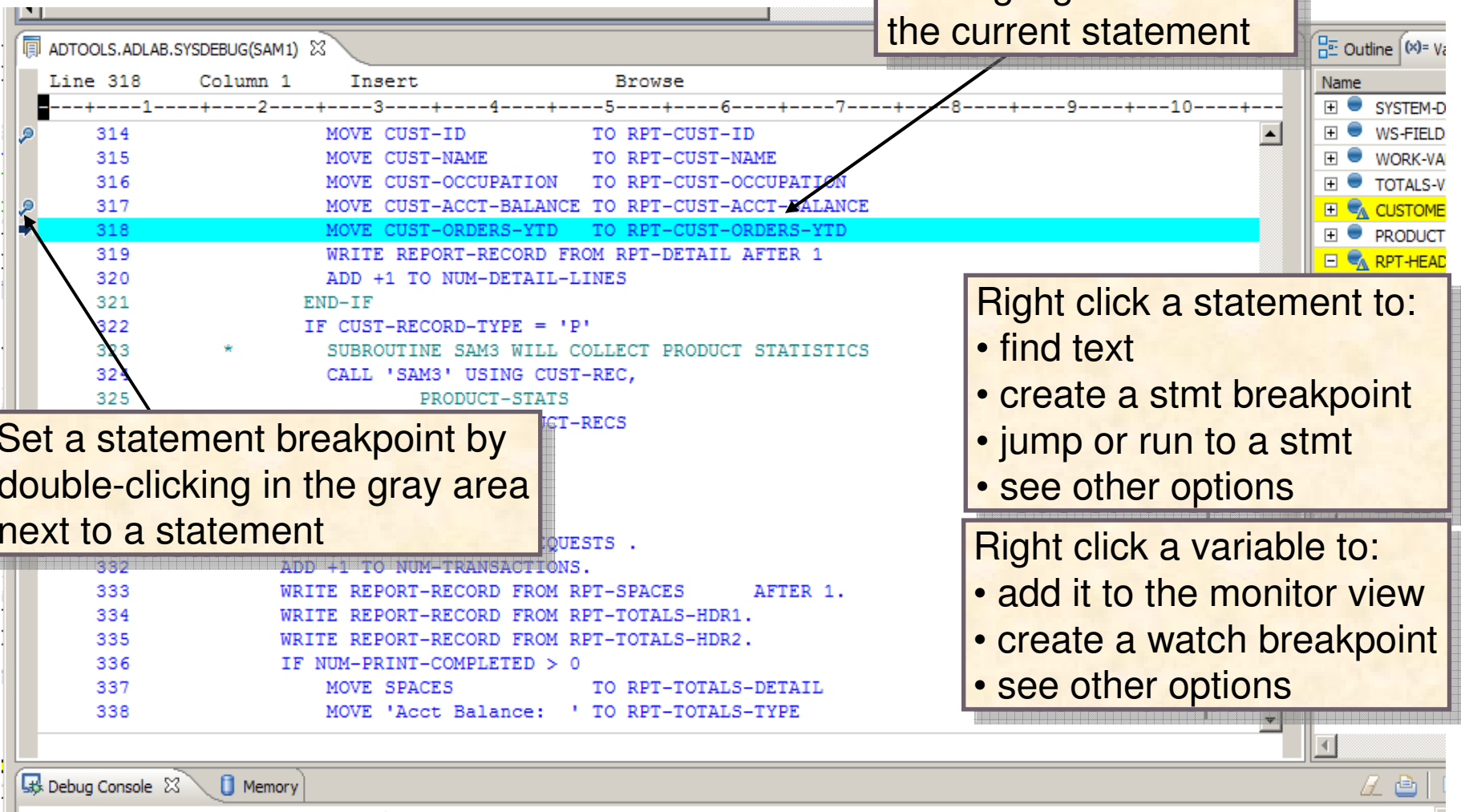
Animated Step: Steps into the program automatically at a rate you specify

Step: run one statement

Step Over: run one statement, but step over a CALL

Step Return: run until return from subprogram

The Program Source view



ADTOOLS.ADLAB.SYSDEBUG(SAM1) ✕

Line	Column	Insert	Browse
314		MOVE CUST-ID	TO RPT-CUST-ID
315		MOVE CUST-NAME	TO RPT-CUST-NAME
316		MOVE CUST-OCCUPATION	TO RPT-CUST-OCCUPATION
317		MOVE CUST-ACCT-BALANCE	TO RPT-CUST-ACCT-BALANCE
318		MOVE CUST-ORDERS-YTD	TO RPT-CUST-ORDERS-YTD
319		WRITE REPORT-RECORD	FROM RPT-DETAIL AFTER 1
320		ADD +1	TO NUM-DETAIL-LINES
321		END-IF	
322		IF CUST-RECORD-TYPE = 'P'	
323	*	SUBROUTINE SAM3 WILL COLLECT	PRODUCT STATISTICS
324		CALL 'SAM3' USING CUST-REC,	
325		PRODUCT-STATS	
326		GT-RECS	
327		QUESTS .	
328		ADD +1	TO NUM-TRANSACTIONS.
329		WRITE REPORT-RECORD	FROM RPT-SPACES AFTER 1.
330		WRITE REPORT-RECORD	FROM RPT-TOTALS-HDR1.
331		WRITE REPORT-RECORD	FROM RPT-TOTALS-HDR2.
332		IF NUM-PRINT-COMPLETED >	0
333		MOVE SPACES	TO RPT-TOTALS-DETAIL
334		MOVE 'Acct Balance: '	TO RPT-TOTALS-TYPE

Outline (X)= V

Name

- SYSTEM-D
- WS-FIELD
- WORK-VA
- TOTALS-V
- CUSTOMER
- PRODUCT
- RPT-HEAD

Debug Console ✕ Memory

Set a statement breakpoint by double-clicking in the gray area next to a statement

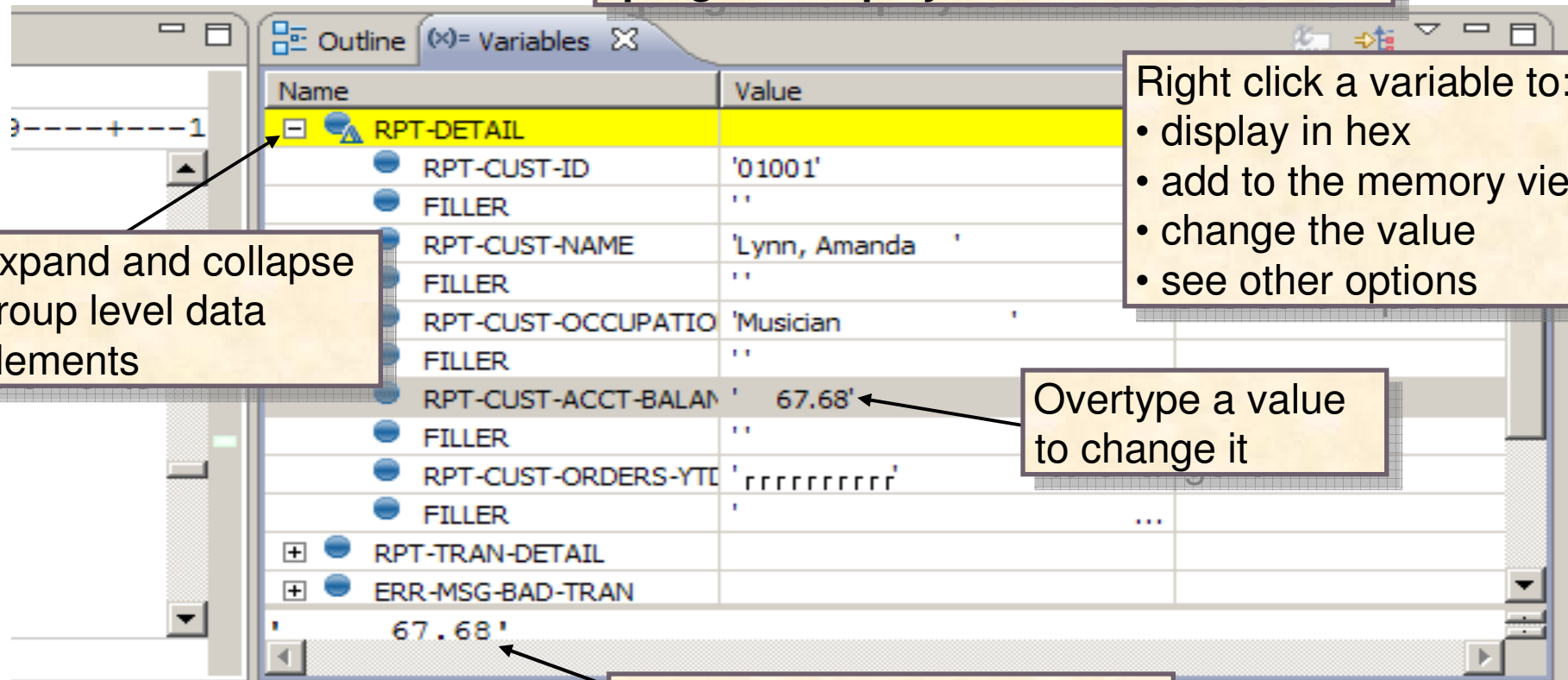
The highlighted line is the current statement

- Right click a statement to:
- find text
 - create a stmt breakpoint
 - jump or run to a stmt
 - see other options

- Right click a variable to:
- add it to the monitor view
 - create a watch breakpoint
 - see other options

The Variables View

View and change variables for the program displayed in the source view.



Name	Value
[-] RPT-DETAIL	
RPT-CUST-ID	'01001'
FILLER	''
RPT-CUST-NAME	'Lynn, Amanda '
FILLER	''
RPT-CUST-OCCUPATIO	'Musician'
FILLER	''
RPT-CUST-ACCT-BALAN	' 67.68'
FILLER	''
RPT-CUST-ORDERS-YTD	' rrrrrrrrrr'
FILLER	' ...
[+] RPT-TRAN-DETAIL	
[+] ERR-MSG-BAD-TRAN	

Expand and collapse group level data elements

Right click a variable to:

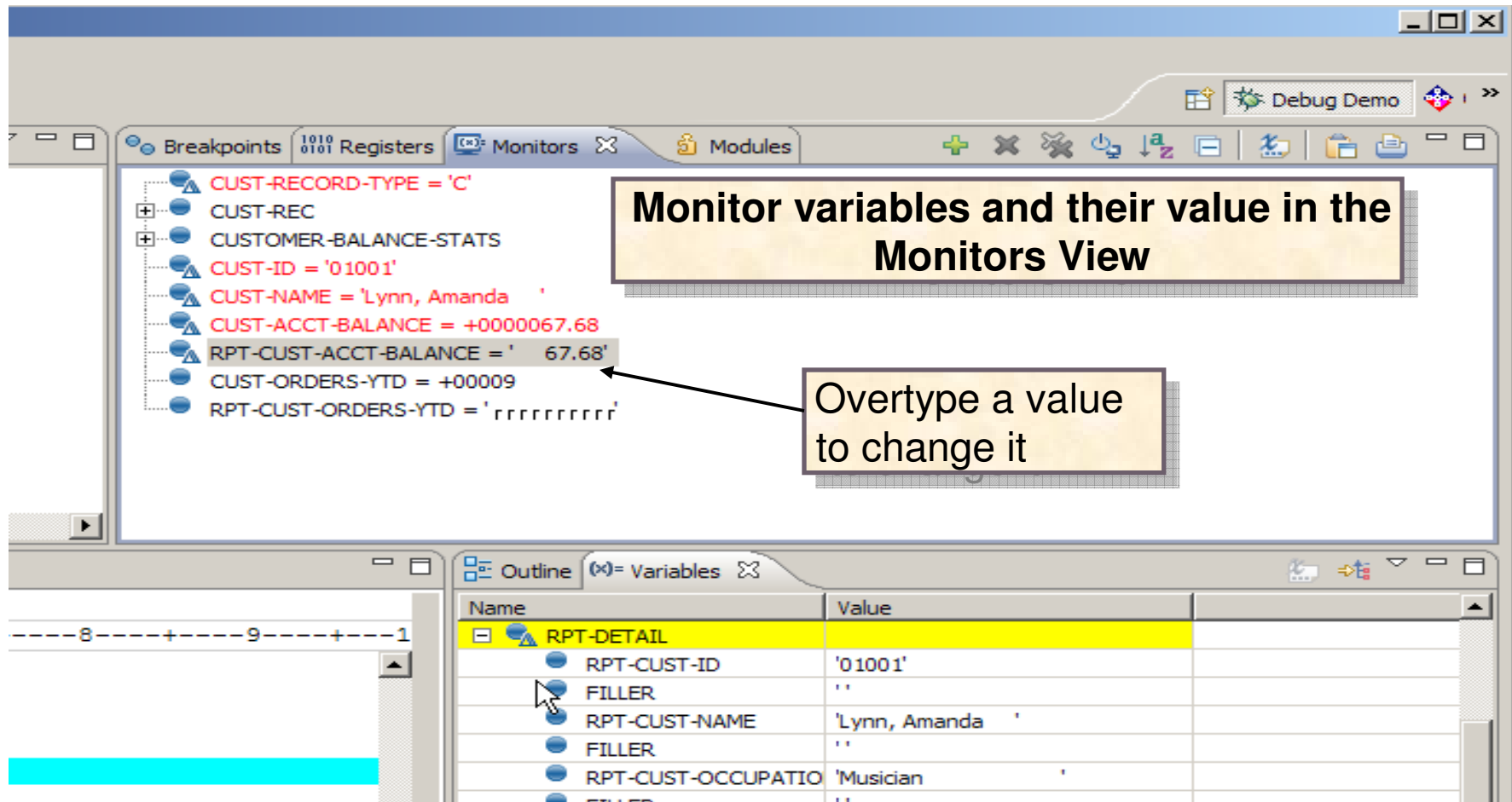
- display in hex
- add to the memory view
- change the value
- see other options

Overtyping a value to change it

Click on a variable to display it in the expanded area

Look at all working storage (show, change screen)

The Monitors View

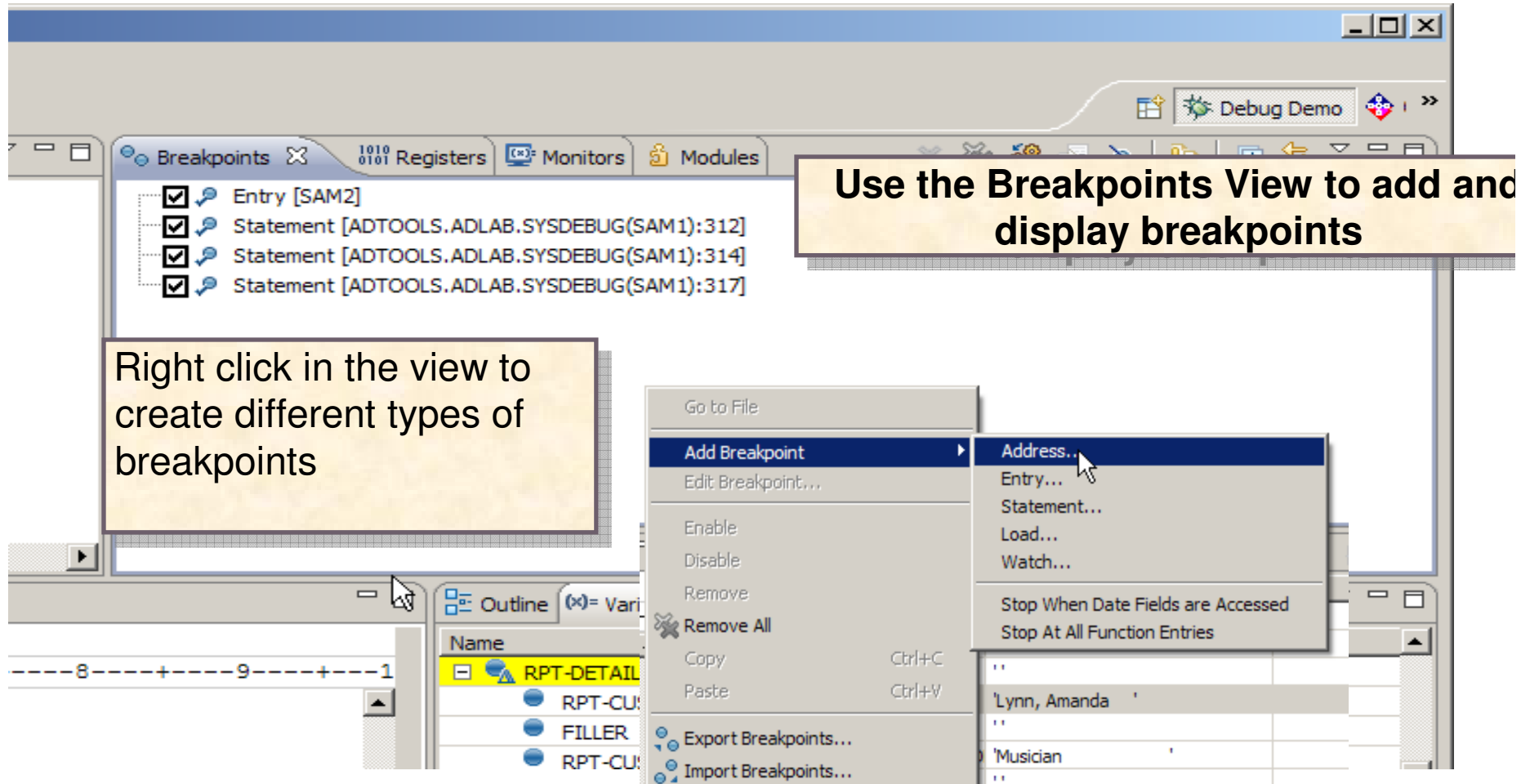


Monitor variables and their value in the Monitors View

Overtyping a value to change it

Name	Value
RPT-DETAIL	
RPT-CUST-ID	'01001'
FILLER	''
RPT-CUST-NAME	'Lynn, Amanda '
FILLER	''
RPT-CUST-OCCUPATIO	'Musician'
FILLER	''

The Breakpoints View



Use the Breakpoints View to add and display breakpoints

Right click in the view to create different types of breakpoints

- Entry [SAM2]
- Statement [ADTOOLS.ADLAB.SYSDEBUG(SAM1):312]
- Statement [ADTOOLS.ADLAB.SYSDEBUG(SAM1):314]
- Statement [ADTOOLS.ADLAB.SYSDEBUG(SAM1):317]

Go to File

- Add Breakpoint
 - Address...
 - Entry...
 - Statement...
 - Load...
 - Watch...
- Edit Breakpoint...
- Enable
- Disable
- Remove
- Remove All
- Copy Ctrl+C
- Paste Ctrl+V
- Export Breakpoints...
- Import Breakpoints...

Stop When Date Fields are Accessed

Stop At All Function Entries

Name

- RPT-DETAIL
- RPT-CU!
- FILLER
- RPT-CU!

8 - 9 - 1

Lynn, Amanda

Musician

The memory view



IBM CICS Explorer

Platform: [Team] zOS 390X Connection: 9.39.68.147:6942
Thread: 1 (Runnable)
Process: 544260880 Program: SAM1

Breakpoints Registers Monitors Modules

CUST-RECORD-TYPE = 'C'
CUST-REC
CUSTOMER-BALANCE-STATS

Variables

Variable	Value
CUST-RECORD-TYPE	'C'
CUST-REC	
CUSTOMER-BALANCE-STATS	
SYSTEM-DATE-AND-TIME	
WS-FIELDS	
WORK-VARIABLES	
TOTALS-VARS	
NIJM-TRANFILE-RFCS	+000000003

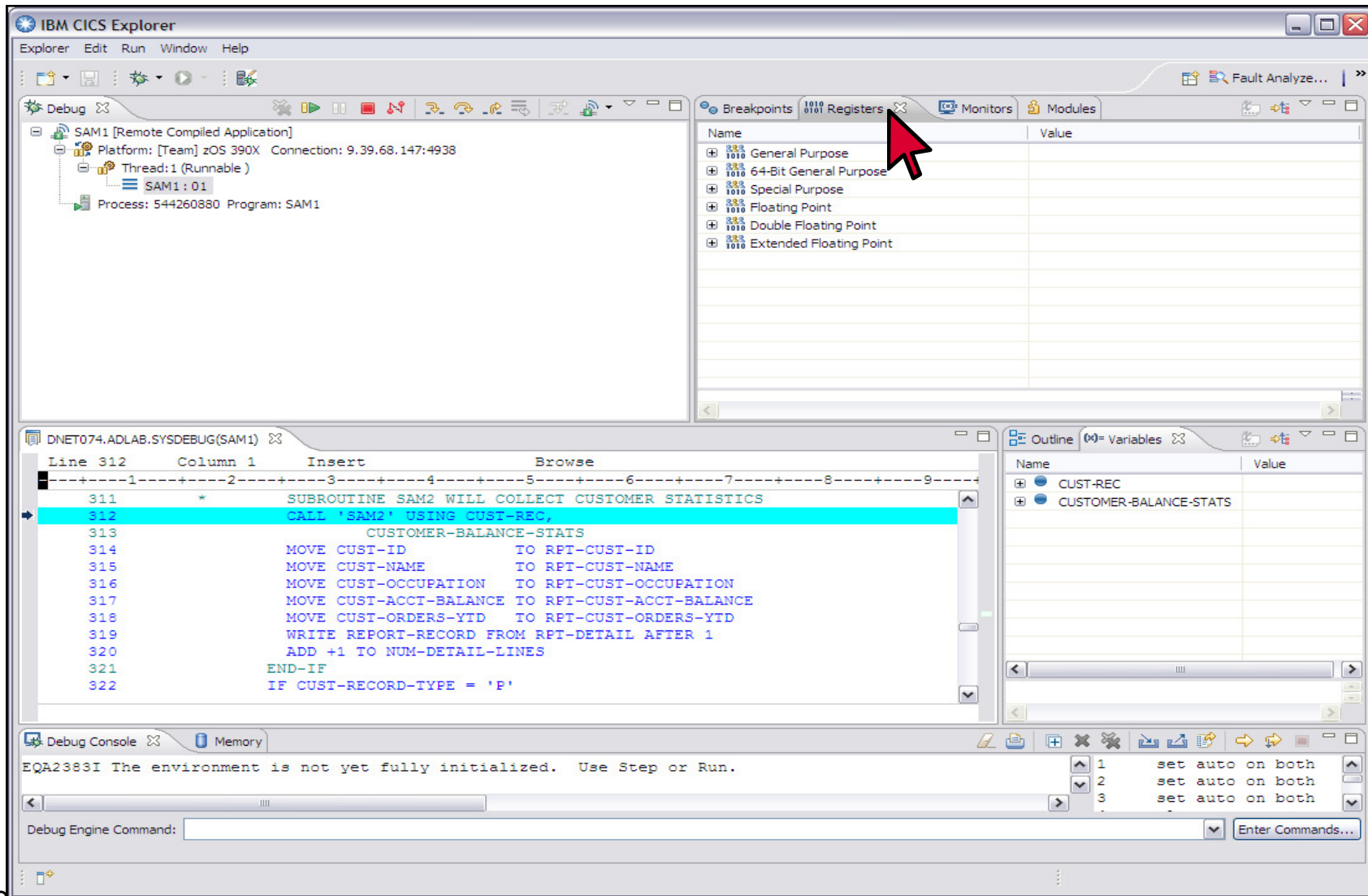
Debug Console Memory

Monitors

CUST-NAME : 0x38D25 <Hex>

Address	0 - 3	4 - 7	8 - B	C - F
00038D20	40404040	40D3A895	956B40C1	94819584
00038D30	81404040	40400000	06768C00	09E29789
00038D40	9989A340	D3819285	40404040	D4A4A289
00038D50	83898195	40404040	40404040	40404040
00038D60	40404040	40404040	F0F2F2F0	F0C34040
00038D70	40404040	40C79981	8881946B	40C19595
00038D80	81404040	40400000	61005C00	0AC1A3A6
00038D90	96954040	40404040	40404040	C39996A2

The registers view



IBM CICS Explorer

Debug Console: EQA2383I The environment is not yet fully initialized. Use Step or Run.

Registers View:

Name	Value
General Purpose	
64-Bit General Purpose	
Special Purpose	
Floating Point	
Double Floating Point	
Extended Floating Point	

Main Editor Code:

```
Line 312 Column 1 Insert Browse
-----1-----2-----3-----4-----5-----6-----7-----8-----9-----
311 * SUBROUTINE SAM2 WILL COLLECT CUSTOMER STATISTICS
312 CALL 'SAM2' USING CUST-REC,
313 CUSTOMER-BALANCE-STATS
314 MOVE CUST-ID TO RPT-CUST-ID
315 MOVE CUST-NAME TO RPT-CUST-NAME
316 MOVE CUST-OCCUPATION TO RPT-CUST-OCCUPATION
317 MOVE CUST-ACCT-BALANCE TO RPT-CUST-ACCT-BALANCE
318 MOVE CUST-ORDERS-YTD TO RPT-CUST-ORDERS-YTD
319 WRITE REPORT-RECORD FROM RPT-DETAIL AFTER 1
320 ADD +1 TO NUM-DETAIL-LINES
321 END-IF
322 IF CUST-RECORD-TYPE = 'P'
```

Outline View:

Name	Value
CUST-REC	
CUSTOMER-BALANCE-STATS	

Debug Engine Command: Enter Commands...

The Debug Tool MFI Interface

Three windows in initial dis

Header: Shows:
 - the name of program
 - current statement number

```

COBOL      LOCATION: SAM1 :> 251.1
Command ==> step 15                               Scroll ==> PAGE
MONITOR  -+---1---+---2---+---3---+---4---+---5---+---6- LINE: 1 OF 7
***** TOP OF MONITOR *****
0001      ***** AUTOMONITOR SAM1 ::> SAM1 :> 251.1 *****
0002      02 CURRENT-DATE
0003      03 CURRENT-YEAR
0004      03 CURRENT-MONTH
0005      03 CURRENT-DAY
0006      ***** AUTOMONITOR - PREVIOUS *****
0007      There are no variables in the statement to display.
SOURCE:  SAM1 +---1---+---2---+---3---+---4---+---5--- LINE: 249 OF 467
249
250      000-MAIN.
251      ACCEPT CURRENT-DATE FROM DATE.
252      ACCEPT CURRENT-TIME FROM TIME.
253      DISPLAY 'SAM1 STARTED DATE = ' CURRENT-DATE
254      CURRENT-DAY '/' CURRENT-YEAR
255      DISPLAY '          TIME = ' CURRENT-HOUR ':'
256      CURRENT-MINUTE ':' CURRENT-SECOND.
257
LOG 0 -+---1---+---2---+---3---+---4---+---5---+---6- LINE: 18 OF 24
0018      There are no breakpoints set.
0019      PLAYBACK ENABLE ;
0020      SET FREQUENCY ON ;
0021      SET AUTOMONITOR ON BOTH ;
0022      *** User preferences file commands end ***
0023      STEP ;
0024      STEP ;
PF 1: ?      2: STEP      3: QUIT      4: LIST      5: FIND      6: AT/CLEAR
PF 7: UP     8: DOWN     9: GO      10: ZOOM     11: ZOOM LOG  12: RETRIEVE
  
```

Monitor Window: Add and watch variables here

Source Window: Program source statements are displayed here

Log Window: Commands and messages are logged

POPUP Command

```

Session A - TLBA07ME
File Edit View Communication Actions Window Help
[Icons]

COBOL      LOCATION: IBS014 :> 29.2
Command ==> popup
Scroll ==> PAGE
MONITOR  -+---1---+---2---+---3---+---4---+---5---+---6- LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: IBS014  ---3---+---4---+---5---+---6---+---7-- LINE: 28 OF 219
28  "<>>>FLOW MSG:IBLS014 BEGIN EXECUTE" upon console;  IBM00290
29  to tgvtcnt  CALL "IBLS014A" USING LVAR , MVAR1.      IBM00300
30  TO TGVTErr.                                       IBM00310
31  TO TGVTPAS.                                       IBM00320
32  TO MVAR1.                                          IBM00330
33  TO NVAR1.                                          IBM00340

LOG 0-+---1---+---2---+---3---+---4---+---5---+---6- LINE: 15 OF 33
0015          NOAWO
0016          NOCMR2
0017          DATA(31)
0018          DBCS
PF  1: ?           2: STEP           3: QUIT           4: LIST           5: FIND           6: AT/CLEAR
PF  7: UP          8: DOWN           9: GO            10: ZOOM          11: ZOOM LOG      12: RETRIEVE

```

Popup window

Session A - TLBA07ME

File Edit View Communication Actions Window Help

COBOL LOCATION: IBS014 :> 29.2

Command ==> Scroll ==> PAGE

0016 NOCMPR2

0017 DATA (31)

0018 DBCS

PF 1: ?	2: STEP	3: QUIT	4: LIST	5: FIND	6: AT / CLEAR
PF 7: UP	8: DOWN	9: GO	10: ZOOM	11: ZOOM LOG	12: RETRIEVE

MA a 04/002

Connected to remote server/host tba07me.torolab.ibm.com using lu/pool S0700063 and port 23 HP DeskJet 820Cse on LPT1:

Enter after continuation character..



```

COBOL      LOCATION: IBS014 :> 29.2
Command ==> this is a very long -
MONITOR  -+----1----+----2----+----3----+----4----+----5----+----6- LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****
  
```

```

SOURCE: IBS014 --1----+----2----+----3----+----4----+----5---- LINE: 28 OF 219
28      DISPLAY "<>>>FLOW MSG:IBLS014 BEGIN EXECUTE" upon console
29      move 0 to tgvtcnt      CALL "IBLS014A" USING LVAR , MVAR1.
30      MOVE 0 TO TGVTTERR.
31      MOVE 0 TO TGVTPAS.
32      MOVE 0 TO MVAR1.
33      MOVE 0 TO NVAR1.
LOG 0--1----+----2----+----3----+----4----+----5----+----6- LINE: 33 OF 36
0033      3      IBS0141
0034 The partially parsed command is:
0035 LEFT
0036 The command element T20 is invalid.
PF 1:?      2:STEP      3:QUIT      4:LIST      5:FIND      6:AT/CLEAR
PF 7:UP      8:DOWN      9:GO      10:ZOOM      11:ZOOM LOG  12:RETRIEVE
  
```


Adding a new monitor using prefix command Mn



```
File Edit View Communication Actions Window Help
MONITOR -+---1---+---2---+---3---+---4---+---5---+---6- LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: IBCUS01 --1---+---2---+---3---+---4---+---5---+ LINE: 37 OF 51
M2 37 INITIALIZE WORK-ALPHA-FIELDS
    38 WORK-NUM-FIELDS
    39 WORK-FLAG-FIELDS.
    40
    41 * S.L
    42 MOVE ZEROS TO WK-NUM-1.
    43 MOVE 1 TO WK-NUM-1.
    44 PERFORM UNTIL WK-LOOP-DONE
    45 ADD 1 WK-NUM-1 GIVING WK-NUM-1
    IF WK-NUM-1 > 5

LOG 0---+---1---+---2---+---3---+---4---+---5---+ LINE: 10 OF 15
0010
0011 EQA1743I SETTINGS not restored from TSFANAY.DBGTOOL.SAVESETS
0012 EQA1872E An error occurred while opening file: INSPREF. The file may not
0013 exist, or is not accessible.
0014 STEP ;
0015 STEP ;

PF 1:?          2:STEP          3:QUIT          4:LIST          5:FIND          6:AT/CLEAR
PF 7:UP         8:DOWN           9:GO           10:ZOOM         11:ZOOM LOG     12:RETRIEVE

MA a 15/006
Connected to remote server /host t1ba07me.torolab.ibm.com using lu/pool S0700021 and port 23 HP DeskJet 820Cse on LPT1:
```

Second variable is now being monitored

```

File Edit View Communication Actions Window Help
MONITOR -+---1---+---2---+---3---+---4---+---5---+---6- LINE: 1 OF 3
***** TOP OF MONITOR *****
0001 1 01 WORK-NUM-FIELDS
0002 02 WK-NUM-1
0003 02 WK-NUM-2
***** BOTTOM OF MONITOR *****

SOURCE: IBCUS01 --1---2---3---4---5--- LINE: 37 OF 51
37 INITIALIZE WORK-ALPHA-FIELDS
38 WORK-NUM-FIELDS
39 WORK-FLAG-FIELDS.
40 * S.L
41 MOVE ZEROES TO WK-NUM-1.
42 MOVE 1 TO WK-NUM-1.
43 PERFORM UNTIL WK-LOOP-DONE
44 ADD 1 WK-NUM-1 GIVING WK-NUM-1
45 IF WK-NUM-1 > 5

LOG 0--1---2---3---4---5--- LINE: 12 OF 17
0012 EQA1872E An error occurred while opening file: INSPREF. The file may not
0013 exist, or is not accessible.
0014 STEP ;
0015 STEP ;
0016 MONITOR
0017 LIST WORK-NUM-FIELDS ;

PF 1: ? 2: STEP 3: QUIT 4: LIST 5: FIND 6: AT/CLEAR
PF 7: UP 8: DOWN 9: GO 10: ZOOM 11: ZOOM LOG 12: RETRIEVE

MA a 02/015
Connected to remote server /host tba07me.torolab.ibm.com using lu/pool S0700021 and port 23 HP DeskJet 820Cse on LPT1:

```

AT Statement.....

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBASW10 initialization
Command ==> go
MONITOR -+---1---+---2---+---3---+---4---+---5---+---6- LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: IBASW10 --1---+---2---+---3---+---4---+---5---+ LINE: 1 OF 206
1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. IBASW10.
3 ENVIRONMENT DIVISION.
4 DATA DIVISION.
5 FILE SECTION.
6 WORKING-STORAGE SECTION.
7 01 CKVAR1 PIC X(4).
8 88 YES1 value x"00000000".
9 88 VAR1 value x"00000001".

LOG 0--1---+---2---+---3---+---4---+---5---+ LINE: 14 OF 19
0014 AT 55 WHEN NVAR1 > 2
0015 BEGIN ;
0016 LIST TITLED ( NVAR1 ) ;
0017 LIST TITLED %BLOCK ;
0018 LIST TITLED %LINE ;
0019 END ;

PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE

MA a 02/017
Connected to remote server/host tba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```


AT Statement.....

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBASW10 :> 55.1
Command ==> [ ] Scroll ==> PAGE
MONITOR -+-----1-----+-----2-----+-----3-----+-----4-----+-----5-----+-----6- LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: IBASW10 --1-----2-----3-----4-----5----- LINE: 55 OF 206
55 COMPUTE NVAR1 = NVAR1 + 1.
56 COMPUTE NVAR1 = NVAR1 + 1.
57 COMPUTE NVAR1 = NVAR1 + 1.
58 SET YES1 TO TRUE.
59 COMPUTE CVAR1 = CVAR1 + 5.
60 COMPUTE CVAR2 = CVAR2 + 5.
61 COMPUTE CVAR3 = CVAR3 + 5.
62 COMPUTE CVAR4 = CVAR4 + 5.
63 COMPUTE CVAR5 = CVAR5 + 5.

LOG 0-----1-----2-----3-----4-----5----- LINE: 18 OF 23
0018 LIST TITLED %LINE ;
0019 END ;
0020 GO ;
0021 NVAR1 = +00000000006
0022 %BLOCK = IBASW10
0023 %LINE = 55.1

PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE

MA a 02/015
Connected to remote server/host t1ba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```

SET AUTO (BOTH, PREVIOUS)

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBAMP10 initialization
Command ==> SET AUTO ON LOG BOTH; Scroll ==> PAGE
SOURCE: IBAMP10 --1---+---2---+---3---+---4---+---5---+ LINE: 1 OF 189
1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. IBAMP10.
3 ENVIRONMENT DIVISION.
4 DATA DIVISION.
5 WORKING-STORAGE SECTION.
6 77 LVAR PIC S9(9) COMP.
7 77 MVAR1 PIC S9(9) COMP.
8 77 NVAR1 PIC S9(9) COMP.
9 77 NVAR2 PIC S9(9) COMP.
10 77 PROGVAR PIC S9(9) COMP.
11 77 LVAR1 PIC S9(9) COMP.
12 77 LVAR2 PIC S9(9) COMP.
13 77 LVAR3 PIC S9(9) COMP.
14 77 ERRMSG PIC S9(9) COMP.
15 77 TGVTCNT PIC S9(9) COMP.
16 77 TGVTTERR PIC S9(9) COMP.
17 77 TGVTPAS PIC S9(9) COMP.
18 77 TGVTTOT PIC S9(9) COMP.
19 77 TGVTRK PIC S9(9) COMP.
20 LINKAGE SECTION.
21 PROCEDURE DIVISION.
22 PARA-IBAMP10.
23 DISPLAY "<>>FLOW MSG:IBAMP10 BEGIN EXECUTE" upon console
24 move 0 to tgvtcnt CALL "IBAMP10A" USING LVAR , MVAR1.
25 MOVE 0 TO TGVTTERR.
26 MOVE 0 TO TGVTPAS.
27 MOVE 0 TO MVAR1.
PF 1: ? 2: STEP 3: QUIT 4: LIST 5: FIND 6: AT/CLEAR
PF 7: UP 8: DOWN 9: GO 10: ZOOM 11: ZOOM LOG 12: RETRIEVE
MA a 02/015
Connected to remote server/host t1ba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```

SET AUTO.....

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBAMP10A :> 42.1
Command ==> [ ] Scroll ==> PAGE
MONITOR -+---1---+---2---+---3---+---4---+---5---+---6--- LINE: 1 OF 6
***** TOP OF MONITOR *****
-----+---1---+---2---+---3---+---4---
0001 ***** AUTOMONITOR IBAMP10 :> IBAMP10A :> 42.1 *****
0002 77 LVAR2A +0000000021
0003 77 MYVAR12A +0000000000
0004 ***** Previous Statement IBAMP10 :> IBAMP10 :> 24.2 *****
0005 77 LVAR +0000000000
0006 77 MYVAR1 +0000000000
***** BOTTOM OF MONITOR *****

SOURCE: IBAMP10A -1---+---2---+---3---+---4---+---5---+ LINE: 42 OF 86
42 CALL "IBAMP102" USING LVAR2A , MYVAR12A.
43 COMPUTE BVAR2 = BVAR2 + 1.
44 COMPUTE BVAR2 = BVAR2 + 1.
45 COMPUTE BVAR2 = BVAR2 + 1.
46 COMPUTE BVAR2 = BVAR2 + 1.
47 COMPUTE BVAR2 = BVAR2 + 1.
48 DISPLAY "<>>FLOW MSG: IBAMP10A END EXECUTION" upon conso
49 GOBACK.
50 IDENTIFICATION DIVISION.

LOG 0---+---1---+---2---+---3---+---4---+---5---+ LINE: 24 OF 29
0024 The current location is IBAMP10 :> IBAMP10A :> 42.1.
0025 77 IBAMP10A:>LVAR2A = +0000000021
0026 77 IBAMP10A:>MYVAR12A = +0000000000
0027 The previous location is IBAMP10 :> IBAMP10:> 24.2.
0028 77 IBAMP10:>LVAR = +0000000000
0029 77 IBAMP10:>MYVAR1 = +0000000000
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE

MA a 02/015
Connected to remote server/host t1ba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```


XML formatting

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBXML10 :> 52.1
Command ==>
MONITOR +---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 17
0001 1 01 XML-DOCUMENT
0002 02 FILLER '<?xml version="1.0" encoding="ibm-1140" '
0003 02 FILLER ' standalone="yes"?>'
0004 02 FILLER '<!--This document is just an example-->'
0005 02 FILLER '<sandwich>'
0006 02 FILLER ' <bread type="baker&apos;s best"/>'
0007 02 FILLER ' <bread2 type="baker&#125;s best"/>'
0008 02 FILLER ' <?spread please use real mayonnaise ?>'
0009 02 FILLER ' <meat>Ham & turkey</meat>'
SOURCE: IBXML10 --1---+---2---+---3---+---4---+---5--- LINE: 49 OF 107
49
50 xml-handler section.
51 move XML-TEXT to x.
52 evaluate XML-EVENT
53 when 'START-OF-DOCUMENT'
54 compute xml-document-length = function length(XML-TEXT)
55 display 'Start of document: length=' xml-document-length
56 ' characters.'
57 when 'END-OF-DOCUMENT'
LOG 0---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 11 OF 16
0011 EQA1743I SETTINGS not restored from TSFANAY.DBGT00L.SAVESETS
0012 EQA1872E An error occurred while opening file: INSPREF. The file may not
0013 exist, or is not accessible.
0014 STEP 5 ;
0015 MONITOR 1
0016 LIST XML-DOCUMENT ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
MA a 02/015
Connected to remote server/host tba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```

XML.... (zooming monitor area)

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBXML10 :> 52.1
Command ==>
Scroll ==> PAGE
MONITOR -+---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 17
***** TOP OF MONITOR *****
-----+---1---+---2---+---3---+---4---
0001 1 01 XML-DOCUMENT
0002 02 FILLER '<?xml version="1.0" encoding="ibm-1140" '
0003 02 FILLER ' standalone="yes"?>'
0004 02 FILLER '<!--This document is just an example-->'
0005 02 FILLER '<sandwich>'
0006 02 FILLER ' <bread type="baker&apos;s best"/>'
0007 02 FILLER ' <bread2 type="baker&#125;s best"/>'
0008 02 FILLER ' <?spread please use real mayonnaise ?>'
0009 02 FILLER ' <meat>Ham &amp; turkey</meat>'
0010 02 FILLER ' <filling>Cheese, lettuce, tomato, etc.'
0011 02 FILLER ' </filling>'
0012 02 FILLER ' <filling2>Cheese, &#125; tomato, etc. '
0013 02 FILLER ' </filling2>'
0014 02 FILLER ' <![CDATA[We should add a <relish>'
0015 02 FILLER ' element in future!]]>'
0016 02 FILLER ' </sandwich>'
0017 02 FILLER
***** BOTTOM OF MONITOR *****

PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
MA a 02/015
Connected to remote server/host t1ba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```

XML...(before entering LIST STORAGE)

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBXML10 :> 52.1
Command ==> LIST STORAGE (xml-document) XML (EBCDIC); Scroll ==> PAGE
MONITOR +-----1-----2-----3-----4-----5-----6 LINE: 1 OF 1
-----1-----2-----3-----4-----
0001 1 01 XML-DOCUMENT
0002 02 FILLER '<?xml version="1.0" encoding="ibm-1140"
0003 02 FILLER ' standalone="yes"?>'
0004 02 FILLER '<!--This document is just an example-->'
0005 02 FILLER '<sandwich>'
0006 02 FILLER ' <bread type="baker&apos;s best"/>'
0007 02 FILLER ' <bread2 type="baker&#125;s best"/>'
0008 02 FILLER ' <?spread please use real mayonnaise ?>'
0009 02 FILLER ' <meat>Ham & turkey</meat>'
SOURCE: IBXML10 --1--2--3--4--5-- LINE: 49 OF 10
49
50 xml-handler section.
51 move XML-TEXT to x.
52 evaluate XML-EVENT
53 when 'START-OF-DOCUMENT'
54 compute xml-document-length = function length(XML-TEX
55 display 'Start of document: length=' xml-document-len
56 ' characters.'
57 when 'END-OF-DOCUMENT'
LOG 0-----1-----2-----3-----4-----5----- LINE: 31 OF 36
0031 <filling2>
0032 Cheese, } tomato, etc.
0033 </filling2>
0034 <!--YCDATA-->We should add a <relish> element in future!
0035 ...>
0036 </sandwich>
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
MA a 02/015
Connected to remote server/host tba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```

XML... formatted document

```

File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: IBXML10 :> 52.1
Command ==>
Scroll ==> PAGE
LOG 0-----1-----2-----3-----4-----5----- LINE: 10 OF 36
0010
0011 EQA1743I SETTINGS not restored from TSFANAY.DBGTOOL.SAVESETS
0012 EQA1872E An error occurred while opening file: INSPREF. The file may not
0013 exist, or is not accessible.
0014 STEP 5 ;
0015 MONITOR 1
0016 LIST XML-DOCUMENT ;
0017 LIST STORAGE ( XML-DOCUMENT ) XML ( EBCDIC ) ;
0018 <?version="1.0" encoding="ibm-1140" standalone="yes"?>
0019 <!--This document is just an example--><sandwich>
0020 <bread type="baker's best">
0021 </bread>
0022 <bread2 type="baker}s best">
0023 </bread2>
0024 <?spread please use real mayonnaise ?>
0025 <meat>
0026 Ham & turkey
0027 </meat>
0028 <filling>
0029 Cheese, lettuce, tomato, etc.
0030 </filling>
0031 <filling2>
0032 Cheese, } tomato, etc.
0033 </filling2>
0034 <![CDATA[We should add a <relish> element in future!
0035 ...
0036 </sandwich>
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
MA a 02/015
Connected to remote server/host tba07me.torolab.ibm.com using lu/pool S0700035 and port 23 HP DeskJet 820Cse on LPT1:

```

XML doc in code page 1141 with XML(EBCDIC)



```
A - tlba07me - [43 x 80]
File Edit View Communication Actions Window Help
[Icons]
COBOL LOCATION: XMLCP02 :> 487.1
Command ==>
LOG @-----1-----2-----3-----4-----5-----6 LINE: 1 OF 33
***** TOP OF LOG *****
0001 An error occurred while opening file: INSPLOG . The file may not exist,
0002 or is not accessible.
0003 IBM Debug Tool Version 10 Release 1 Mod 0
0004 10/12/2009 1:58:17 PM
0005 5655-V50: Copyright IBM Corp. 1992, 2009
0006 The operating system has generated the following message:
0007 EQA2458I SVC Screening is disabled by EQA0PTS. Handling of non-LE
0008 events is not available. Debugging of non-LE programs will be restricted
0009 in this Debug Tool session.
0010
0011 EQA1743I SETTINGS not restored from ELIN.DBGTOOL.SAVESETS
0012 EQA1872E An error occurred while opening file: INSPREF. The file may not
0013 exist, or is not accessible.
0014
0015 STEP ;
0016 LIST STORAGE ( XML-TK-1141 ) XML ( EBCDIC ) ;
0017 <?version="1.0"?>
0018 <person>
0019 <njmn>
0020 <family>
0021 BOSS
0022 </family>
0023 <given>
0024 BIG
0025 </given>
0026 </njmn>
0027 <email>
0028 one$foo.com
0029 </email>
0030 <pdata>
0031 Åz19äüÄÜ
0032 </pdata>
0033 </person>
***** BOTTOM OF LOG *****
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
MA a 02/015
Connected to remote server/host tlba07me.torolab.ibm.com using lu/pool S0700(
```

Debug Tool: What's new in version 11?

- A new mode of operation, explicit debug mode, is now supported. In this mode, the user identifies the compile units to debug, then Debug Tool loads debug data only for those compile units. This mode can significantly improve debugger performance when it is debugging very large and complex programs. This new mode is an alternative to the standard Debug Tool mode of operation where debug data is automatically loaded for all compile units. It is intended to be used only when debugging large, complex applications that don't perform as well in the standard Debug Tool mode.
- A new user interface is added to the Terminal Interface Manager (TIM) that helps you create and manage the TEST runtime options data set.
- The TIM has been enhanced to remove the need for a site to set up a separate TN3270E port or to customize a set of terminal LUs.
- A GUI interface is added that helps you create and manage the TEST runtime options data set from the workstation.
- The Debug Tool Language Environment user exit for DB2 (EQADDCXT) now supports debugging of DB2 stored procedures of type SUB invoked using the call_sub function.
- EQAOPTS commands can now be specified at runtime in addition to the use of a user-generated EQAOPTS load module. This allows individual users to enter EQAOPTS commands at runtime by supplying a data set containing EQAOPTS commands.
- Support is added for debugging of assembler programs that exploit the latest IBM zEnterprise 196 architecture.
- Enhanced performance while debugging C and C++ applications.

Debug Tool: What's new in version 11?

- A Popup window, which displays the result of the LIST expression command when the Log window, is not visible.
- Support for the Enterprise PL/I ADDRDATA built-in function.
- Support for the Enterprise PL/I V4.1 compiler and its new GONUMBER(SEPARATE) option.
- For programs compiled with any level of Enterprise PL/I, you can now list a single element of an array of structures. For programs compiled with Enterprise PL/I V4.1, you can list a single element of an array of structures in automonitor or use the L prefix command in the Source window to list a single element of an array of structures.
- For programs compiled with any level of Enterprise PL/I, you can now change the format in which Debug Tool displays an array. By using the SET LIST BY SUBSCRIPT ON command, you can have Debug Tool display the array as it is stored in memory.
- A new keyword LABELS is added to the LIST NAMES command where you can list the names of all section and paragraph names in a COBOL program, and the names of all instruction labels in an assembler program.

Debug Tool: What's new in version 11?

- The following breakpoints are enhanced:
 - AT CHANGE and AT LABEL breakpoints are enhanced to allow a user to limit the scope of the breakpoint to a specific compile unit.
 - AT GLOBAL is enhanced to provide an OCCURRENCE option or wild card (*) to stop for any condition raised in the application.
 - The QUERY LOCATION command is enhanced to provide more information when Debug Tool stops for an AT CHANGE breakpoint.
- Automonitor enhancements:
 - You can change the subscripts of an array directly in the Monitor window.
 - You can delete multiple items from Monitor window at one time.
 - You can use the cursor (in combination with the CLEAR MONITOR command) to indicate which variable to remove from the Monitor window.
- Automated allocation of the commands, log, preferences, save settings and save breakpoints and monitor specifications files.
- New functions are included in Debug Tool Utilities to help an application programmer more easily start debugging IMS applications running in BTS.
- A CICS transaction, DTNP, is provided which issues NEWCOPY or PHASEIN of application programs.
- Documentation is provided to assist debugging of Language Environment C/C++, COBOL, and PLI programs in the Java JNI environment in z/OS.

Agenda

- Fault Analyzer
- Debug Tool
- Application Performance Analyzer
- File Manager

Application Performance Ana 3270 or multiple GUI interfaces

New in APA V11.1

- Plug-in for CICS Explorer
- Source code drill down
- JAVA/WAS Enhancements
- 64-bit Java support
- Enhanced CICS, DB2, and IMS support
- NATURAL and ADABAS support

Session A - [24 x 80]

File Edit View Communication Actions Window Help

File View Navigate Help

R01: IBM APA for z/OS Performance Reports (6852/MACHIND) Row 00001 of 00007
Command ==> Scroll ==> PAGE

Select a category from the list to the right to view the available reports in the selection list below.

- A Admin/Miscellaneous
- S **Statistics/Storage**
- C CPU Usage Analysis
- D DASD I/O Analysis
- W CPU WAIT Analysis
- H HFS Analysis
- V Variance Reports
- I IMS Measurement
- E CICS Measurement
- F DB2 Measurement

Enter S to make a selection or enter the report code on

- S01 Measurement Profile
- S02 Load Module Attributes
- S03 Load Module Summary
- S04 TCB Summary
- S05 Memory Usage Timeline
- S06 Data Space Usage Timeline

F1=Help F2=Split F3=End
F9=Swap F10=Left F11=Right F12=Cancel

Connected to remote server/host 9.30.128.24 using lu/pool TCP00006 and port 23

Source-level support for:

- C/C++
- Assembler
- COBOL
- PL1
- JAVA

Types of Observation Sessions

- Real-Time
- Scheduled
- Via batch submission

IBM CICS Explorer

Explorer Edit Window Help

STC View

APA Observations List (CAZA) - Local

ReqN...	Owned By	Description	Job Name	Date/Time	Samples	Status
6263	MACHIN2	v10ref	PLITEST	May-04 09:40	5,282	Ended
6259	MACHIN2	v10ref-uc29-F7	JAVATST1	May-04 09:38	9,999	USS
		v9	MQPUT	May-04 09:37	774	Ended
		Jeremys performance capture of SA...	TSS09APA	May-03 17:39	10,000	Steps
0001	IKJEFT01	CUSTKSDS CH...		May-03 17:46	5	Ended
0002	IEFBR14	CUSTKSDS ALL...		May-03 17:46	1	Failed
0003	IDCAMS	CUSTKSDS CO...		May-03 17:46	1	Failed
0004	IKJEFT01	CUSTKSDS CH...		May-03 17:46	3	Ended
0005	IEFBR14	CUSTKSDS ALL...		May-03 17:46	1	Failed
0006	IDCAMS	CUSTKSDS CO...		May-03 17:46	1	Failed
0007	IDCAMS	VERIFY		May-03 17:46	18	Ended
0008	SAMIV	RUNSAM		May-03 17:48	10,000	Ended
		Douins performance capture of SAM	TSS16APA	May-03 13:36	10,000	Steps

STC Properties

Details (6254) Reports (6254)

S01: Measurement Profile

Overall S...
CPU A...
WAIT
Queued

CPU Usage Distri...
CPU Active
Application
System
DB2 SQL 0
Data Mgmt 12
Unresolved 714
IMS DLI Call 0 0.0%

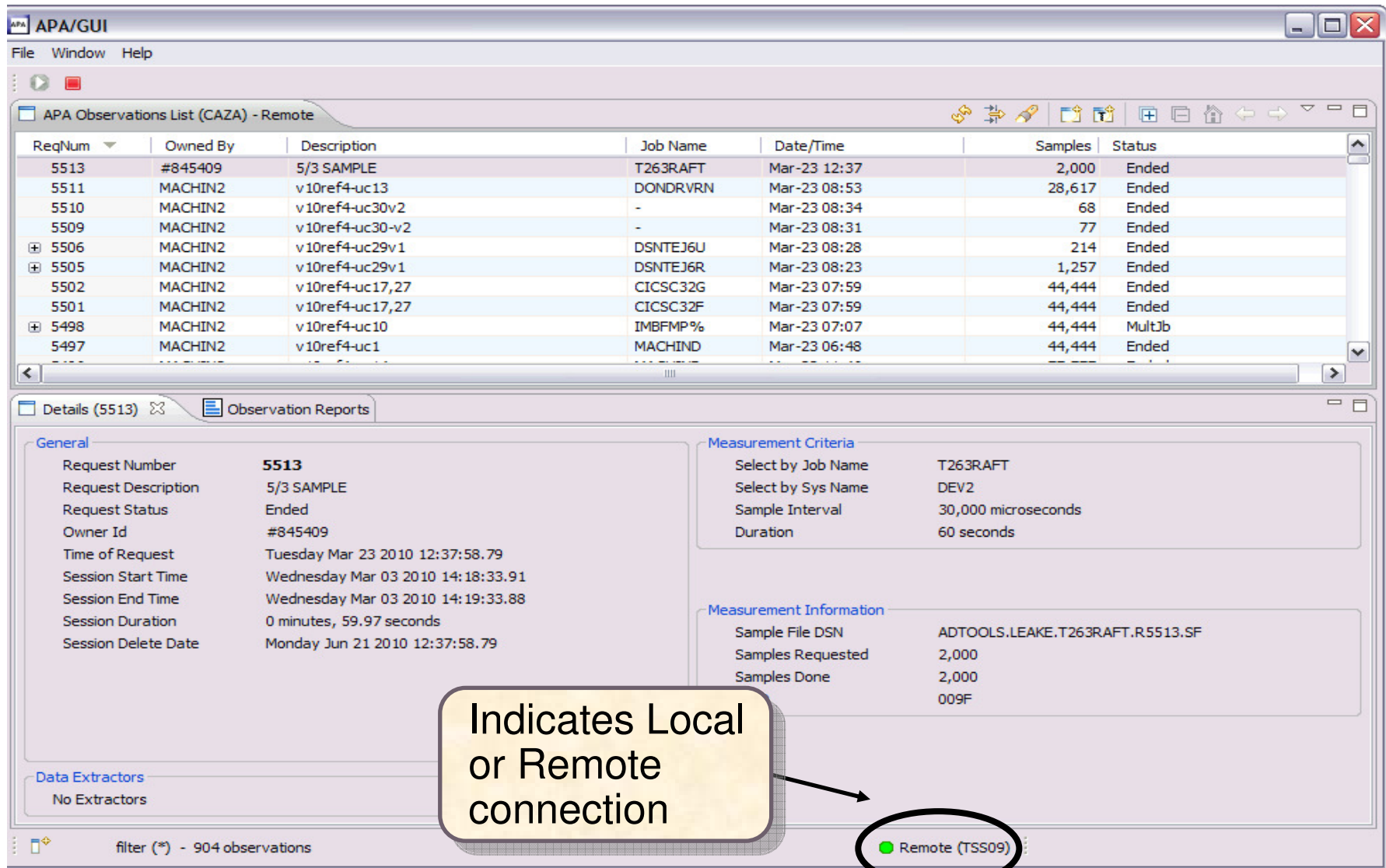
S01 Options

0 : 0 Local

FREE!!

**Eclipse Based
GUI**

The Observations List View



The screenshot displays the APA/GUI interface. The main window shows a table of observations with columns for ReqNum, Owned By, Description, Job Name, Date/Time, Samples, and Status. Below the table, the 'Details (5513)' panel is expanded, showing 'General', 'Measurement Criteria', and 'Measurement Information' sections. A callout box points to the 'Remote (TSS09)' connection indicator in the bottom right corner.

ReqNum	Owned By	Description	Job Name	Date/Time	Samples	Status
5513	#845409	5/3 SAMPLE	T263RAFT	Mar-23 12:37	2,000	Ended
5511	MACHIN2	v10ref4-uc13	DONDRVRN	Mar-23 08:53	28,617	Ended
5510	MACHIN2	v10ref4-uc30v2	-	Mar-23 08:34	68	Ended
5509	MACHIN2	v10ref4-uc30-v2	-	Mar-23 08:31	77	Ended
5506	MACHIN2	v10ref4-uc29v1	DSNTEJ6U	Mar-23 08:28	214	Ended
5505	MACHIN2	v10ref4-uc29v1	DSNTEJ6R	Mar-23 08:23	1,257	Ended
5502	MACHIN2	v10ref4-uc17,27	CICSC32G	Mar-23 07:59	44,444	Ended
5501	MACHIN2	v10ref4-uc17,27	CICSC32F	Mar-23 07:59	44,444	Ended
5498	MACHIN2	v10ref4-uc10	IMBFMP%	Mar-23 07:07	44,444	MultiJob
5497	MACHIN2	v10ref4-uc1	MACHIND	Mar-23 06:48	44,444	Ended

Details (5513)

General

Request Number: 5513
Request Description: 5/3 SAMPLE
Request Status: Ended
Owner Id: #845409
Time of Request: Tuesday Mar 23 2010 12:37:58.79
Session Start Time: Wednesday Mar 03 2010 14:18:33.91
Session End Time: Wednesday Mar 03 2010 14:19:33.88
Session Duration: 0 minutes, 59.97 seconds
Session Delete Date: Monday Jun 21 2010 12:37:58.79

Measurement Criteria

Select by Job Name: T263RAFT
Select by Sys Name: DEV2
Sample Interval: 30,000 microseconds
Duration: 60 seconds

Measurement Information

Sample File DSN: ADTOOLS.LEAKE.T263RAFT.R5513.SF
Samples Requested: 2,000
Samples Done: 2,000
009F

Data Extractors

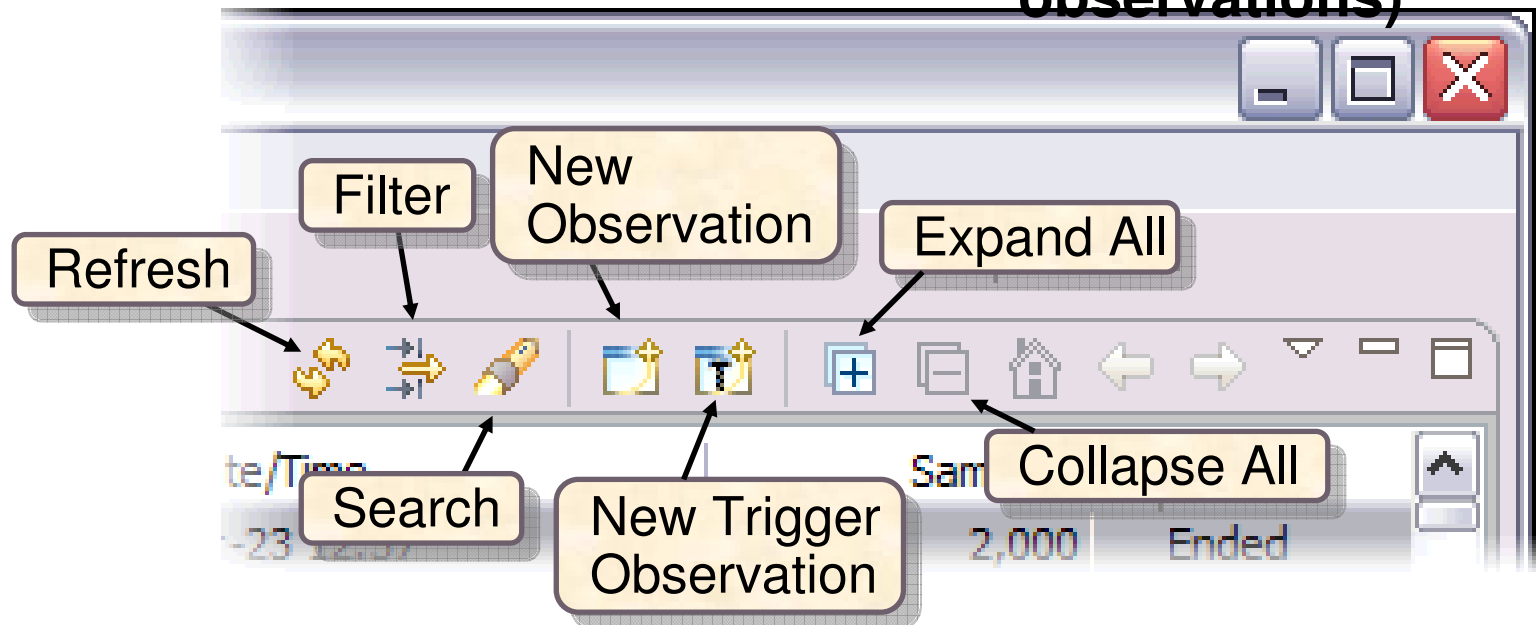
No Extractors

filter (*) - 904 observations

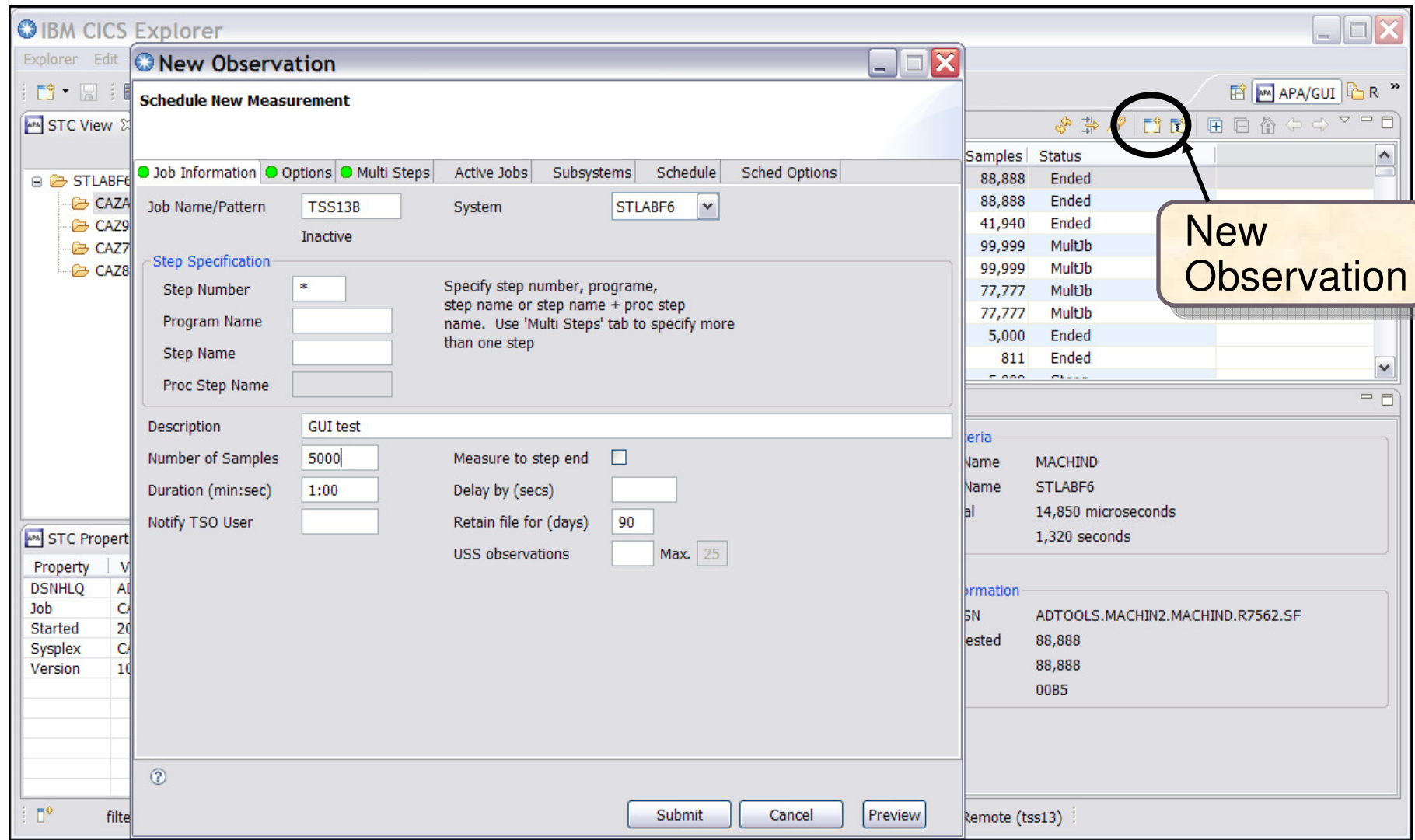
Remote (TSS09)

Observations List View Toolbar

- **Observations List toolbar**
 - Refresh Observations List
 - Filter Observations List
 - Search Observations
 - New Observation
 - New Trigger Observation
 - Expand All (expand all observations)
 - Collapse All (collapse all observations)



Click on new observation button Create a new observation



IBM CICS Explorer

New Observation

Schedule New Measurement

Job Information Options Multi Steps Active Jobs Subsystems Schedule Sched Options

Job Name/Pattern: TSS13B System: STLABF6

Inactive

Step Specification

Step Number: * Specify step number, program, step name or step name + proc step name. Use 'Multi Steps' tab to specify more than one step

Program Name: []

Step Name: []

Proc Step Name: []

Description: GUI test

Number of Samples: 5000 Measure to step end:

Duration (min:sec): 1:00 Delay by (secs): []

Notify TSO User: [] Retain file for (days): 90

USS observations: Max. 25

Submit Cancel Preview

New Observation

Samples	Status
88,888	Ended
88,888	Ended
41,940	Ended
99,999	MultJb
99,999	MultJb
77,777	MultJb
77,777	MultJb
5,000	Ended
811	Ended
5,000	Ended

Series

Name: MACHIND

Name: STLABF6

Time: 14,850 microseconds

Duration: 1,320 seconds

Information

SN: ADTOOLS.MACHIN2.MACHIND.R7562.SF

Created: 88,888

Modified: 88,888

Version: 0085

Remote (tss13)

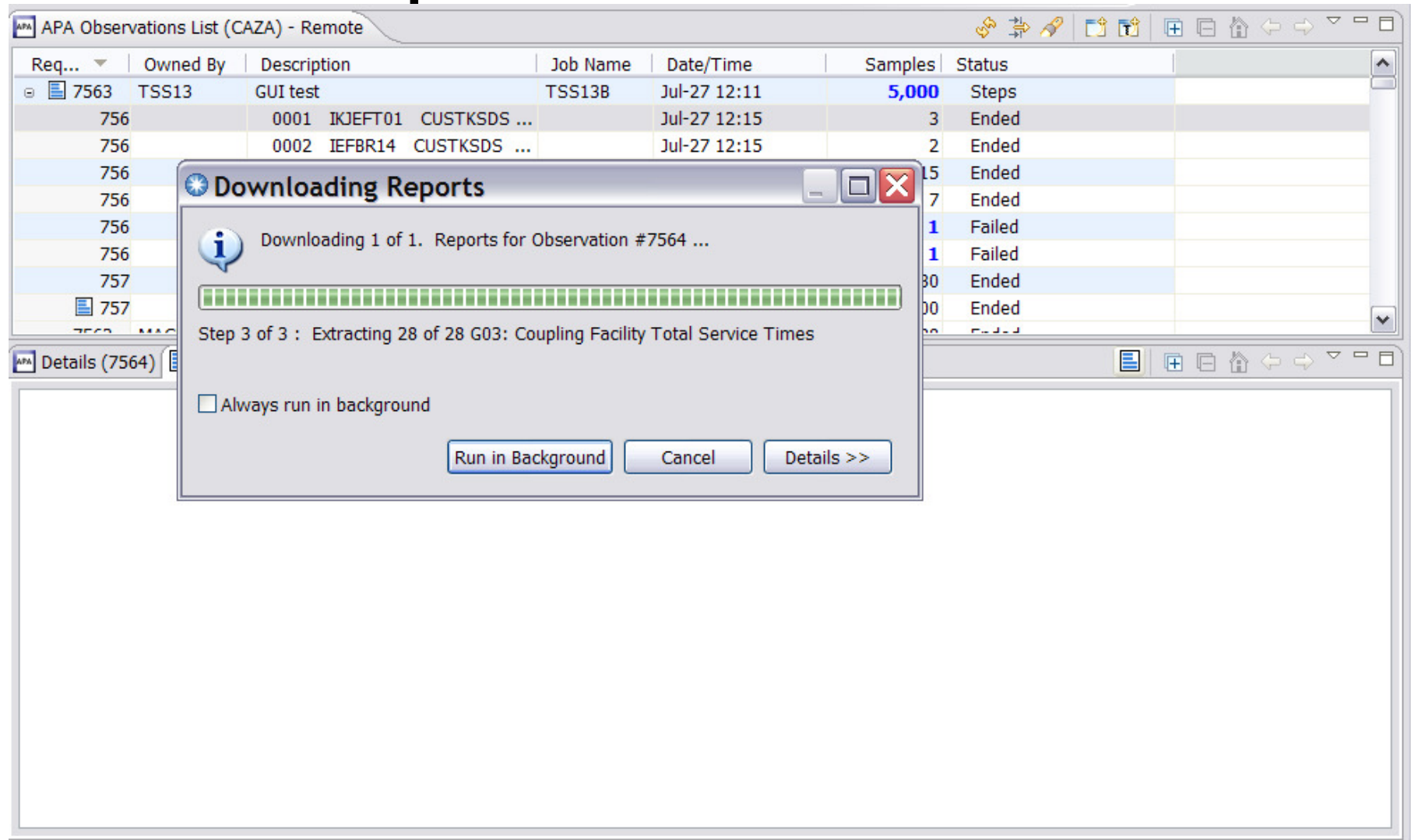
Observation is scheduled

APA Observations List (CAZA) - Remote

Req...	Owned By	Description	Job Name	Date/Time	Samples	Status
7552	TSS13	GUI test job	TSS13B	Jul-27 10:33	5,000	Steps
7551	MACHIN2	v10H-uc26	DB2V9TEP	Jul-27 10:33	22,222	Sched
7533	MACHIN2	v10H-cst6	CIC%	Jul-27 09:45	99,999	MultJb
7532	MACHIN2	v10H-cst6	CIC%	Jul-27 09:45	99,999	MultJb
7527	MACHIN2	v10H-cst6	CIC%	Jul-27 09:09	77,777	MultJb
7522	MACHIN2	v10H-cst6	CIC%	Jul-27 08:47	77,777	MultJb
7521	VNDBKNT	Natural pause II	VNDBKNT1	Jul-27 07:50	5,000	Ended
7520	VNDBKNT	Natural pause	VNDBKNT1	Jul-27 07:33	811	Ended
7511	TSS13	New measurement sampling	TSS13A	Jul-27 07:04	5,000	Steps

APA Details (7562) Reports (7562)

Right click on report and select Download Reports

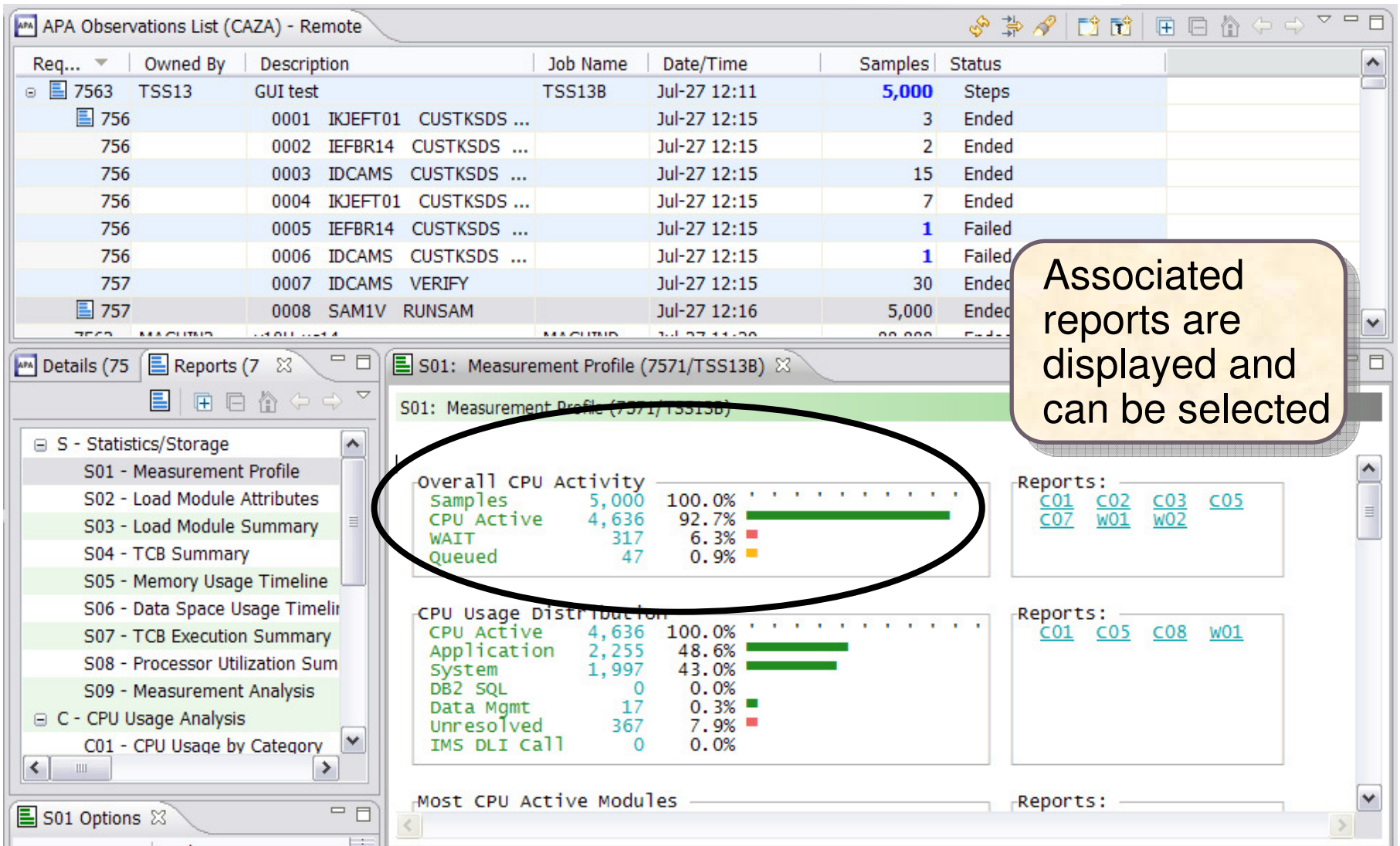


The screenshot shows a web-based application interface for 'APA Observations List (CAZA) - Remote'. A table lists various reports with columns for 'Req...', 'Owned By', 'Description', 'Job Name', 'Date/Time', 'Samples', and 'Status'. A 'Downloading Reports' dialog box is overlaid on the table, indicating the download progress for a report. The dialog box shows a progress bar and the text 'Step 3 of 3 : Extracting 28 of 28 G03: Coupling Facility Total Service Times'. Below the progress bar, there is a checkbox for 'Always run in background' and three buttons: 'Run in Background', 'Cancel', and 'Details >>'.

Req...	Owned By	Description	Job Name	Date/Time	Samples	Status
7563	TSS13	GUI test	TSS13B	Jul-27 12:11	5,000	Steps
756		0001 IKJEFT01 CUSTKSDS ...		Jul-27 12:15	3	Ended
756		0002 IEFBR14 CUSTKSDS ...		Jul-27 12:15	2	Ended
756					15	Ended
756					7	Ended
756					1	Failed
756					1	Failed
757					30	Ended
757					00	Ended
757					00	Ended

Report list is displayed

S01 Measurement Profile report shows high CPU activity



The screenshot displays the SHARE software interface. At the top, a table lists observations. Below it, the 'S01: Measurement Profile (7571/TSS13B)' report is open. A callout box points to the 'Overall CPU Activity' section, which is circled in black. The 'Overall CPU Activity' section shows a bar chart for 'Overall CPU Activity' at 100.0%. Below it, the 'CPU Usage Distribution' section shows a bar chart for 'CPU Active' at 100.0%. The 'Reports:' section on the right lists several reports: C01, C02, C03, C05, C07, W01, W02, C01, C05, C08, W01.

Req...	Owned By	Description	Job Name	Date/Time	Samples	Status
7563	TSS13	GUI test	TSS13B	Jul-27 12:11	5,000	Steps
756		0001 IKJEFT01 CUSTKSDS ...		Jul-27 12:15	3	Ended
756		0002 IEFBR14 CUSTKSDS ...		Jul-27 12:15	2	Ended
756		0003 IDCAMS CUSTKSDS ...		Jul-27 12:15	15	Ended
756		0004 IKJEFT01 CUSTKSDS ...		Jul-27 12:15	7	Ended
756		0005 IEFBR14 CUSTKSDS ...		Jul-27 12:15	1	Failed
756		0006 IDCAMS CUSTKSDS ...		Jul-27 12:15	1	Failed
757		0007 IDCAMS VERIFY		Jul-27 12:15	30	Ended
757		0008 SAM1V RUNSAM		Jul-27 12:16	5,000	Ended

Overall CPU Activity

Samples	5,000	100.0%
CPU Active	4,636	92.7%
WAIT	317	6.3%
Queued	47	0.9%

CPU Usage Distribution

CPU Active	4,636	100.0%
Application	2,255	48.6%
System	1,997	43.0%
DB2 SQL	0	0.0%
Data Mgmt	17	0.3%
Unresolved	367	7.9%
IMS DLI call	0	0.0%

Reports: C01 C02 C03 C05 C07 W01 W02

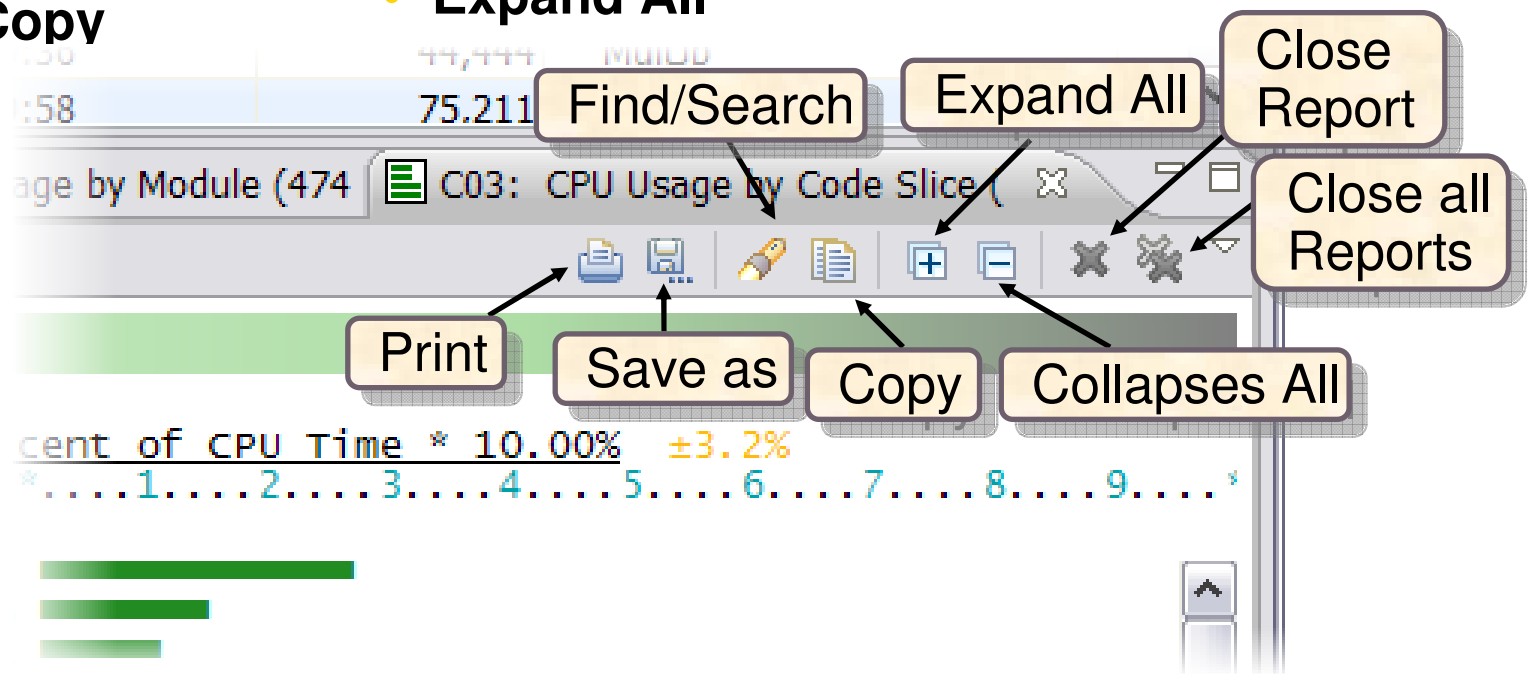
Reports: C01 C05 C08 W01

Reports:

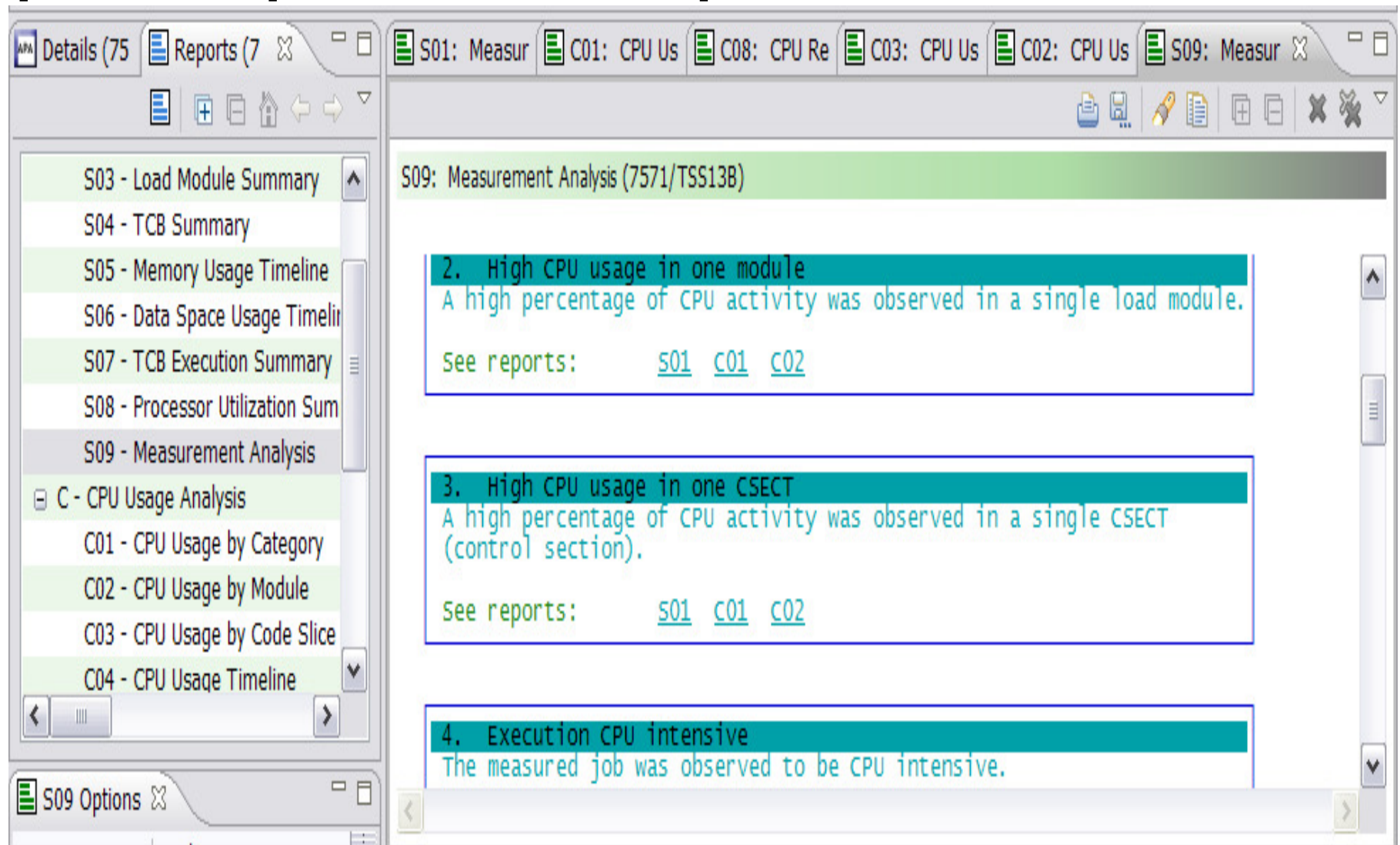
Report View

- **Toolbar**

- Provides buttons for report-level actions which include:
 - **Print**
 - **Save As**
 - **Find**
 - **Copy**
 - **Close Report**
 - **Close All Reports**
 - **Expand All**



S09 Measurement Analysis report displays possible performance improvement



The screenshot shows the SHARE Measurement Analysis report for job S09 (7571/TSS13B). The left sidebar lists various reports, with S09 - Measurement Analysis selected. The main content area displays three key findings:

- 2. High CPU usage in one module**
A high percentage of CPU activity was observed in a single load module.
see reports: [S01](#) [C01](#) [C02](#)
- 3. High CPU usage in one CSECT**
A high percentage of CPU activity was observed in a single CSECT (control section).
see reports: [S01](#) [C01](#) [C02](#)
- 4. Execution CPU intensive**
The measured job was observed to be CPU intensive.

APA V11 Java Test Case (Java 5)

APA/GUI

File Window Help

APA Observations List (CAZA) - Remote

Reports (1295) Details (1295)

Job Name Date/Time Samples Status

[J01: Java Summary/Attributes \(1295/\)](#)
[J04: Java CPU Usage by Package \(12\)](#)
[S01: Measurement Profile \(1295/JAVA\)](#)
[J15: Java Wait Time by Class \(1295/\)](#)
[J10: Java Svc Time by Class \(1295/JA\)](#)

S - Statistics/Storage

- S01 - Measurement Profile
- S02 - Load Module Attributes
- S03 - Load Module Summary
- S04 - TCB Summary
- S05 - Memory Usage Timeline
- S06 - Data Space Usage Timeline
- S07 - TCB Execution Summary
- S08 - Processor Utilization Summary
- S09 - Measurement Analysis

C - CPU Usage Analysis

- C01 - CPU Usage by Category
- C02 - CPU Usage by Module
- C03 - CPU Usage by Code Slice
- C04 - CPU Usage Timeline
- C05 - CPU Usage Task/Category
- C06 - CPU Usage Task/Module
- C07 - CPU Usage by Procedure
- C08 - CPU Referred Attribution
- C09 - CPU Usage by PSW/ObjCode

D - DASD I/O Analysis

W - CPU WAIT Analysis

H - HFS Analysis

G - Coupling Facility

J - Java Measurement

- J01 - Java Summary/Attributes
- J04 - Java CPU Usage by Package
- J05 - Java CPU Usage by Class
- J06 - Java CPU Usage by Method
- J07 - Java CPU Usage by Call Path
- J09 - Java Svc Time by Package
- J10 - Java Svc Time by Class
- J11 - Java Svc Time by Method
- J12 - Java Svc Time by Call Path
- J14 - Java Wait Time by Package
- J15 - Java Wait Time by Class
- J16 - Java Wait Time by Method
- J17 - Java Wait Time by Call Path

S01: Measurement Profile (1295/JAVATST1)

Overall CPU Activity

Samples	4,657	100.0%
CPU Active	2,192	47.0%
WAIT	1,222	26.2%
Queued	1,243	26.6%

Reports: [C01](#) [C02](#) [C03](#) [C05](#) [C07](#) [W01](#) [W02](#)

CPU Usage Distribution

CPU Active	2,233	100.0%
Application	975	43.6%
System	1,016	45.4%
DB2 SQL	0	0.0%
Data Mgmt	0	0.0%
Unresolved	242	10.8%
IMS DLI Call	0	0.0%

Reports: [C01](#) [C05](#) [C08](#) [W01](#)

Most CPU Active Modules

CPU Active	2,233	100.0%
CEEPLPKA	910	40.7%
CELHV003	40	1.7%
CAZ00086	36	1.6%
CAZ00977	13	0.5%
GFUAPFS1	12	0.5%

Reports: [C02](#)

Most CPU Active CSECTS

CPU Active	2,233	100.0%
CEEOPCW in CEEPLPKA	728	32.6%
ut_trace in *PATHNAM	120	5.3%
CEEOPMLX in CEEPLPKA	81	3.6%
IPProfile in *PATHNAM	68	3.0%
JBCSTACK in *PATHNAM	58	2.5%

Reports: [C02](#)

CPU Modes

Active CPU	2,233	100.0%
Supv Mode	98	4.3%
Prob Mode	2,135	95.6%
In SVC	13	0.5%
AMODE 24	0	0.0%
AMODE 31	2,209	98.9%
AMODE 64	24	1.0%
User Key	2,139	95.7%
System Key	94	4.2%

Reports: [S08](#)

Request parameters

Request number 1295
 Description Z/OS s390-31 j9vmmz3123-20090707 (JIT enabled).J
 Sample file DSN ADTOOLS.APAA10.MACHIN2.R1295.JAVATST1.SF
 Retention Thu Nov-05-2009
 Data extractors IMS, DB2, DB2+, IMS+, JAVA

Requesting user	MACHIN2	Nbr of samples	9,999
Time of request	06:30:44	Duration	22 sec
Date of request	wed Oct-07-2009	Active/pending	Pending
Job name	JAVATST1	Proc step name	n/a
Step name/number	0002	Delay time	none
Step program	n/a		

Measurement environment

Job name	JAVATST1	Region size <16MB	11,240K
Job number	J0804560	Region size >16MB	1,778,688K
Step name	*OMVSEX	Step program	BXPXPRECP

S01 Options

Option	Value

0:0 Remote (leak)

APA V11 Java Test Case (Java 5)

APA/GUI

File Window Help

APA Observations List (CAZA) - Remote

ReqNum	Owned By	Description	Job Name	Date/Time	Samples	Status
1310	MACHIN2	v10ref7-uc19	STEPS	Oct-07 09:50	9,999	Steps
1301	MACHIN2	v10ref7-uc27	CICSC32F	Oct-07 07:15	99,999	Ended
1299	MACHIN2	v10ref7-uc27	CICSC32F	Oct-07 07:03	99,999	Ended
1298	MACHIN2	v10ref7-uc27	CICSC32F	Oct-07 06:54	547	Cancel
1292	MACHIN2	v10ref7-uc29	JAVATST1	Oct-07 06:29	9,999	USS
1293		BPXBATCH RUN		Oct-07 06:30	9	Ended
1294		BPXPREFC *OMVSEX		Oct-07 06:30	3	Ended
1295		BPXPREFC *OMVSEX *Java*		Oct-07 06:30	4,658	Ended
1296		n/a		Oct-07 06:30	1	Failed
1242	MACHIN2	v10ref7-uc15	DB2DATA	Oct-06 14:02	21,277	Ended
1231	MACHIN2	v10ref7-uc13v2	DONDRVRN	Oct-06 10:33	87,541	Ended

Reports (1295) Details (1295)

C01: CPU Usage by Category (1295/JAVATST1) J01: Java Summary/Attributes (1295/JAVATST1)

J01: Java Summary/Attributes (1295/JAVATST1)

Observed Java Virtual Machines (JVMs)

JVMId	Identifier	Heap	Max	Description
00001	00200000	2M	67M	J2RE 1.5.0 IBM J9 2.3 z/OS s390-31 j9vmmz3123-20090707 (JIT enabled).J9VM - 20090706_38445_bhdsmr.JIT - 20090623_1334_r8.gc - 200906_09

Observed Java Packages

PkgId	Package Name
00001	java/lang
00002	com/ibm/oti/vm
00003	sun/misc
00004	java/math

Observed Java Classes

ClsId	PkgId	Class Name
00001	00000	Burner4Test
00002	00000	Burner4
00003	00001	Runtime
00004	00002	BootstrapClassLoader
00005	00001	ClassLoader
00006	00003	Launcher\$AppClassLoader
00007	00004	BigDecimal
00008	00001	J9VMInternals
00009	00002	AbstractClassLoader
00010	00004	BigInteger

Observed Java Methods

MthId	ClsId	Method Name
00001	00001	checkMem
00002	00002	calc
00003	00002	exec
00004	00001	main
00005	00003	freeMemory
00006	00002	next1

J01 Options

Option	Value

0 : 0 Remote (leake)

APA V11 Java Test Case (Java 5)

APA/GUI

File Window Help

APA Observations List (CAZA) - Remote

ReqNum	Owned By	Description	Job Name	Date/Time	Samples	Status
1310	MACHIN2	v10ref7-uc19	STEPS	Oct-07 09:50	9,999	Steps
1301	MACHIN2	v10ref7-uc27	CICSC32F	Oct-07 07:15	99,999	Ended
1299	MACHIN2	v10ref7-uc27	CICSC32F	Oct-07 07:03	99,999	Ended
1298	MACHIN2	v10ref7-uc27	CICSC32F	Oct-07 06:54	547	Cancel
1292	MACHIN2	v10ref7-uc29	JAVATST1	Oct-07 06:29	9,999	USS
1293		BPXBATCH RUN		Oct-07 06:30	9	Ended
1294		BPXPREC *OMVSEX		Oct-07 06:30	3	Ended
1295		BPXPREC *OMVSEX *Java*		Oct-07 06:30	4,658	Ended
1296		n/a		Oct-07 06:30	1	Failed
1242	MACHIN2	v10ref7-uc15	DB2DATA	Oct-06 14:02	21,277	Ended
1231	MACHIN2	v10ref7-uc13v2	DONDRVRN	Oct-06 10:33	87,541	Ended

Reports (1295) Details (1295)

- S08 - Processor Utilization Summary
- S09 - Measurement Analysis
- C - CPU Usage Analysis
 - C01 - CPU Usage by Category
 - C02 - CPU Usage by Module
 - C03 - CPU Usage by Code Slice
 - C04 - CPU Usage Timeline
 - C05 - CPU Usage Task/Category
 - C06 - CPU Usage Task/Module
 - C07 - CPU Usage by Procedure
 - C08 - CPU Referred Attribution
 - C09 - CPU Usage by PSW/ObjCode
- D - DASD I/O Analysis
- W - CPU WAIT Analysis
- H - HFS Analysis
- G - Coupling Facility
- J - Java Measurement
 - J01 - Java Summary/Attributes
 - J04 - Java CPU Usage by Package
 - J05 - Java CPU Usage by Class
 - J06 - Java CPU Usage by Method
 - J07 - Java CPU Usage by Call Path
 - J09 - Java Svc Time by Package
 - J10 - Java Svc Time by Class
 - J11 - Java Svc Time by Method
 - J12 - Java Svc Time by Call Path
 - J14 - Java Wait Time by Package
 - J15 - Java Wait Time by Class
 - J16 - Java Wait Time by Method
 - J17 - Java Wait Time by Call Path

J10: Java Svc Time by Class (1295/JAVATST1)

JavaId	Class/Method	Percent of Time * 10.00% ±2.2%
00003	Runtime	61.46
00005	FreeMemory	61.46
00002	Burner4	29.99
00002	calc	11.01
00006	next1	7.50
00007	next2	7.50
00003	exec	3.95
00001	Burner4Test	8.25
00001	checkMem	8.25
00010	BigInteger	0.14
00017	<clinit>	0.09
00016	<init>	0.04
00004	BootstrapClassLoader	0.04
00008	loadClass	0.04
00007	BigDecimal	0.04
00012	<clinit>	0.04
00009	AbstractClassLoader	0.04
00015	getPackageName	0.04

J10 Options

Option	Value
Levels	2

0 : 0 Remote (leake)

APA V11 Base User Interface

APA/GUI

File Window Help

APA Observations List (CAZA) - Remote

ReqNum	Owned By	Description	Job Name	Date/Time	Samples	Status
1518	MACHIN2	test 6 cics's	CICSC41F	Oct-15 16:18	99,999	Ended
1517	MACHIN2	test 6 cics's	CICSC32G	Oct-15 16:18	99,999	Ended
1516	MACHIN2	test 6 cics's	CICSC32F	Oct-15 16:18	99,999	Ended
1515	MACHIN2	test 6 cics's	CICSC31G	Oct-15 16:18	99,999	Ended
1514	MACHIN2	test 6 cics's	CICSC31F	Oct-15 16:18	99,999	Ended
1513	MACHIN2	test 6 cics's	CICSC11A	Oct-15 16:18	99,999	Ended
1512	MACHIN2	test	CICSC32G	Oct-15 14:09	10,000	Ended
1511	MACHIN2	test	CICSC32F	Oct-15 14:09	10,000	Ended
1507	TSS13		JAVATST1	Oct-13 16:11	1,000	Steps
1506	MACHIN2	v10ref7-uc14	MACHIND	Oct-13 14:38	99,999	Ended
1505	MACHIN2	v10ref7-uc7	CICSC32F	Oct-13 12:10	99,999	Ended
1502	MACHIN2	v10ref7-uc7	IMBFMP%	Oct-13 09:07	99,999	MultiB
1501	TSS21	CPU Bound Sample	TSS21A	Oct-12 12:33	50,000	Ended
1497	AGM01	CICS MASS #2	CICS32B	Oct-09 09:50	1,000	Ended
1496	AGM01	CICS MASS #1	CICS32A	Oct-09 09:50	1,000	Ended
1495	AGM01	DB2 MASS #3	DB8GWLM1	Oct-09 11:46	2,984	Ended
1494	AGM01	DB2 MASS #2	DB8GWLM1	Oct-09 11:46	5,825	Ended
1493	AGM01	DB2 MASS #1	DB8GWLM1	Oct-09 11:46	7,652	Ended
1492	AGM01	DB2 MULTIPLE ADDRESS SPACE SUPPORT	DBACS27	Oct-09 11:46	7,776	Ended
1491	AGM01	DB2 SP Call	DBACS27	Oct-09 11:46	7,776	Ended
1490	MACHIN2	APA V7 FILE	DB2V9TEP	Oct-08 10:15	10,043	Ended
1489	A27	KNLIN SPLIT MODULE SAMPLE	DB8LOCKT	Oct-08 10:05	5,153	Ended
1488	MACHIN2		IM8FMP00	Oct-08 09:55	99,999	Ended
1487	MACHIN2	APA V9 FILE	MQPUT	Oct-08 09:53	774	Ended
1486	MACHIN2	v10ref7-uc30v4	-	Oct-08 07:29	156	Ended
1485	MACHIN2	v10ref7-uc30v3	-	Oct-08 07:19	207	Ended
1483	MACHIN2	v10ref7-uc30v2	DSNTEJ6U	Oct-08 07:04	1,037	Ended
1481	MACHIN2	v10ref7-uc30	DSNTEJ6R	Oct-08 06:59	1,828	Ended
1470	MACHIN2	v10ref7-uc26	DB2V9TEP	Oct-07 14:34	16,094	Ended
1440	MACHIN2	v10ref7-uc19v2	STEPS	Oct-07 10:15	9,999	Steps
1310	MACHIN2	v10ref7-uc19	STEPS	Oct-07 09:50	9,999	Steps

Details (1518) Reports (1518)

General

Request Number: **1518**
 Request Description: test 6 cics's
 Request Status: Ended
 Owner Id: MACHIN2
 Time of Request: Thursday Oct 15 2009 16:03:53.79
 Session Start Time: Thursday Oct 15 2009 16:03:54.03
 Session End Time: Thursday Oct 15 2009 16:18:54.01
 Session Duration: 14 minutes, 59.98 seconds
 Session Delete Date: Saturday Nov 14 2009 16:18:57.74

Measurement Criteria

Select by Job Name: CICSC41F
 Select by Sys Name: STLABF6
 Sample Interval: 9,000 microseconds
 Duration: 900 seconds

Measurement Information

Sample File DSN: ADTOOLS.APAA10.MACHIN2.R1518.CICSC41F.SF
 Samples Requested: 99,999
 Samples Done: 99,999
 ASID: 00B0

Data Extractors

CICS, IMS, IMS+, DB2, DB2+

filter (*) - 264 observations

Remote (leak)

APA V11 CICS Test Case Sample

APA/GUI

File Window Help

APA Observations List (CAZA) - Remote

ReqNum	Owned By	Description	Job Name	Date/Time	Samples	Status
1518	MACHIN2	test 6 cics's	CICSC41F	Oct-15 16:18	99,999	Ended
1517	MACHIN2	test 6 cics's	CICSC32G	Oct-15 16:18	99,999	Ended
1516	MACHIN2	test 6 cics's	CICSC32F	Oct-15 16:18	99,999	Ended
1515	MACHIN2	test 6 cics's	CICSC31G	Oct-15 16:18	99,999	Ended
1514	MACHIN2	test 6 cics's	CICSC31F	Oct-15 16:18	99,999	Ended
1513	MACHIN2	test 6 cics's	CICSCI1A	Oct-15 16:18	99,999	Ended
1512	MACHIN2	test	CICSC32G	Oct-15 14:09	10,000	Ended
1511	MACHIN2	test	CICSC32F	Oct-15 14:09	10,000	Ended
1507	TSS13		JAVATST1	Oct-13 16:11	1,000	Steps

Details (1516) Reports (1516) S01: Measurement Profile (1516/CICSC32F)

S01: Measurement Profile (1516/CICSC32F)

Overall CPU Activity

Category	Samples	Percentage
CPU Active	99,999	100.0%
WAIT	3	0.0%
Queued	99,983	99.9%
	13	0.0%

Reports: [C01](#) [C02](#) [C03](#) [C05](#)
[C07](#) [W01](#) [W02](#)

CPU Usage Distribution

Category	Samples	Percentage
CPU Active	3	100.0%
Application	0	0.0%
System	3	100.0%
DB2 SQL	0	0.0%
Data Mgmt	0	0.0%
Unresolved	0	0.0%
IMS DLI Call	0	0.0%

Reports: [C01](#) [C05](#) [C08](#) [W01](#)

Most CPU Active Modules

Module	Samples	Percentage
CPU Active	3	100.0%
IAXVF	2	66.6%
DFHSIP	1	33.3%

Reports: [C02](#)

Most CPU Active CSECTS

CSECT	Samples	Percentage
CPU Active	3	100.0%
IARVFRMN in IAXVF	2	66.6%
KEDRT in DFHSIP	1	33.3%

Reports: [C02](#)

CPU Modes

Mode	Samples	Percentage
Active CPU	3	100.0%
Supv Mode	2	66.6%
Prob Mode	1	33.3%
In SVC	2	66.6%
AMODE 24	0	0.0%
AMODE 31	3	100.0%
AMODE 64	0	0.0%
User Key	1	33.3%
System Key	2	66.6%

Reports: [S08](#)

Request parameters

S01 Options

Option	Value

0 : 0 Remote (leake)

The Application Performance Analyzer ISPF Interface

Each step generates reports, select the appropriate report

```

File View Navigate Help

R02: IBM APA for z/OS Observation List (CAZA) Row 00001 of 00177
Command ===> Scroll ===> PAGE

ReqNum Owned By Description Job Name Date/Time Samples Status

7511 + TSS13 New measurement TSS13A Jul-27 7:04 5,000 STEPS
-> 7512 0001 IKJEFT01 CUSTKSDS CHECKV Jul-27 7:06 63 Ended
-> 7513 0002 IEFBR14 CUSTKSDS ALLOCV Jul-27 7:06 2 Ended
-> 7514 0003 IDCAMS CUSTKSDS COPYV Jul-27 7:06 50 Ended
-> 7515 0004 IKJEFT01 CUSTKSDS CHECKV Jul-27 7:06 4 Ended
-> 7516 0005 IEFBR14 CUSTKSDS ALLOCV Jul-27 7:06 2 Ended
-> 7517 0006 IDCAMS CUSTKSDS COPYV Jul-27 7:06 51 Ended
-> 7518 0007 IDCAMS VERIFY Jul-27 7:06 13 Ended
- r519 0008 SAM1V RUNSAM Jul-27 7:07 5,000 Ended

7510 MACHIND v10H- uc8 VSAMJOB Jul-27 6:37 78,787 Sched
7509 MACHIND v10H-uc20 CICSC31G Jul-27 6:36 11 Active
7508 MACHIND v10H- uc5 VSAMREAD Jul-27 6:25 59,218 E
7498 MACHIN2 v10H-uc10 PLITEST Jul-26 16:58 2,088 E
7496 + MACHIN2 v10H-uc23v2 COBOLPLI Jul-26 16:14 34,567 T
  
```



R01 Performance Report index is displayed

Select S01 Measurement Report

```

File View Navigate Help
-----
R01: IBM APA for z/OS Performance Reports (7519/TSS13A)      Row 00001 of 00007
Command ==> _____ Scroll ==> PAGE

Select a category from the list to the right to view the available
reports in the selection list below.

_ A Admin/Miscellaneous      _ I IMS Measurement
_ S Statistics/Storage    _ E CICS Measurement
_ C CPU Usage Analysis      _ F DB2 Measurement
_ D DASD I/O Analysis       _ Q MQ Measurement
_ W CPU WAIT Analysis       _ G Coupling Facility
_ H HFS Analysis            _ J Java Measurement
_ V Variance Reports        _ X Multi Address Space

More: +
Enter S to make a selection or enter the report code on the command line

S S01 Measurement Profile      _ S07 TCB Execution Summary
_ S02 Load Module Attributes    _ S08 Processor Utilization Summary
_ S03 Load Module Summary      _ S09 Measurement Analysis
_ S04 TCB Summary
_ S05 Memory Usage Timeline
_ S06 Data Space Usage Timeline

Enter
  
```


Use the 'p' line command to display program source for the SAM2V csect



```

File View Navigate Help
-----
C01: CPU Usage by Category (7519/TSS13A) Row 00001 of 00081
Command ==> _____ Scroll ==> PAGE

Name      Description      Percent of CPU Time * 10.00%  +1.4%
          *.....1.....2.....3.....4.....5.....6.....7.....8
APPLCN    Application Code  48.66  ██████████
→ SAM2V   Application Program 48.66  ██████████
  pSAM2V  CSECT in SAM2V    48.66  ██████████

SYSTEM    System/OS Services 43.76  ██████████
→ LERUNLIB Language      43.29  ██████████
  Environment Runtime
→ IGZCPAC COBPACK      43.24  ██████████
  → IGZCXDI Double
    precision
    division
→ IGZEINI Environment    0.02
  initialization
  → IGZEINI CSECT in IGZEINI 0.02
→ IGZCPCO COBPACK      0.02
  → IGZEVIO VSAM
    input/output
  
```



The program statements that used the most CPU time are displayed Bar charts indicate statements using the most resources



LineNo	Offset	Prcnt	Source Statement
000097			
000098			100-CRUNCH-LOOP.
000099	0003C2	.90	MOVE 'CALCULATING BALANCE STATS' TO WS-PROGRAM-
000100			* *** Increment Record Count ***
000101	0003D2	5.24	ADD +1 TO BALANCE-COUNT
000102			* *** Add this customer's BALANCE to the grand tot
000103	0003EA	11.32	COMPUTE BALANCE-TOTAL =
000104			BALANCE-TOTAL + CUST-ACCT-BALANCE
000105			* *** Calculate Average ***
000106	000412	13.97	COMPUTE BALANCE-AVERAGE =
		46.09	<- CPU time attributed to above statement
000107			BALANCE-TOTAL / BALANCE-COUNT
000108			* *** Calculate Minimum ***
000109	00045A	2.41	IF WS-FIRST-TIME-SW = 'Y'
000110	00046A		MOVE CUST-ACCT-BALANCE TO BALANCE-MIN.
000111	000474	1.61	IF CUST-ACCT-BALANCE < BALANCE-MIN
000112	000486		MOVE CUST-ACCT-BALANCE TO BALANCE-M
000113			* *** Calculate Maximum ***



Application Performance Analyzer: What's new in version 11?

- The IBM Application Performance Analyzer Plug-in for Eclipse, when integrated with Application Performance Analyzer for z/OS and CICS Explorer, encompasses both the Observation Request and Reporting functions, including the R02 screens list, detail views, edit functions, and reports for the observation. The plug-in GUI can be used for submitting new observation requests and for navigating the performance analysis reports generated from observation requests. The plugin GUI can display and provide functions to multiple components of Application Performance Analyzer at the same time. The major views include:
 - STC View, which lists all active started tasks
 - Observations List View, which lists all observations
 - Observation Detail View, which provides details of an observation
 - Reports List View, which lists all reports for an observation
 - Report View, which displays an individual report
- The Application Performance Analyzer Plug-in is enhanced to support IMS Multiple Address Space measurements, source program mapping, and to display windows for details of the sample file and the module information, to make it consistent with the ISPF panels.
- 64-bit support for xplink.
- 64-bit Java support

Application Performance Analyzer: What's new in version 11?

- CICS+ new CICS intercept extractor.
- New CICS reports are added to report mean and total service times by user, and to report CPU/service time by CICS transaction.
- New Java reports are added to report the Java heap usage timeline and Java CPU usage by thread.
- The "Variance Report" feature is improved by providing three new variance reports highlighting the main difference between the CICS, DB2, and IMS "summary reports." Up to 20 measurements can be selected for variance reporting, providing the ability to evaluate the performance of specific jobs over an extended time period.
- The DB2 CPU/service time reports are enhanced to allow the developer to display the percentage used in place of the mean fields.
- Support for the natural language and ADATABASE from Software AG.
- Recommendation to the developer that a VSAM reorganization be done when CI and CA splits are present. This is shown in the Application Performance Analyzer S09 report.
- Support for large block size (greater than 262K).

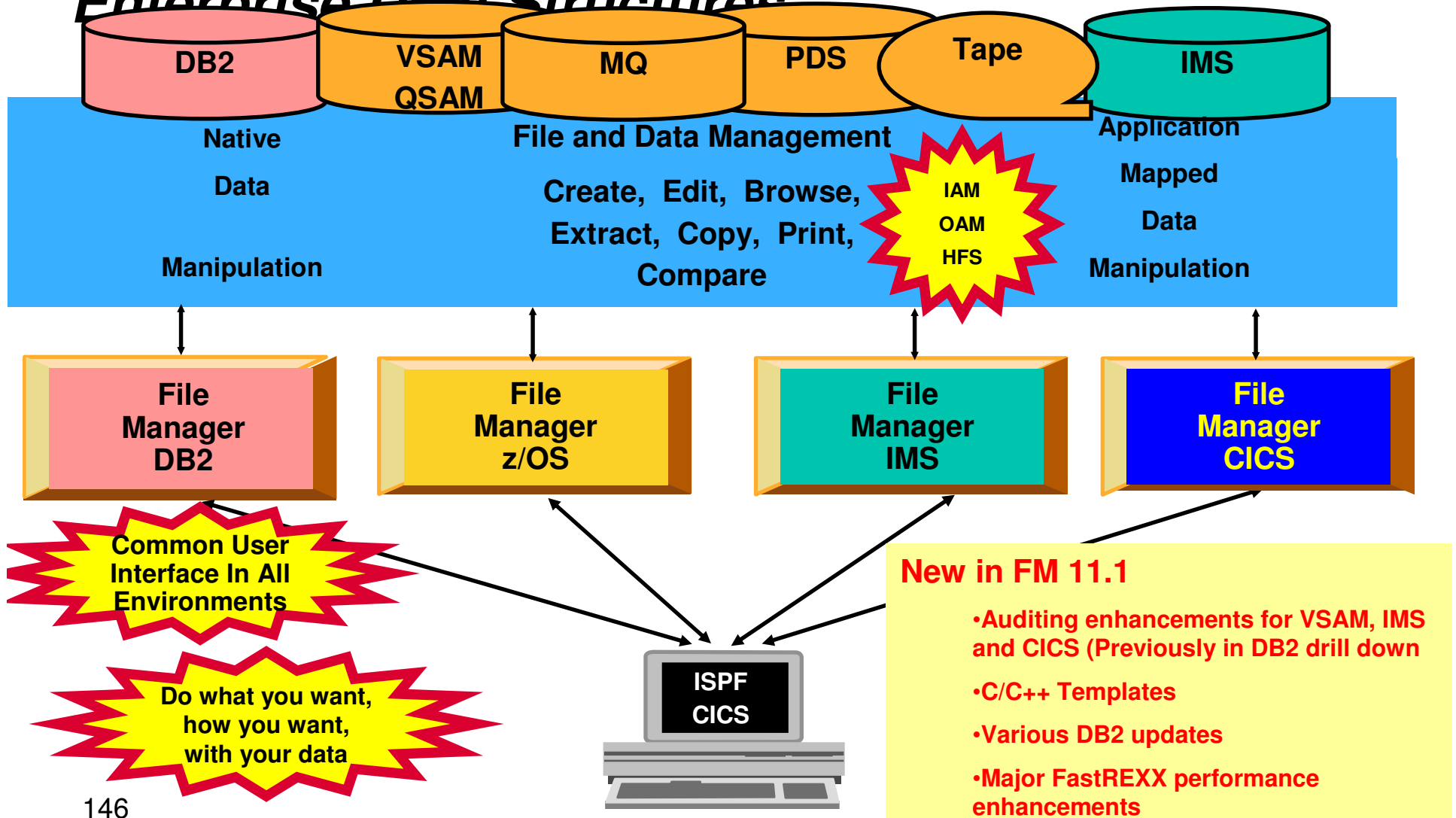
Application Performance Analyzer: What's new in version 11?

- A memory tracking exit that can include data about modules managed via directed load.
- Permit use of system symbols in SampleHLQ, and allow complete control of sample file naming convention via SampleDSN and DuplicateDSN configuration settings.
- C/C++ mapping time stamp interval is reduced.
- An option to load source and then map it to the module (the inverse of usual C/C ++).
- IMS Multiple Address Space Support that groups all IMS MPP region observations under a single parent observation in R02.
- IMS Multiple Address Space Support for IMSplex.
- Support a shared source program mapping dataset list, called the Common Data Store.
- Support measuring Java jobs running in WebSphere V7.
- Currency support for DB2 V10.

Agenda

- Fault Analyzer
- Debug Tool
- Application Performance Analyzer
- File Manager

File Manager for z/OS (FM) – Manage a variety of Enterprise Data Structures



Formatted Data Editor

Display and edit PDS members, sequential datasets, and VSAM datasets using the Formatted Data editor

Template Associated: TSS09.ADLAB.COPYLIB(CUST1)

Layout: CUST-REC

CUST-ID	NAME	ACCT-BALANCE	ORDERS-YTD	ADDR
01001	Lynn, Amanda	67.68	9	119 North Lake Road
02200	Graham, Anna	610.05	10	89 Clay Springs Rd
02202	Major, Art	1234.56	5	
03003	Prentice, Anna	0.00	7	
5	03390	Deeds, Darren	74.00	649 Brown Street
6	05570	Parker, Ford	233.27	3039 Manning St.

Associated template

Table Format

Single Mode

Field	Picture	Type	Start	Length	Data
CUST-ID	X(5)	AN	1	5	01001
NAME	X(17)	AN	6	17	Lynn, Amanda
ACCT-BALANCE			23	5	67.68
ORDERS-YTD			28	2	9
ADDR			30	20	119 North Lake Road
CITY	X(14)	AN	50	14	Spirit Lake

Switch to unformatted

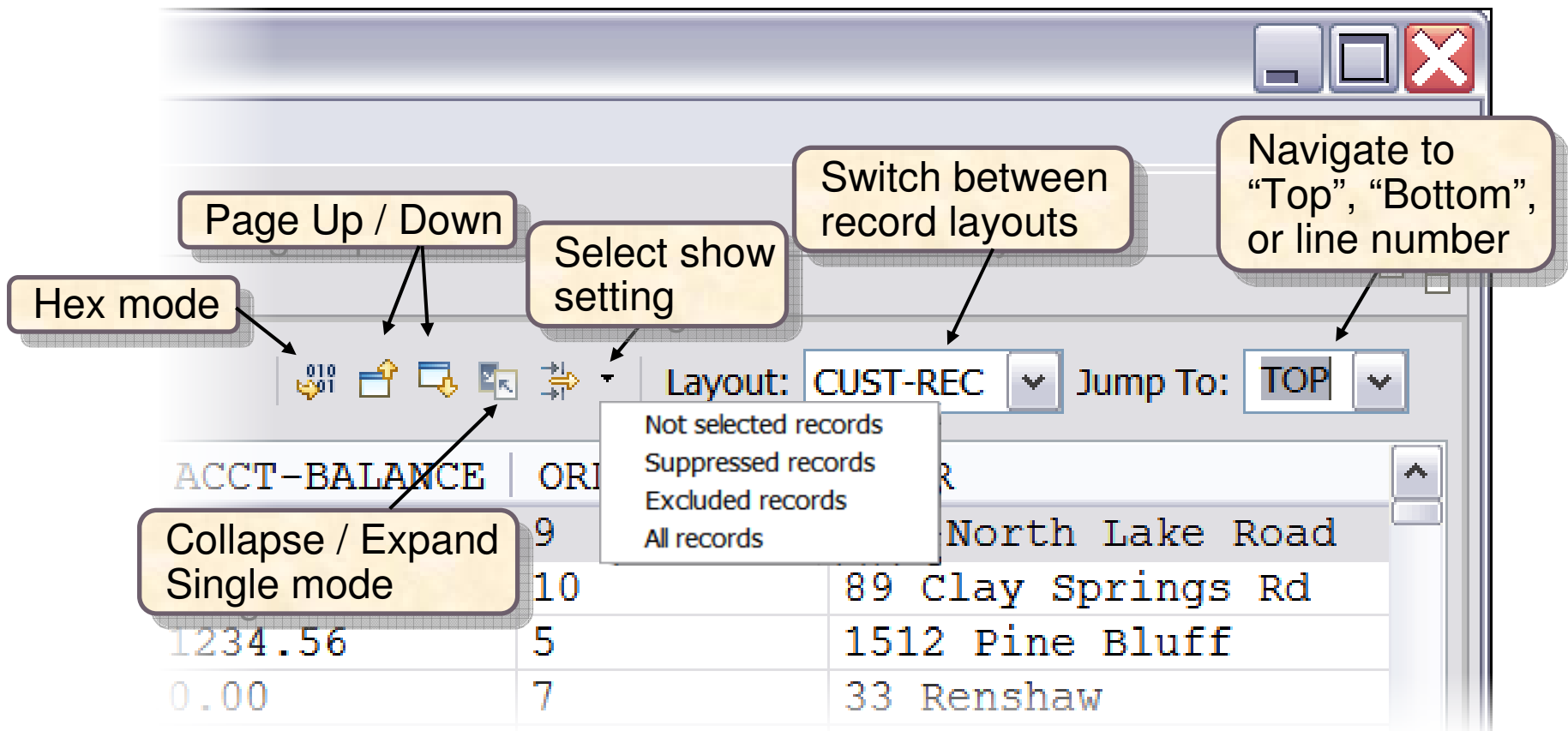
Single Format

Formatted Character

Remote System Details Tasks z/OS File System Mapping

Subsystem JES

Formatted Data Editor Actions



The screenshot shows the Formatted Data Editor interface with several callout boxes explaining actions:

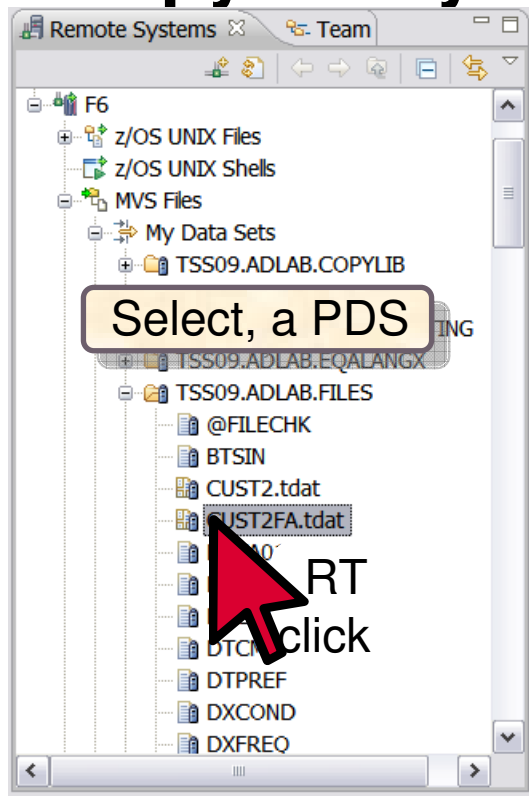
- Hex mode:** Points to the '010 01' icon.
- Page Up / Down:** Points to the up and down arrow icons.
- Select show setting:** Points to the dropdown menu showing 'CUST-REC'.
- Switch between record layouts:** Points to the 'Layout: CUST-REC' dropdown.
- Navigate to "Top", "Bottom", or line number:** Points to the 'Jump To: TOP' dropdown.
- Collapse / Expand Single mode:** Points to the icon with a plus sign.

The data table shown is:

ACCT-BALANCE	ORI	
1234.56	5	1512 Pine Bluff
0.00	7	33 Renshaw

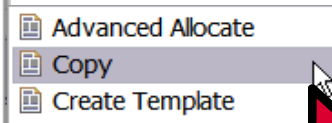
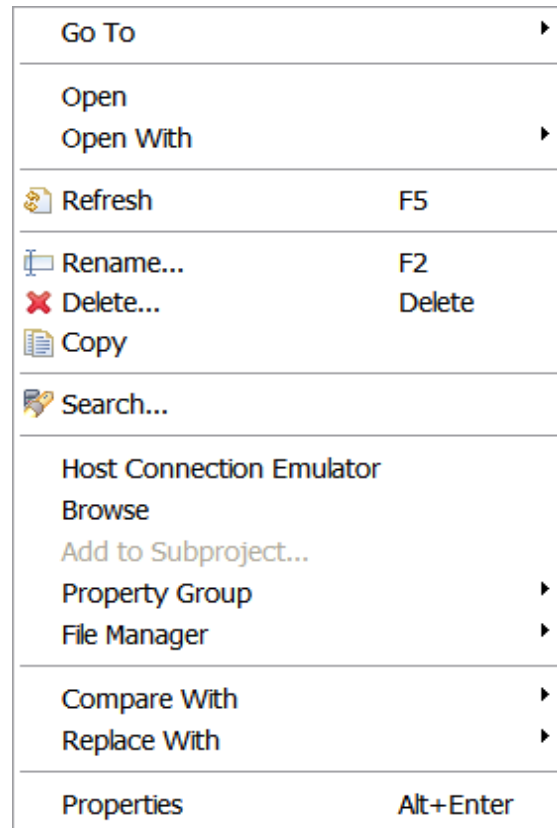
A dropdown menu for 'Select show setting' is open, showing options: Not selected records, Suppressed records, Excluded records, and All records.

Copy Utility



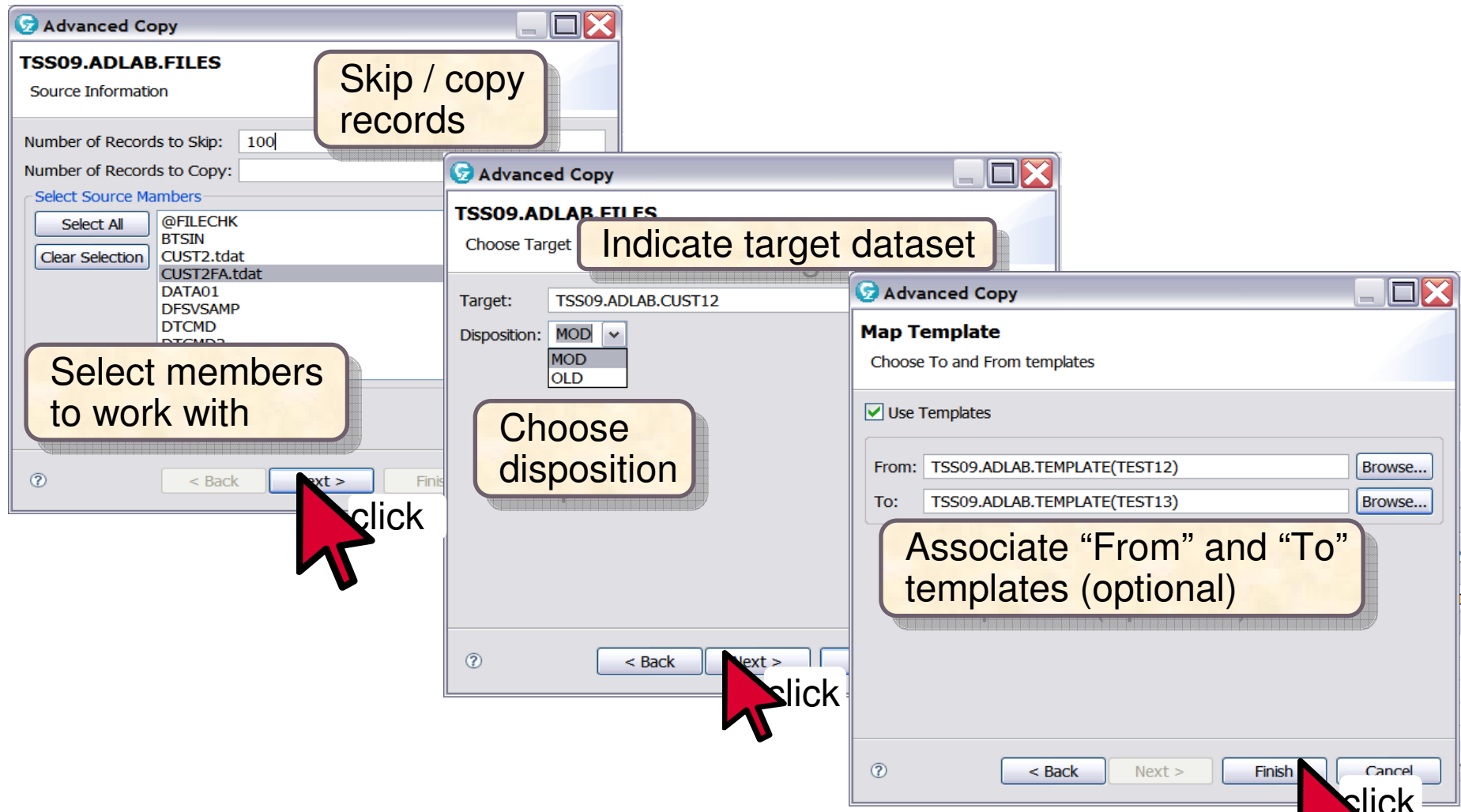
Select, a PDS

RT
click



click

Copy Utility (continued)

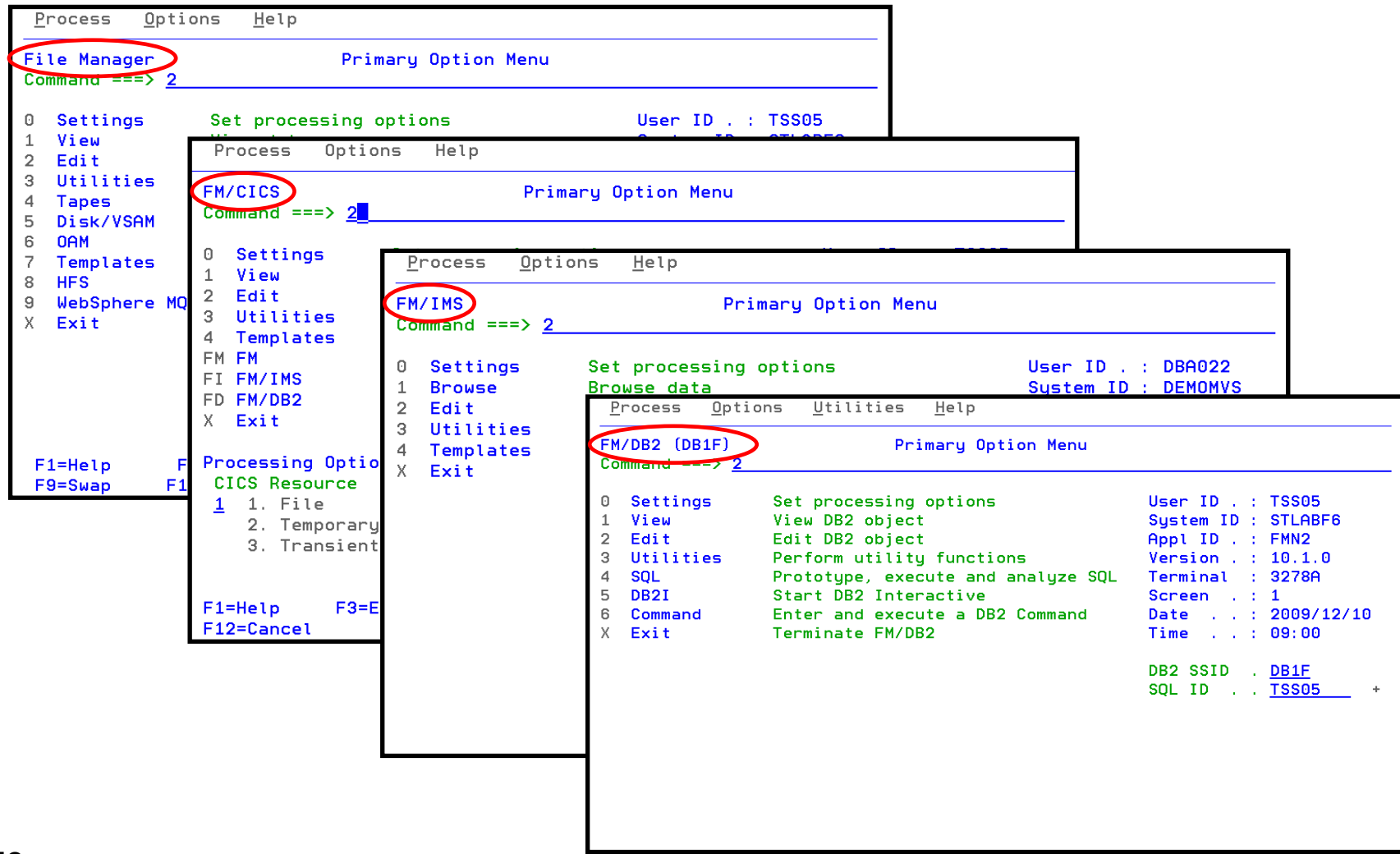


The image shows three overlapping screenshots of the 'Advanced Copy' utility interface, illustrating the steps in a wizard:

- Top Screenshot (Source Information):** Shows the 'Number of Records to Skip' set to 100. A callout box says 'Skip / copy records'. Below, under 'Select Source Members', a list of members is shown. A callout box says 'Select members to work with'. A red arrow points to the 'Next >' button with the text 'click'.
- Middle Screenshot (Choose Target):** Shows the 'Target' field set to 'TSS09.ADLAB.CUST12'. A callout box says 'Indicate target dataset'. Below, the 'Disposition' dropdown is set to 'MOD'. A callout box says 'Choose disposition'. A red arrow points to the 'Next >' button with the text 'click'.
- Bottom Screenshot (Map Template):** Shows the 'Map Template' section with 'Use Templates' checked. The 'From' field is 'TSS09.ADLAB.TEMPLATE(TEST12)' and the 'To' field is 'TSS09.ADLAB.TEMPLATE(TEST13)'. A callout box says 'Associate "From" and "To" templates (optional)'. A red arrow points to the 'Finish' button with the text 'click'.

The File Manager ISPF Interface

File Manager Inclusive of all environments



The image displays four overlapping screenshots of the File Manager interface, illustrating the navigation path from the main menu to a specific database environment.

Top Screenshot: File Manager
 Menu: Process Options Help
 Title: File Manager Primary Option Menu
 Command ==> 2
 List:
 0 Settings Set processing options User ID . : TSS05
 1 View
 2 Edit
 3 Utilities
 4 Tapes
 5 Disk/VSAM
 6 OAM
 7 Templates
 8 HFS
 9 WebSphere MQ
 X Exit
 Bottom: F1=Help F9=Swap

Second Screenshot: FM/CICS
 Menu: Process Options Help
 Title: FM/CICS Primary Option Menu
 Command ==> 2
 List:
 0 Settings
 1 View
 2 Edit
 3 Utilities
 4 Templates
 FM FM
 FI FM/IMS
 FD FM/DB2
 X Exit
 Bottom: F1=Help F3=E F12=Cancel

Third Screenshot: FM/IMS
 Menu: Process Options Help
 Title: FM/IMS Primary Option Menu
 Command ==> 2
 List:
 0 Settings Set processing options User ID . : DBA022
 1 Browse Browse data System ID : DEMOMVS
 2 Edit
 3 Utilities
 4 Templates
 X Exit

Bottom Screenshot: FM/DB2 (DB1F)
 Menu: Process Options Utilities Help
 Title: FM/DB2 (DB1F) Primary Option Menu
 Command ==> 2
 List:
 0 Settings Set processing options User ID . : TSS05
 1 View View DB2 object System ID : STLABF6
 2 Edit Edit DB2 object Appl ID . : FMN2
 3 Utilities Perform utility functions Version . : 10.1.0
 4 SQL Prototype, execute and analyze SQL Terminal . : 3278A
 5 DB2I Start DB2 Interactive Screen . : 1
 6 Command Enter and execute a DB2 Command Date . : 2009/12/10
 X Exit Terminate FM/DB2 Time . : 09:00
 Bottom: DB2 SSID . DB1F
 SQL ID . TSS05 +

- Use a copybook or template to format the display
- A COBOL or PL/I

```

EDIT      TSS12.ADLAB.COPYLIB (CUST1) - 01.00
Command ==> █
=COLS>  ---1---+---2---+---3---+---4---+---5---+---
***** ***** Top of Data *****
000100 *  -----
000200 *  Sample COBOL Copybook for IBM PD Tools Workshops
000300 *  Describes file <userid>.ADLAB.CUST1
000400 *  -----
000500 01  CUST-REC.
000600     05  CUSTOMER-KEY.
000700         10  CUST-ID                PIC X(5).
000800     05  NAME                        PIC X(17).
000900     05  ACCT-BALANCE                 PIC S9(7)V99  COMP-3.
001000     05  ORDERS-YTD                 PIC S9(4)   COMP.
  
```

```

EDIT      TSS12.ADLAB.COPYLIB (PLCU1) - 01.00                Columns 000
Command ==> █                Scroll =
=COLS>  ---+---1---+---2---+---3---+---4---+---5---+---6---
***** ***** Top of Data *****
000001 /*  ----- */
000002 /*  SAMPLE PLI COPYBOOK FOR IBM PD TOOLS WORKSHOPS */
000003 /*  DESCRIBES FILE <USERID>.ADLAB.CUST1 */
000004 /*  ----- */
000005 DCL 1 CUST_REC,
000006     2  CUSTOMER_KEY,
000007     3  CUST_ID                CHAR(5),
000008     2  NAME                    CHAR(17),
000009     2  ACCT_BALANCE            FIXED DEC (9,2) UNALIGNED,
000010     2  ORDERS_YTD              FIXED BINARY(15,0) SIGNED UNALIGNED,
  
```

```

EDIT      TSS12.ADLAB.COPYLIB (ASCU1)
Command ==> █
=COLS>  ---+---1---+---2---+---3---
***** *****
000001 *  -----
000002 *  SAMPLE ASSEMBLER DSECT FOR
000003 *  DESCRIBES FILE <USERID>.AD
000004 *  -----
000005 CUST_REC      DSECT
000006 CUST_ID        DS CL5
000007 NAME           DS CL17
000008 ACCT_BAL       DS 5D
000009 ORDS_YTD       DS 4H
  
```

copybook, or
an
assembler
DSECT can
be used

Option 1 displays the view entry panel

```
Process  Options  Help
-----
File Manager Primary Option Menu
Command ==> 1

0 Settings      Set processing options      User ID . . : TSS12
1 View          View data                   System ID  : STLABF6
2 Edit          Edit data                   Appl ID   : FMN
3 Utilities     Perform utility functions   Version . . : 10.1.0
4 Tapes         Tape specific functions     Terminal. : 3278A
5 Disk/VSAM     Disk track and VSAM CI functions
6 OAM           Work with OAM objects       Screen. . : 1
7 Templates     Template and copybook utilities
8 HFS           Access Hierarchical File System
9 WebSphere MQ  List, view and edit MQ data
X Exit          Terminate File Manager

Date. . . : 2010/05/19
Time. . . : 03:15

F1=Help      F2=Split      F3=Exit      F4=CRetriev  F7=Backward  F8
F9=Swap      F10=Actions   F12=Cancel
```



Enter the name of the copybook, and specify the 1 (above) option



```
Process  Options  Help
-----
File Manager                               View Entry Panel
Command ==> _____

Input Partitioned, Sequential or VSAM Data Set, or HFS file:
  Data set/path name ADLAB.CUST1.KSDS +
  Member . . . . . (Blank or pattern for member list)
  Volume serial . . . . . (If not cataloged)
  Start position . . . . . +
  Record limit . . . . . Record sampling _

Copybook or Template:
  Data set name . ADLAB.COPYLIB
  Member . . . . . CUST1 (Blank or pattern for member list)

Processing Options:
Copybook/Template  Start position type  Enter "/" to select option
1 1. Above          _ 1. Key                _ Edit template _ Type (1,2,S)
    2. Previous      _ 2. RBA                _ Include only selected records
    3. None          _ 3. Record number     _ Binary mode, reclen 80
    4. Create dynamic

F1=Help    F2=Split    F3=Exit    F4=Expand    F7=Backward  F8
F9=Swap    F10=Left   F11=Right  F12=Cancel
```



Records are formatted showing fields defined in the copybook



Process Options Help

View TSS12.ADLAB.CUST Top of 99

Command ==> Scroll CSR

Key Type KSDS RBA Format TABL

Reference number	Field name	Format Indicator
#3	CUST-ID	AN 1:5
#4	NAME	AN 6:17
#5	ACCT-BALANCE	PD 23:5
#6	ORDERS-YTD	BI 28:2
#7	ADDR	AN 30:20

```

***** **** Top of data ****
000001 01001 Lynn, Amanda 610.05 10 89 Clay Springs Rd
000002 02200 Graham, Anne 67.68 9 11
000003 02202 Major, Art 1234.56 5 15
000004 03003 Prentice, Anna 0.00 7 33
000005 03390 Deeds, Darren 74.00 3 64
000006 05570 Parker, Ford 233.27 12 30
000007 06101 Early, Brighton 311.08 10 96
000008 06106 Lander, Annette 489.84 7 61
000009 06711 Dubree, Dustin 192.98 11 922
000010 06900 Bacon, Chris P. 1001.01 0 1134 Rosetta
000011 07008 Houston, Roger 296.97 10 4411 Northside Pkway
000012 07044 Schauer, April 88.83 7 7331 Gulf Shore Dr.
  
```

F1=Help F2=Zoom F3=Exit F4=CRetriev F5=RFind F6=RChange
 F7=Up F8=Down F9=Swap F10=Left F11=Right F12=Cancel

Field type and start : length
 AN=alphanumeric
 PD=packed dec.
 BI=binary
 and others

Some commands can use the field reference number



Command ==> **f mann #4**

Enter

This find command searches only field #4

View TSS12.ADLAB.CUST1.KSDS

Command ==> _____

Key 01001 Type KSDS RBA 0

CUST-ID NAME ACCT-BALANCE ORDERS-YTD ADDR

#3 #4 #5 #6 #7

AN 1:5 AN 6:17 PD 23:5 BI 28:2 AN 30:20

<---> <---+----1-----> <---+----1> <---+> <---+----1----->

000001	01001	Lynn, Amanda	610.05	10	89	Clay Springs Rd
000002	02200	Graham, Anne	67.68	9	119	North Lake Road
000003	02202	Major, Art	1234.56	5	1512	Pine Bluff
000004	03003	Prentice, Anna	0.00	7	33	Renshaw
000005	03390	Deeds, Darren	74.00	3	649	Brown Street
000006	05570	Parker, Ford	233.27	12	3039	Manning St.
000007	06101	Early, Brighton	311.08	10	9662	Summit Road
000008	06106	Lander, Annette	489.84	7	6127	Cedar Street
000009	06711	Dubree, Dustin	192.98	11	9229	Delegate's Row
000010	06900	Bacon, Chris P.	1001.01	0	1134	Rosetta
000011	07008	Houston, Roger	296.97	10	4411	Northside Pkway
000012	07044	Schauer, April	88.83	7	7331	Gulf Shore Dr.
000013	07077	Mann, Mr. E.	621.05	1	24	Valentine Rd

F1=Help F2=Zoom F3=Exit F4=CRetrieve F5=RFind F6=RChange
F7=Up F8=Down F10=Left F12=Cancel

#4

Mann

Manning St.

match found

Out of scope

Utilities

- Search for/change Test data generation
 - Generate new data based on existing copybooks
- Copy data
 - Reformat and generate data while copying
 - Field values can be “**scrambled**” to protect sensitive data
 - Copy data into XML format
- Global Find/Change data across members in a PDS(E)
 - Perform a new search based on the results of a previous search
- Compare
 - Compare records/fields between files
 - Use field level mapping for comparison criteria
 - Special options for load module comparisons
- Websphere MQ support

File Manager: What's new in version 11?

- File Manager Editor and Batch performance is improved with enhanced expression processing which includes:
 - Improved performance for the File Manager Base Editor with REXXTM template expressions
 - Improved performance for the File Manager Base Utility functions with REXX procedures
 - Additional programming constructs supported in FASTREXX
 - Ability to access files in read only mode for Data Set Edit Batch (DSEB) and to run DSEB procedures using FASTREXX
 - Improved expression capability for segmented data
- The File Manager Base is enhanced to work with Rational® Developer for System z V7.6.2 to enable compiler option processing.
- Auditing enhancements for the File Manager Base, CICS, and IMS components. The enhancements are built on the facility provided in the File Manager DB2 V10 component.
- Support for DB2 export to produce column names in CSV format as well as supporting DBCS characters.
- Support for creating and updating the DB2 template in batch.
- Support for setting commit conditions for FM DB2 edit and import.
- Usability enhancements:
 - Member list panel enhancements to support COPY, DELETE, MOVE, PRINT, RESET, and SUBMIT commands
 - Allocation of template data sets when the specified data set does not exist

Get more information about these tools at: www.ibm.com/software/awdtools/deployment

- [z/OS Problem Determination Tools](#)
- [Library](#)
- [News](#)
- [How to buy](#)
- [Training and certification](#)
- [Services](#)

Related software

- Application Performance Analyzer for z/OS
- DebugTool for z/OS
- Fault Analyzer for z/OS
- Optim Move for DB2
- File Manager for z/OS
- Workload Simulator for z/OS and OS/390

Related hardware

- System z servers

Related services

- Application Time Facility for z/OS
- Warranties and

Software > Software Development >

z/OS Problem Determination Tools

z/OS® Problem Determination Tools have powerful functions and features. Organizations that choose to use them improve the health of their application portfolios. To help you to transform your System z environment into a service-oriented architecture (SOA) hub, the IBM Problem Determination Tools deliver support right across the life cycle whether you are building new or reusing existing applications. These tools can help you to modernize and transform existing System z applications whether your goal is to develop and deploy new workloads to leverage the unique performance, availability, security, and cost benefits of System z, increase your responsiveness to business requirements by modernizing your mainframe platform, or optimize management of your IT environment, reducing cost and complexity while improving governance and compliance. These latest versions of the IBM Problem Determination Tools continue the trend of cost-effectively protecting tool investments and maximizing IT productivity.

Select a product



Products

- **Application Performance Analyzer for z/OS**
 A non-intrusive application performance analyzer that aids developers in the design, development and maintenance cycles. Its key function is to measure and report how resources are used by applications running in virtually any z/OS address space.




Solutions

- **Safari of IBM PD Tools: A Live Exploration**
 Join us in this complimentary seminar for hands-on labs that will build your understanding of IBM problem determination tool capabilities, so you can develop applications more efficiently.
- **System z Enterprise Development Tools and Compilers information**

We're here to help



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 **IBM PD Tools win top spot in Software Strategies analyst report**



Highlights



IBM Education Assistant

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IBM Education Assistant - Systems and servers (and related software) - Mozilla Firefox

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IBM systems and servers (and related software)

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Systems and servers

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IBM Education Assistant A Drill Down



The screenshot shows the IBM Education Assistant website in a Mozilla Firefox browser. The page title is "IBM Education Assistant - Systems and servers (and related software) - Mozilla Firefox". The URL is "http://publib.boulder.ibm.com/infocenter/eduasst/stgv1r0/index.jsp". The page features a navigation pane on the left with a search bar and a list of products. The main content area displays the "Debug Tool for z/OS" page, which includes a description, links to training materials, and additional resources. A red arrow points from the "Additional resources" link in the navigation pane to the "Additional resources" section in the main content area.

Navigation pane to access available materials (Web-based training, Classroom-based training, Maintenance, and Additional Resources)

Debug Tool for z/OS

IBM Education Assistant

Debug Tool for z/OS

Description

Debug Tool for z/OS you examine, monitor, and control the execution of programs written in Language Environment assembler, C, C++, COBOL, or PL/I on z/OS and OS/390. Allows you to debug Enterprise COBOL applications that have been compiled with OPTIMIZE or OPTIMIZE(FULL) compiler options.

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Additional resources

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- [Classroom-based training](#)
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Additional resources

- [Debug Tool for z/OS product information](#)
- [Debug Tool for z/OS information center](#)
- [Debug Tool for z/OS support](#)

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Systems and servers

The Education Assistant More Information



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Before you begin

- [About this training](#) 2 min
- Debug Tool for z/OS Version 10 tutorials (also beneficial for V9, V8, and V7 users)**
 - [Introduction](#) 18 min 1.5M
 - [Preparing programs for use with the debugger: an overview](#) 12 min 512K
- Starting the debugger for batch applications**
 - [Selecting a method for debugging batch LE applications](#) 7 min 571K
 - [Use a GUI interface and debug in batch using an LE TEST option in JCL](#) 11 min 971K
 - [Use a GUI interface and debug in batch using the 'User exit data set' facility](#) 16 min 1.1M
 - [Use a dedicated TIM \(terminal interface manager\) terminal and](#)

*Multimedia content including
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