IBM System z Technology Summit

IBM Problem Determination Tools
Overview of Version 11

Why are Customers Migrating?

Issues with Productivity, Functionality, Cost

Business (Vendor Issues)

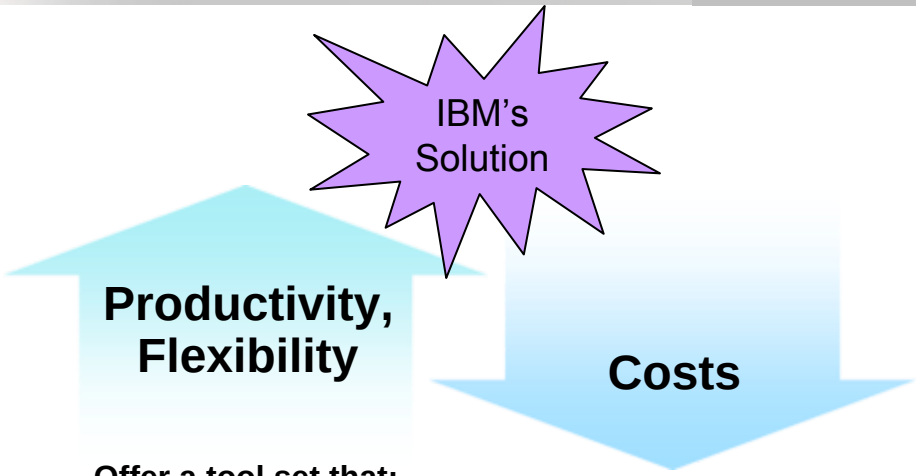
- Business Practices
- Pricing Issues
  - Upgrade fees
  - Rising maintenance fees
  - Unplanned budget overages
  - Long term contracts

Technical (Product Issues)

- Ongoing enhancements
  - Integration with other products and hardware
  - Product support
  - Administrative complexity

Application Development Environment

- Unable to deploy new applications on the platform that best meets business needs (z/OS)
- Forced to consider other platforms for application hosting or affordable tools and utilities
- Reuse traditional assets in the Internet world



Offer a tool set that:

- Exploits IBM's latest software and processor technology
- Offers wide array of key features and functions
- Enhances the Application Development Lifecycle
- Provides opportunity for increased user productivity
- Is affordably priced
- Has flexible terms and conditions
- Has no license keys

IBM Problem Determination Tools Suite for z/OS

Best of breed application development tooling

IBM Problem Determination Tools

IBM 2011 Offerings

- Debug Tool for z/OS V11
- File Manager for z/OS V11
- Fault Analyzer for z/OS V11
- Application Performance Analyzer for z/OS V11
- Workload Simulator for z/OS & OS/390
  - Rational Functional Tester Ext
  - Rational Performance Tester z/OS
- Migration Utility
- Hourglass
- ISPF Productivity Tool

www.ibm.com/software/awdtools/deployment

GUI interfaces

Proven Functionality

- zIIP zAAP
- RDZ Integration
- WASz/Java
- Data Privacy
- Time Shifting
- IMS v11 DB2 v10 CICS TS v4.1
- ISPF Object Lists Command Lists
- End-to-End Debug
- SVC Dump Analysis
- COBOL Modernization

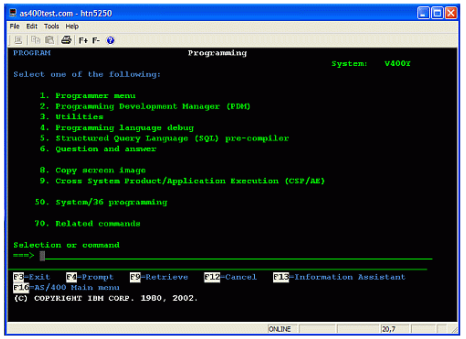
z/OS Problem Determination Tools
Core Product descriptions

- **Debug Tool z/OS**
  - Interactive source level debugging for multiple languages
- **Fault Analyzer for z/OS**
  - Captures and analyzes abend information about application and environment
- **File Manager for z/OS**
  - Manages production, test, and development data across multiple file formats and storage media
- **Application Performance Analyzer for z/OS**
  - Helps maximize application performance and resource consumption
- **Workload Simulator for z/OS and OS/390**
  - Regression, performance, stress, function, and capacity testing
- **ISPF Productivity Tool**
  - Integrates with ISPF providing improved access to key functionality, reducing time-consuming navigation steps
- **HourGlass**
  - Provides date and time manipulation for time sensitive applications

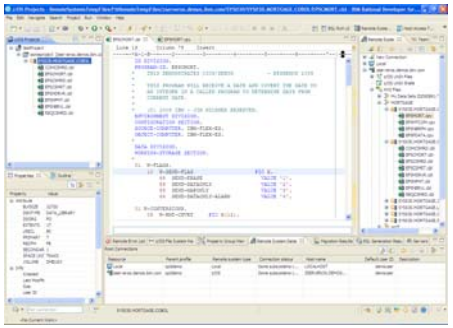
Improve developer productivity with modern interfaces

New Stand-alone GUI interfaces

- A user interface's design affects the amount of **effort** needed to **provide** input and **interpret** output from a system, and the **effort** required to **learn** how.
- Use common Eclipse-based tooling across multiple platforms and languages
  - Achieve ~15% improvement in mainframe developer productivity[1]
  - Reduce host CPU usage 50%-80%[1] with workstation syntax checking
  - Reduce training costs, more attractive IDE for younger developers



✓ **Produce code faster, save MIPS**



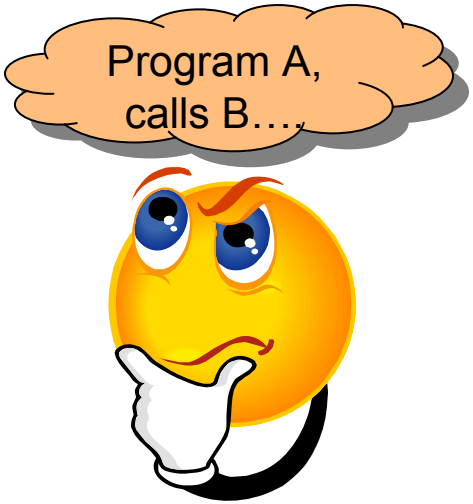
- Speed development with specialized editors

1. Aggregation of results from a productivity study conducted by IBM mainframe customers

IBM Debug Tool for z/OS
Version 11

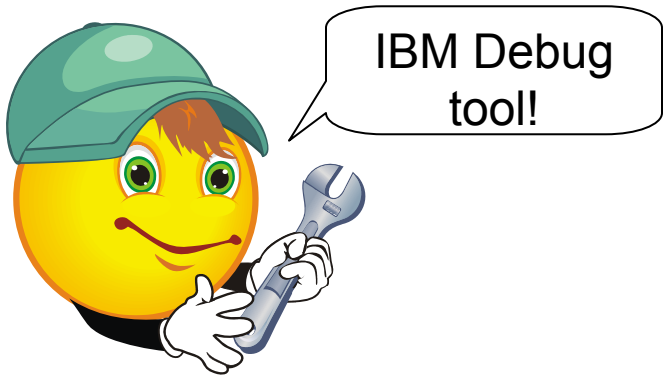
IBM Debug Tool for z/OS

Examine, monitor, and control program execution



Problem

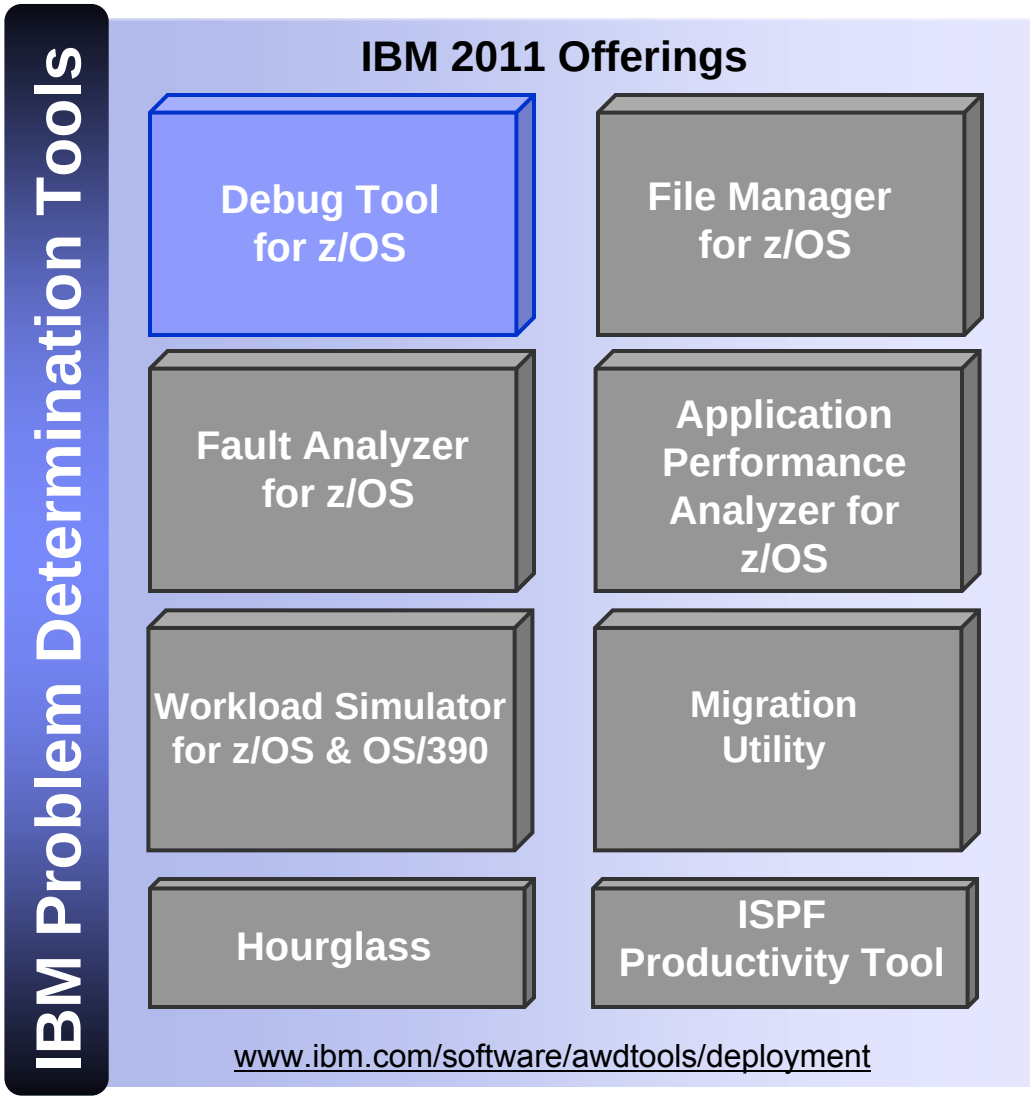
- **Need a program testing and analysis aid that helps examine, monitor, and control the execution of application programs on a z/OS system**



Solution

- **Source level debugging**
  - Conditional and unconditional breakpoints
  - Step mode debugging
  - Variable and storage monitoring and update
- **Single debugging engine for many environments**
  - Batch
  - TSO
  - CICS
  - IMS
  - WLM
  - WASz
  - UNIX System Services
  - DB2 Stored Procedures
  - JZOS
- **Ability to run automated command scripts**
- **Frequency sampler**
- **Interactive playback support**

The IBM Problem Determination Tools Suite for z/OS

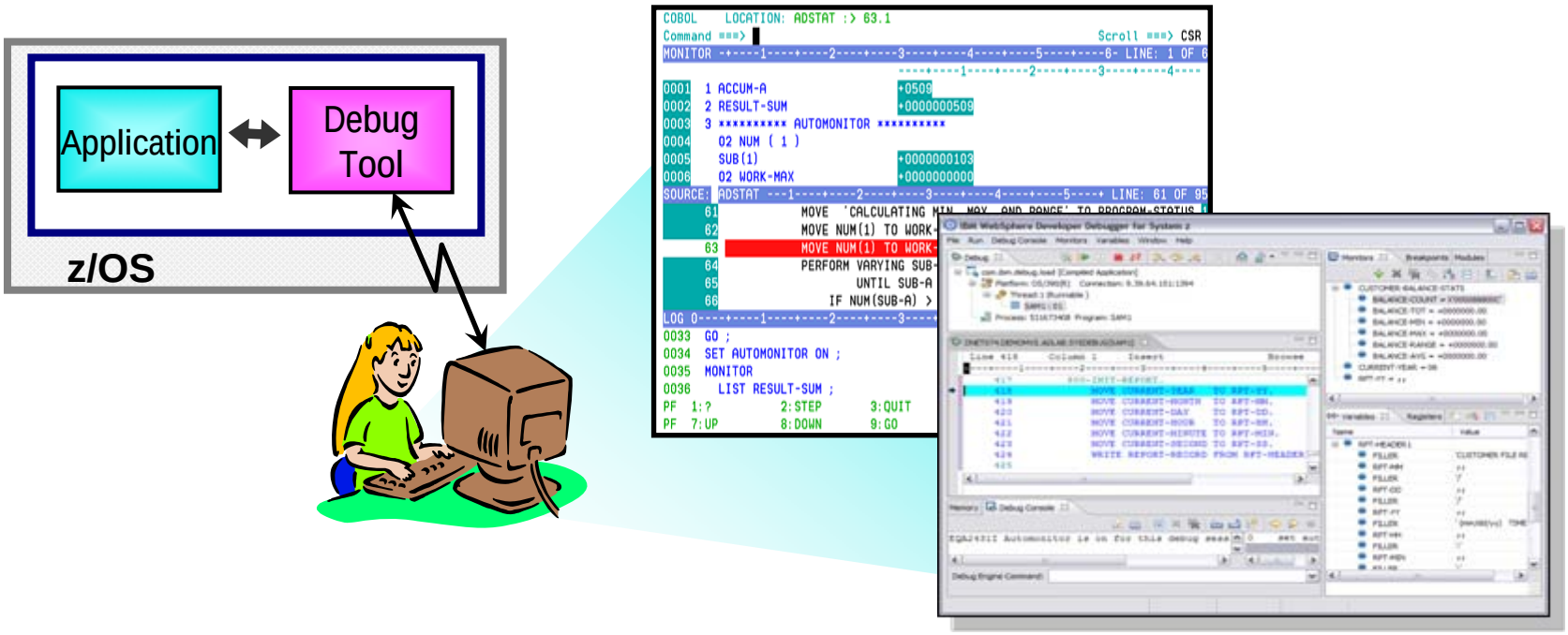


Debug Tool for zOS

- Interactive program debugging
- Easy setup – debug your program quickly
- Multiple languages:
  - COBOL
  - PL/I
  - C/C++
  - Assembler
- Multiple z/OS environments
  - Batch
  - TSO
  - CICS
  - IMS/TM
  - DB2 stored procedures
  - Websphere application server
  - Unix system services
- Code coverage reporting
- COBOL modernization
- GUI Eclipse plug-in for CICS Explorer **at no additional cost!**

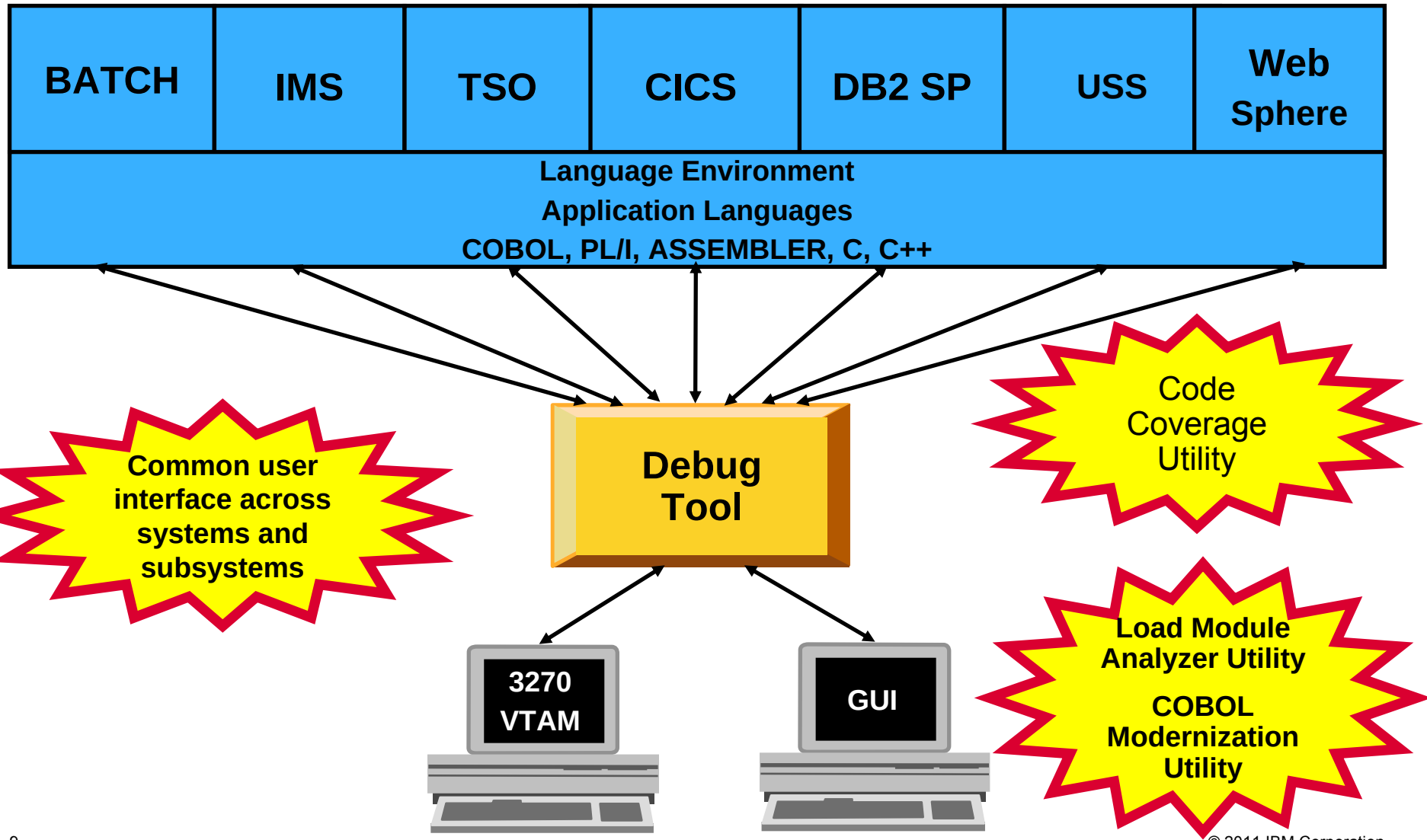
What is IBM Debug Tool for z/OS ?

- An interactive program debugger to control and monitor application programs while they run

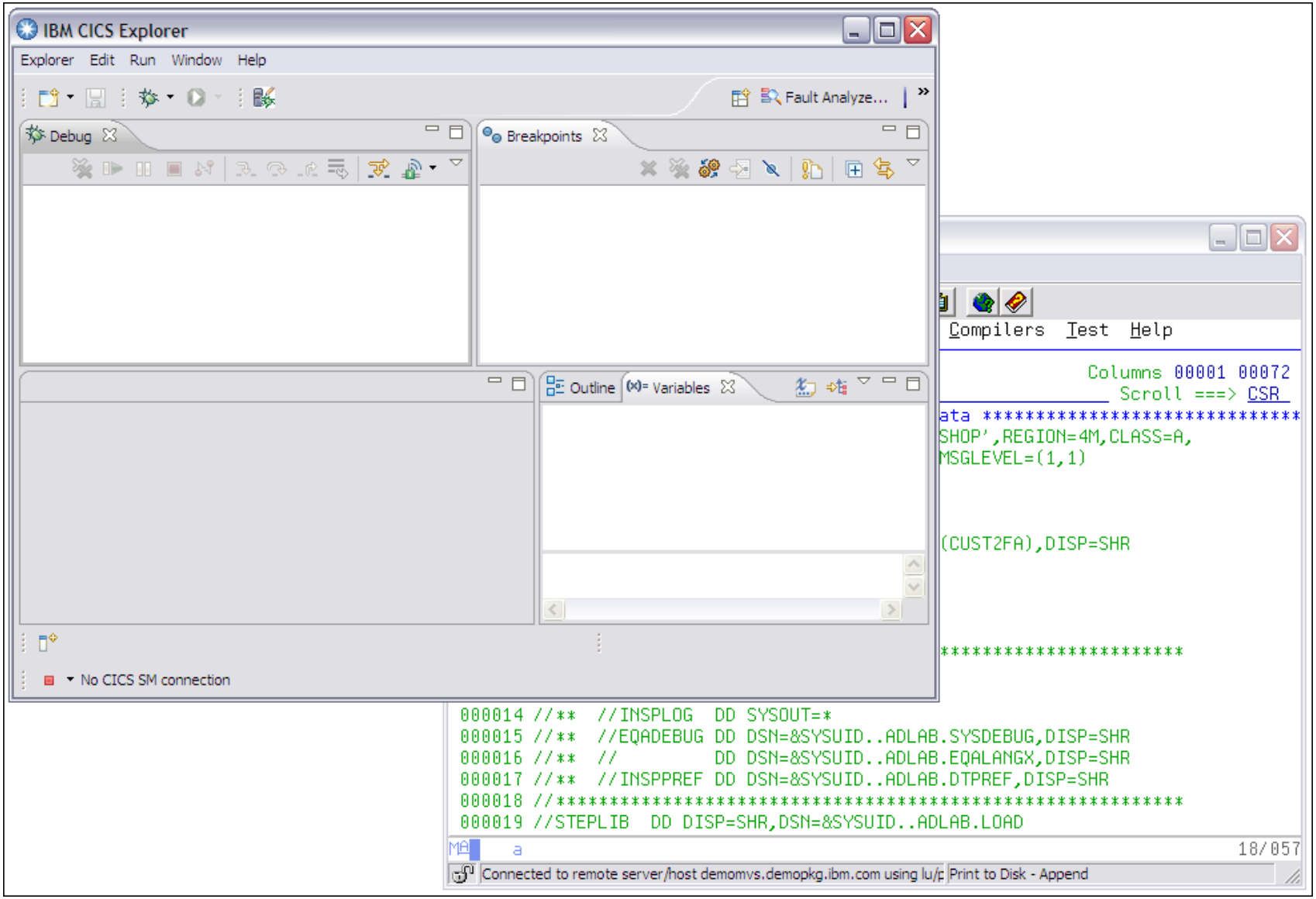


- And a set of related online panels and batch utilities

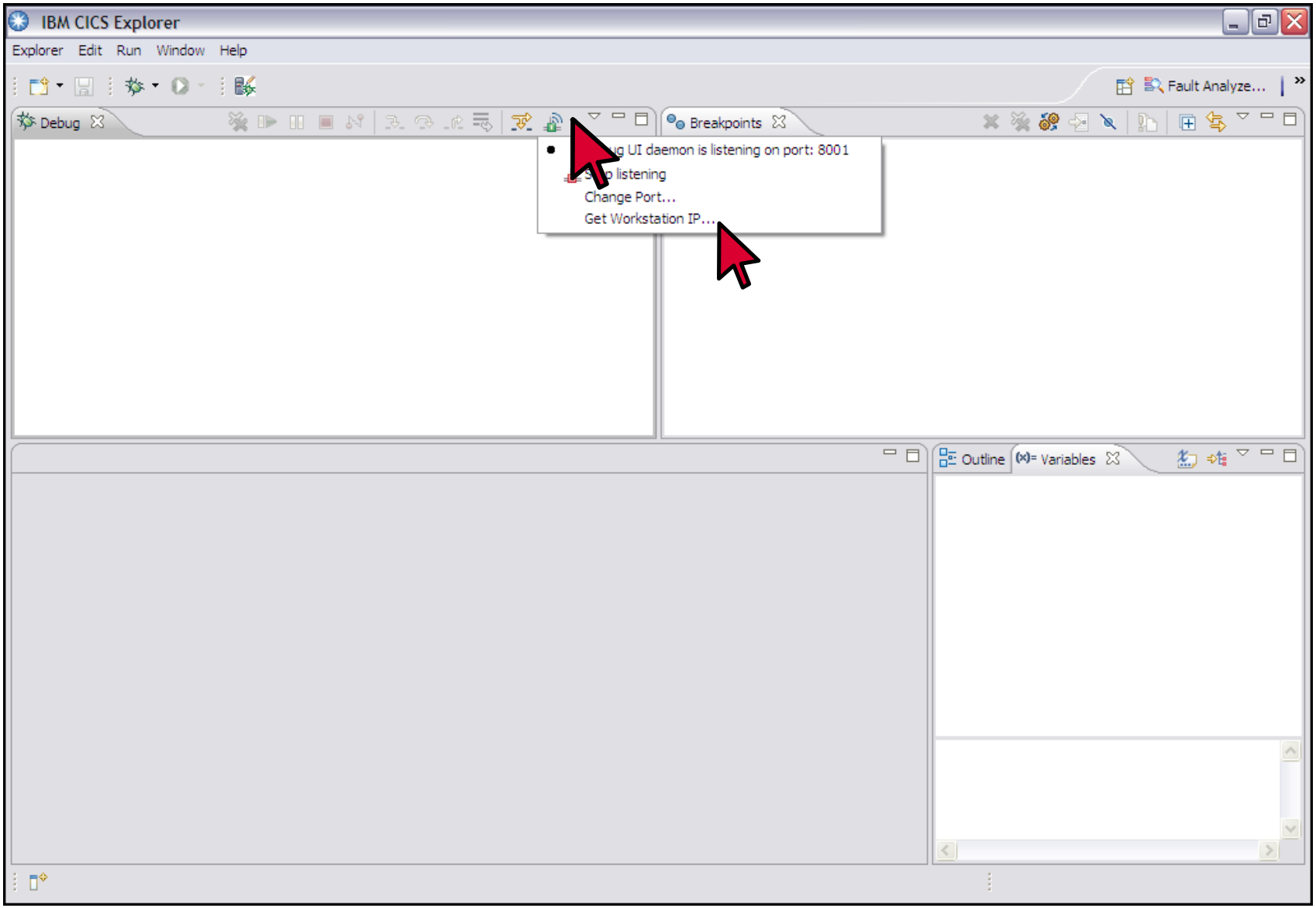
Debug enterprise applications to isolate coding issues



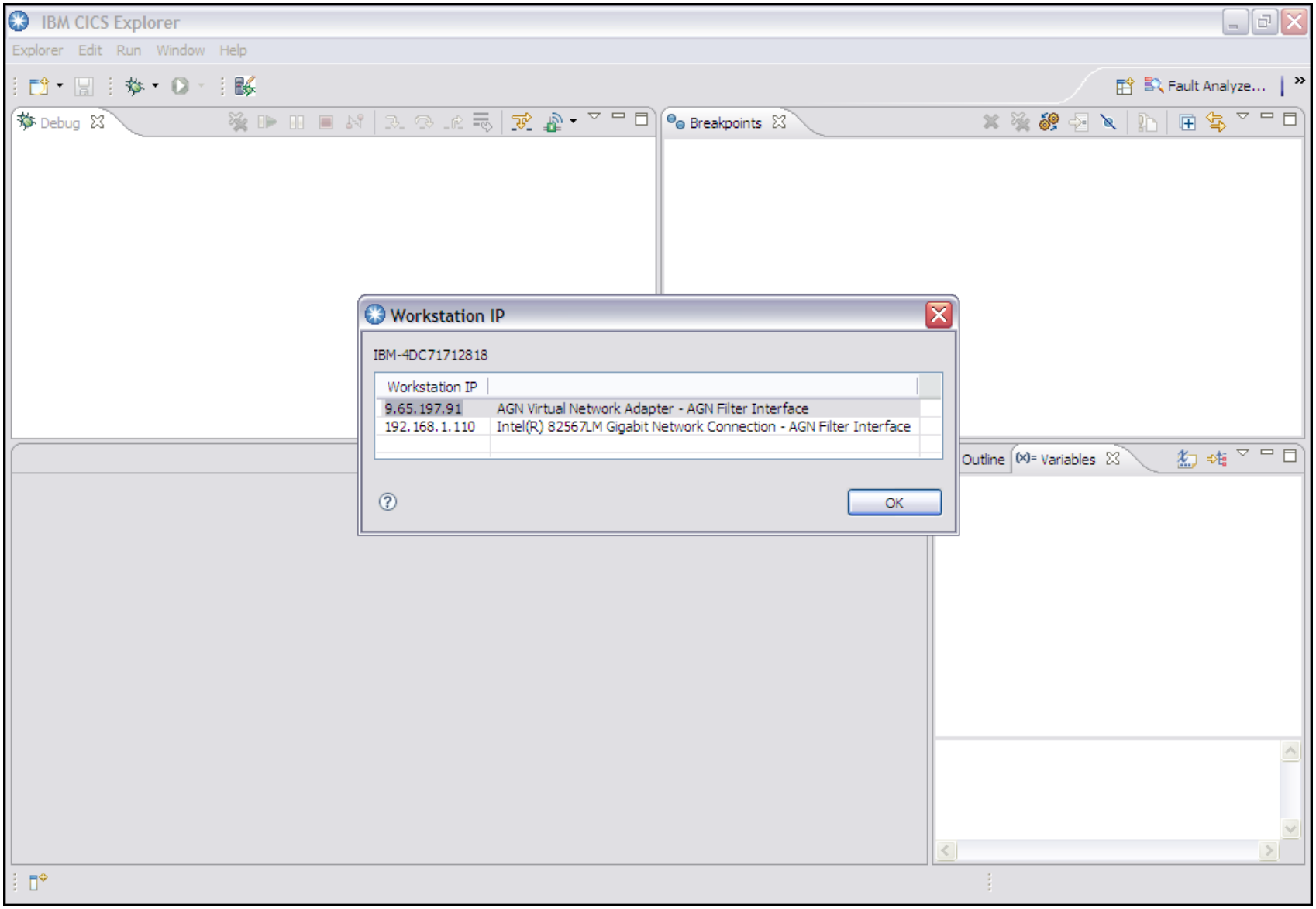
Start CICS Explorer



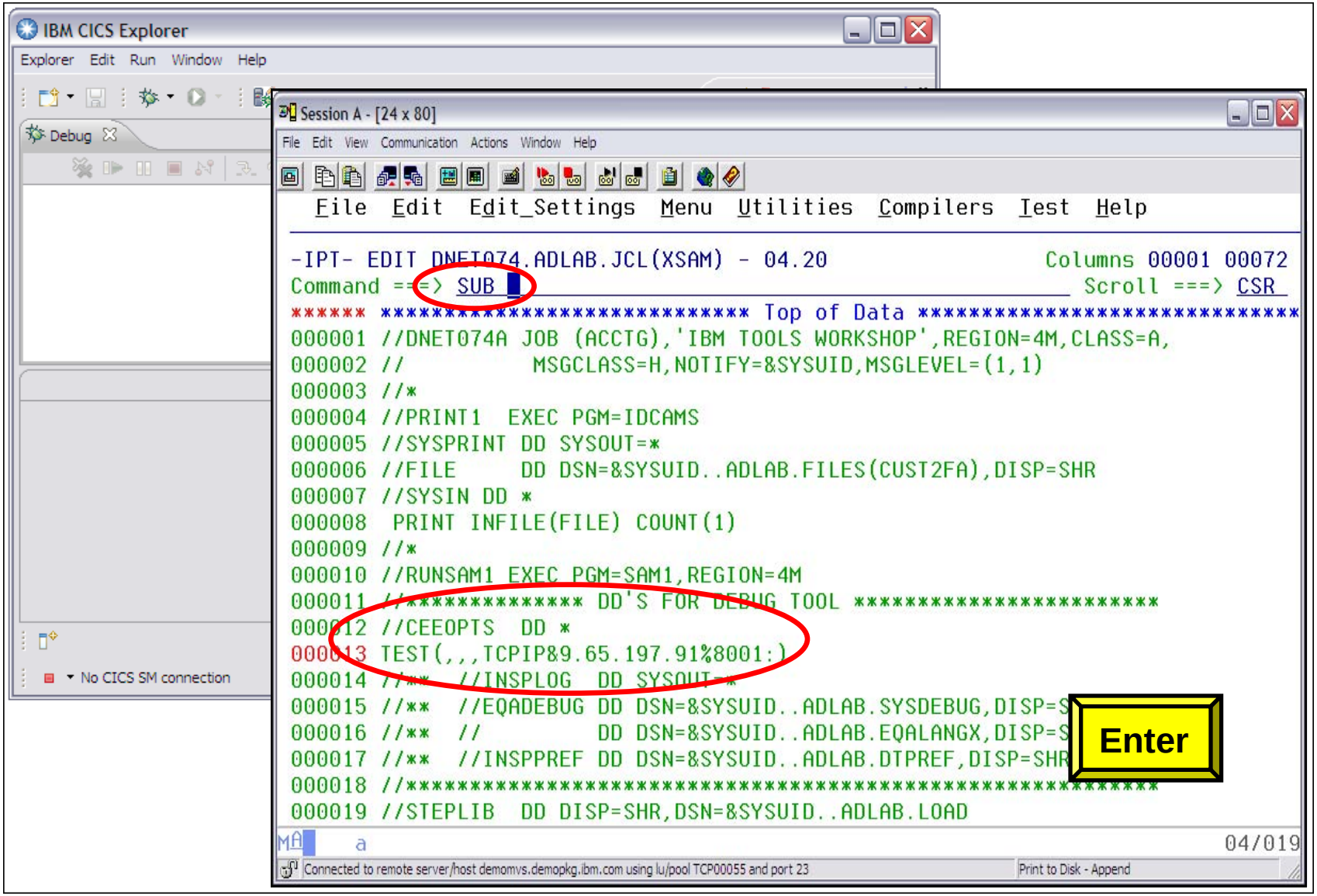
Select 'Get workstation IP address'



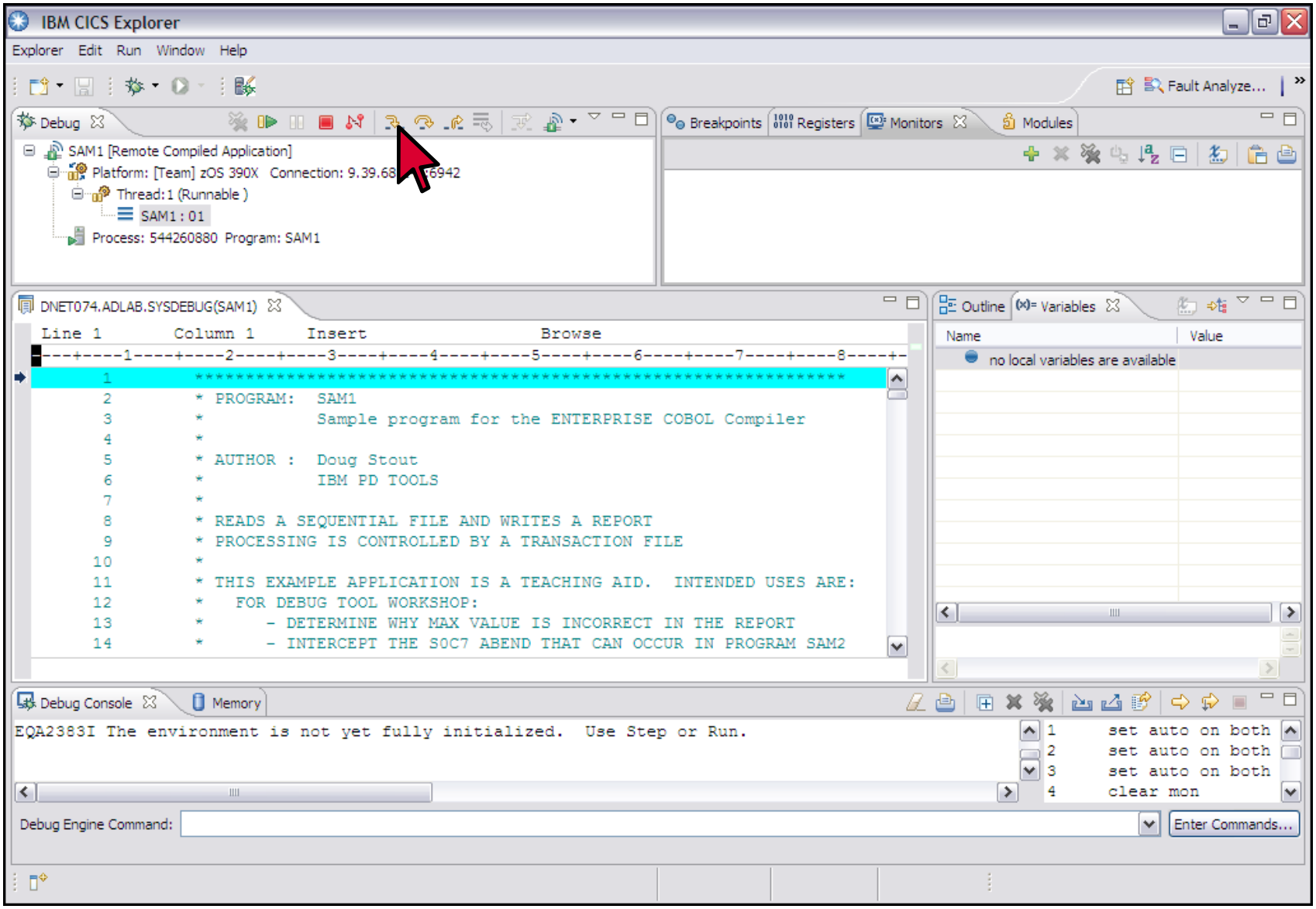
Copy the workstation's IP address



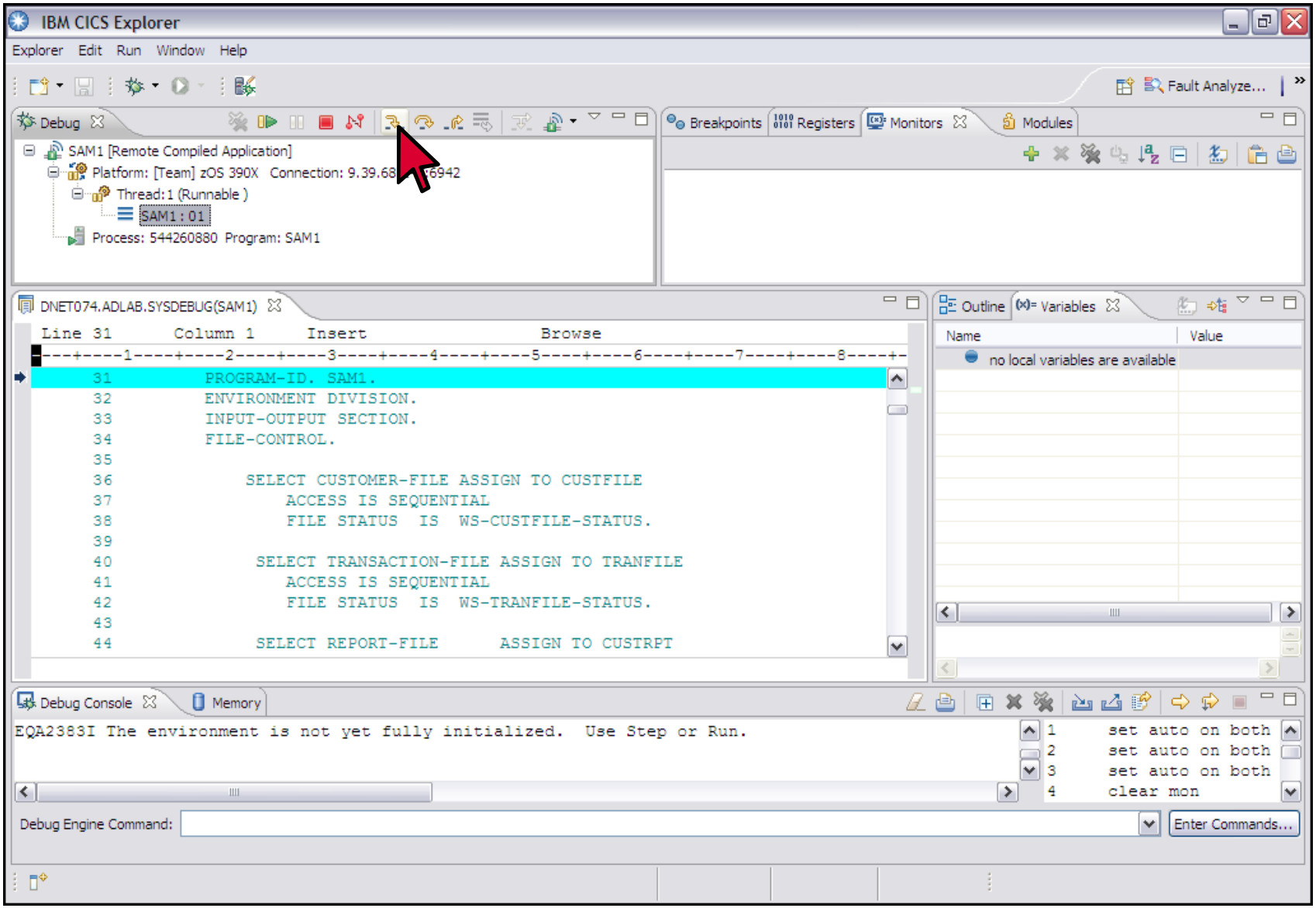
Submit the job that will be debugged



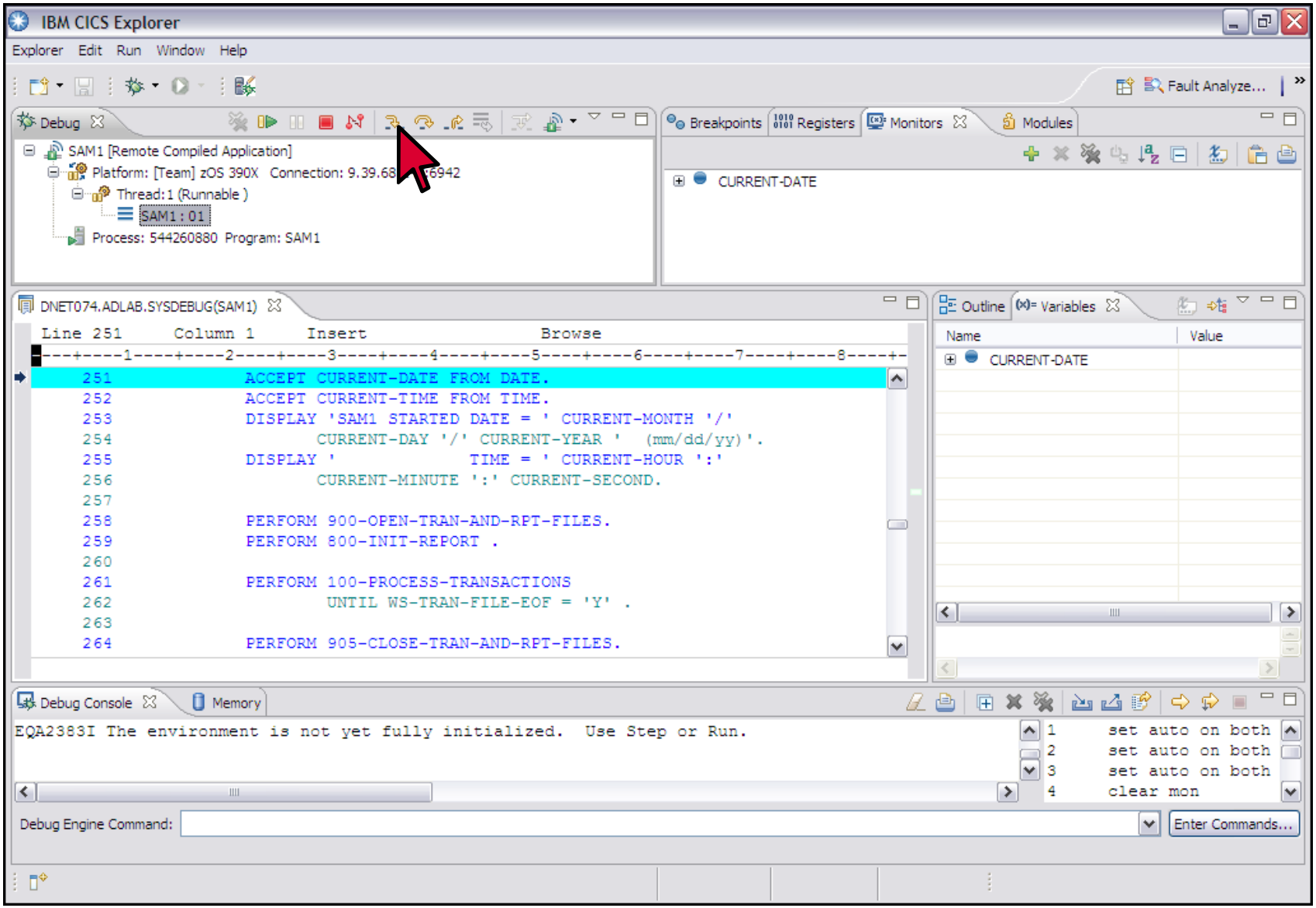
The debugger started, step



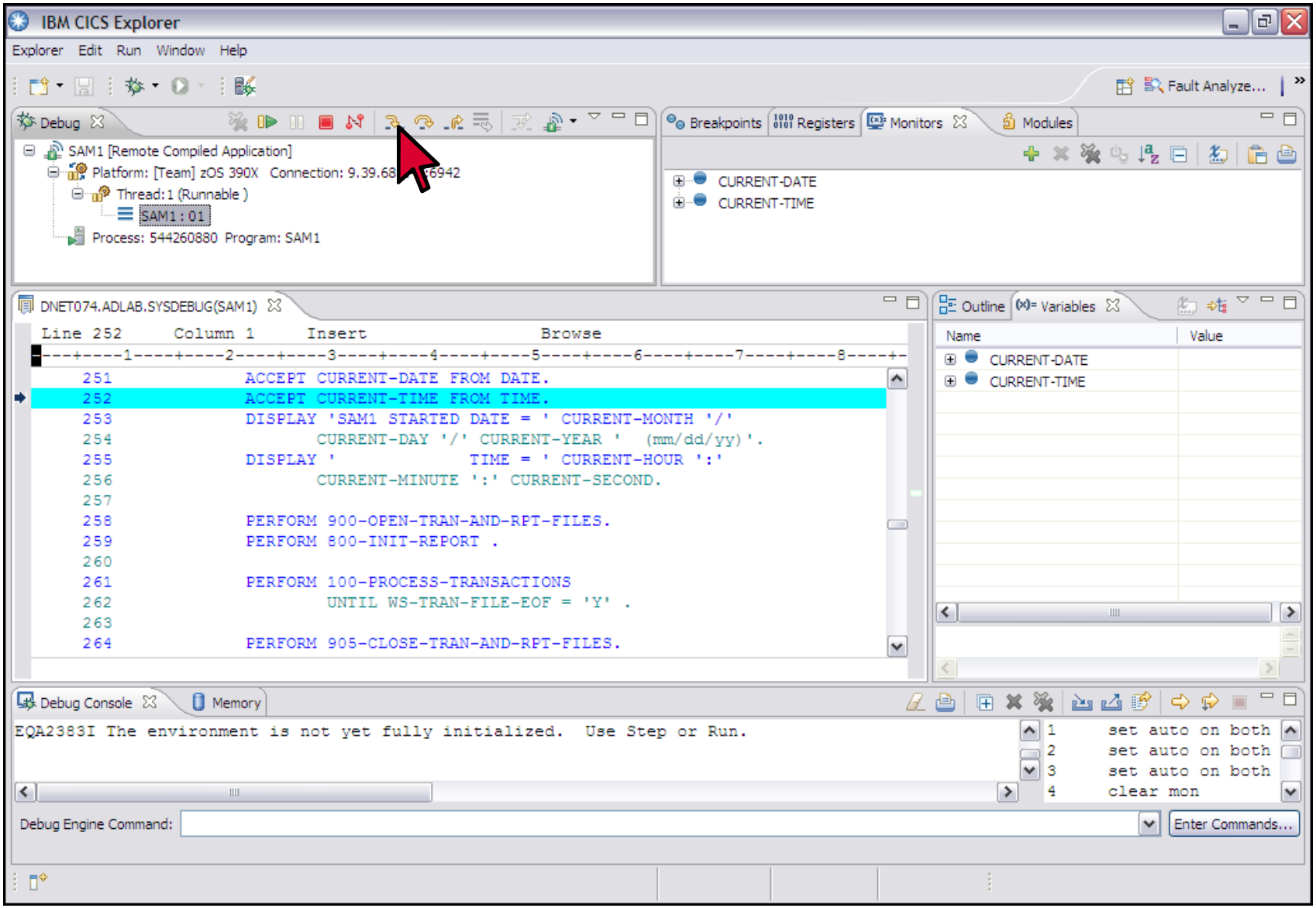
Step



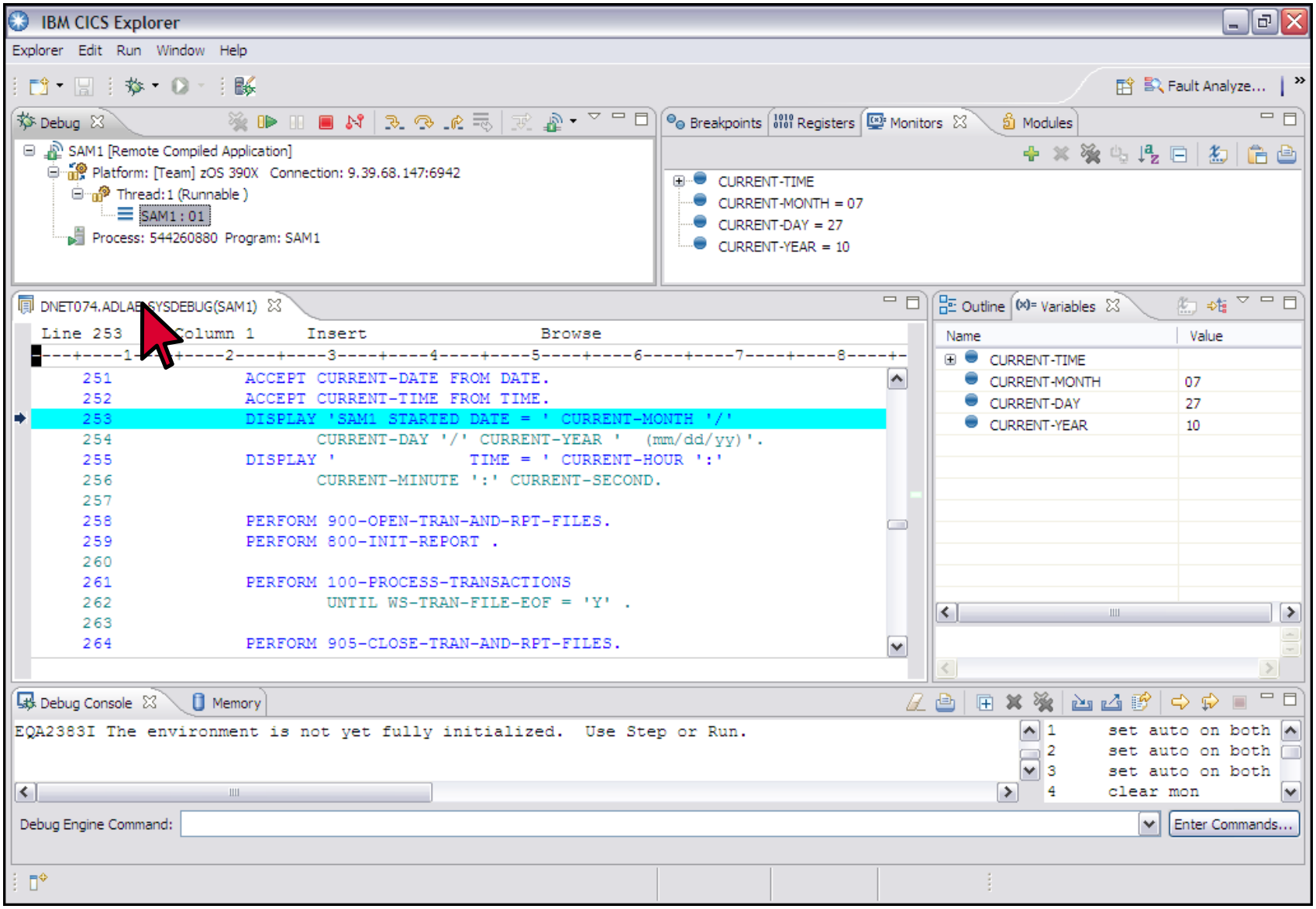
Step



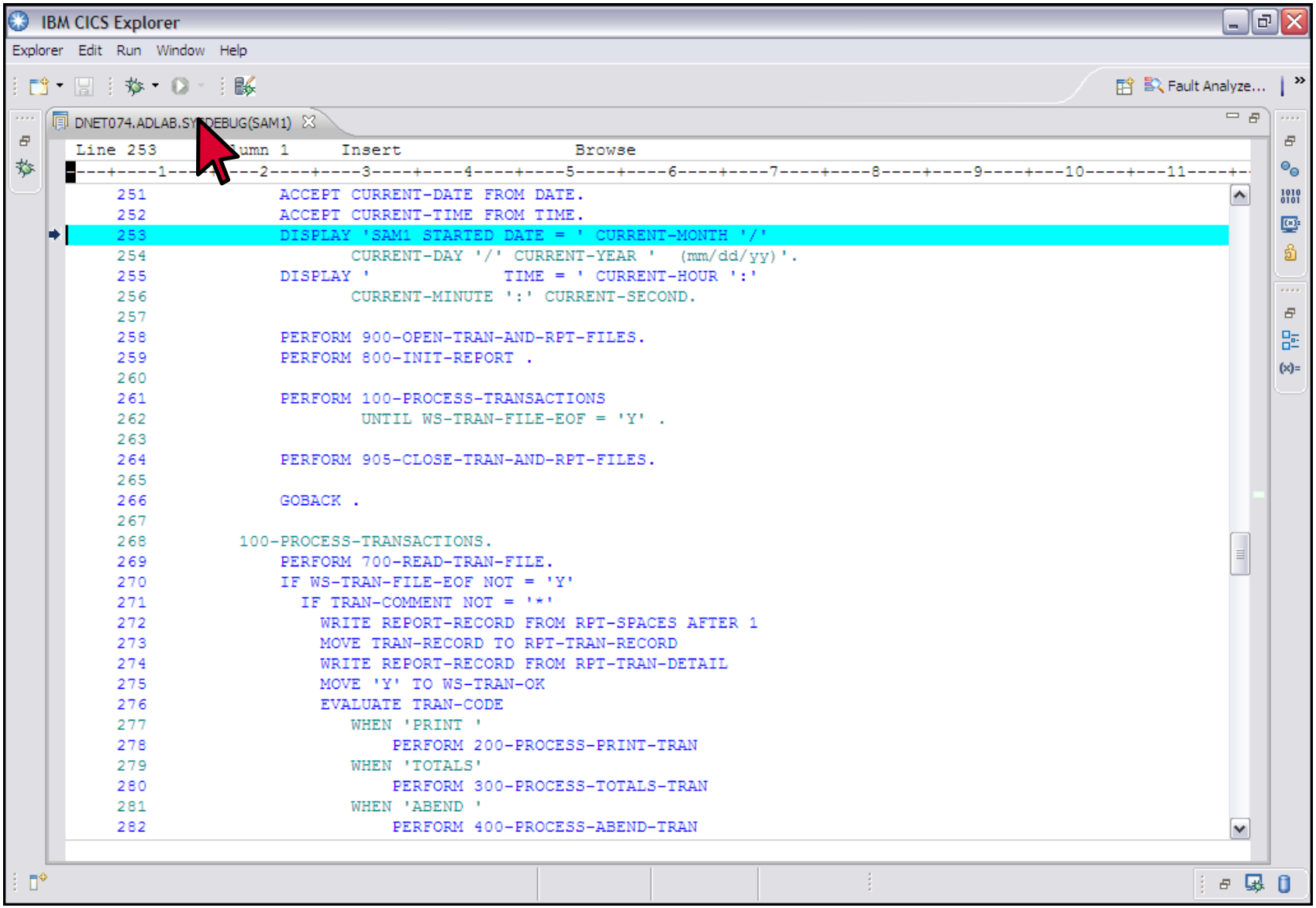
Step



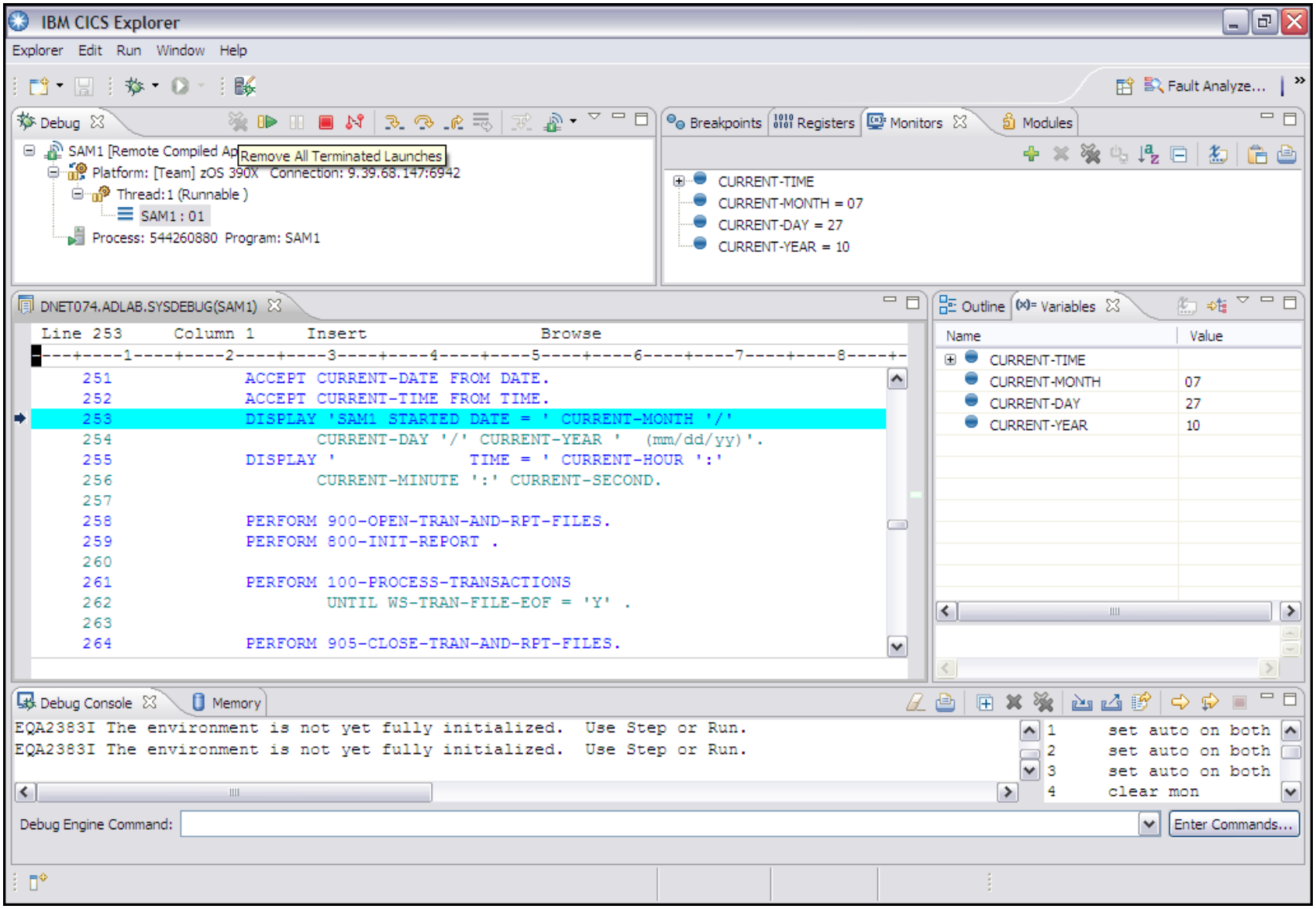
After stepping



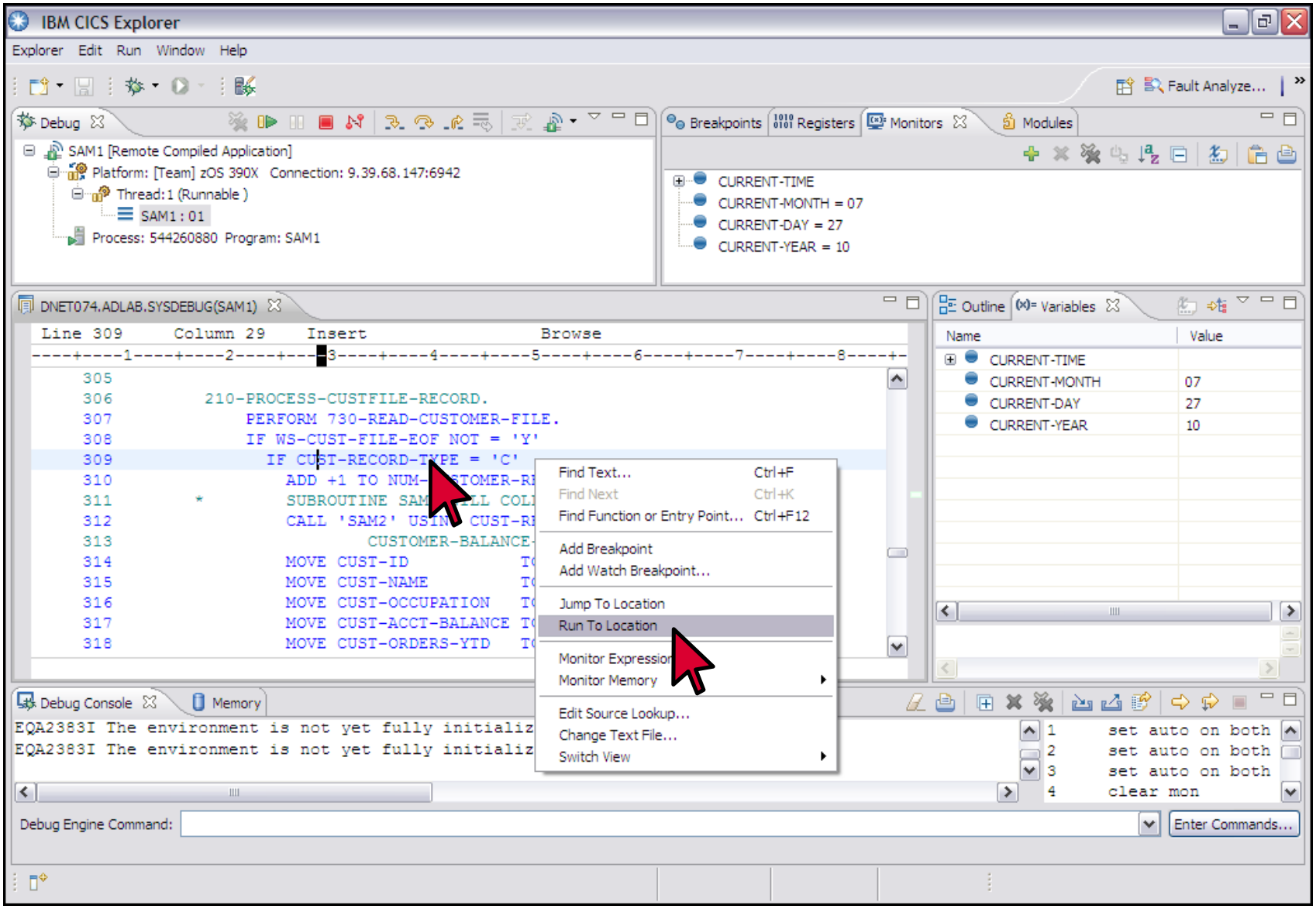
An expanded view



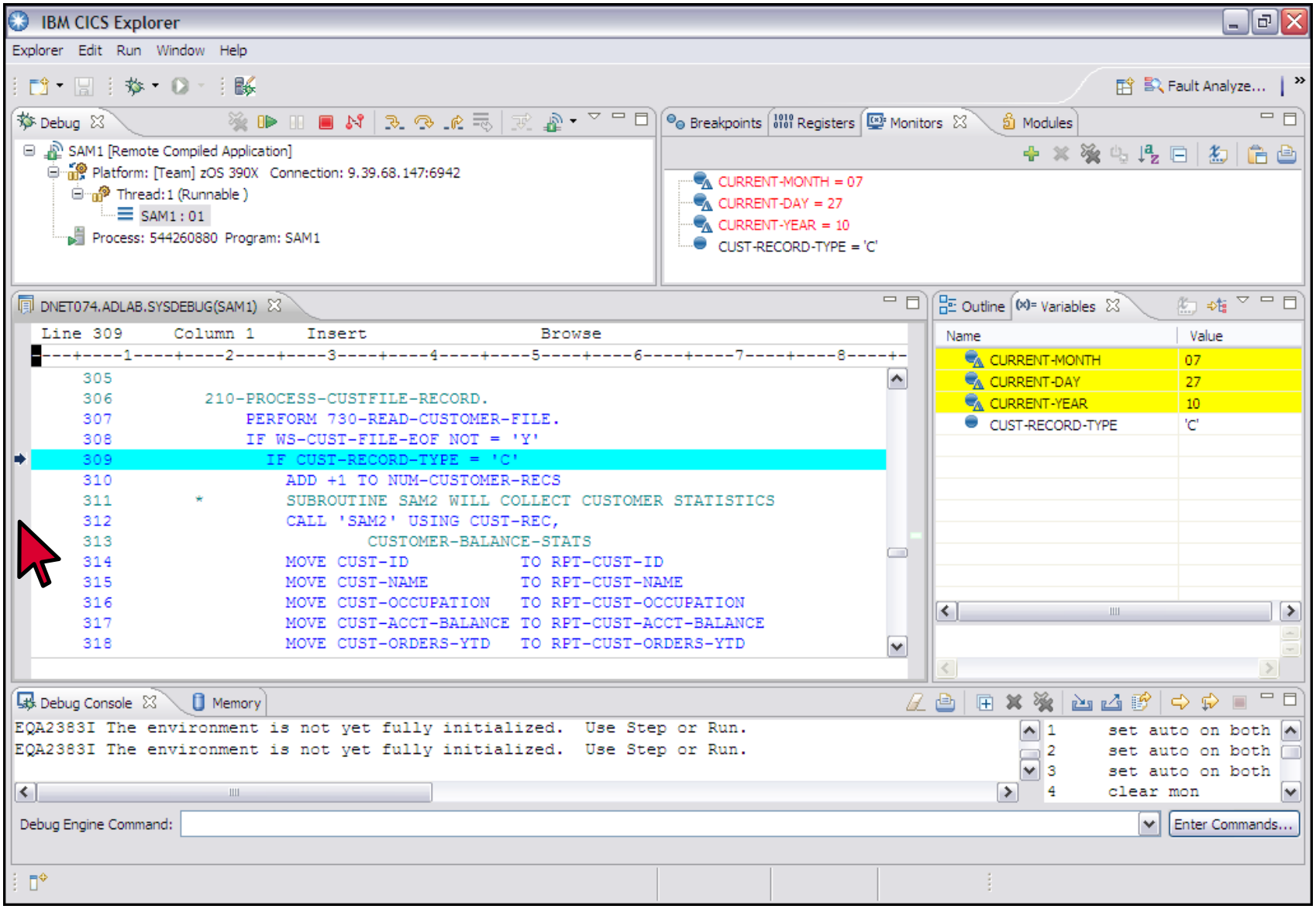
The view was collapsed



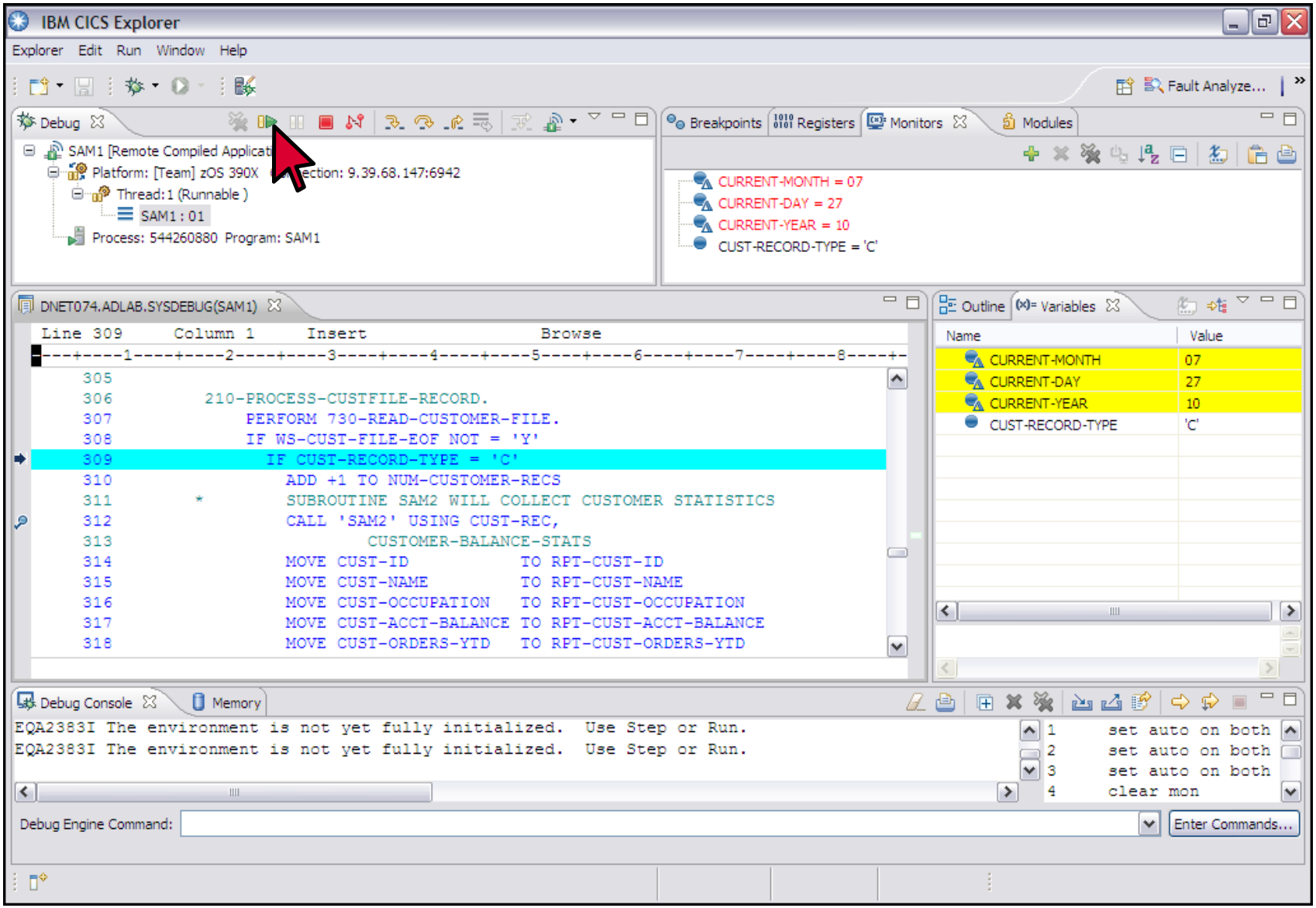
Run to a statement



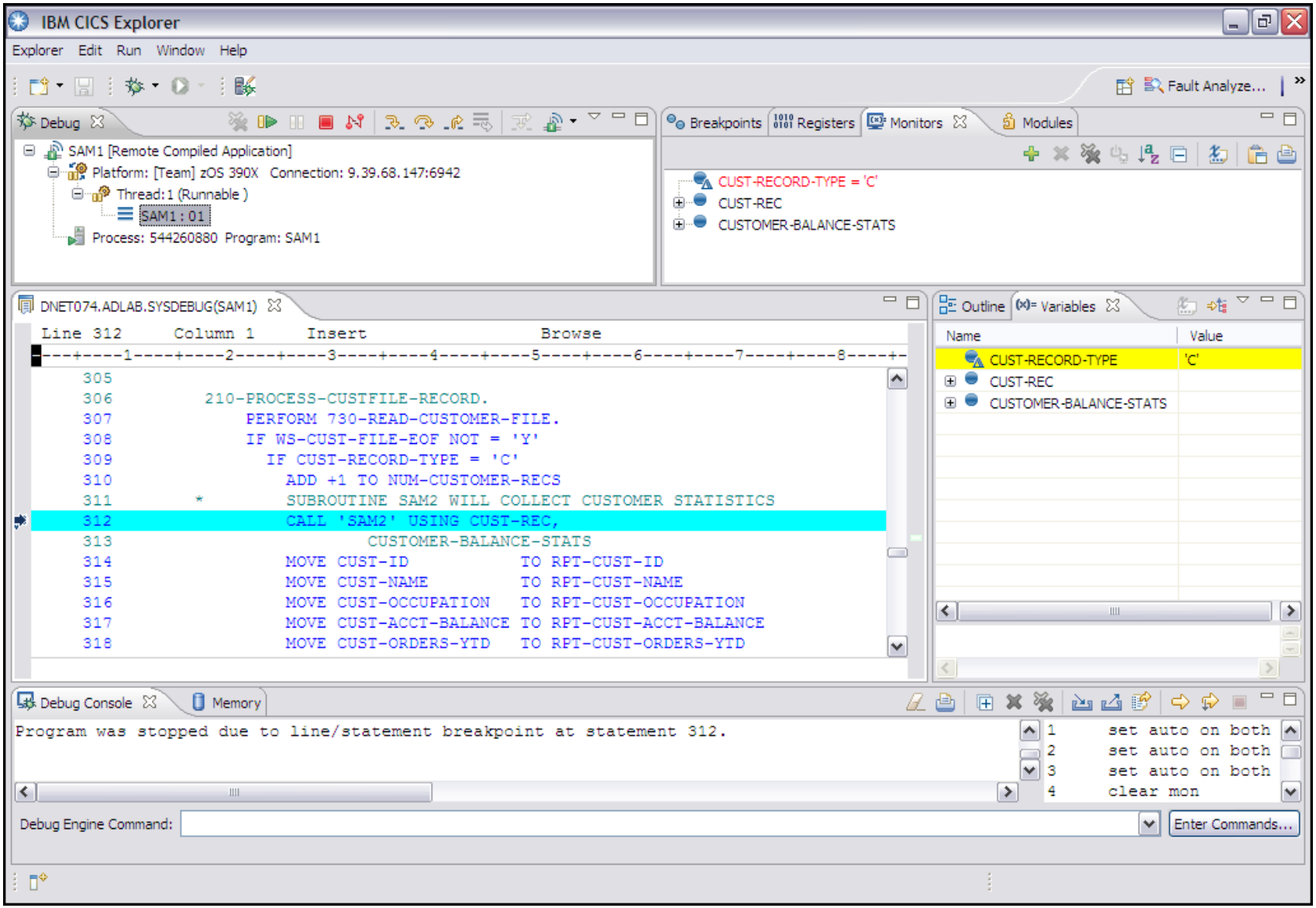
After running to a statement, Set a breakpoint



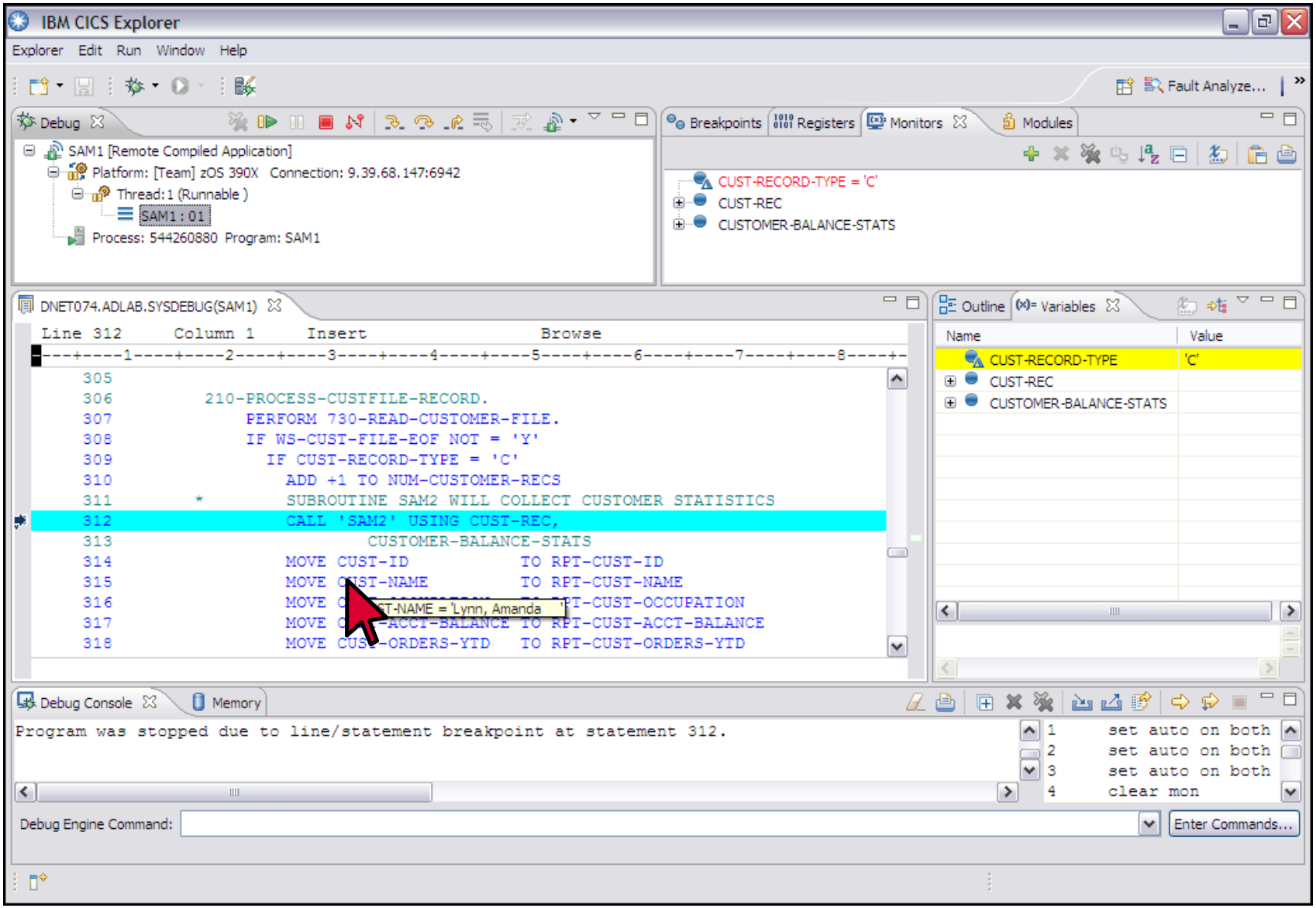
A breakpoint was set, Resume



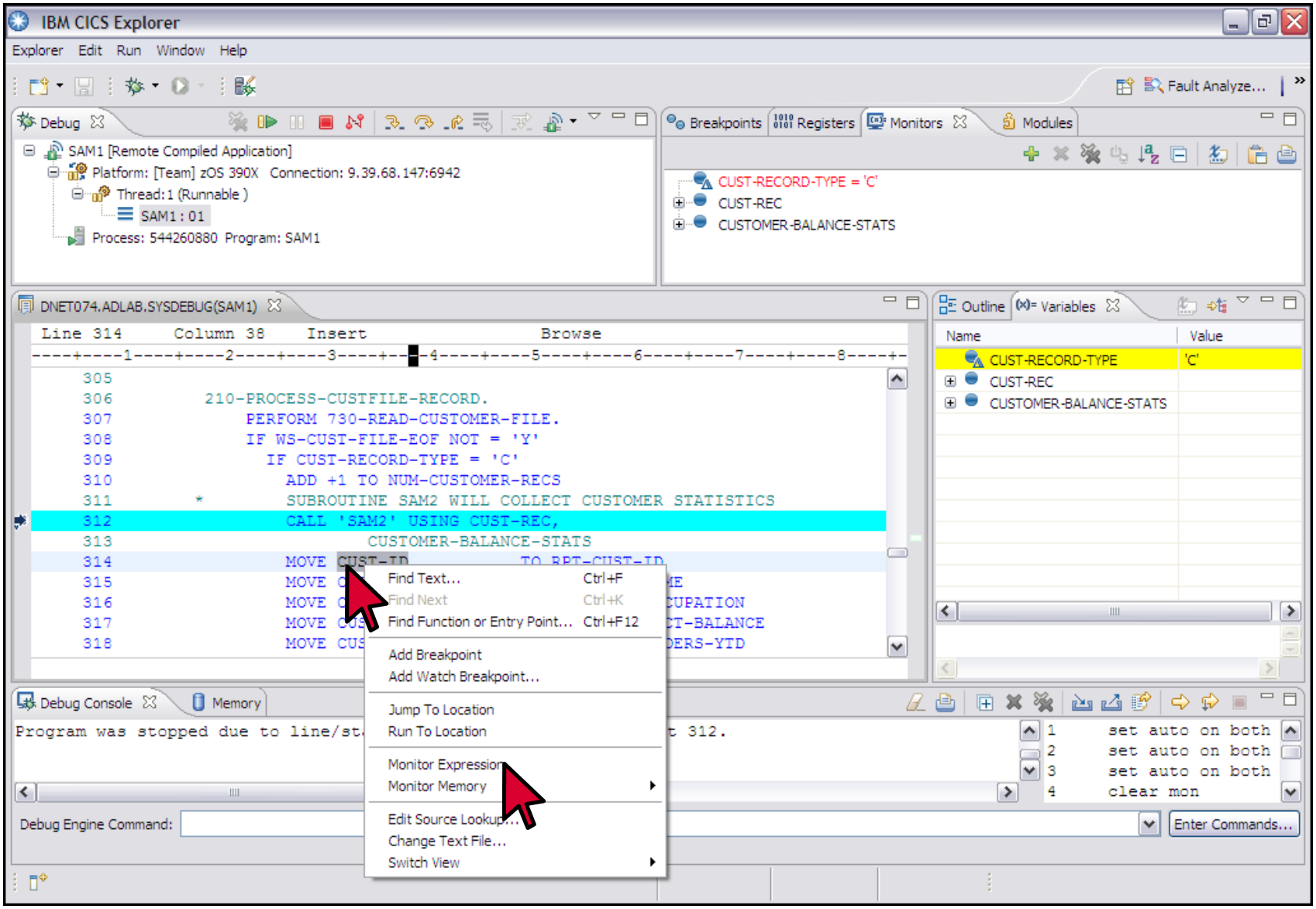
Stopped at a breakpoint



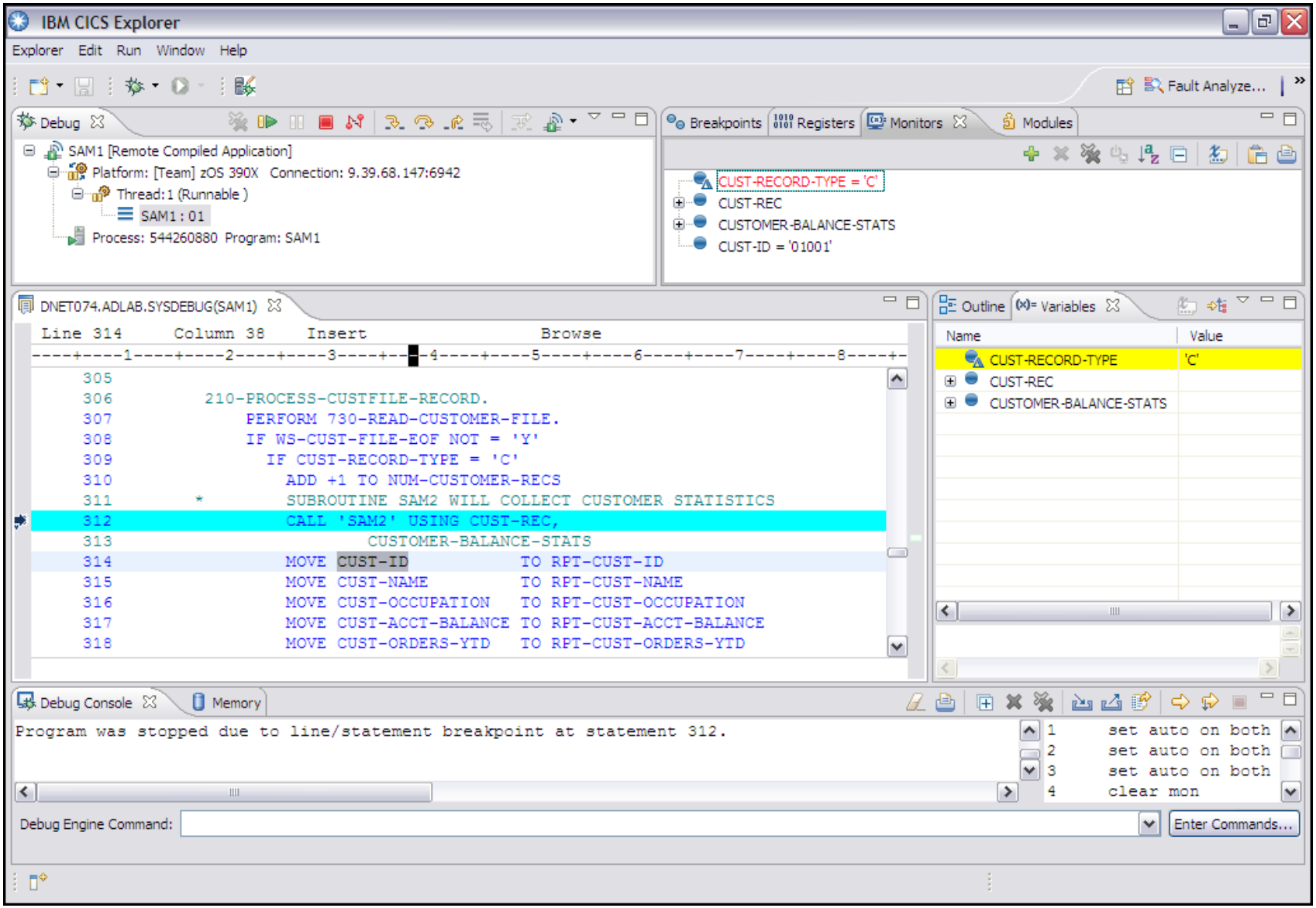
Hover over a variable to display it's value



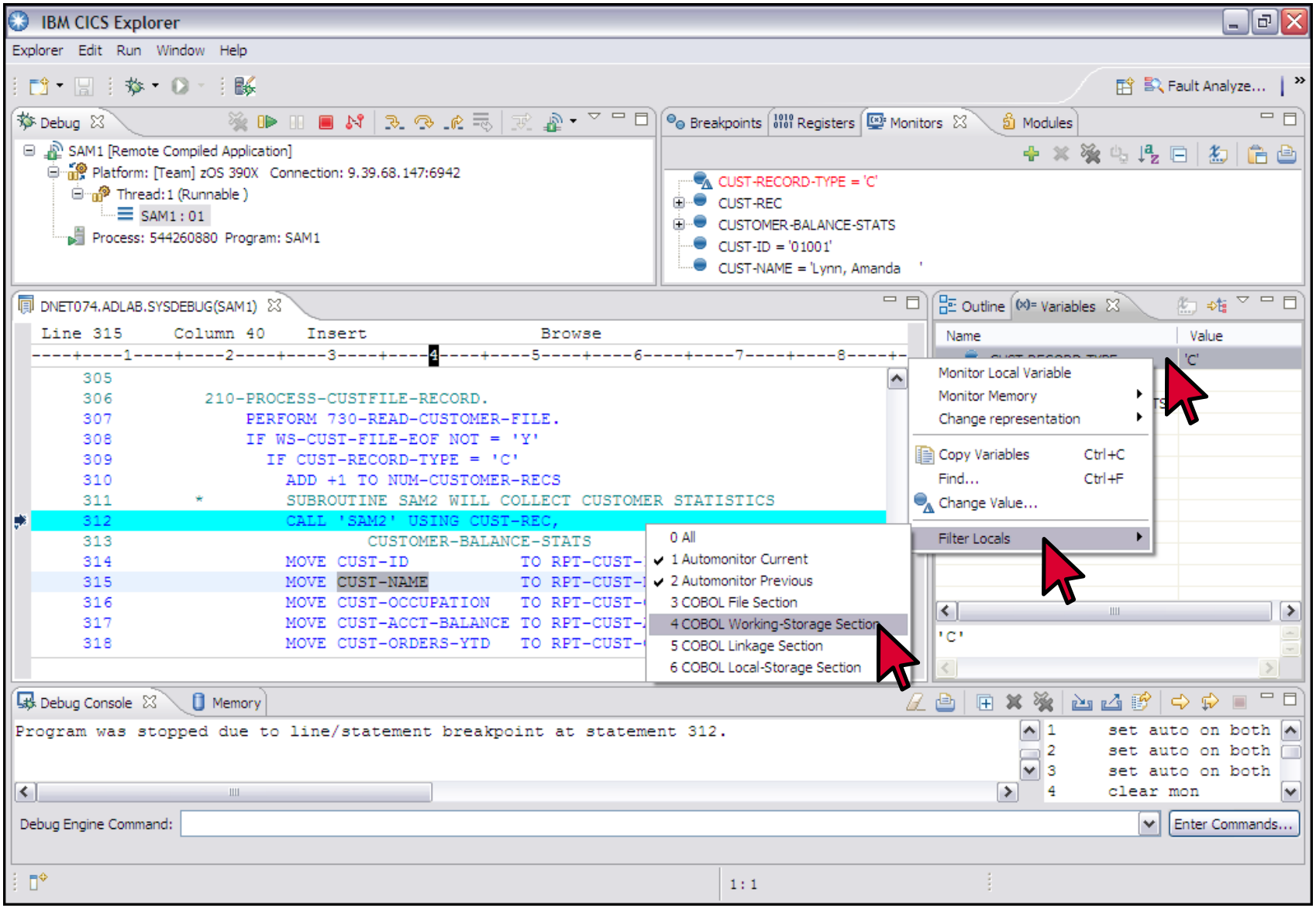
Add a variable to the monitor



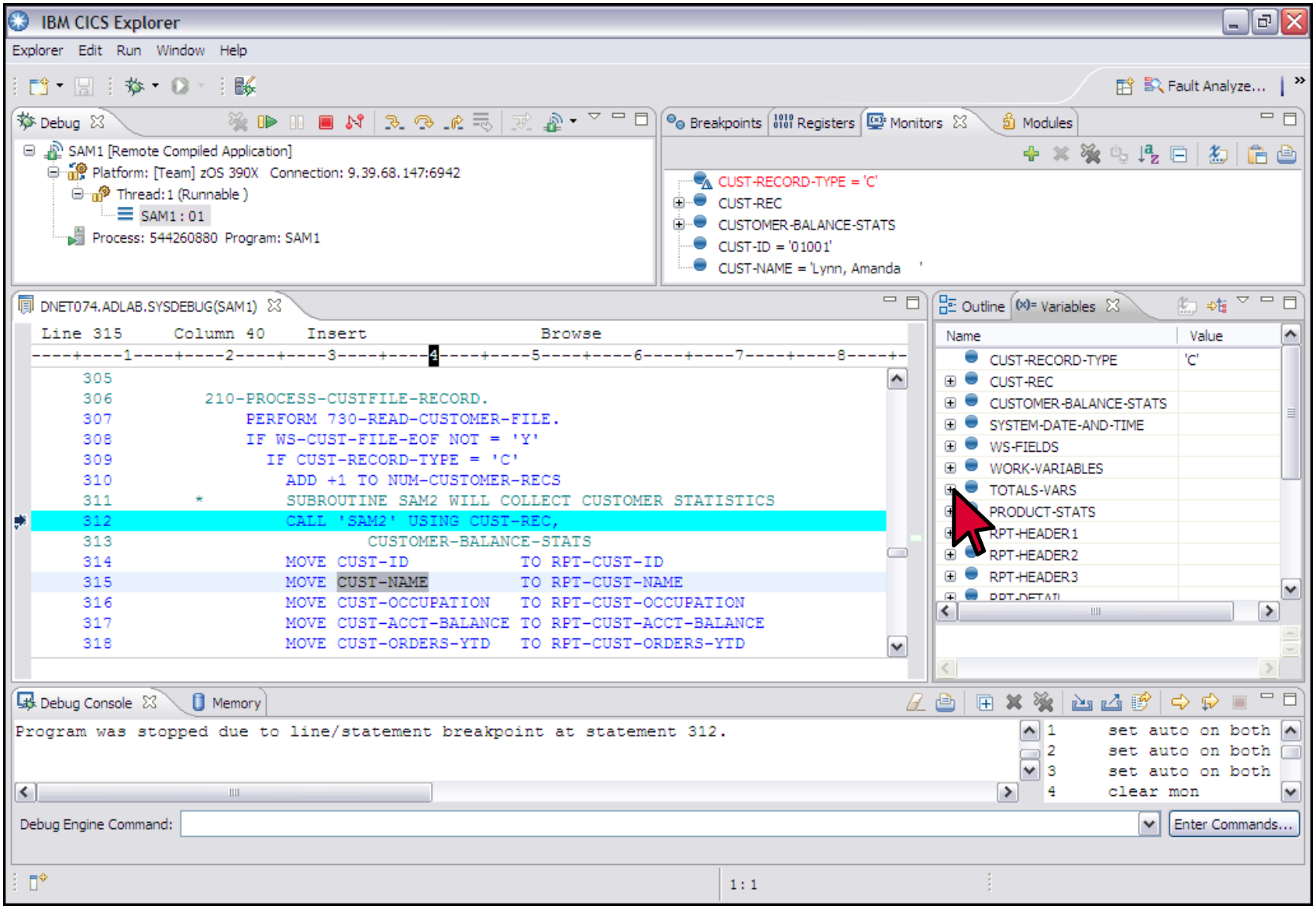
Variable was added to the monitor



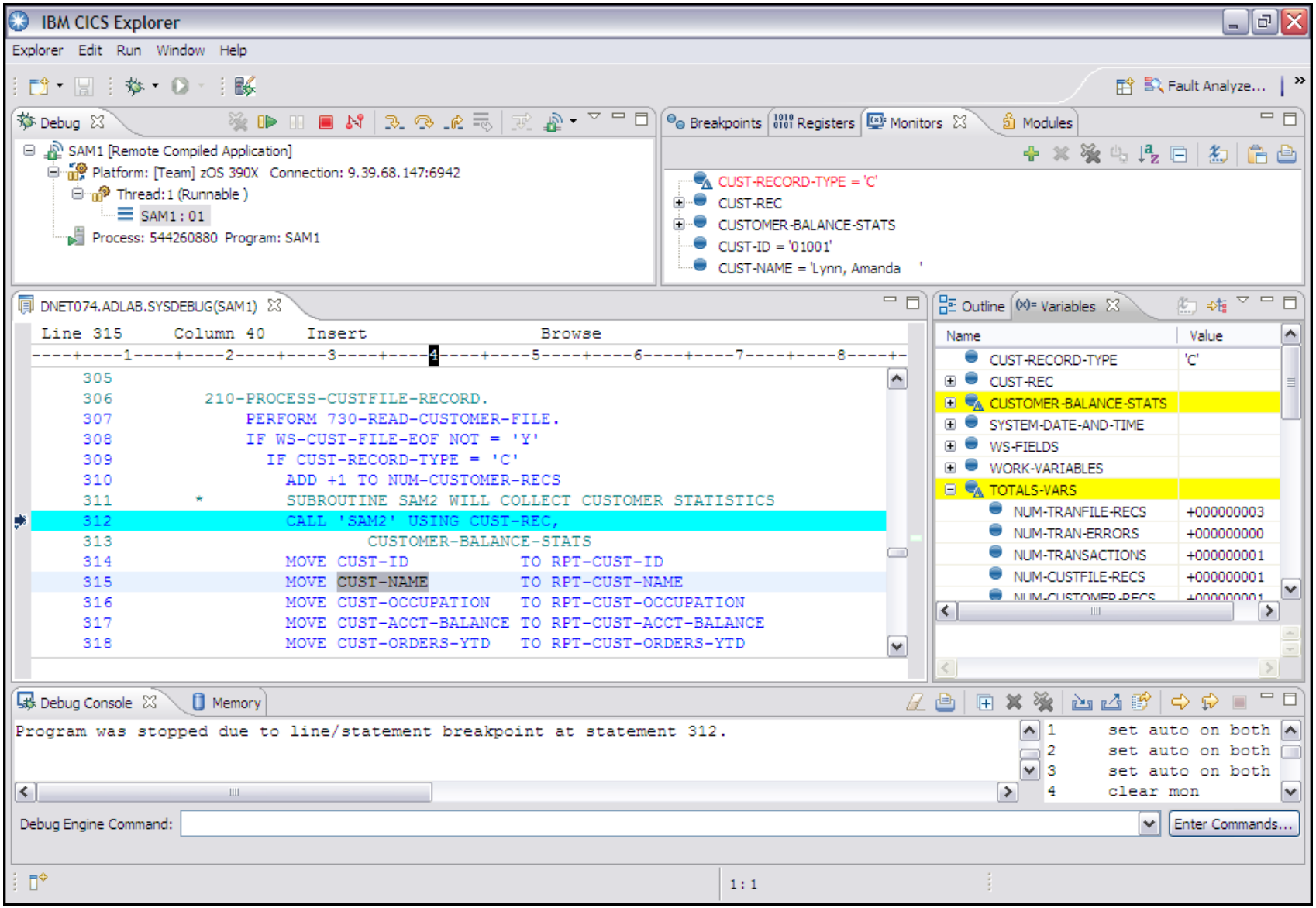
Display all working-storage in the variables view



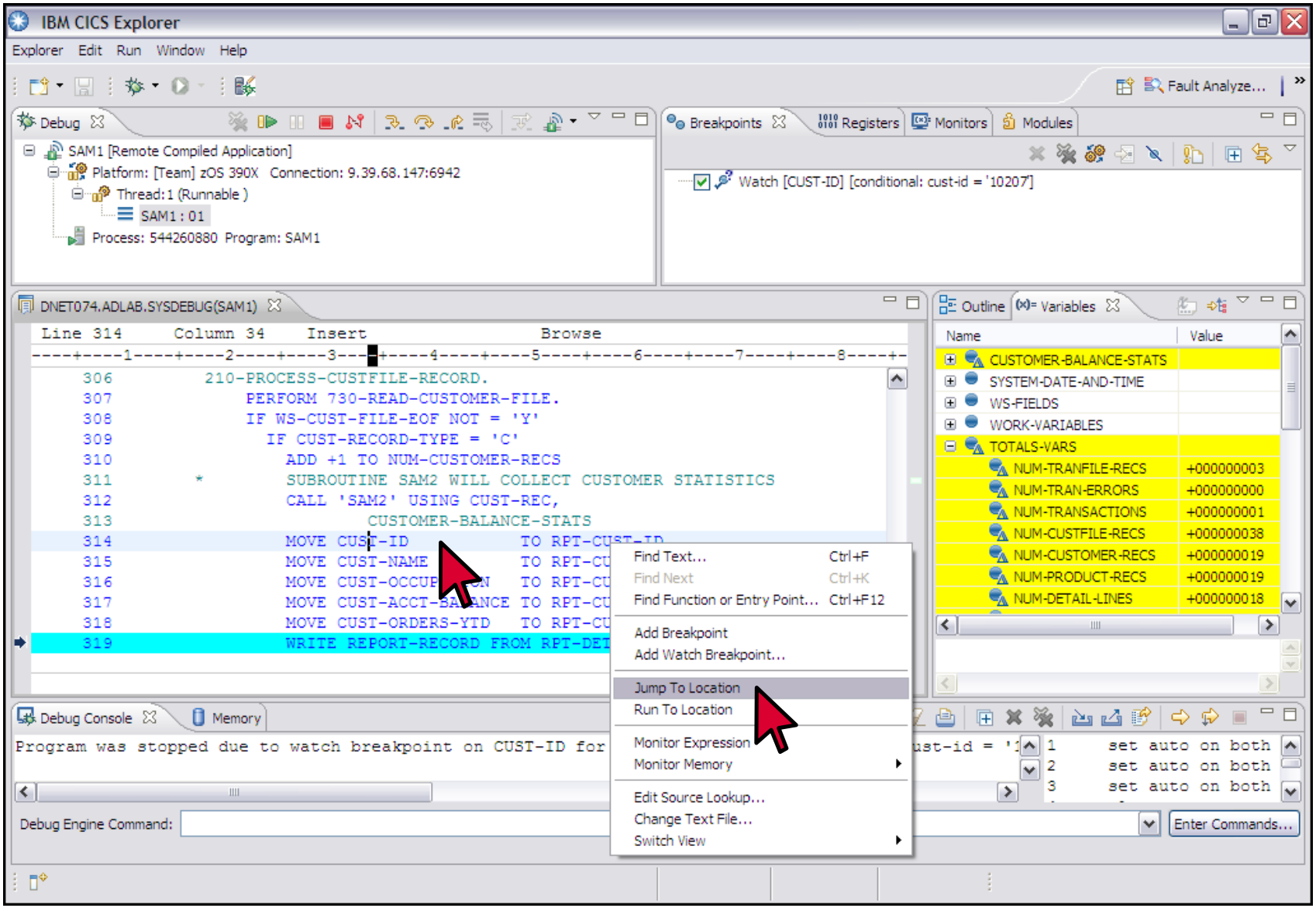
Working-storage is displayed in the variables view



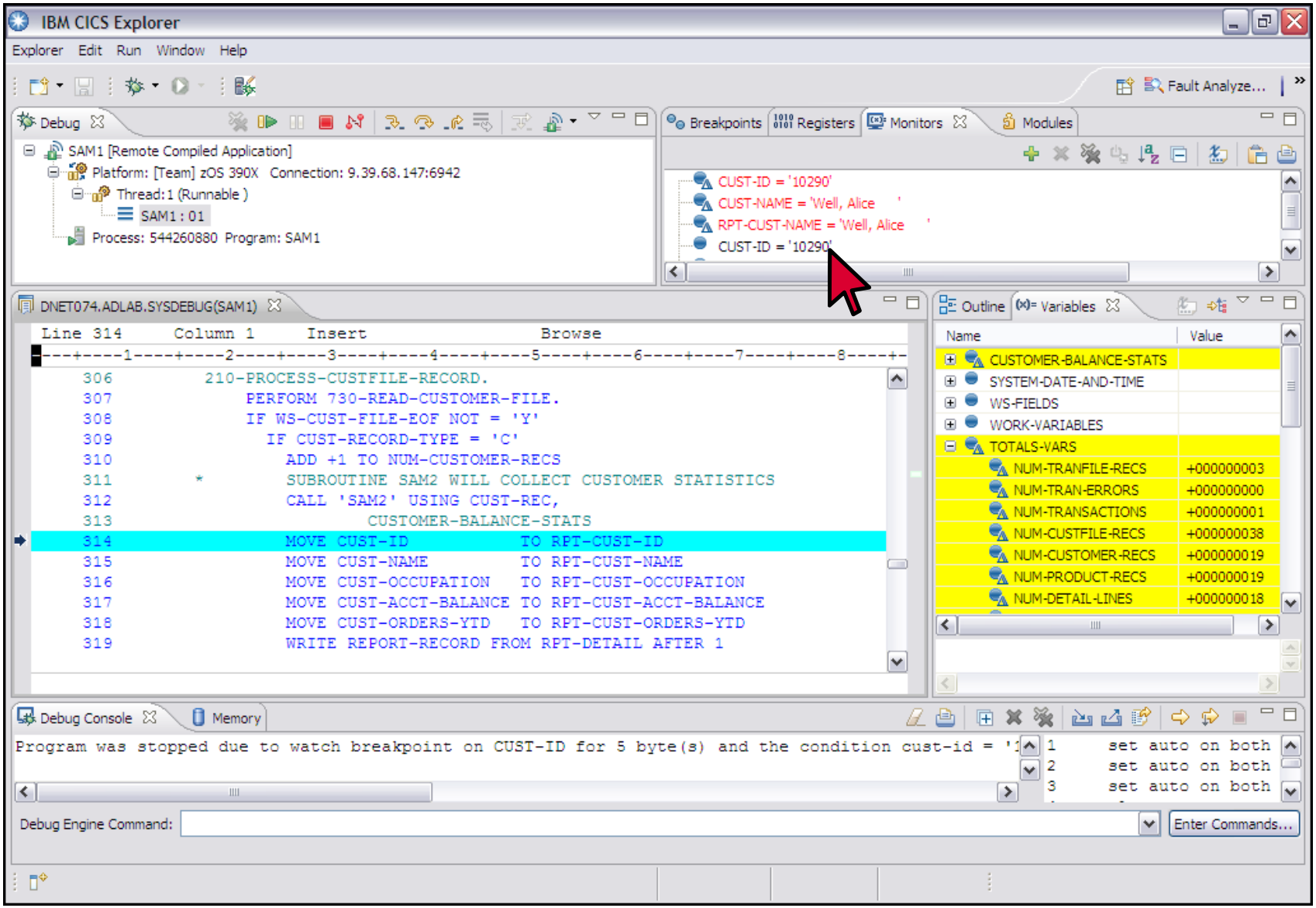
A group variable was expanded



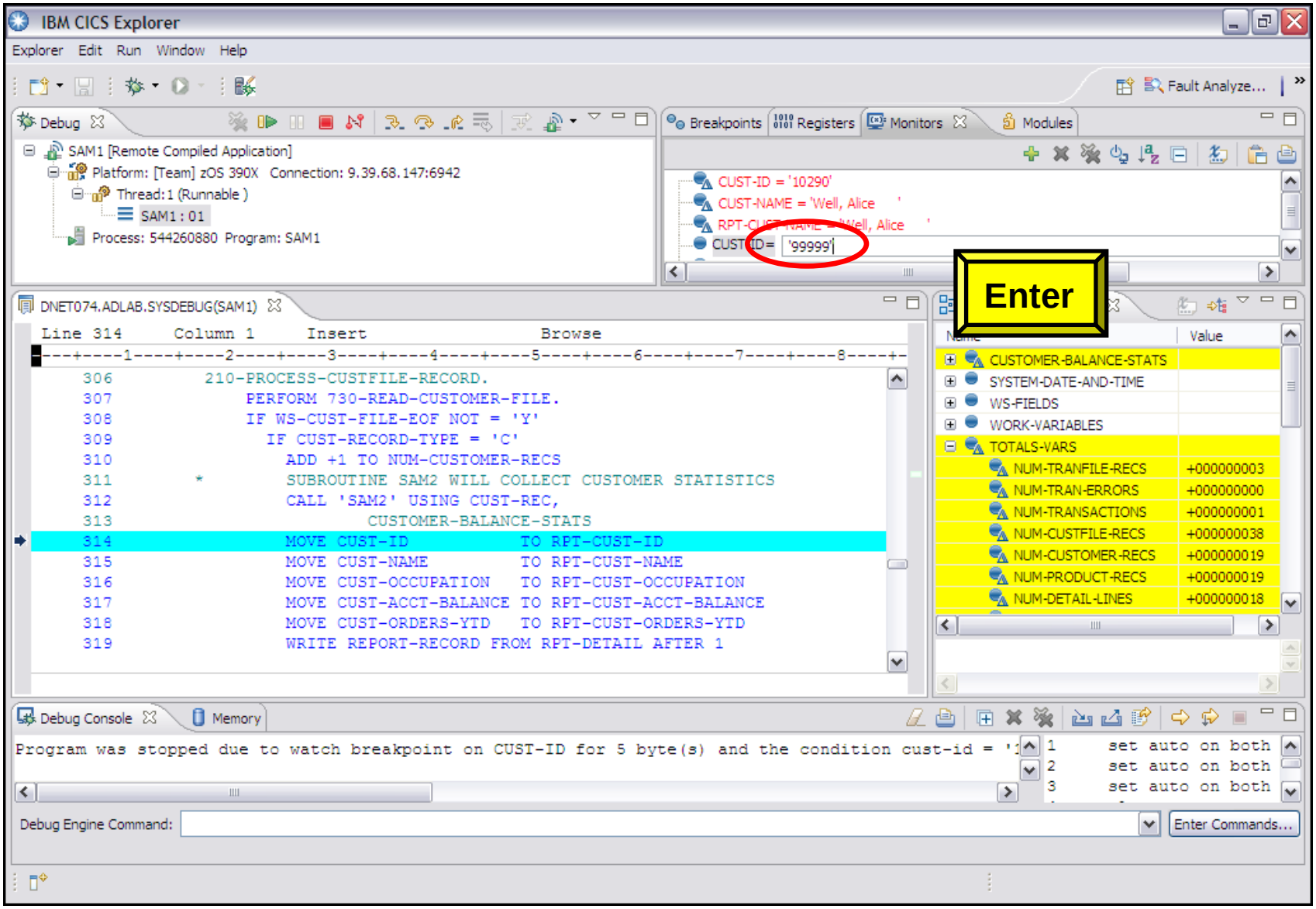
Jump to a statement



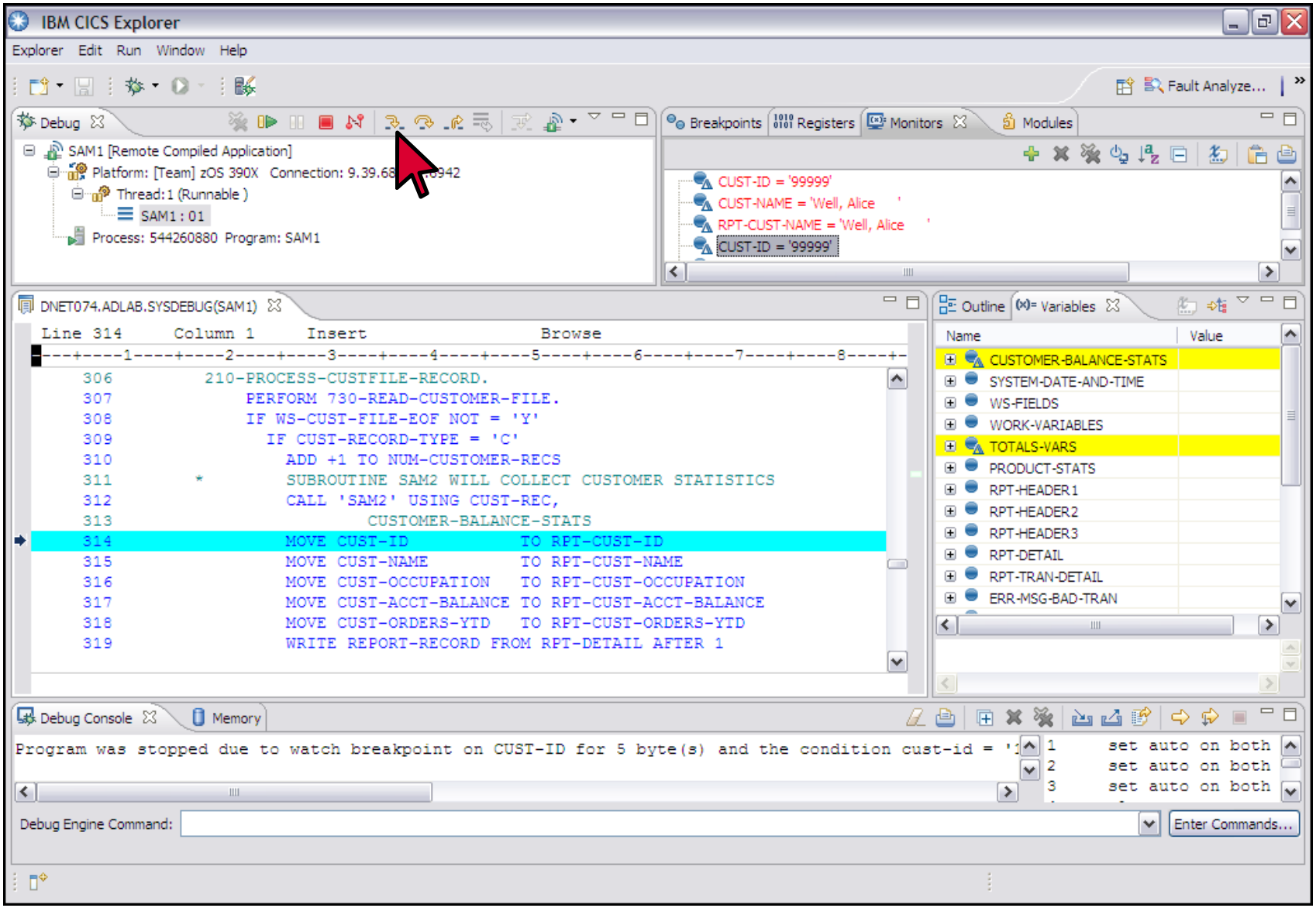
Change a value in the monitor



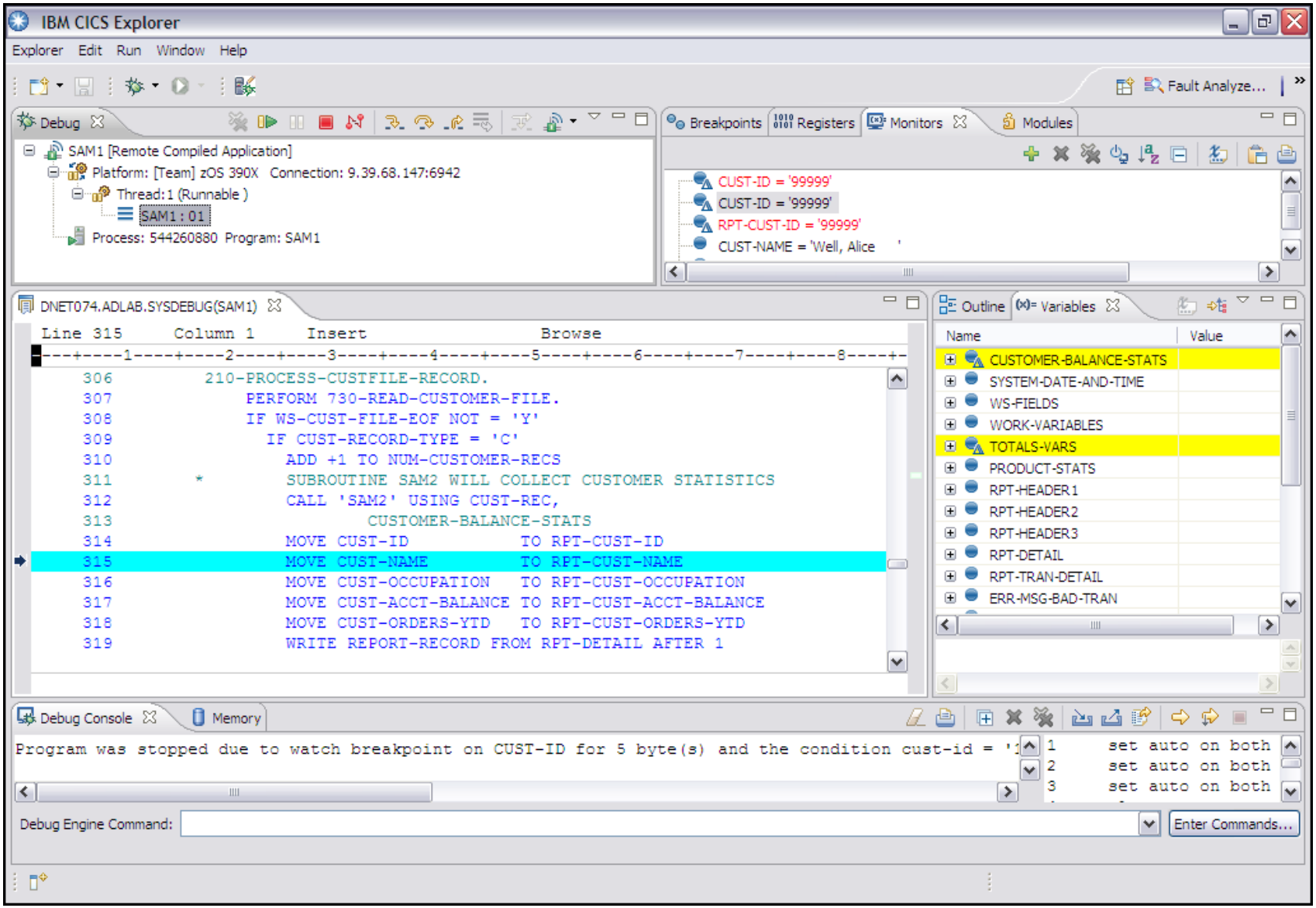
Change a value in the monitor



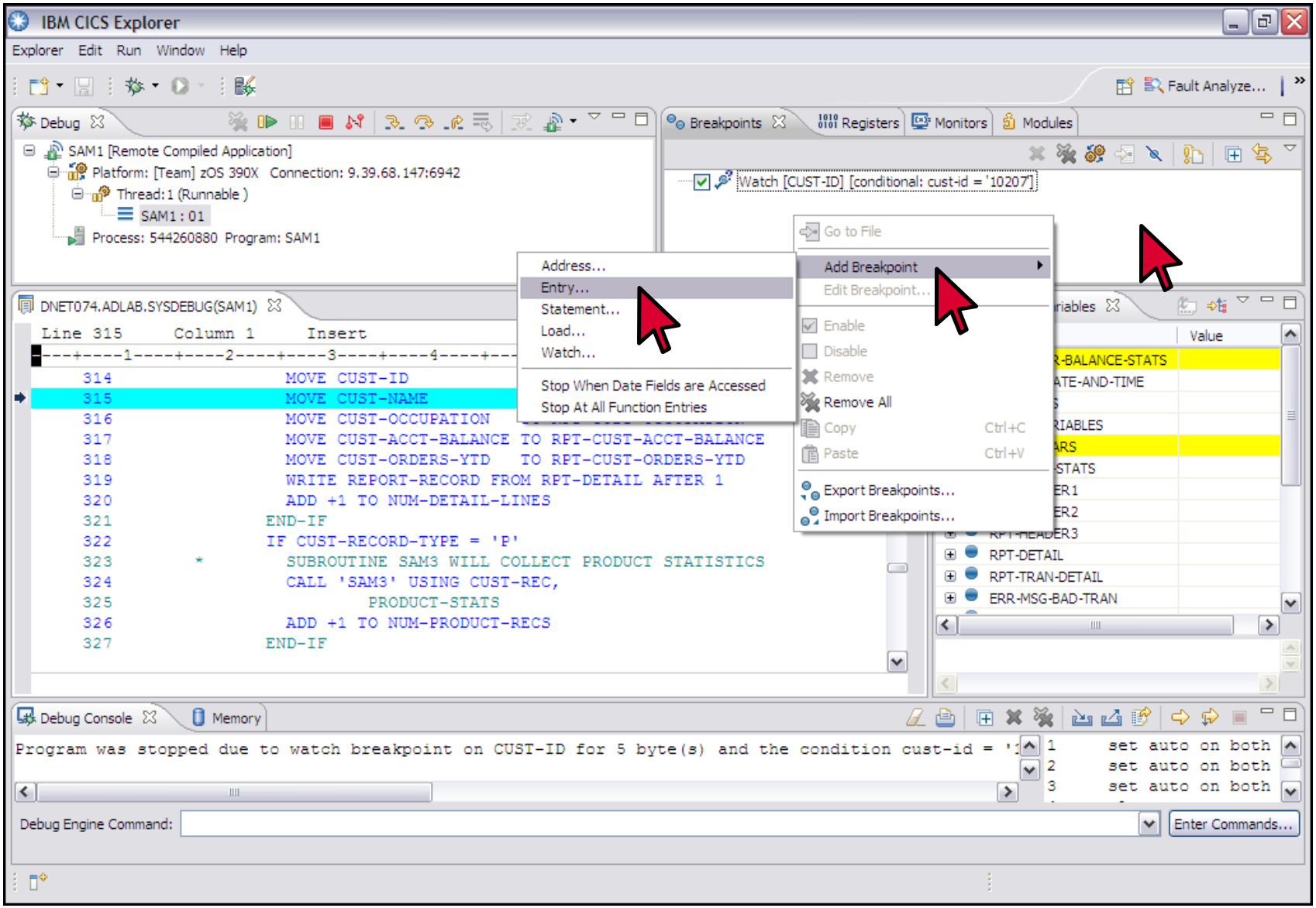
Step



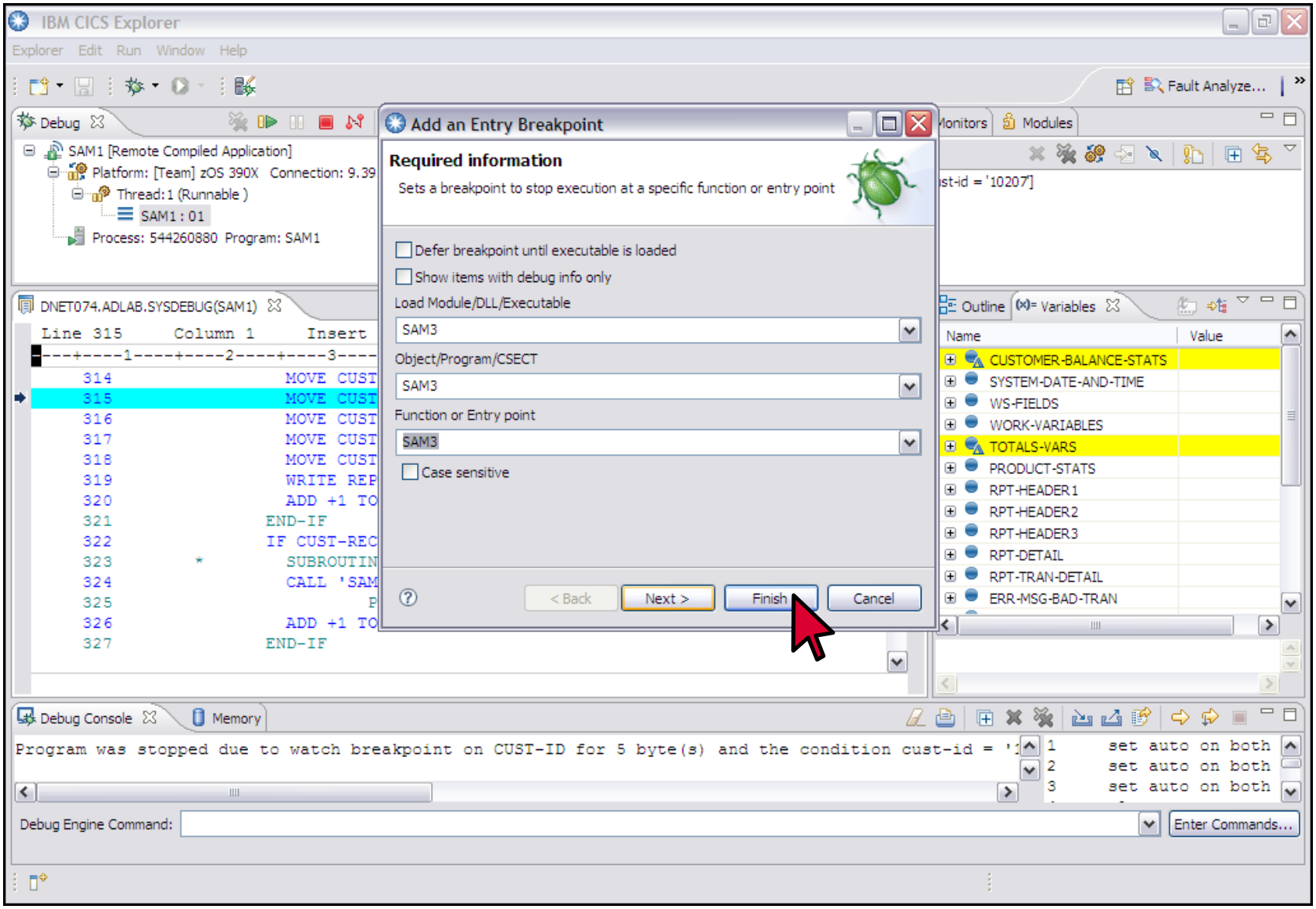
After stepping



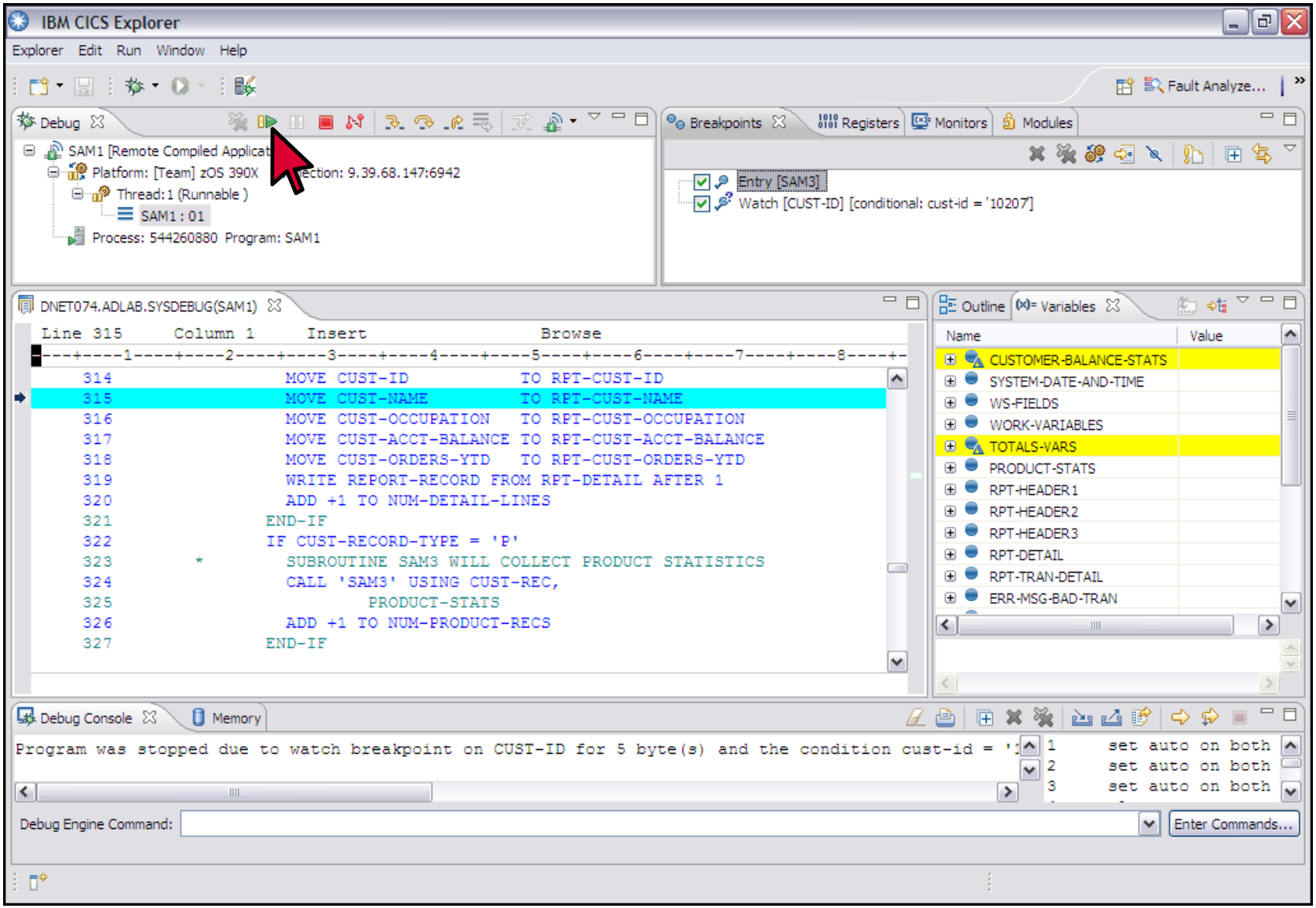
Create an Entry breakpoint



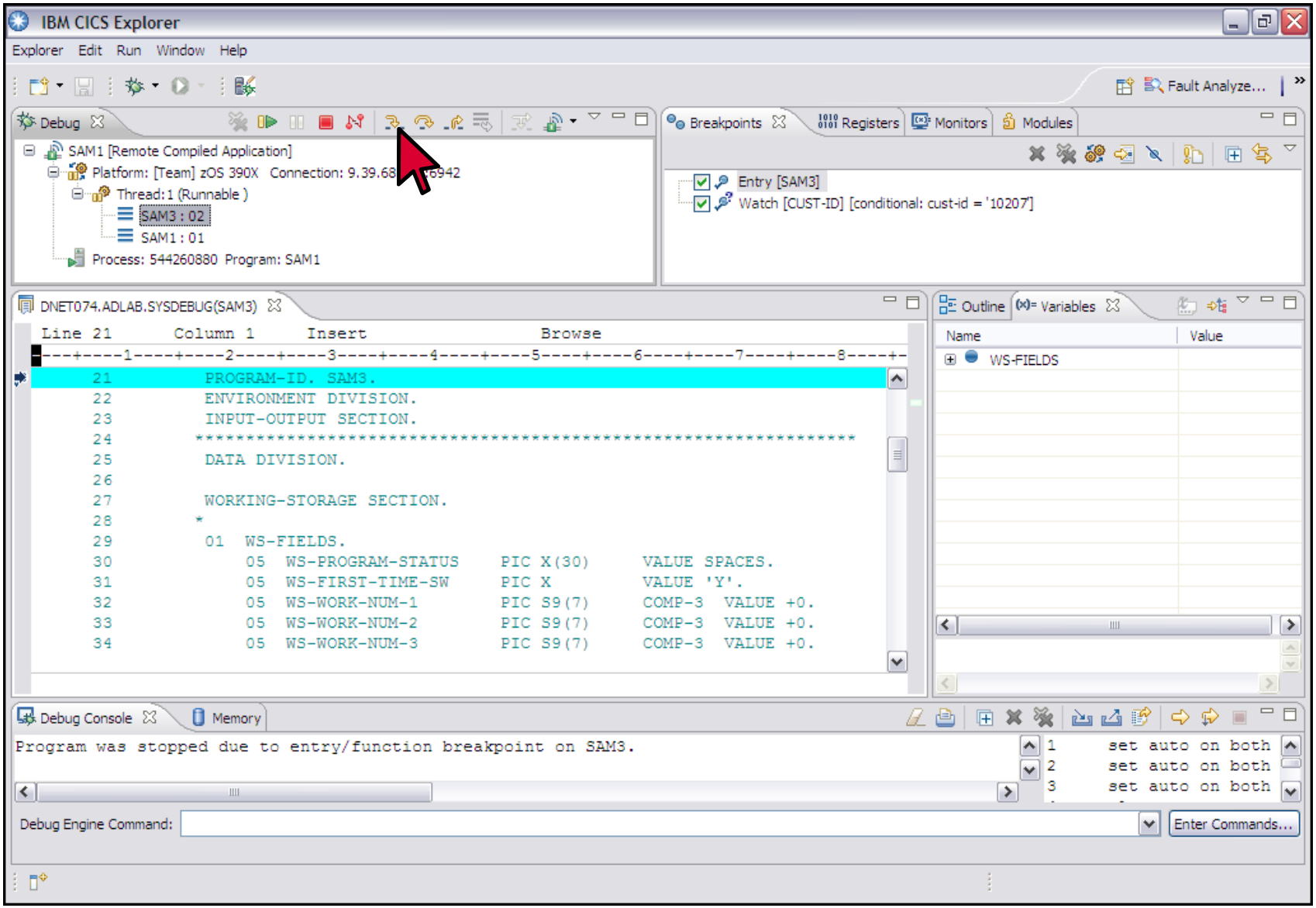
Create an Entry breakpoint



Resume

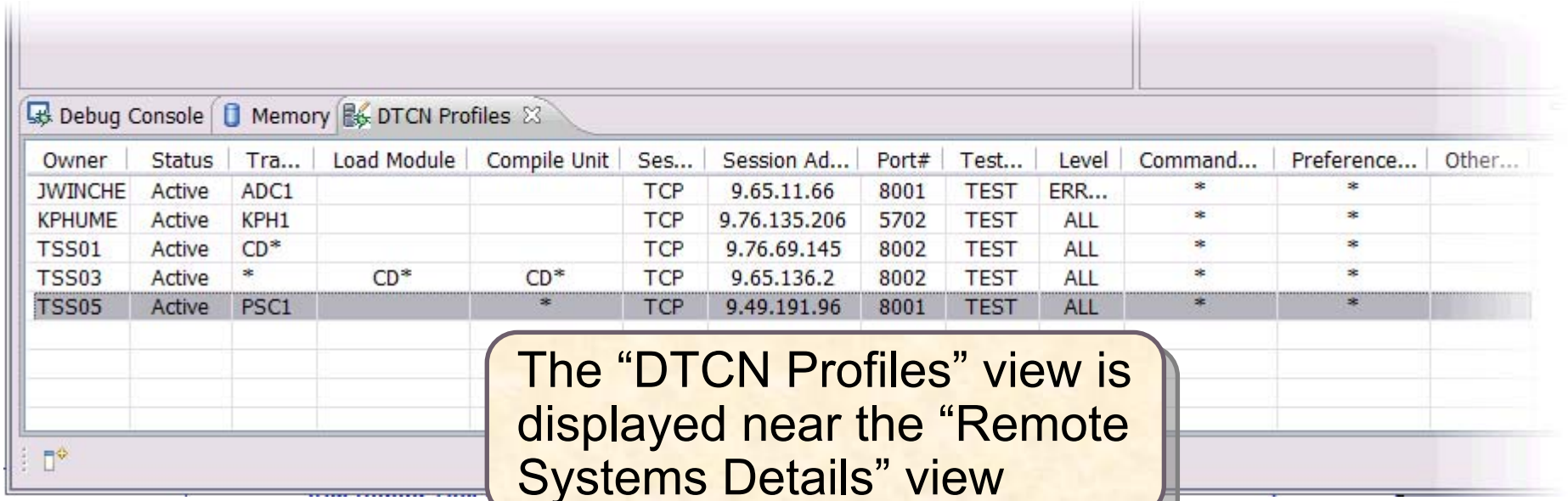


Stopped at the Entry breakpoint, Step

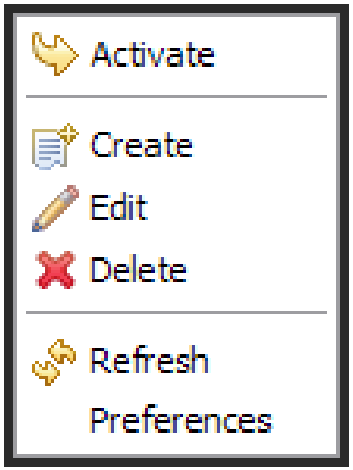


The DTCN Eclipse plug-in

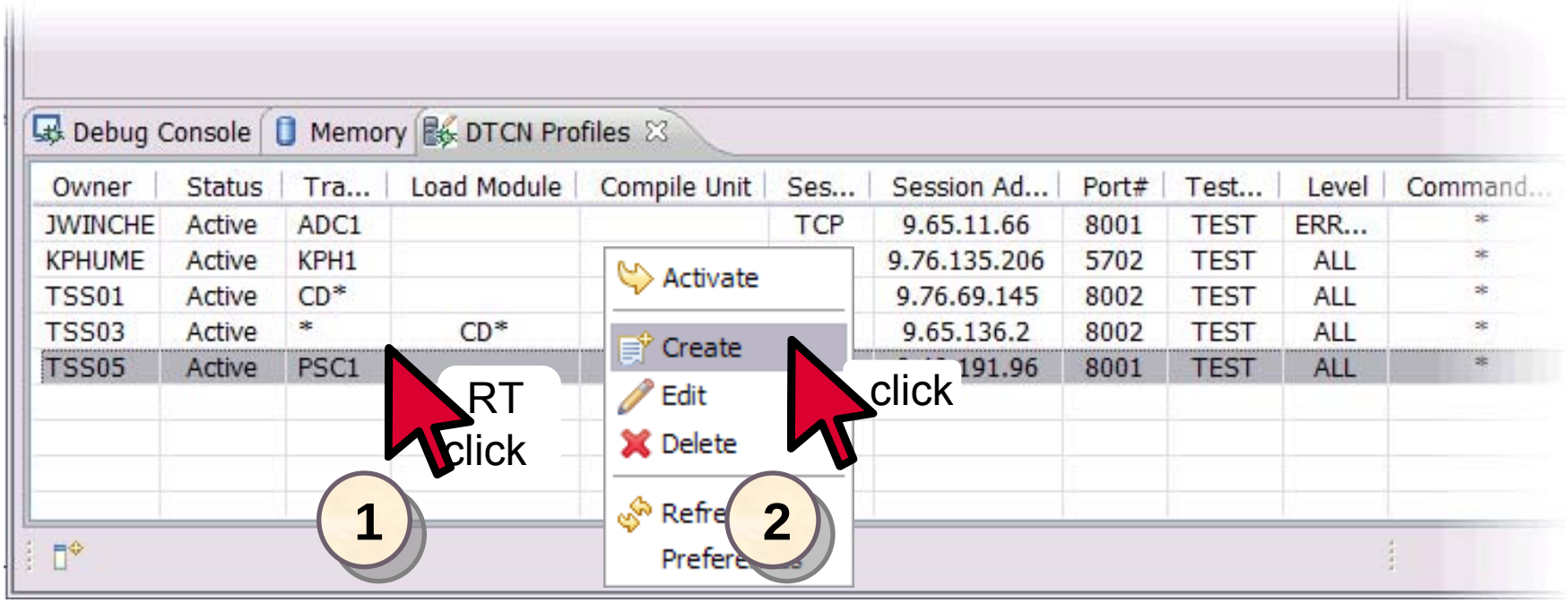
The DTCN profiles view is displayed



- “Right click” actions:
  - Activate – activate a profile
  - Create – begin wizard driven profile creation
  - Edit – wizard driven profile editing
  - Delete – remove a profile
  - Refresh – refresh view
  - Preferences – edit the DTCN connection information defined at installation

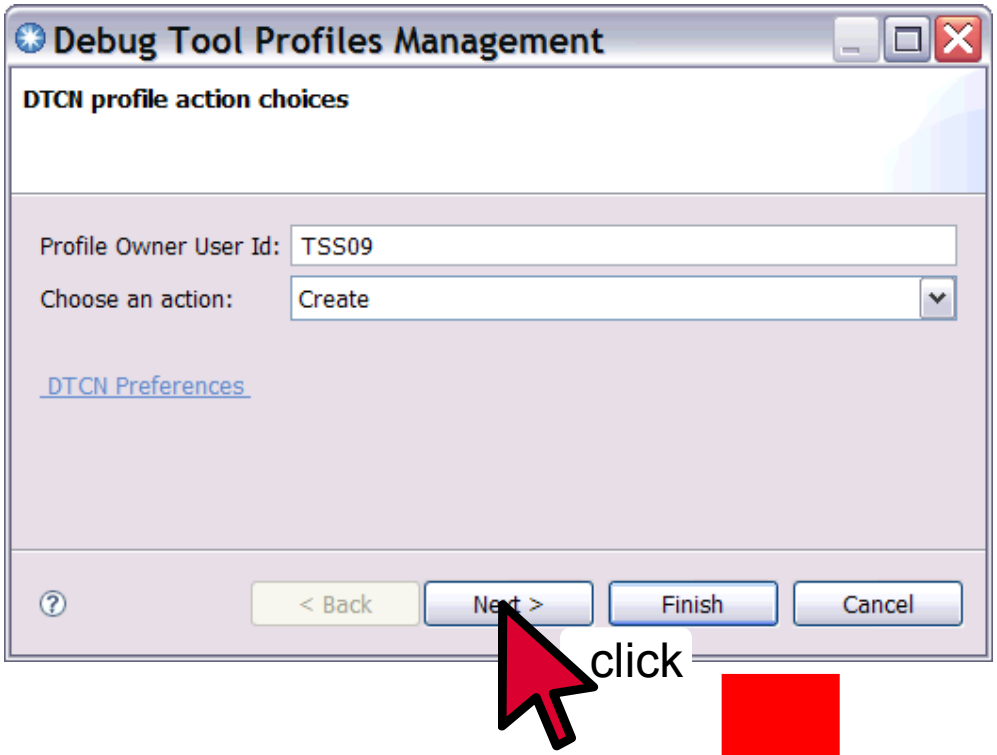


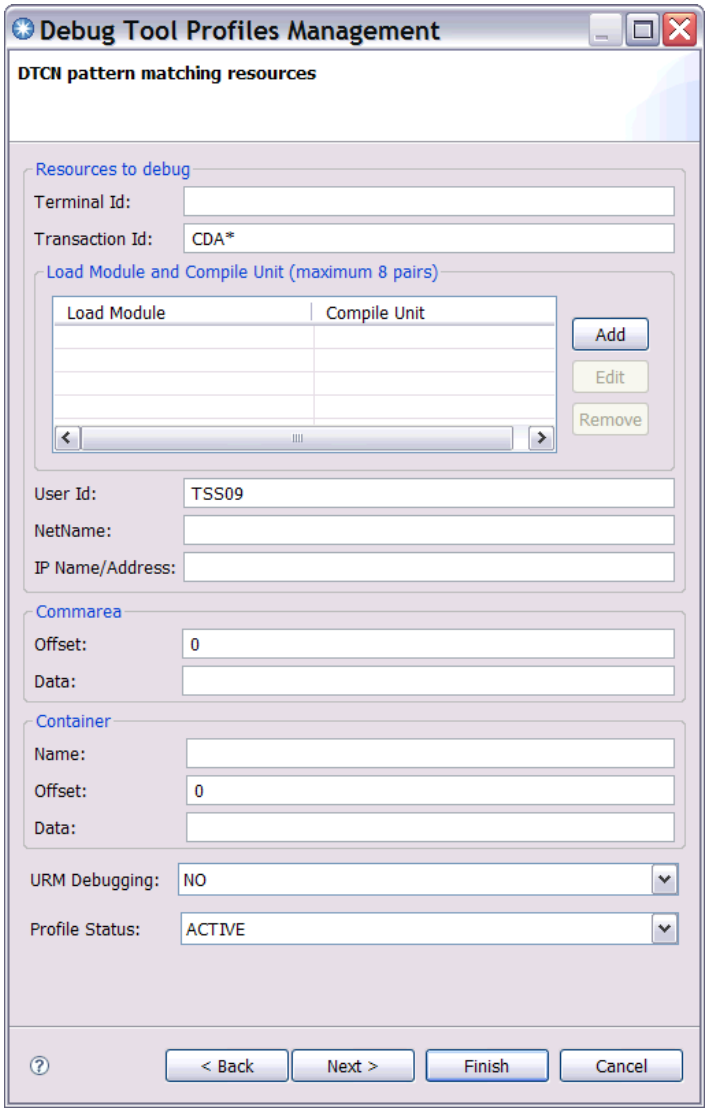
Create a new DTCN Profile



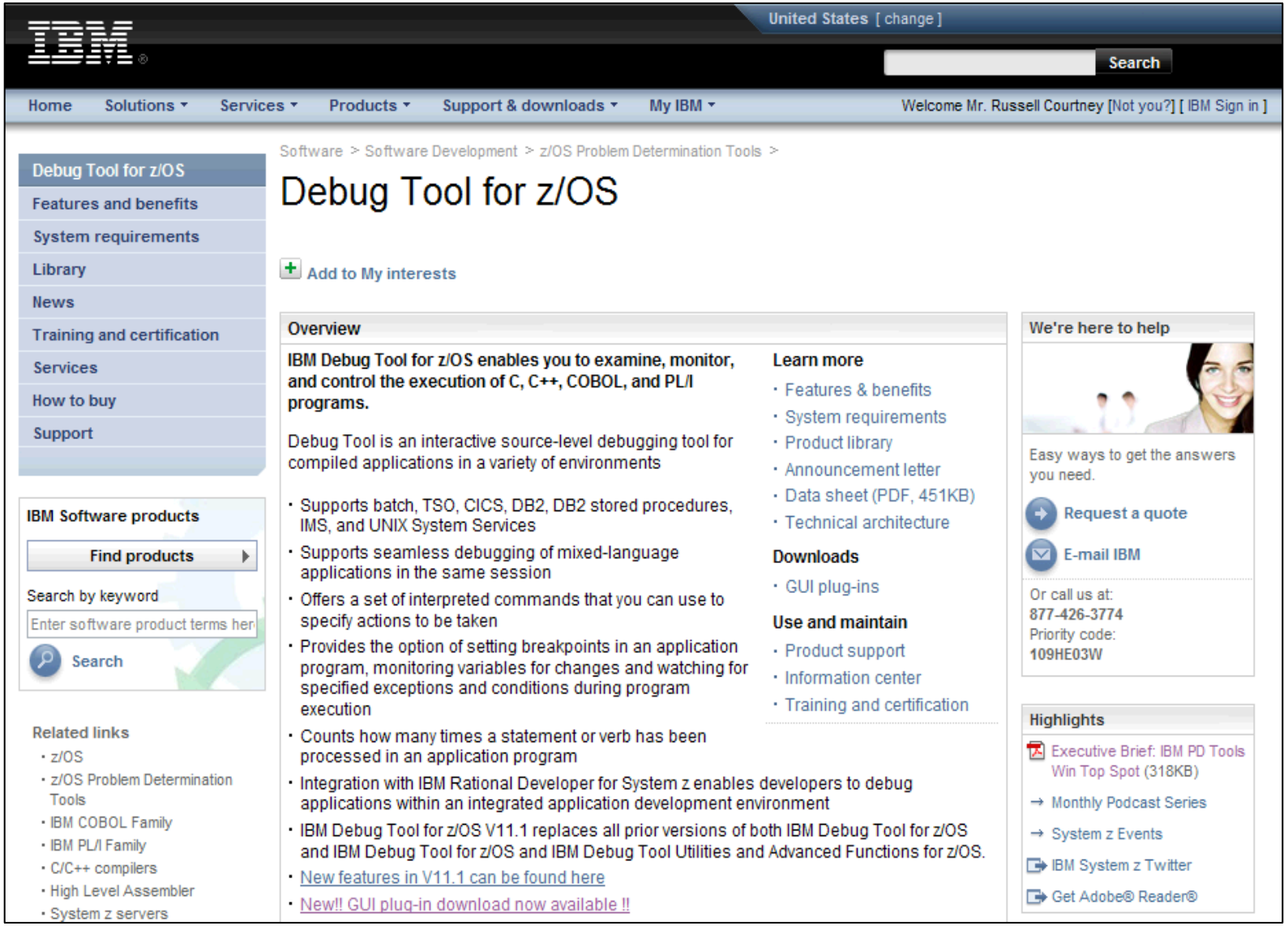
In the “DTCN Profiles” view, right click and select “Create”

Specify your CICS user ID and "create"





Visit our web site: www.ibm.com/software/awdtools/debugtool



IBM Fault Analyzer for z/OS Version 11

IBM Fault Analyzer for z/OS

Assists in analyzing and fixing application and system failures

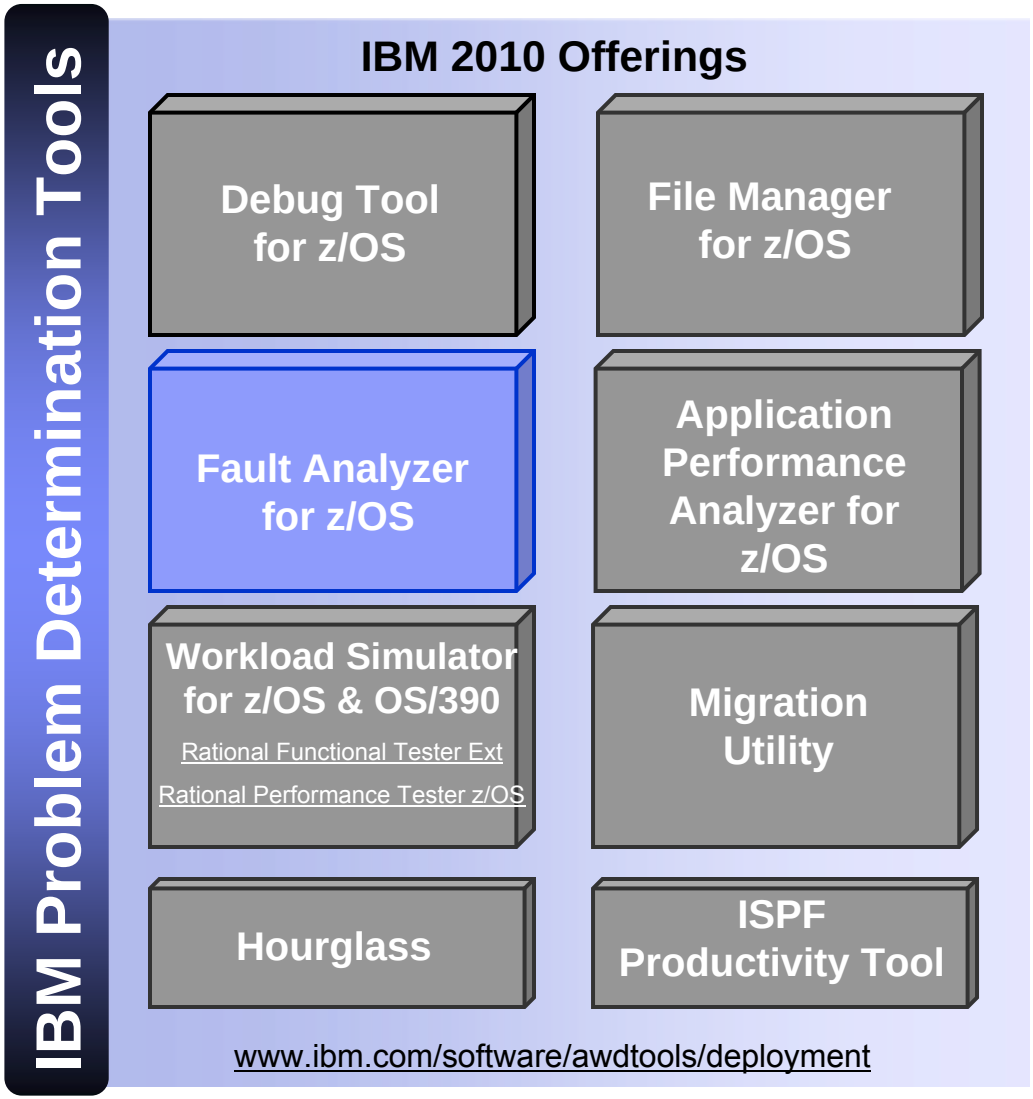
Problem

- **Your new developers don't have the experience to diagnose faults and dumps**
- **Your experienced developers don't have the time**

Solution

- **Analysis at application level**
- **Information gathered at time of abend**
- **Translates low-level dump information into application-level information**
- **Expands abend code and message descriptions**
- **No recompile of applications or JCL changes**
- **No performance overhead**
- **Integrated 64-bit DB2 support**
- **Interface to File Manager for z/OS**

The IBM Problem Determination Tools Suite for z/OS

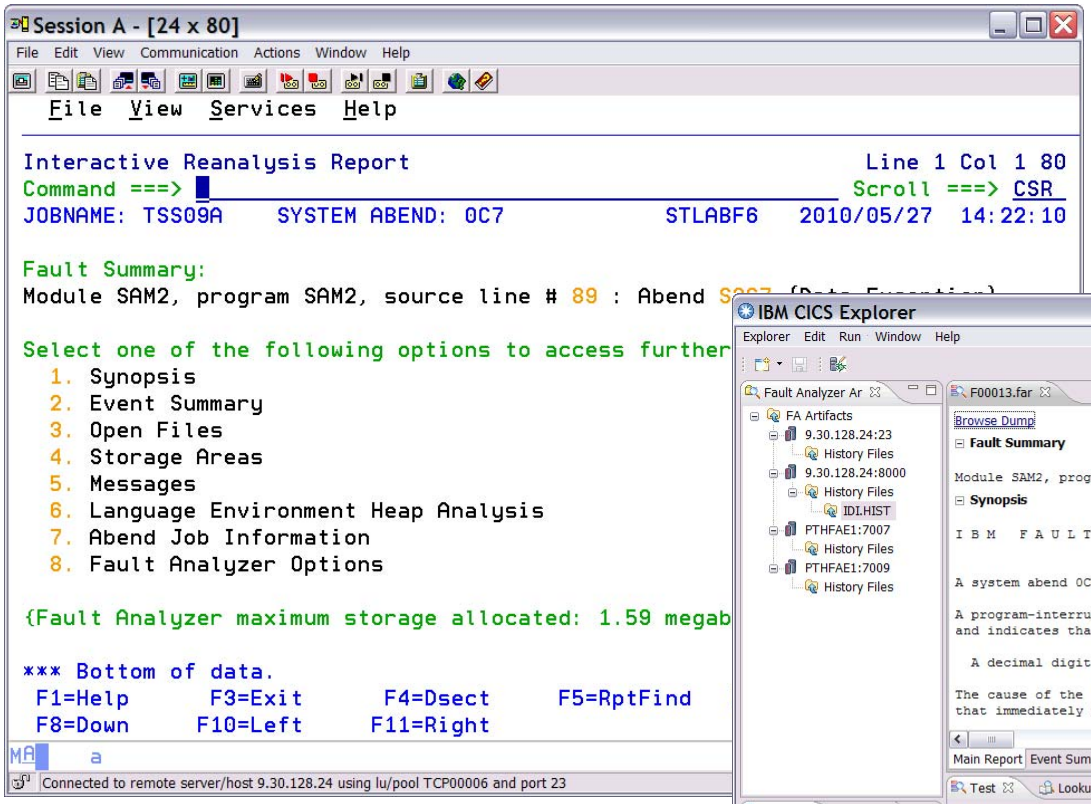


Fault Analyzer for zOS Highlights

- Automatic program abend capture and reporting
- Program source-level reporting
- Multiple languages and zOS environments including CICS, DB2, IMS, Enterprise PL/I, Enterprise COBOL and WebSphere Application Server for z/OS systems
- Provides a detailed report about program failures to help resolve them quickly
- Enables you to track and manage application failures and fault reports
- Offers a view of storage contents, trace tables and terminal screen images at the time of failure to help speed corrective action
- Provides the ability to customize message descriptions to be used in application-failure reports
- Eclipsed-based GUI plug-in available for download

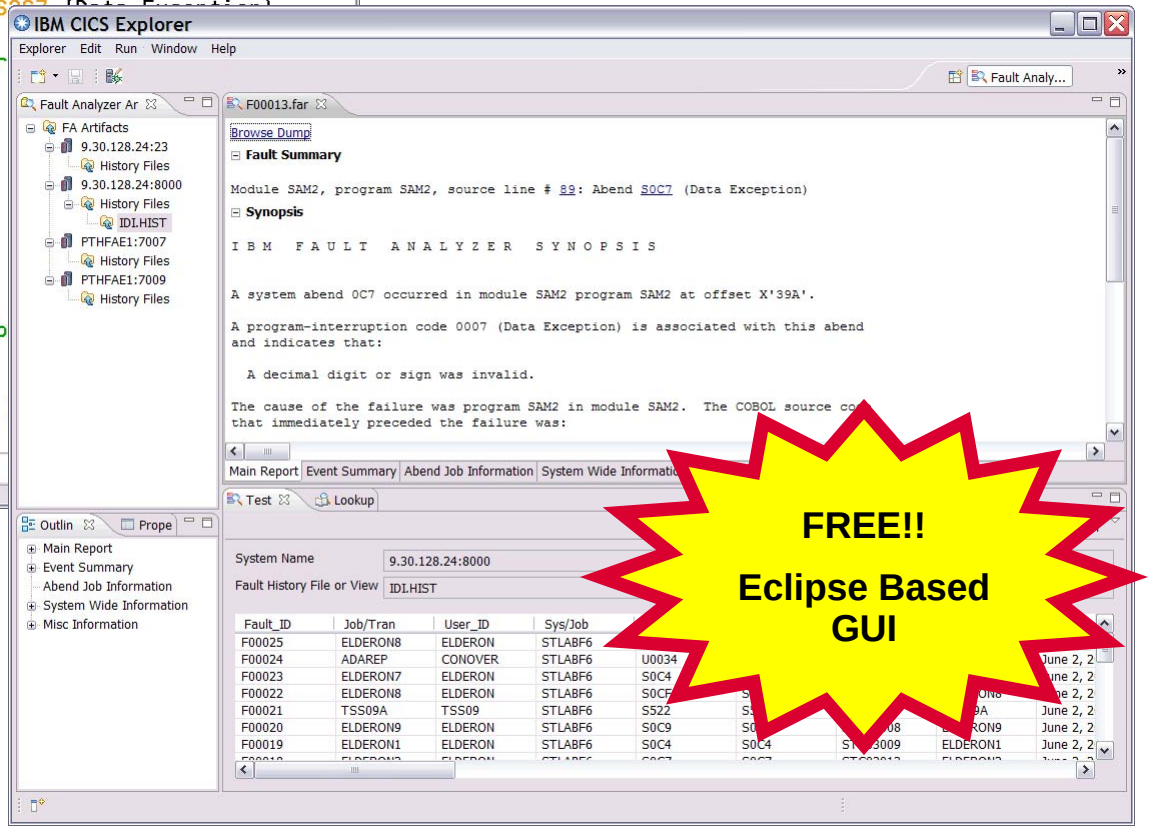
IBM Fault Analyzer for z/OS

Multiple interfaces and modes of operation



Interfaces

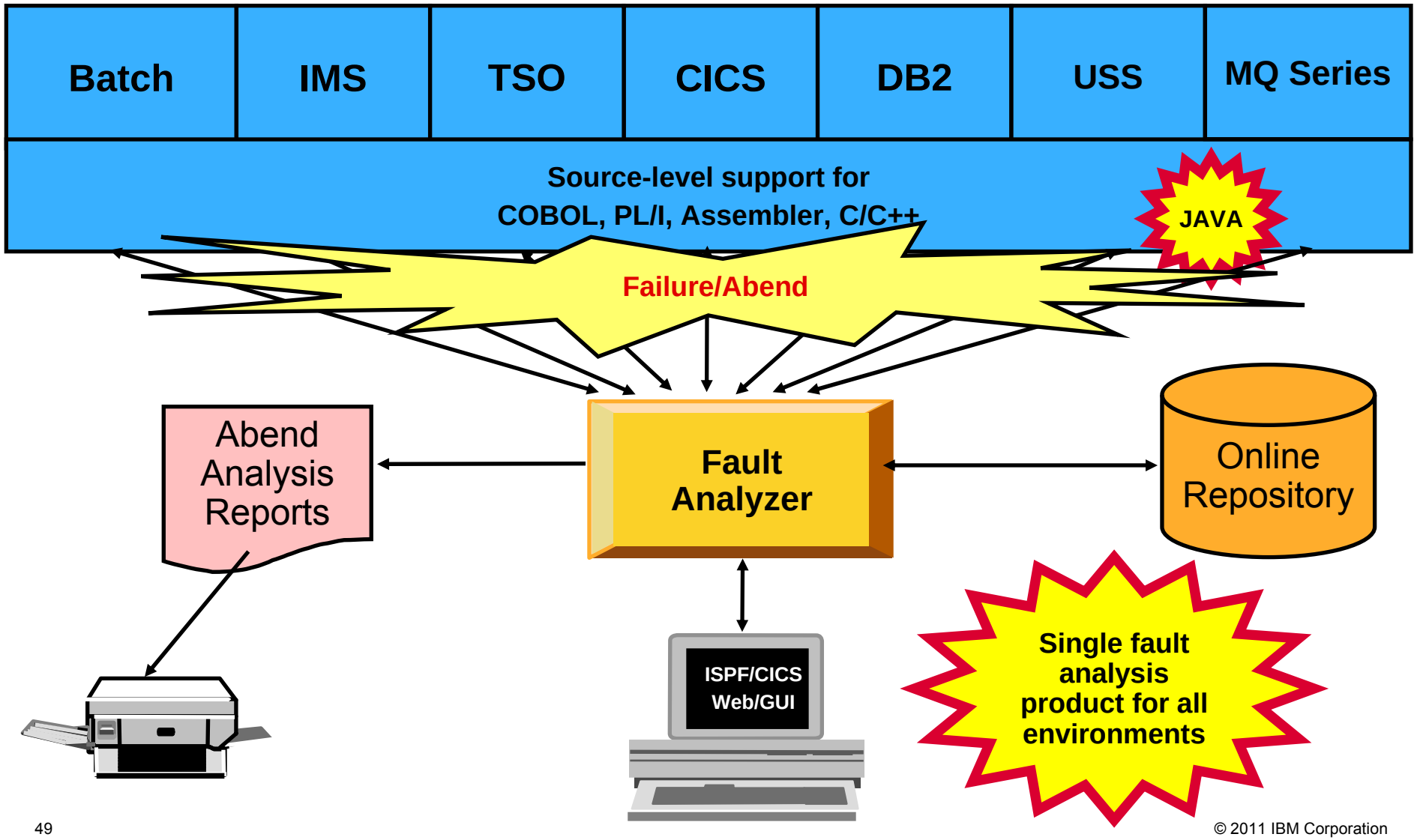
- ISPF
- RDz
- GUI
- CICS
- Web



Modes Of Operation

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

Fault Analyzer - Helps you rapidly pinpoint why and where an application failed

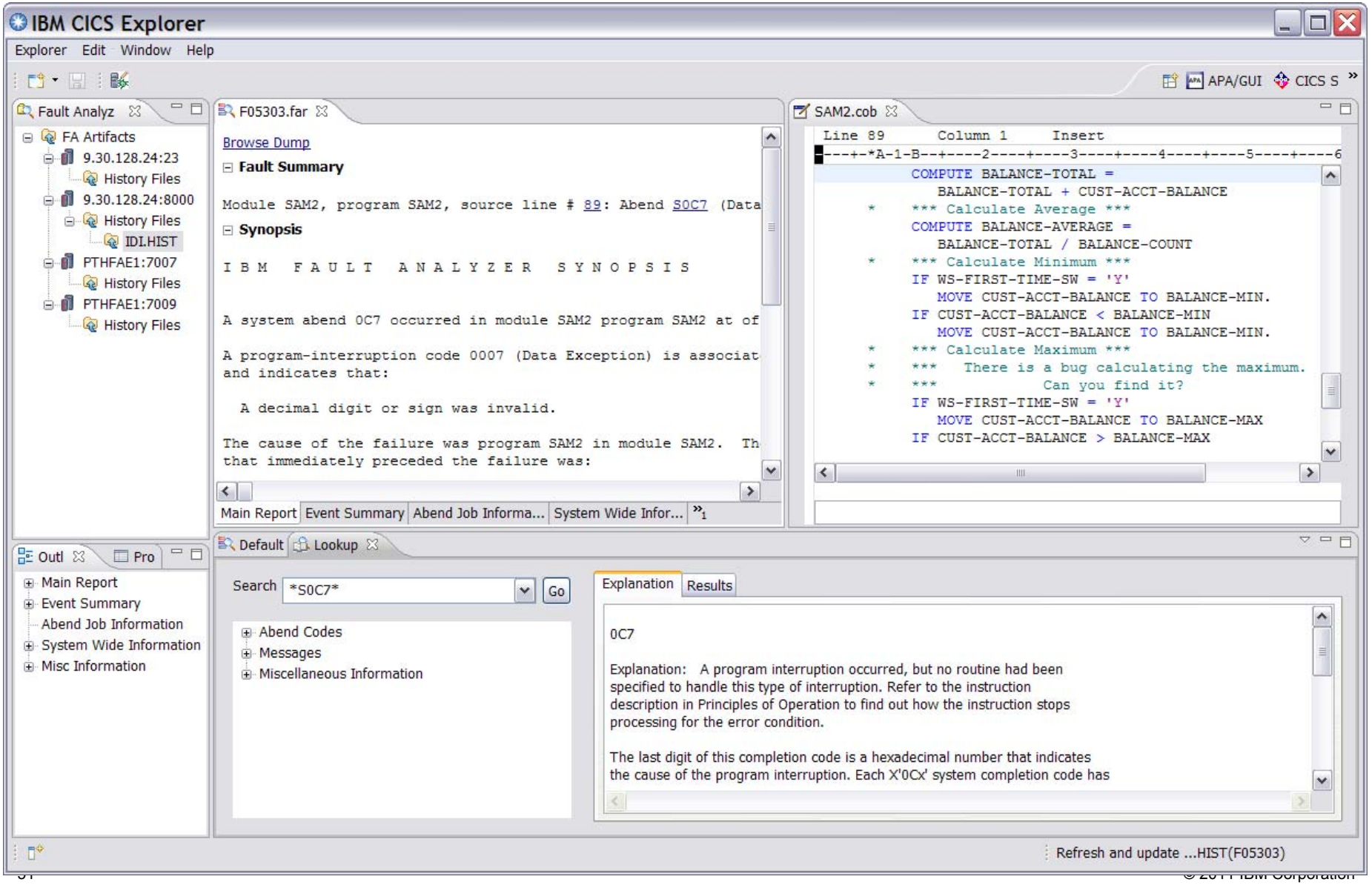


Fault Analyzer provides information to determine the cause and resolution of application and system failures

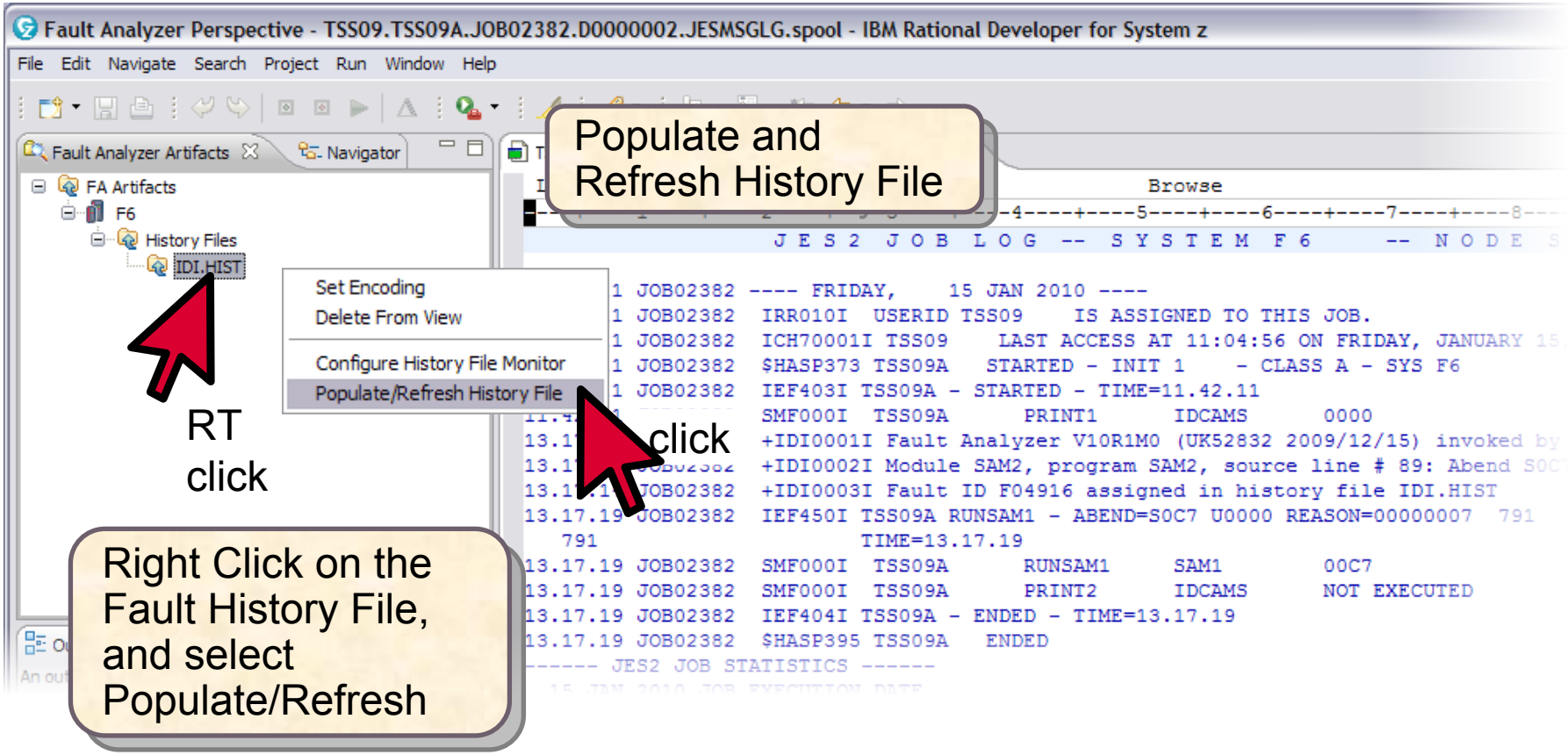
- Analysis at the application level
- Information gathered at time of abend
- Translates low-level dump information into application-level information
- Expands abend code and message descriptions
- No recompile of applications
- No JCL changes
- No performance overhead
- Integrated 64-bit support
- Interface to File Manager for z/OS

- Three Modes Of Operation
  - Real-time analysis
  - Batch dump re-analysis
  - Interactive dump re-analysis
- Interfaces
  - RDz
  - Eclipsed-based GUI
  - ISPF
  - CICS
  - Web
- Support for IBM software
  - CICS TS 4.2
    - **Channels and containers** in 64-bit storage
  - DB2 V10
  - IMS V11

Fault Analyzer Interface inside CICS Explorer



Populate/Refresh history file



Contents of the fault history file

```
11.42.11 JOB02382 ---- FRIDAY,    15 JAN 2010 ----
11.42.11 JOB02382  IRR010I  USERID TSS09    IS ASSIGNED TO THIS JOB.
11.42.11 JOB02382  ICH70001I TSS09    LAST ACCESS AT 11:04:56 ON FRIDAY, JANUARY 15, 2010
```

Fault History file refreshed in the “Default” view

Default | Lookup | Column Configuration

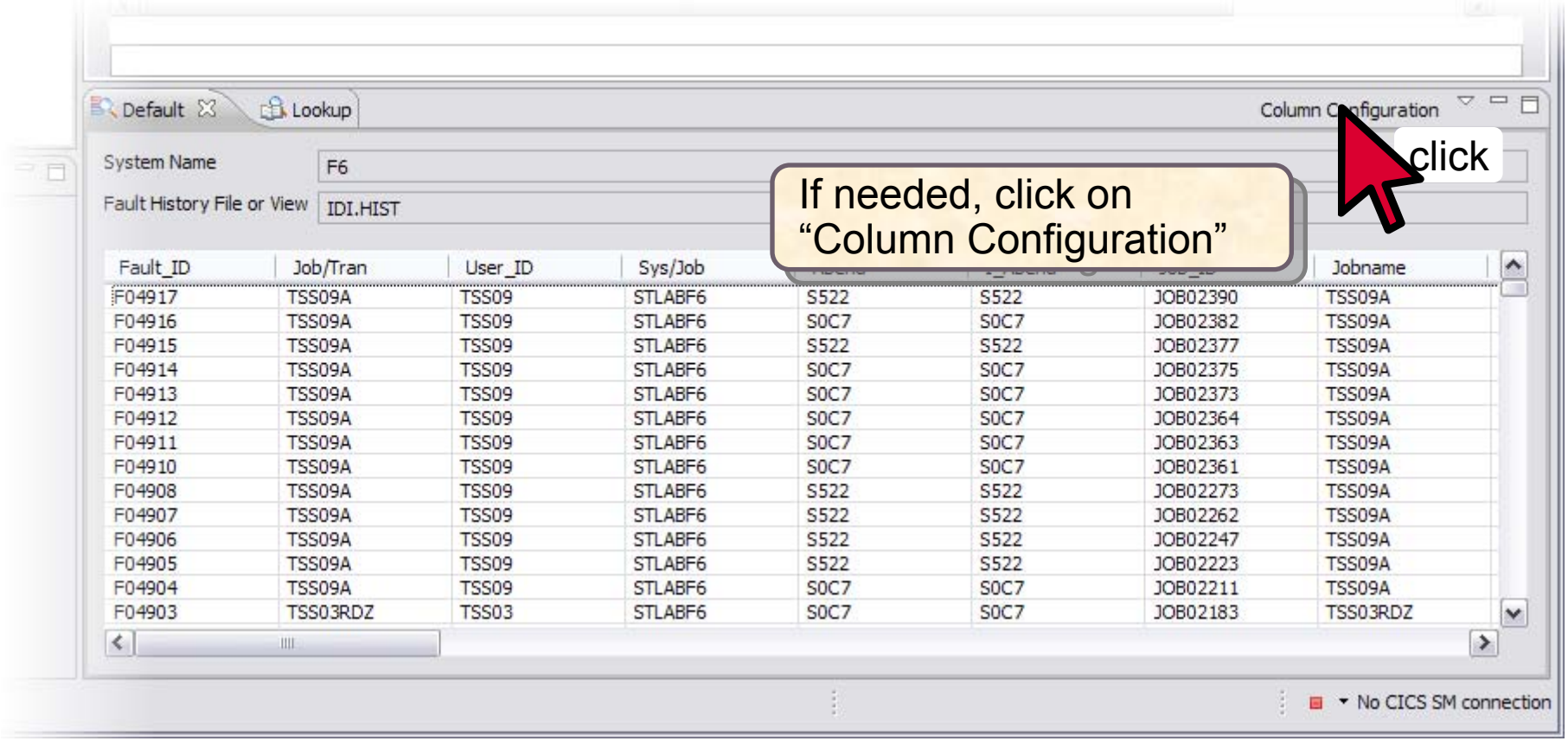
System Name: F6

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	STLABF6	S0C7	S0C7	JOB02375	TSS09A
F04913	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02373	TSS09A
F04912	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02364	TSS09A
F04911	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02363	TSS09A
F04910	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02361	TSS09A
F04908	TSS09A	TSS09	STLABF6	S522	S522	JOB02273	TSS09A
F04907	TSS09A	TSS09	STLABF6	S522	S522	JOB02262	TSS09A
F04906	TSS09A	TSS09	STLABF6	S522	S522	JOB02247	TSS09A
F04905	TSS09A	TSS09	STLABF6	S522	S522	JOB02223	TSS09A
F04904	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02211	TSS09A
F04903	TSS03RDZ	TSS03	STLABF6	S0C7	S0C7	JOB02183	TSS03RDZ

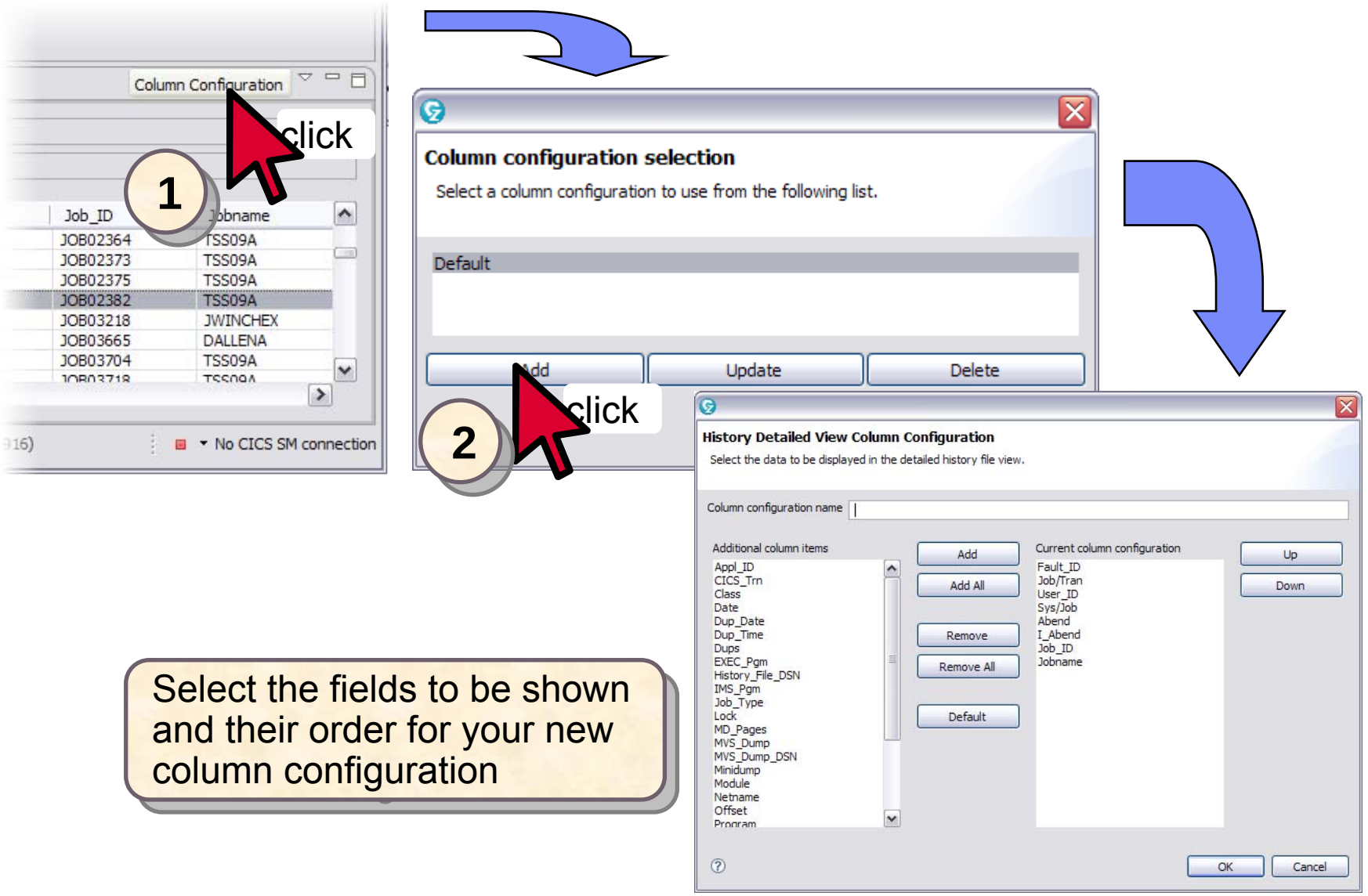
No CICS SM connection

Default Fault History File View



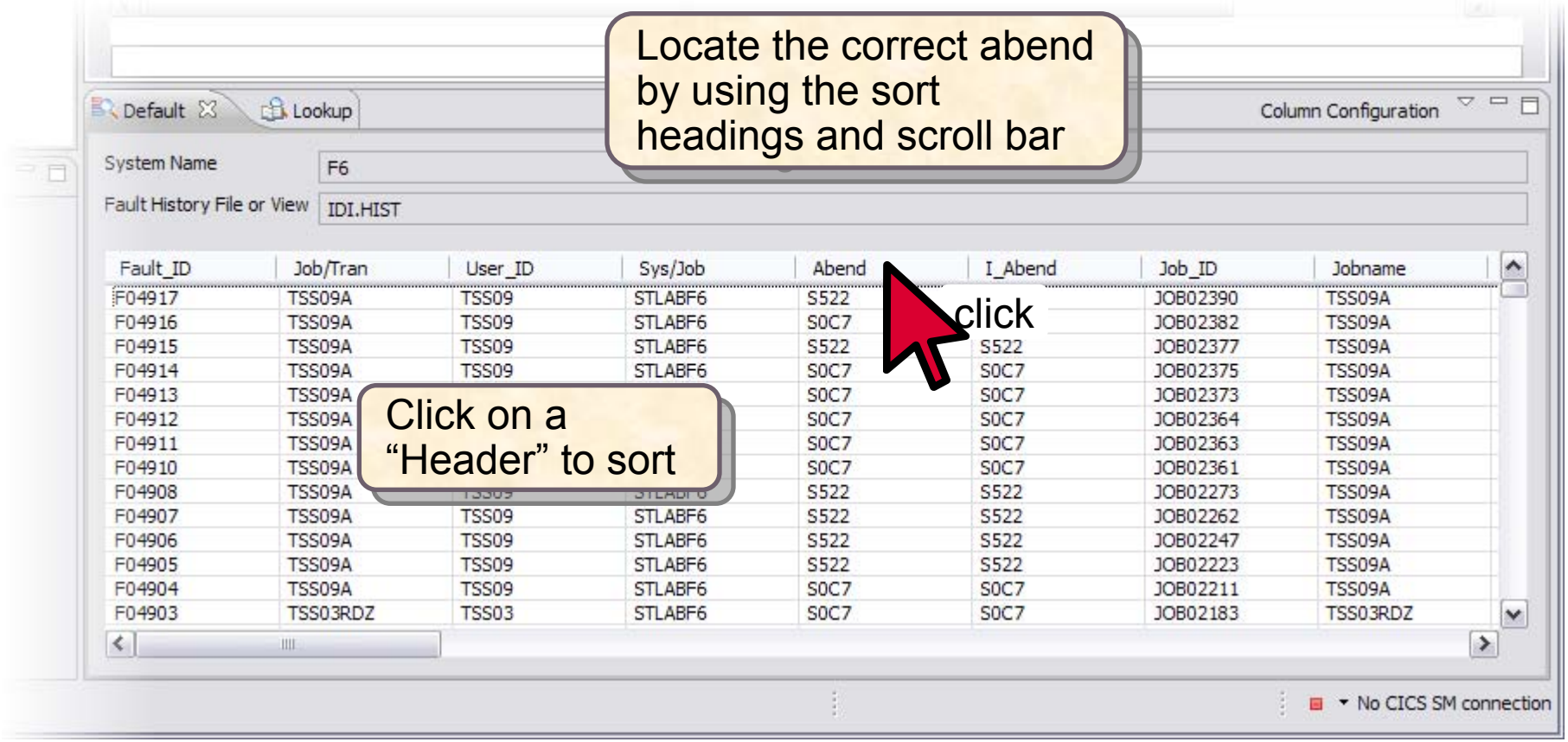
Fault_ID	Job/Tran	User_ID	Sys/Job				Jobname
F04917	TSS09A	TSS09	STLABF6	S522	S522	JOB02390	TSS09A
F04916	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02382	TSS09A
F04915	TSS09A	TSS09	STLABF6	S522	S522	JOB02377	TSS09A
F04914	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02375	TSS09A
F04913	TSS09A	TSS09	STLABF6	S0C7	S0C7	JOB02373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

Column Configuration

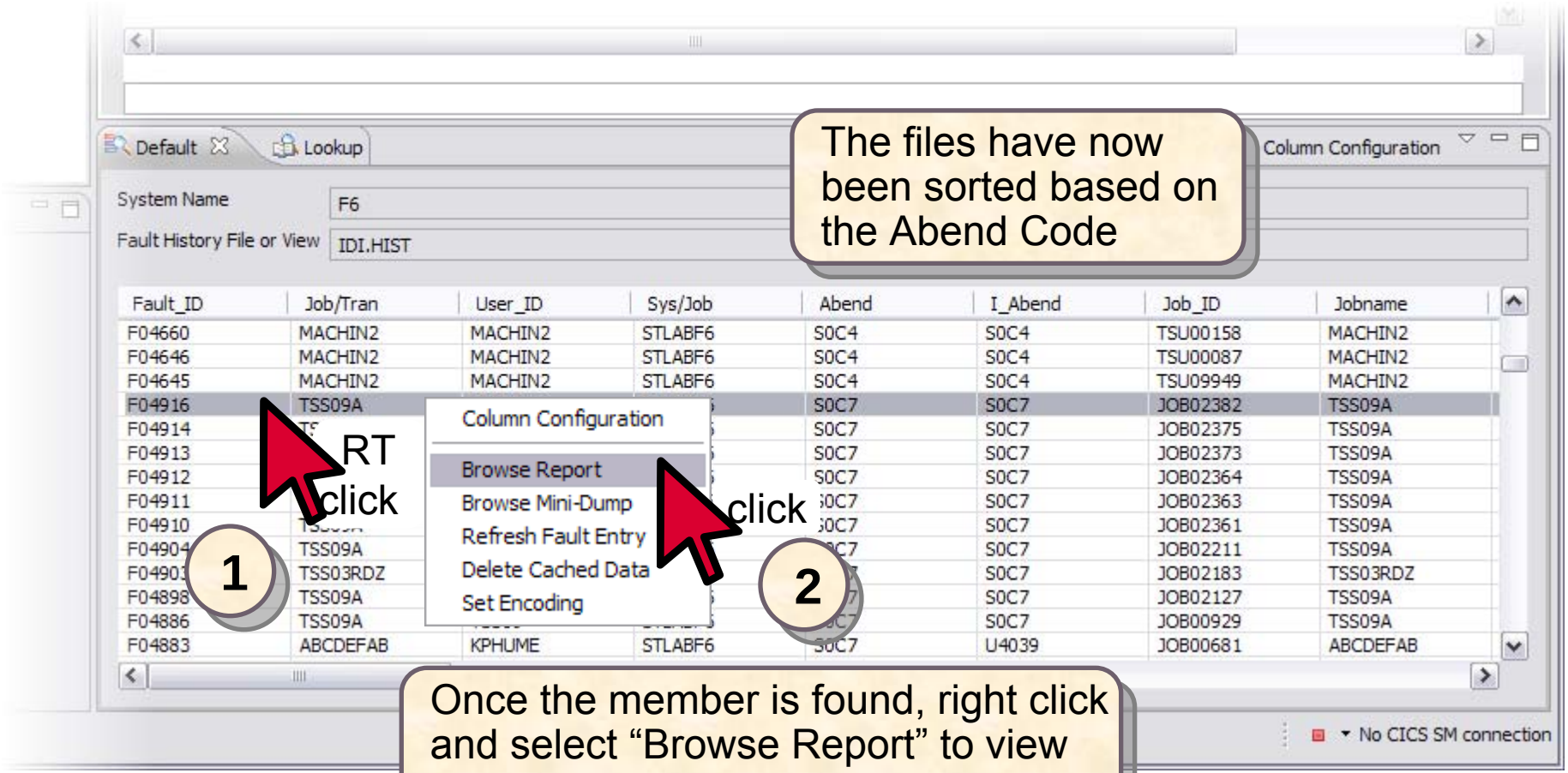


Select the fields to be shown and their order for your new column configuration

Sort fault history files



Opening a Fault Entry



The files have now been sorted based on the Abend Code

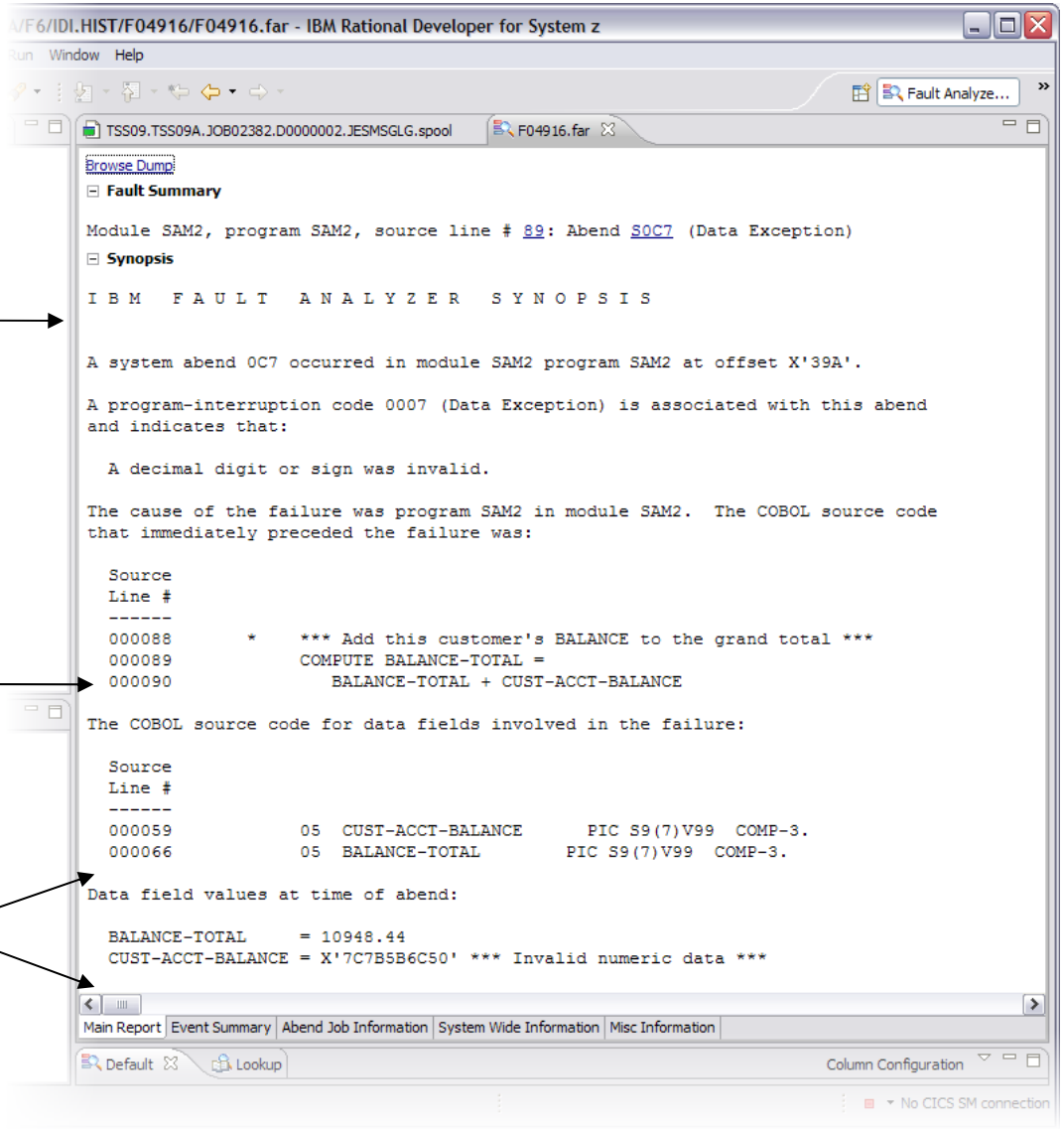
Once the member is found, right click and select “Browse Report” to view the Fault Analyzer Report

Fault Analyzer Main Report

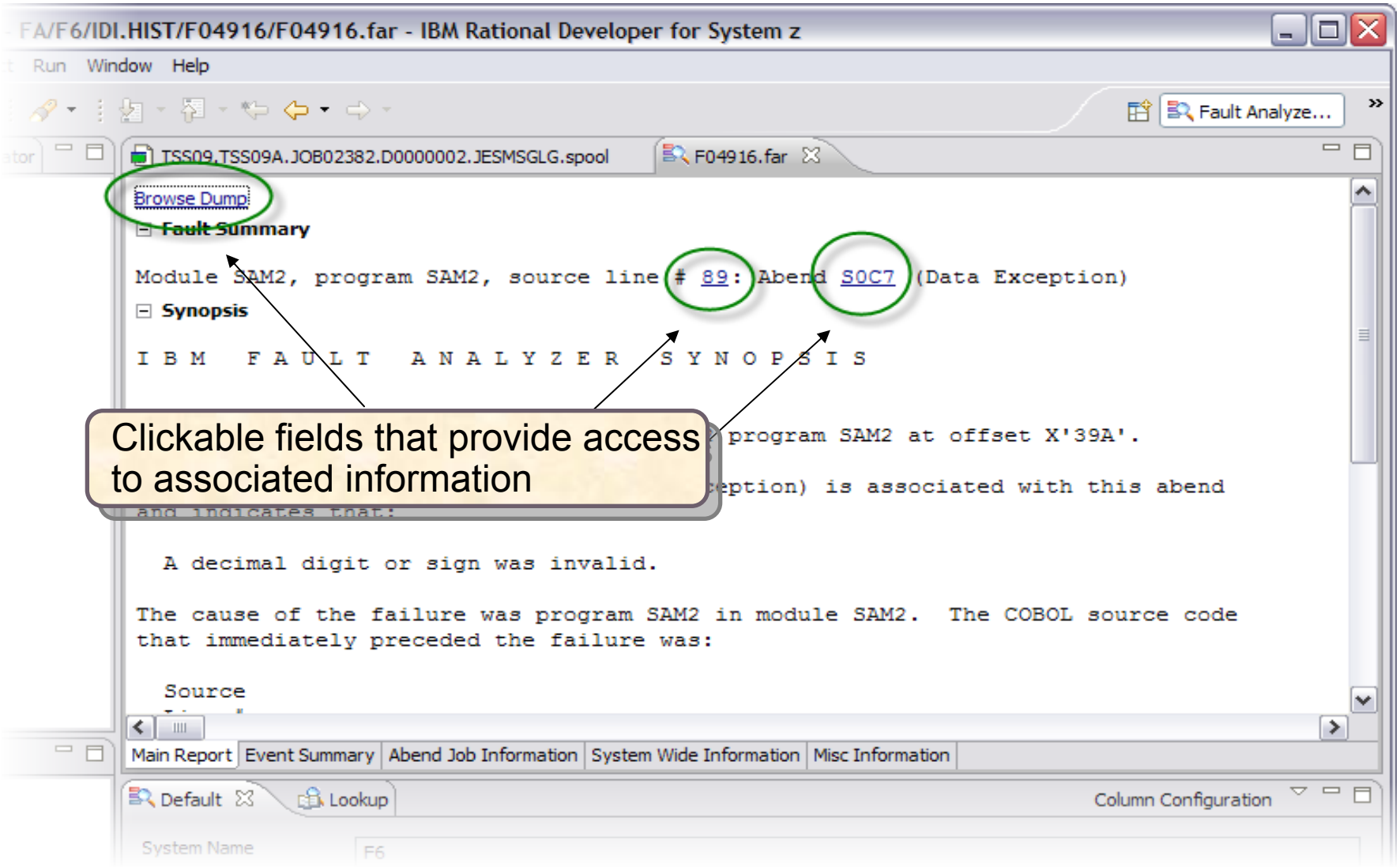
Fault Analyzer Synopsis

Source code that preceded the ABEND

Data Field Information

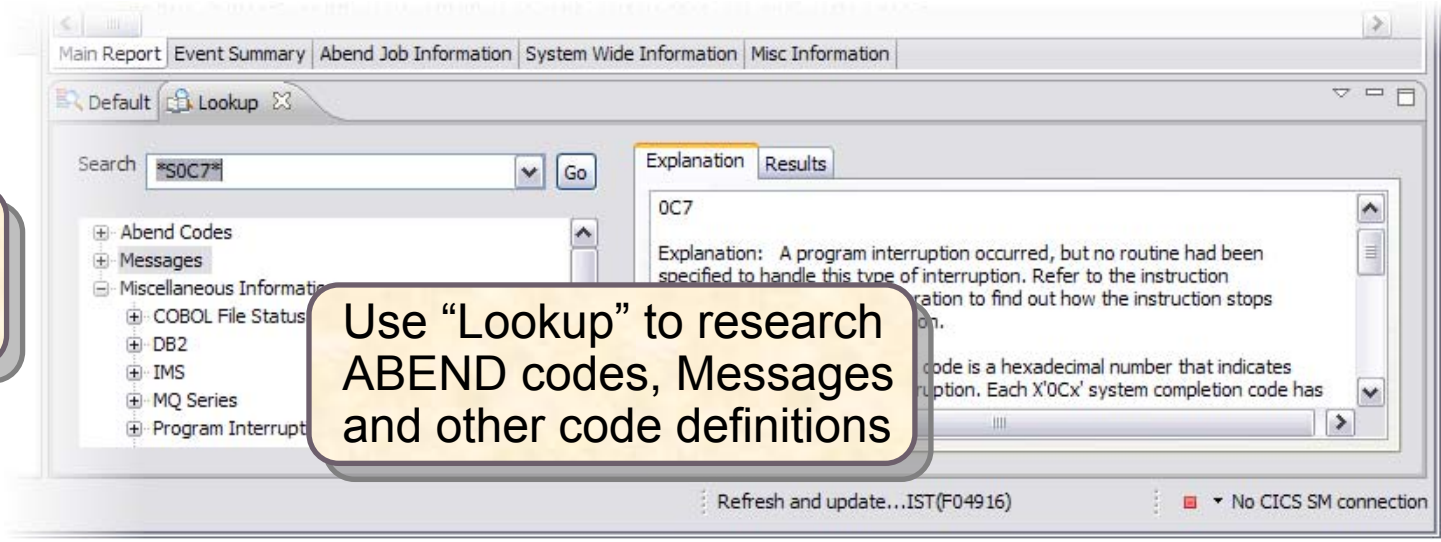


The Main Report “Hotkeys”



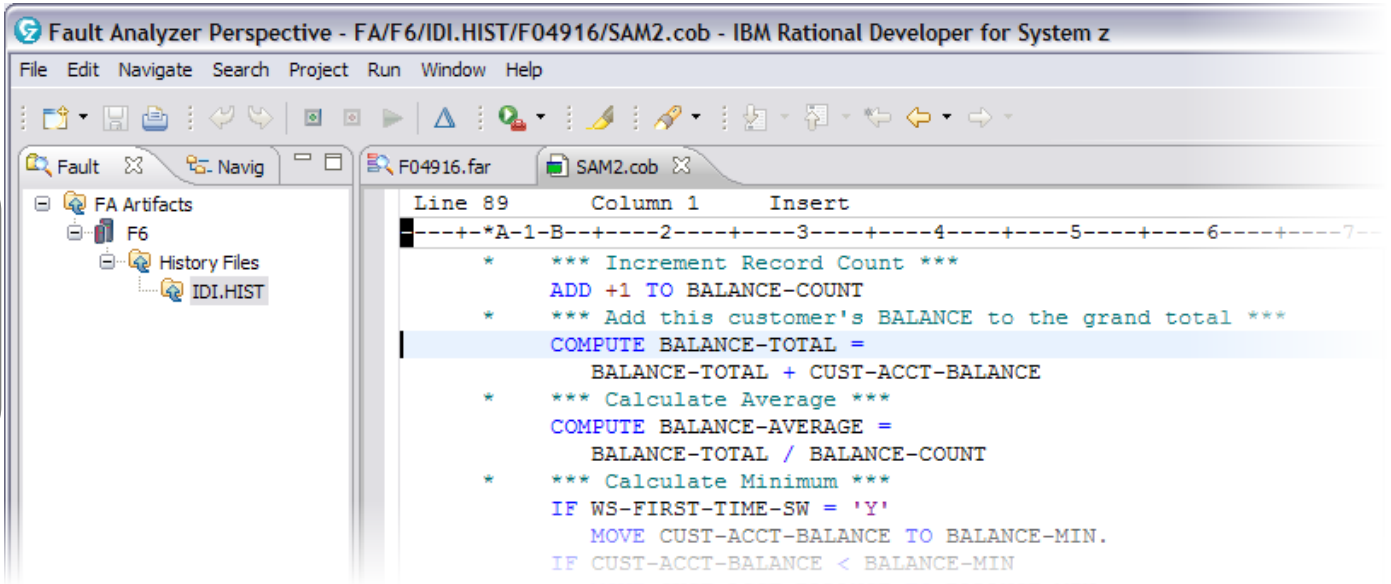
Results of clicking Hotkeys

Clicking Abend code invokes the "lookup" view

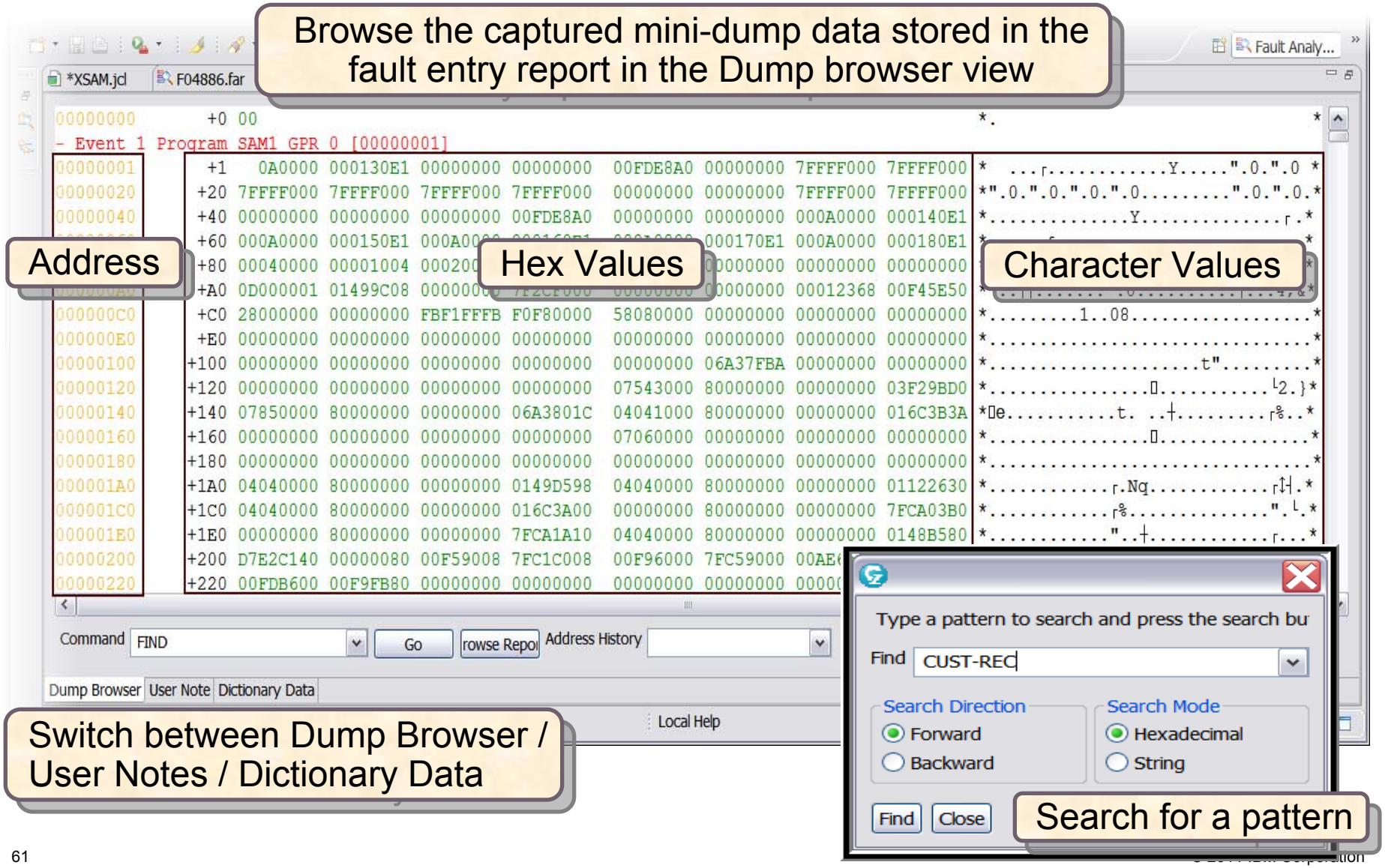


Use "Lookup" to research ABEND codes, Messages and other code definitions

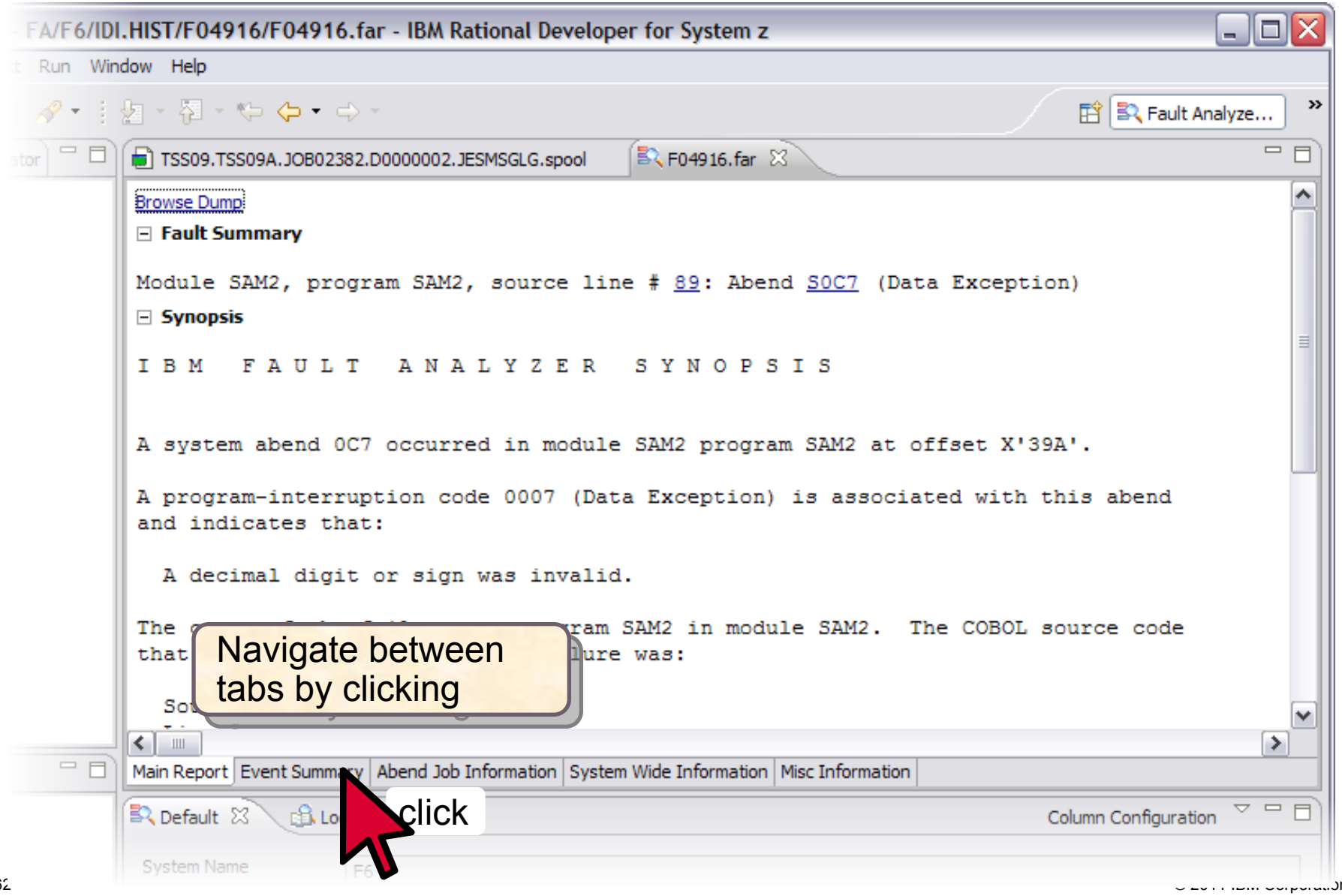
Clicking the source line number opens the side file copy of the source



Dump Browser View



Navigating the Report

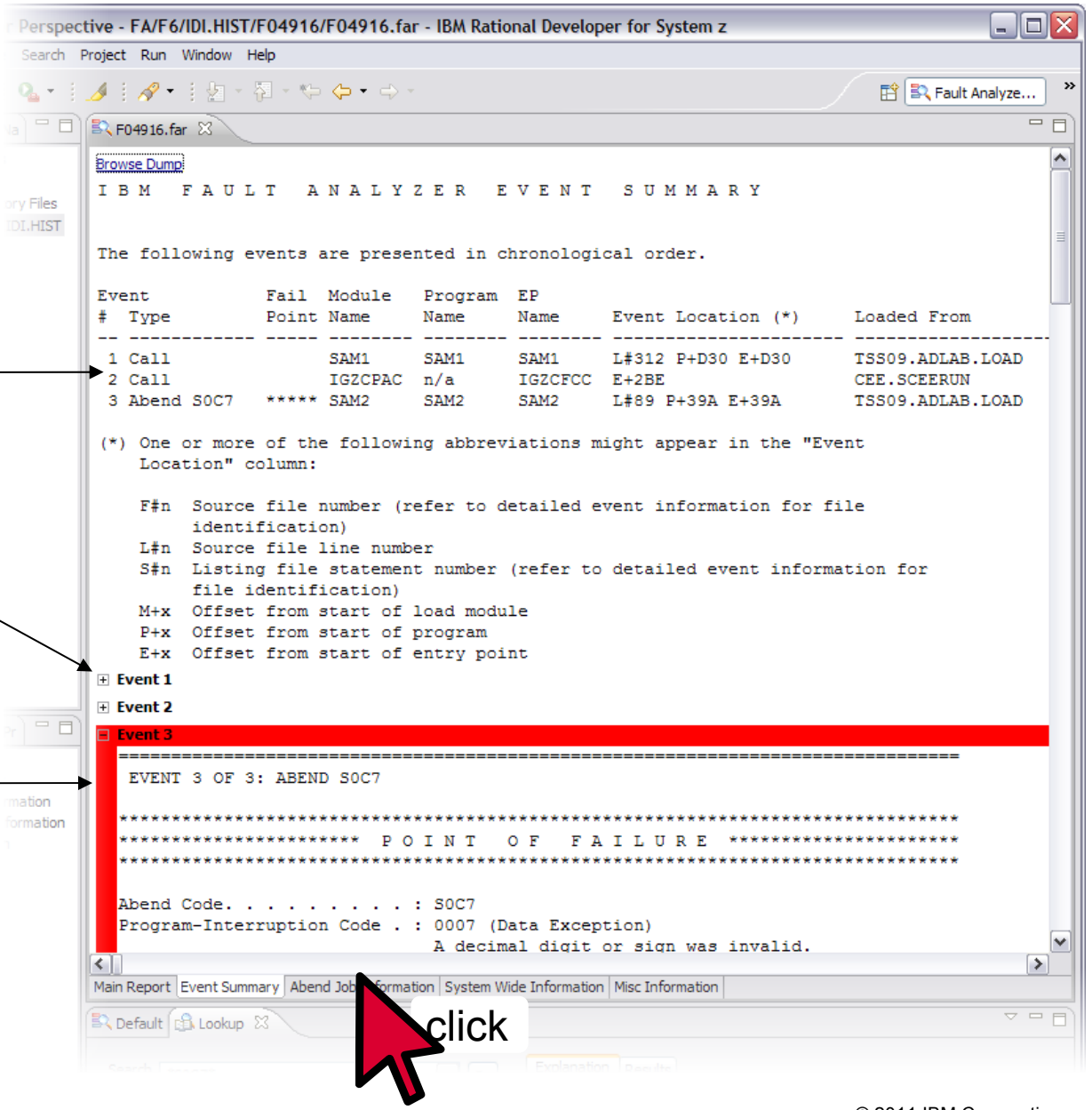


Event Summary Tab

Chronological order of events

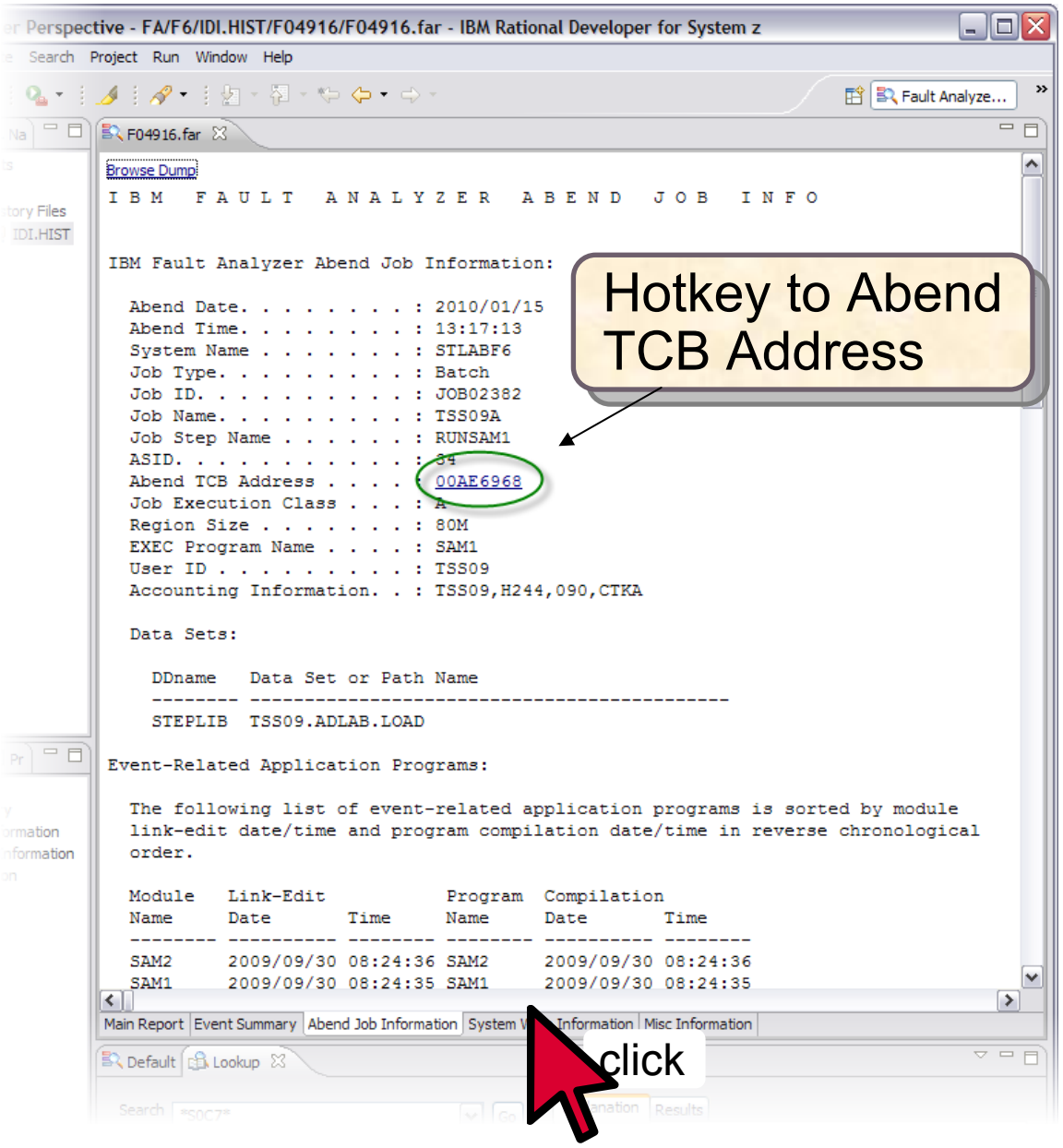
Expandable event details

Highlighted “POINT OF FAILURE” event details



Abend Job Information

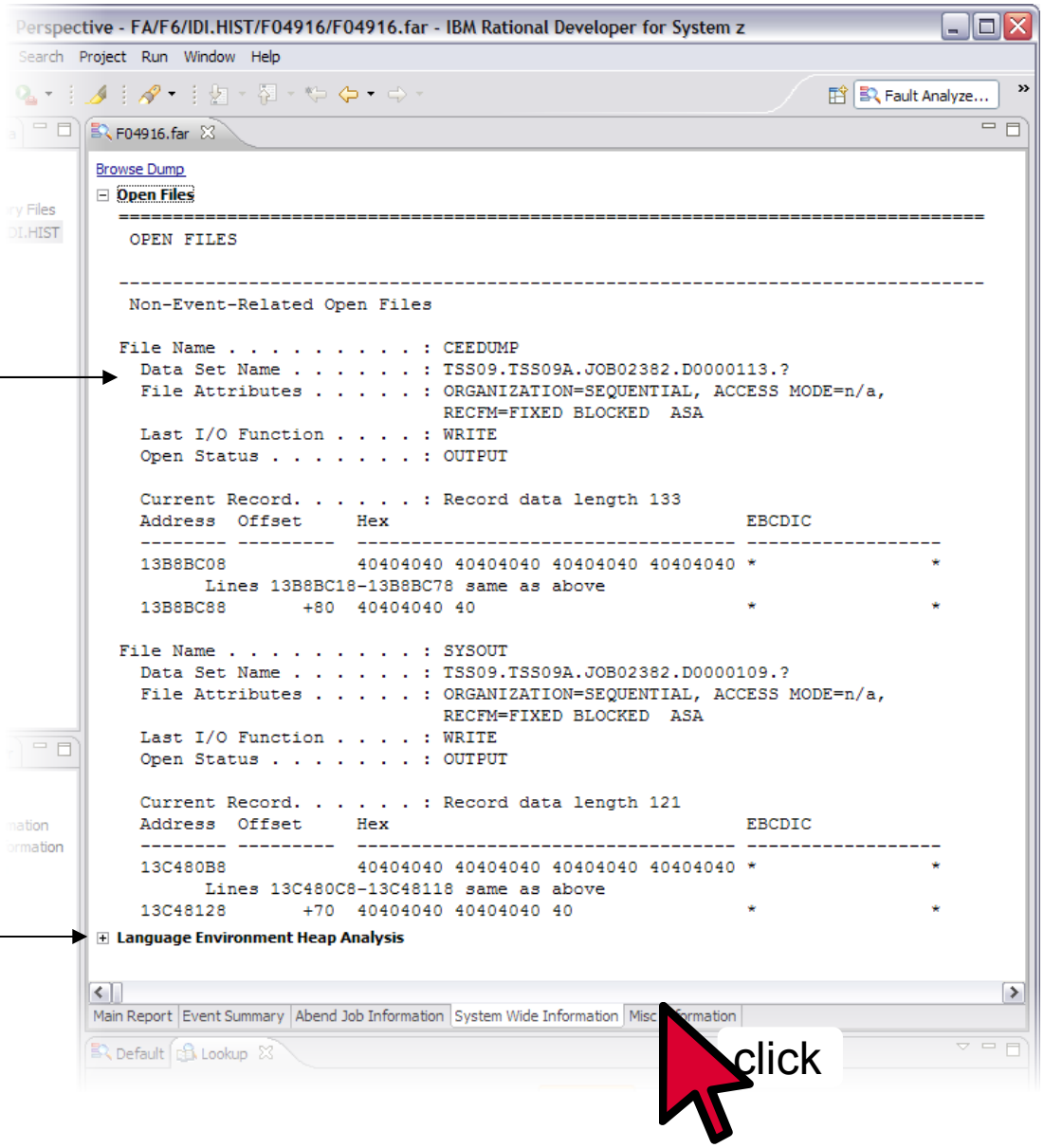
ABEND Job details



System Wide Information

Open Files

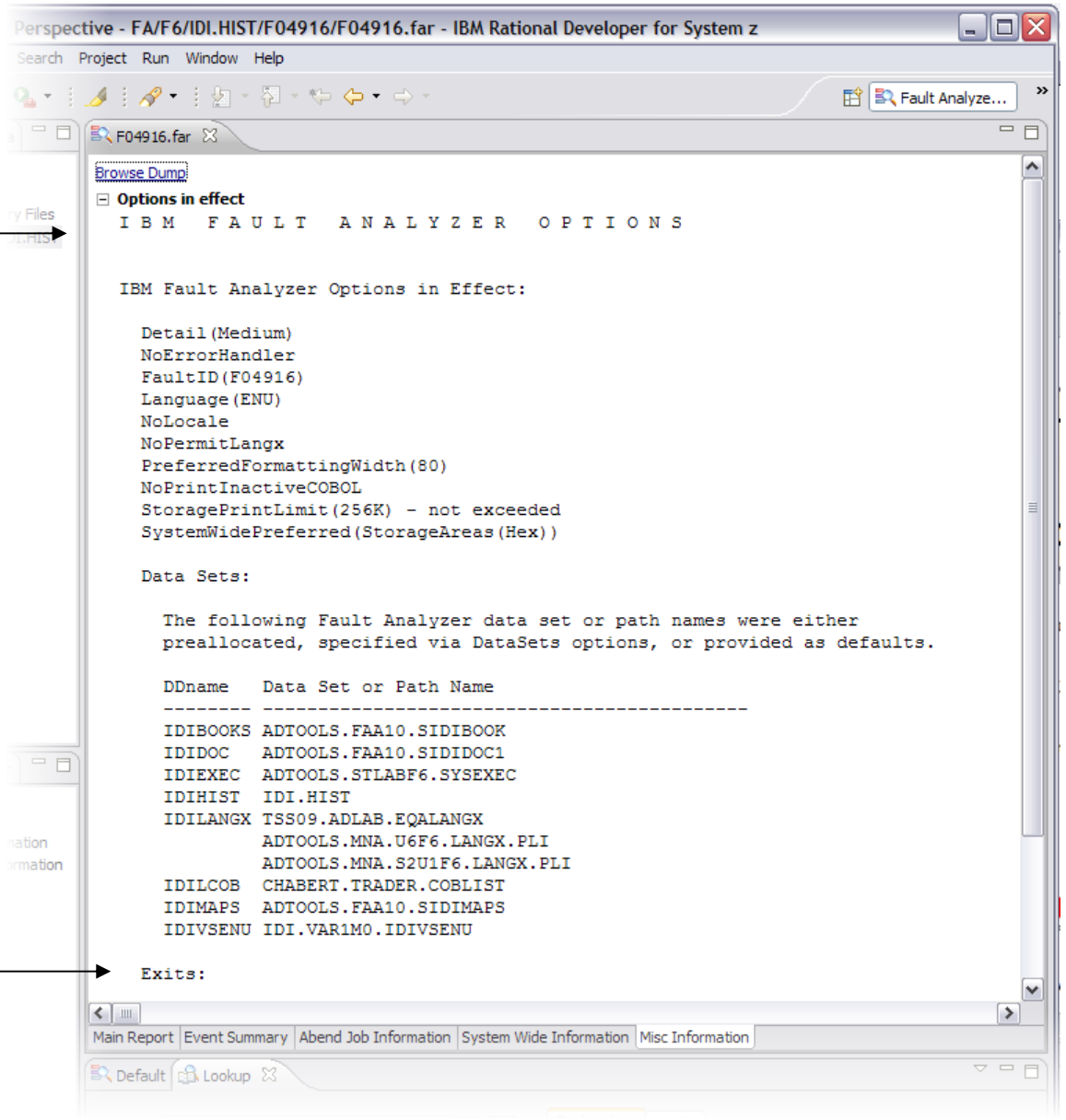
LE Heap Analysis



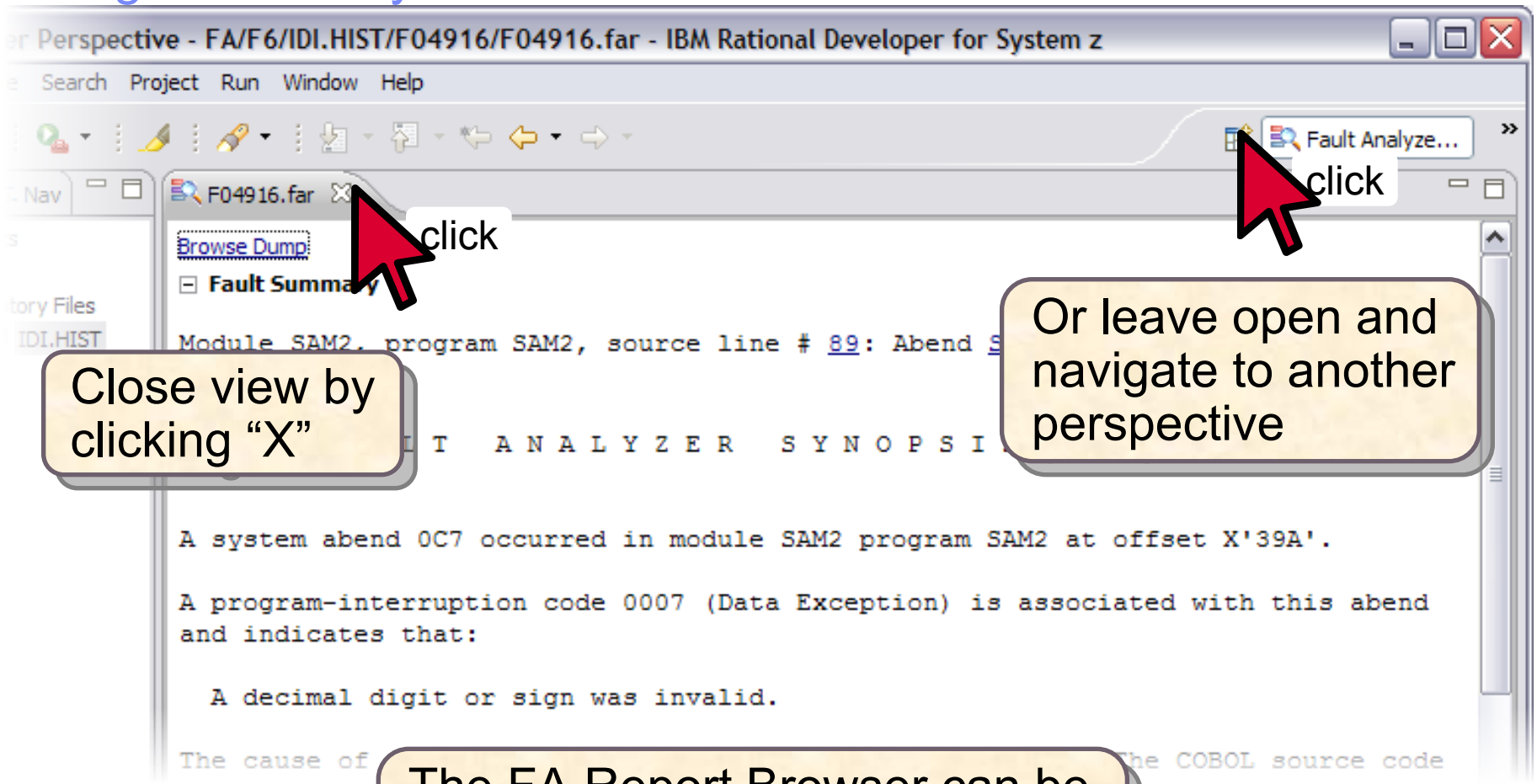
Misc Information

Options in effect

Exits

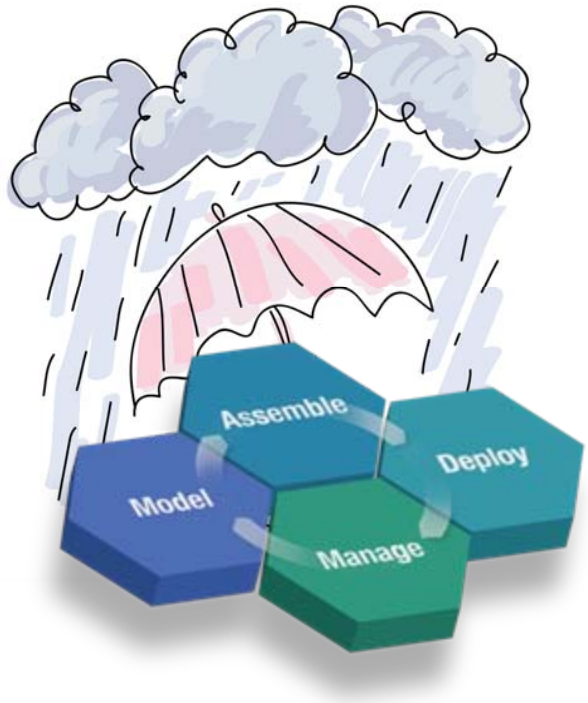


Exiting Fault Analyzer



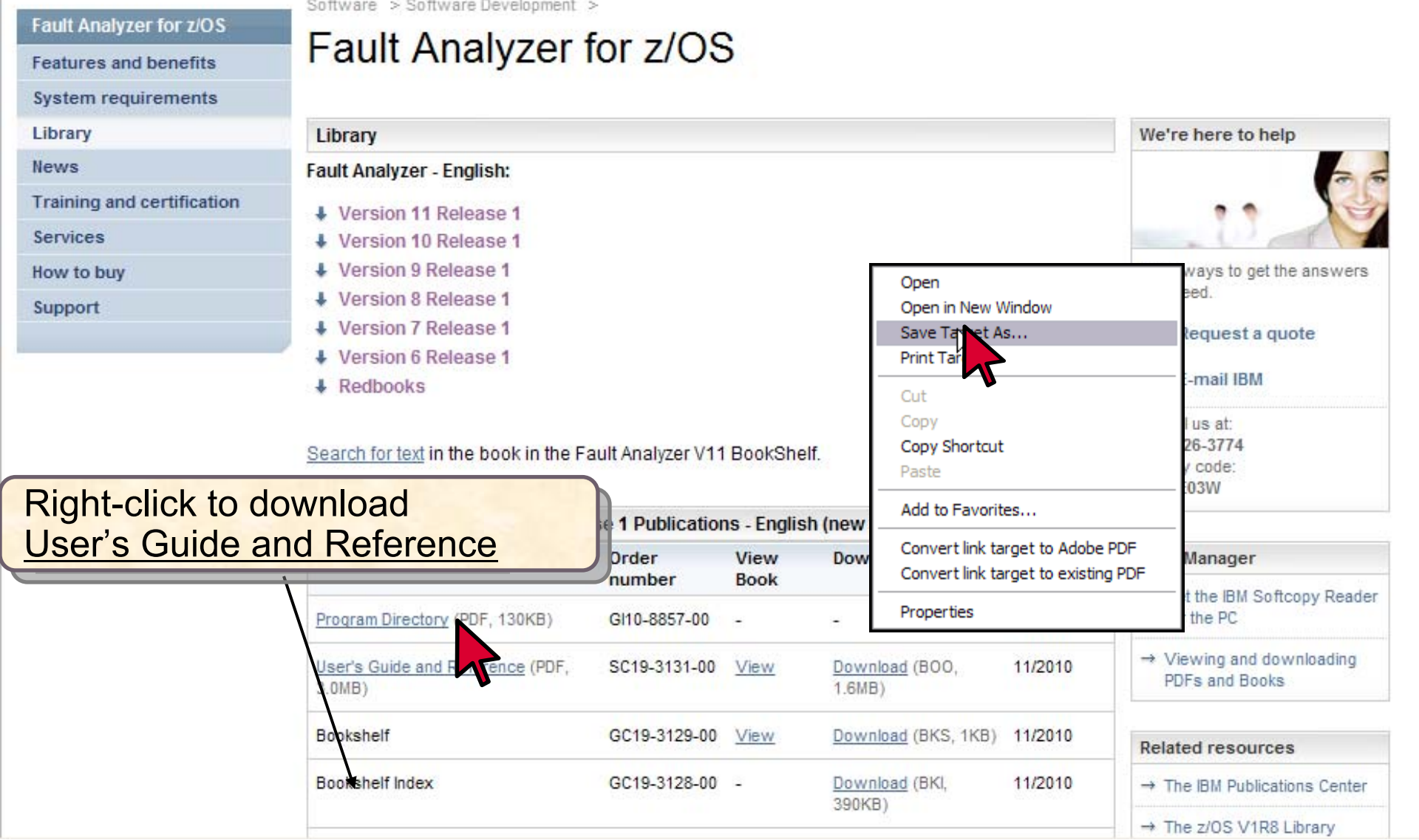
IBM Fault Analyzer for zOS

One tool for all your application abend reporting



- **Identifies the cause of a program abend**
  - Helps you quickly resolve the problem
- **Reports detailed information for:**
  - CICS
  - WAS
  - Batch
- **Source-level support for programs**
  - COBOL, PL/I, C/C++ and assembler
  - Provides detailed program source and variable value information
- **Advanced CICS Transaction Server support**
  - Reports channels and containers in 64-bit storage
  - CICS containers with XML data are formatted to simplify reviewing the XML information
- **Java enhancements**
  - Use of Java-supplied Diagnostic Tooling Framework for Java (DTFJ)
  - Java information is captured and displayed

http://www.ibm.com/software/awdtools/faultanalyzer/library



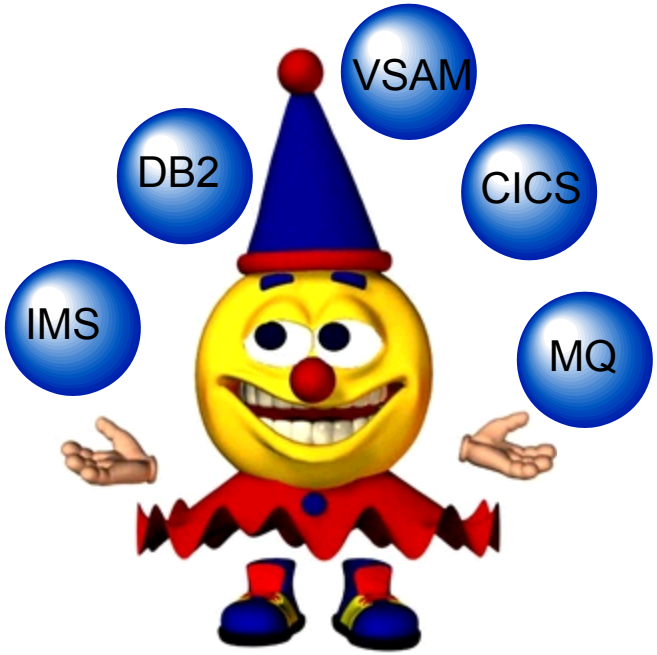
Right-click to download
User's Guide and Reference

Order number	View Book	Download	
Program Directory (PDF, 130KB)	GI10-8857-00	-	-
User's Guide and Reference (PDF, 3.0MB)	SC19-3131-00	View	Download (BOO, 1.6MB) 11/2010
Bookshelf	GC19-3129-00	View	Download (BKS, 1KB) 11/2010
Bookshelf Index	GC19-3128-00	-	Download (BKI, 390KB) 11/2010

IBM File Manager for z/OS
Version 11

IBM File Manager for z/OS

Manage, Edit, View, Browse data stored in various formats



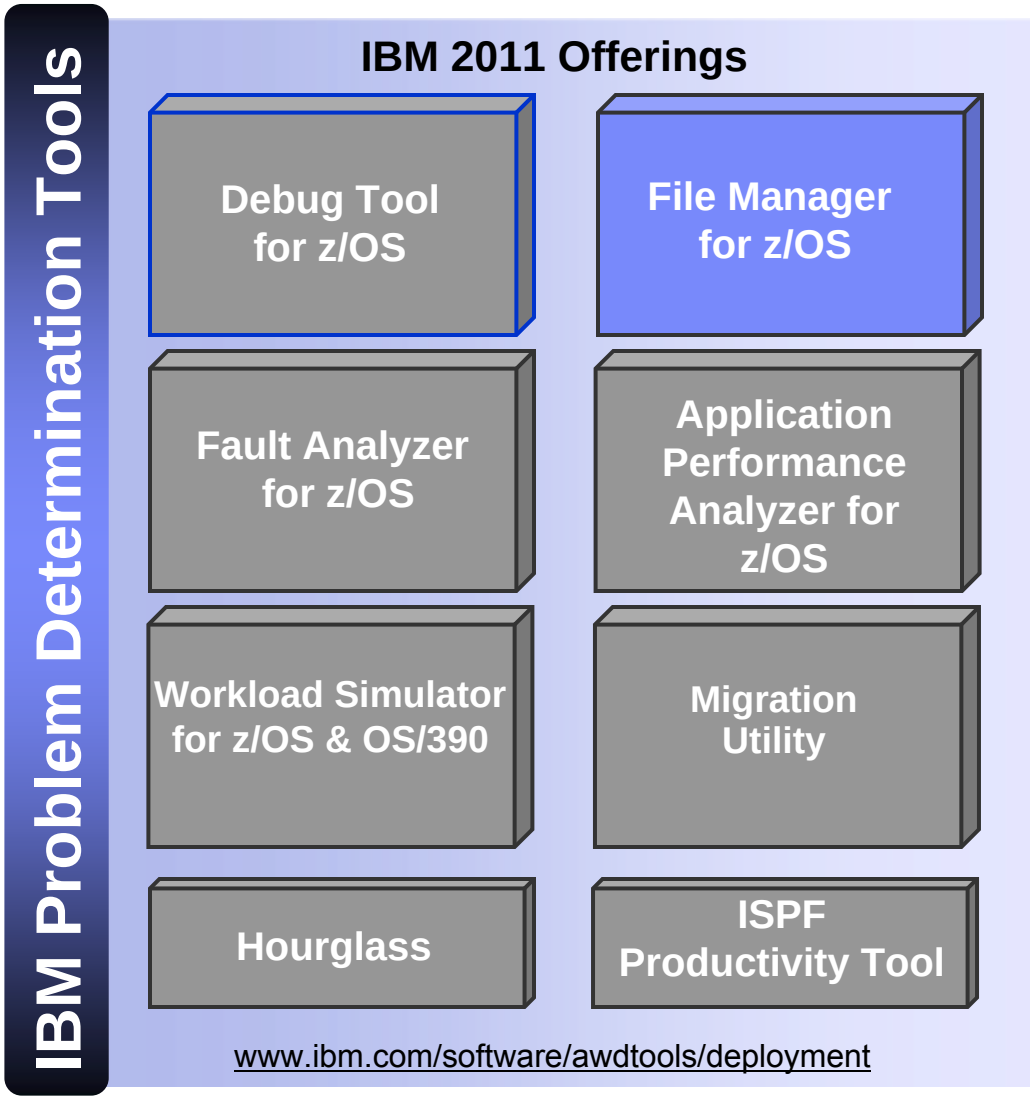
Problem

- **Developers need to see data in a formatted mode so they don't see non-display data**
- **Your developers need to browse, edit and view data in DB2, IMS, VSAM, Sequential datasets, etc**

IBM File Manager

- **Edit entire files regardless of size**
- **Format data with COBOL, PL/I or Assembler record layouts**
- **Scrambling sensitive data to insure data privacy across all environments**
- **Identify fields that contain invalid values**
- **Find and change data within specific fields**
- **Websphere MQ support**
- **Test data generation based on record layouts**
- **Compare data/load modules between datasets using field level mapping**

The IBM Problem Determination Tools Suite for z/OS

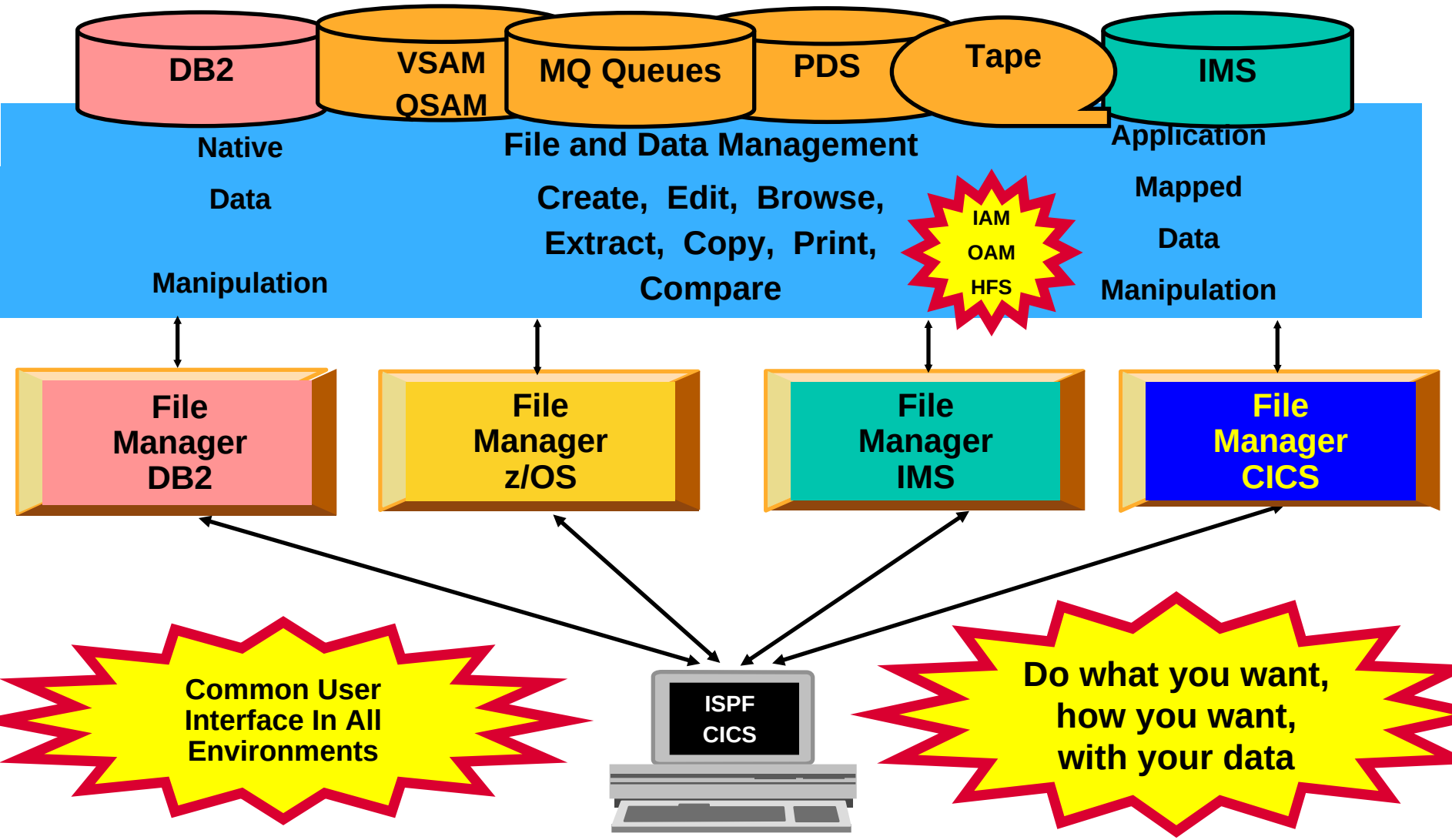


File Manager for zOS Highlights

- Select, create, browse, copy, edit, print, and format or reformat data files
- Manipulate data using COBOL, Assembler and PL/I record layouts interactively or in batch
- Scrambling of data for data privacy
- SQL Prototyping and Execution
- Comprehensive, user-friendly, batch and interactive utilities extends standard ISPF
- Multiple z/OS environments
  - Batch
  - TSO/ISPF
  - CICS
  - IMS/TM
  - DB2
  - Websphere MQ

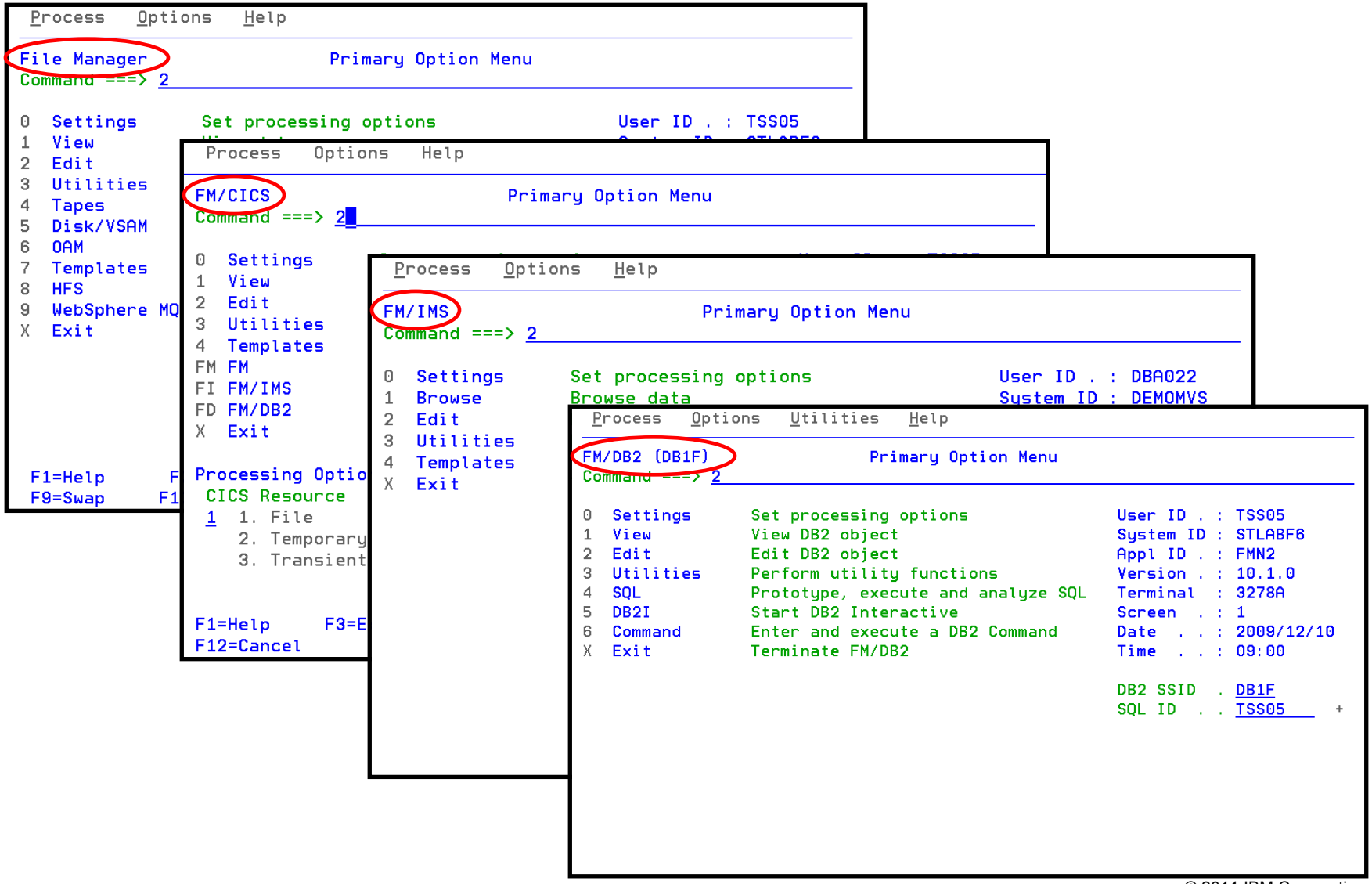
IBM File Manager for z/OS

Manage a variety of enterprise data file structures



IBM File Manager for z/OS

Inclusive of all environments



IBM File Manager for z/OS

CICS Feature

File Manager / CICS functions

- Edit and Browse data
  - Process CICS file
  - Process CICS temporary queue or transient data queue
  - Select rows / items and columns displayed
- Print
  - Table, Single, Hex or Character format
  - Select rows / items and columns
- Work with a list of CICS resources
  - Use line commands to initiate functions
- No destructive reads when accessing TD queues
- Copy option supports data scrambling
- Link to FM base, FM DB2 and FM IMS

FM / CICS Primary Option Menu

```
 Process    Options    Help
```

```
FM/CICS                          Primary Option Menu
Command ===> FM

0  Settings       Set processing options              User ID . : DBA022
1  View           View data                           CICS User : DBA022
2  Edit           Edit data                           CICS Appl : CICSACB4
3  Utilities      Perform utility functions           Date. . . : 2011/01/07
4  Templates      Template and copybook utilities     Time. . . : 13:32
5  WebSphere MQ   List, view and edit MQ data
FM FM             File Manager z/OS
FI FM/IMS         File Manager for IMS z/OS
X  Exit           Terminate FM/CICS

Processing Options:
 CICS Resource
 1  1. File
       2. Temporary Storage
       3. Transient Data


F1=Help     F3=Exit     F4=CRetriev F7=Backward F8=Forward  F10=Actions
F12=Cancel
```

File Manager Primary Option Menu

Edit

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

Input Partitioned, Sequential or VSAM Data Set, or HFS file:
   Data set/path name 'TSS05.TESTDATA'                                    +
   Member . . . . . . FMNCDATA      (Blank or pattern for member list)
   Volume serial  . . ______        (If not cataloged)
   Start position . . ________________________________  +
   Record limit . . . ________      Record sampling  _
   Inplace edit . . . _             (Prevent inserts and deletes)
Copybook or Template:
   Data set name  . . 'TSS05.BASE.COPYLIB'
   Member . . . . . . FMNCDATA__    (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                      _  Create audit trail
```

Edit

```
 Process    Options    Help
-------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Top of 40
Command ===> x all                                               Scroll CSR
SHAD                                                  Record AT TOP   Format TABL
       REC-TYPE NAME                    EMPLOYEE-NO      AGE   SALARY    MONTH(1)
       #2       #3                            #4         #5        #6          #7
       AN 1:2   AN 3:20                   BI 23:2  BI 25:2  PD 27:4    BI 31:4
       <>       <---+----1----+---->      <---+>   <---+>  <---+-->  <---+----1>
****** ****  Top of data  ****
000003 01       Graham Purdie                5512       94     68000           7
000006 01       Bill Soper                   4412       28     68000           5
000008 01       Tyrone Dalais                3312       21     60000          14
000012 01       Silvano Prez                 2312       50     60000           1
000016 01       Don Pharoah                  4412       55     63000          38
000017 01       John Levrington              3412       40     67000          14
000018 01       Liz Rushton                  3412       40     66000          44
000021 01       Keith Stewart                2312       40     70000          26
000022 01       John Nicholls                3412       40     69000          30
000026 01       Bnna Waghorn                 7812       33     60000           2
000029 01       Merrill Bani                 7712       96     58000          18
****** ****  End of data  ****
```

Edit

```
 Process    Options    Help
-------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                        Top of 40
Command ===> f 40 (#2 #4 #5) all                                   Scroll CSR
Some shadows are off, so no records displayable
        REC-TYPE NAME                    EMPLOYEE-NO     AGE    SALARY    MONTH(1)
        #2       #3                            #4       #5        #6          #7
        AN 1:2   AN 3:20                   BI 23:2  BI 25:2  PD 27:4     BI 31:4
        <>       <---+----1----+---->       <---+>   <---+>  <---+--> <---+----1>
****** ****  Top of data  ****
****** ****  End of data  ****
```

Edit

```
 Process    Options    Help
-------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                  4 string(s) found
Command ===> res                                             Scroll CSR
SHAD                                                  Record AT TOP    Format TABL
       REC-TYPE NAME                 EMPLOYEE-NO      AGE    SALARY     MONTH(1)
       #2       #3                          #4       #5       #6           #7
       AN 1:2   AN 3:20             BI 23:2 BI 25:2  PD 27:4     BI 31:4
       <>       <---+----1----+---->      <---+>   <---+>   <---+-->   <---+----1>
****** ****  Top of data  ****
000017 01       John Levrington          3412       40      67000          14
000018 01       Liz Rushton              3412       40      66000          44
000021 01       Keith Stewart            2312       40      70000          26
000022 01       John Nicholls            3412       40      69000          30
****** ****  End of data  ****
```

Edit

```
 Process    Options    Help
-------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Top of 40
Command ===> sha sup on                                         Scroll CSR
SHAD                                                 Record AT TOP    Format TABL
       REC-TYPE NAME                    EMPLOYEE-NO     AGE   SALARY    MONTH(1)
       #2       #3                            #4        #5       #6          #7
       AN 1:2   AN 3:20                   BI 23:2  BI 25:2  PD 27:4    BI 31:4
       <>       <---+----1----+---->      <---+>   <---+>  <---+-->  <---+----1>
****** ****  Top of data  ****
000003 01       Graham Purdie                5512       94    68000           7
000006 01       Bill Soper                   4412       28    68000           5
000008 01       Tyrone Dalais                3312       21    60000          14
000012 01       Silvano Prez                 2312       50    60000           1
000016 01       Don Pharoah                  4412       55    63000          38
000017 01       John Levrington              3412       40    67000          14
000018 01       Liz Rushton                  3412       40    66000          44
000021 01       Keith Stewart                2312       40    70000          26
000022 01       John Nicholls                3412       40    69000          30
000026 01       Bnna Waghorn                 7812       33    60000           2
000029 01       Merrill Bani                 7712       96    58000          18
****** ****  End of data  ****
```

Edit

```
 Process    Options    Help
-------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Top of 40
Command ===> _____________________________________________________ Scroll CSR
SHAD                                                  Record AT TOP  Format TABL
       REC-TYPE NAME                  EMPLOYEE-NO      AGE   SALARY    MONTH(1)
       #2       #3                        #4          #5       #6          #7
       AN 1:2   AN 3:20               BI 23:2 BI 25:2  PD 27:4     BI 31:4
       <>       <---+----1----+---->      <---+>  <---+>  <---+-->  <---+----1>
****** ****  Top of data  ****
000003 01       Graham Purdie              5512      94    68000           7
- - -  - - - - - - REC-TYPE02  - - - - - - - - - - - 2 Line(s) suppressed
000006 01       Bill Soper                 4412      28    68000           5
- - -  - - - - - - REC-TYPE02  - - - - - - - - - - - 1 Line(s) suppressed
000008 01       Tyrone Dalais              3312      21    60000          14
000012 01       Silvano Prez               2312      50    60000           1
-v-  - - - - - - - REC-TYPE02  - - - - - - - - - - - 3 Line(s) suppressed
000016 01       Don Pharoah                4412      55    63000          38
000017 01       John Levrington            3412      40    67000          14
000018 01       Liz Rushton                3412      40    66000          44
- - -  - - - - - - REC-TYPE02  - - - - - - - - - - - 1 Line(s) suppressed
000021 01       Keith Stewart              2312      40    70000          26
000022 01       John Nicholls              3412      40    69000          30
- - -  - - - - - - REC-TYPE02  - - - - - - - - - - - 2 Line(s) suppressed
```

Edit

```
 Process    Options    Help
-------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Top of 40
Command ===> fs                                                 Scroll CSR
SHAD                                                  Record AT TOP   Format TABL
       REC-TYPE NAME                 JOB-TITLE      ADDR1                ADDR2
       #2       #3                   #4             #5                   #6  +
       AN 1:2   AN 3:20              AN 23:14       AN 37:20             AN 57
       <>       <---+----1----+----> <---+----1---> <---+----1----+----> <---+
****** ****  Top of data  ****
- - -  - - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
000004 02       Bndrew Bstle         Developer       44  Eagle Rise       River
000005 02       Jim Blexander        Manager         123 Wellington St    Gilfo
- - -  - - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
000007 02       Graham Purdie        Developer       256 Hay St           Canni
- - -  - - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
- - -  - - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
000013 02       Rod Turner           Manager         184 Blexander Dve    Swan
000014 02       Clive Nealon         Manager         28  Bern Rd          Middl
000015 02       Silvano Prez         Programmer      48  Small Lane       Mt Pl
- - -  - - - - - - - REC-TYPE01  - - - - - - - - - - 3 Line(s) suppressed
000020 02       Liz Rushton          Sysprog         96  High Rd          Yange
- - -  - - - - - - - REC-TYPE01  - - - - - - - - - - 2 Line(s) suppressed
000024 02       Don Pharoah          Programmer      661 Byton Way        Flore
```

Edit

```
 Process    Options    Help
--------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Rec 4 of 40
Command ===> hex on                                            Scroll CSR
                                                  Record 4     Format SNGL
                                                      Top Line is 3    of 11
Current 01: REC-TYPE02                                         Length 80
Ref Field    Picture Typ Start   Len   Data
  2  2 REC-TYPE
               XX      AN      1     2   02
  3  2 NAME    X(20)   AN      3    20   Bndrew Bstle
  4  2 JOB-TITLE
               X(14)   AN     23    14   Developer
  5  2 ADDR1   X(20)   AN     37    20   44  Eagle Rise
  6  2 ADDR2   X(20)   AN     57    20   Riverton
  7  2 POSTCODE
               X(4)    AN     77     4   6133
***  End of record  ***
```

Edit

```
 Process    Options    Help
--------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Rec 4 of 40
Command ===> ft_                                                Scroll CSR
                                                  Record 4      Format SNGL
                                                      Top Line is 3    of 29
Current 01: REC-TYPE02                                          Length 80
Ref Field    Picture Typ Start   Len   Data
  2  2 REC-TYPE
             XX      AN      1     2   02
                                       FF
                                       02

  3  2 NAME  X(20)   AN      3    20   Bndrew Bstle
                                       C9898A4CAA9844444444
                                       254956022335000000000

  4  2 JOB-TITLE
             X(14)   AN     23    14   Developer
                                       C8A89998944444
                                       45553675900000

  5  2 ADDR1 X(20)   AN     37    20   44  Eagle Rise
                                       FF44C88984D8A8444444
```

Edit

```
 Process    Options    Help
--------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Rec 4 of 40
Command ===> hex off                                            Scroll CSR
SHAD                                                 Record 4   Format TABL
       REC-TYPE NAME                  JOB-TITLE      ADDR1                ADDR2
       #2       #3                    #4             #5                   #6  +
       AN 1:2   AN 3:20               AN 23:14       AN 37:20             AN 57
       <>       <---+----1----+----> <---+----1---> <---+----1----+----> <---+
000004 02       Bndrew Bstle          Developer      44  Eagle Rise       River
       FF       C9898A4CAA9844444444 C8A89998944444 FF44C88984D8A8444444 D8A89
       02       2549560223350000000  45553675900000 4400517350992500000  99559

000005 02       Jim Blexander         Manager        123 Wellington St    Gilfo
       FF       D894C98A898894444444 D8988894444444 FFF4E899898A994EA444 C8989
       02       1940235715459000000  41517590000000 12306533957365023000 79366

- - -  - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed



000007 02       Graham Purdie         Developer      256 Hay St           Canni
       FF       C988894DA98884444444 C8A89998944444 FFF4C8A4EA4444444444 C8998
       02       7918140749495000000  45553675900000 2560818023000000000  31559
```

Edit

```
 Process    Options    Help
-------------------------------------------------------------------------------
Edit              TSS05.TESTDATA(FMNCDATA)                      Rec 4 of 40
Command ===> _____________________________________________________ Scroll CSR
SHAD                                                 Record 4     Format TABL
       REC-TYPE NAME                 JOB-TITLE      ADDR1                ADDR2
       #2       #3                   #4             #5                   #6  +
       AN 1:2   AN 3:20              AN 23:14       AN 37:20             AN 57
       <>       <---+----1----+----> <---+----1---> <---+----1----+----> <---+
000004 02       Bndrew Bstle         Developer       44  Eagle Rise       River
000005 02       Jim Blexander        Manager         123 Wellington St    Gilfo
- - -  - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
000007 02       Graham Purdie        Developer       256 Hay St           Canni
- - -  - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
- - -  - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
000013 02       Rod Turner           Manager         184 Blexander Dve    Swan
000014 02       Clive Nealon         Manager         28  Bern Rd          Middl
000015 02       Silvano Prez         Programmer      48  Small Lane       Mt Pl
- - -  - - - - - - REC-TYPE01  - - - - - - - - - - 3 Line(s) suppressed
000020 02       Liz Rushton          Sysprog         96  High Rd          Yange
- - -  - - - - - - REC-TYPE01  - - - - - - - - - - 2 Line(s) suppressed
000024 02       Don Pharoah          Programmer      661 Byton Way        Flore
000025 02       Tyrone Dalais        Developer       92  Smith St         Belmo
- - -  - - - - - - REC-TYPE01  - - - - - - - - - - 1 Line(s) suppressed
```

Utilities

- 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
  - Search for/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

Utilities

```
 Process    Options    Help
-------------------------------------------------------------------------
File Manager                      Utility Functions
Command ===> 3_

0  DBCS           Set DBCS data format for print
1  Create         Create data
2  Print          Print data
3  Copy           Copy data
4  Dslist         Catalog services
5  VTOC           Work with VTOC
6  Find/Change    Search for and change data
7  AFP            Browse AFP data
8  Storage        Browse user storage
9  Printdsn       Browse File Manager print data set
10 Loadlib        Load module utility functions
11 Compare        Compare data
12 Audit trail    Print audit trail report
13 Copybook       View and Print
14 Websphere MQ   List Websphere MQ managers and queues
```

IBM File Manager for z/OS

DB2 Feature

File Manager / DB2 functions

- Edit and Browse data
  - –Edit a DB2 Table or View
  - –select rows and columns displayed
- Print
  - –Table or Single format
  - –select rows and columns
- Create and Drop DB2 objects
- Copy data
  - –select rows
  - –“map” columns from an input table to an output table
  - –reformat and generate data while copying
  - –Scrambling of sensitive data for data privacy

File Manager / DB2 functions

- Work with a list of DB2 objects
  - Use line commands to initiate functions
- Grant and Revoke DB2 privileges
- Import and Export data
  - Select Rows
  - Export to a file in default FM/DB2 format, a format defined by a copybook, or a comma-delimited file
  - Import from a file generated by the Export function, or a file described by a copybook
- Generate JCL for DB2 utilities:
  - COPY, LOAD, REBUILD, RECOVER, REORG, and RUNSTATS
- Execute SQL Statements
- Create and test new SQL statements
  - Two methods: Basic and Advanced

IBM File Manager for z/OS

IMS Feature

File Manager / IMS functions

- **Online utilities for IMS databases**
  - –Edit and Browse data
  - –ISPF Job setup for batch utilities
    - Extract segments from a database
    - Load segments into a database
    - Print
    - Batch Edit/Browse
- **Support for processing databases using either:**
  - –physical DBD
  - –logical DBD
- **Access databases using either:**
  - –Static (existing) PSBs
  - –Dynamic PSBs

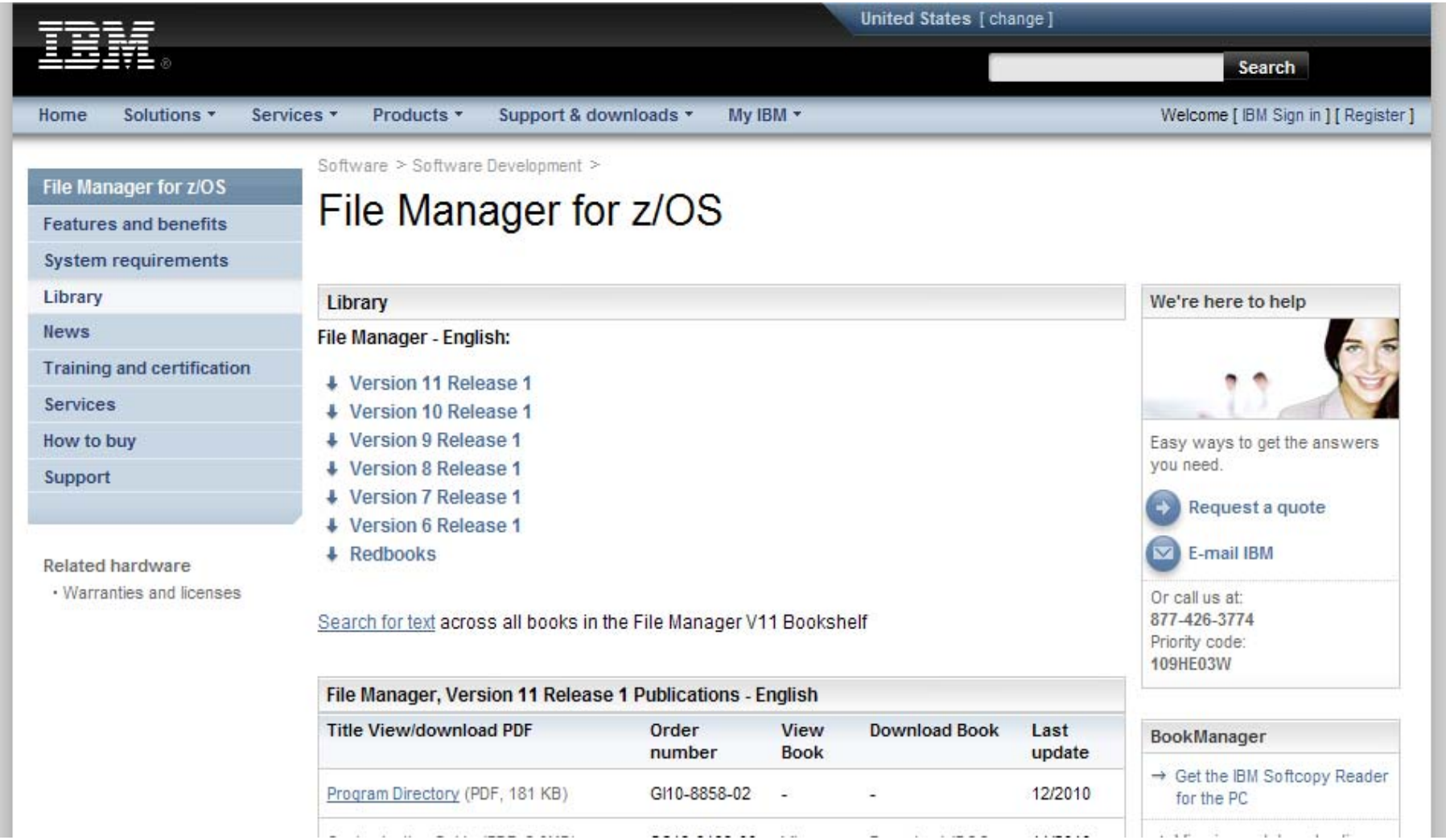
File Manager / IMS functions

- **Support for:**
  - PHDAM (HALDB)
  - HDAM
  - PHIDAM (HALDB)
  - HIDAM
  - HISAM
  - HSAM
  - DEDB
  - MSDB
- **Process databases in alternate sequences using secondary indexes**
- **Optional audit trail to record database updates**

File Manager / IMS functions

- **Optionally use COBOL, Assembler or PL/I segment layouts to format data into fields**
  - Edit and Browse segments in tabular or character format
  - Access source in PDS, PDSE, or Panvalet libraries
  - Work with segments that have multiple layouts
- **Use flexible criteria to select segments for browse, edit, and extract processing**
- **Change segment selection criteria and formatting interactively, while browsing or editing**
- **Batch creation and refreshing of templates created from COBOL, Assembler or PL/I segments**

Visit our web site:
www.ibm.com/software/awdtools/filemanager/library



IBM Application Performance Analyzer for z/OS Version 11

IBM Application Performance Analyzer for z/OS

Fine tune application performance

Problem

- **Application performance problems often mean unhappy users, missed deadlines, and and unmet service levels.**

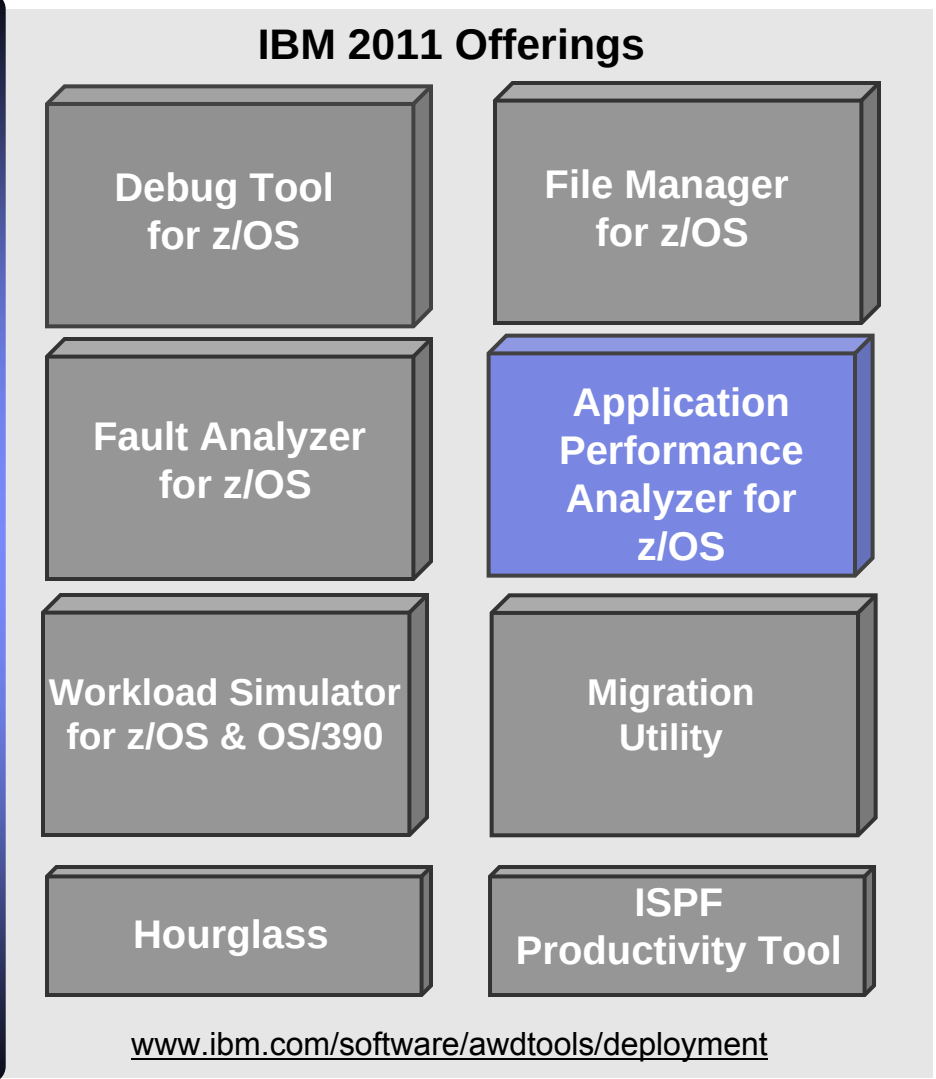
IBM Application Performance Analyzer

Solution

- **APA helps programmers identify constraints and the root cause of performance bottlenecks. Drill down to modules, programs, files, databases, SQL statements, CICS transactions, and even individual program source statements.**

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

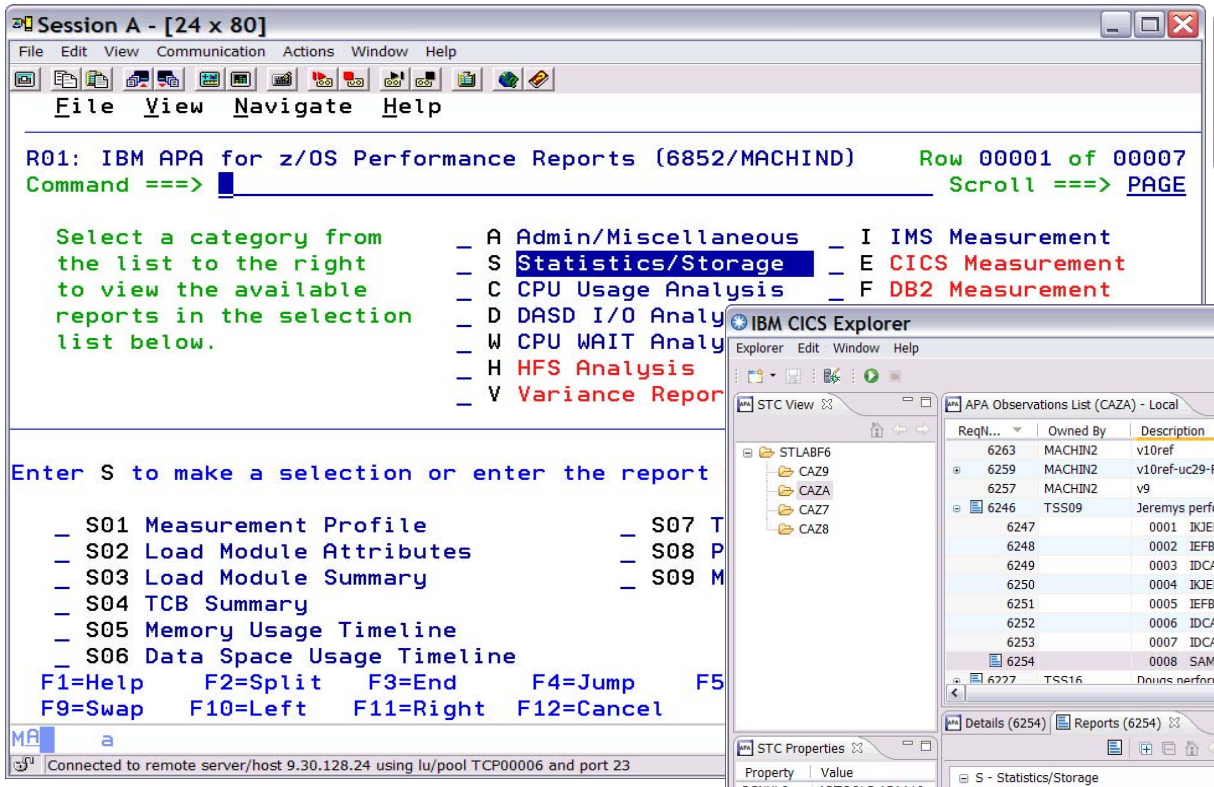


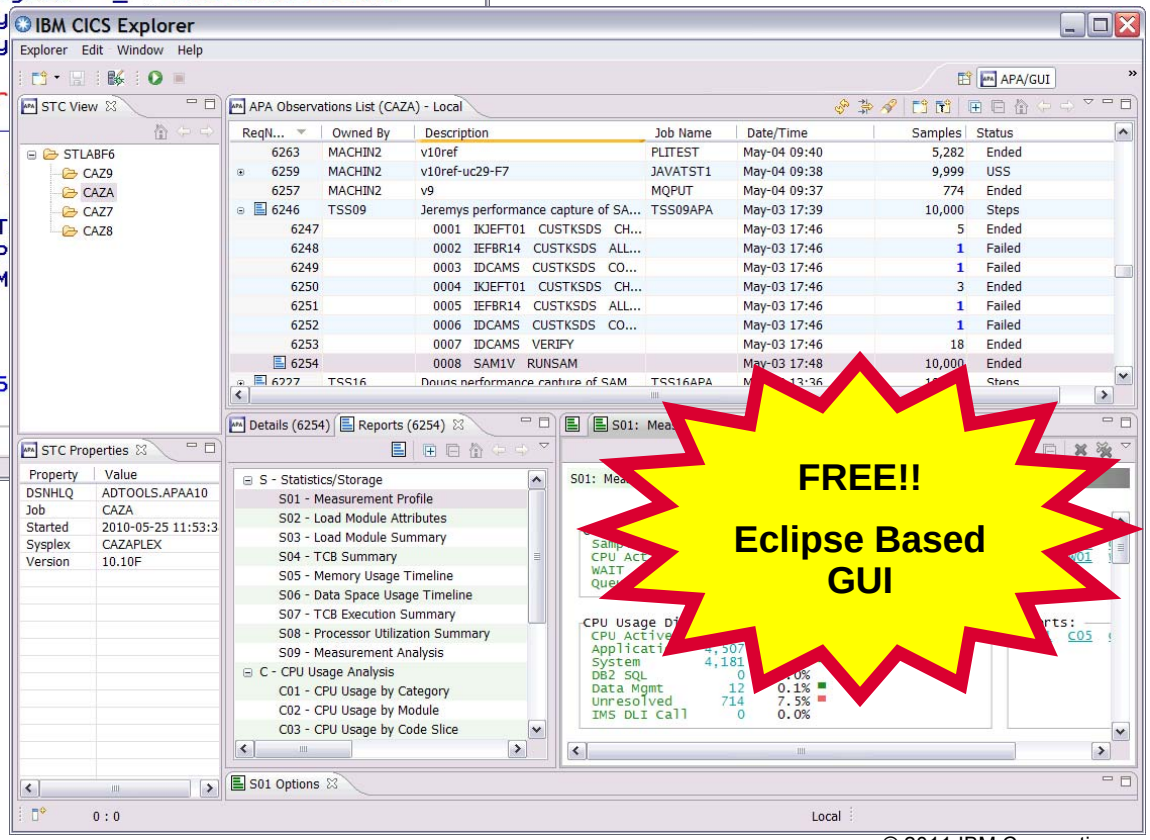
Application Performance Analyzer for z/OS

- Identify performance and response time problems in production
- Reduce batch application turnaround time
- Multiple languages:
  - COBOL
  - PL/I
  - C/C++
  - Assembler
  - Java
  - Natural
- Multiple z/OS environments
  - Batch
  - CICS
  - IMS
  - DB2 (SP, DDF/DRDA)
  - Websphere MQ
  - Websphere Application Server
  - Adabas
- Can be integrated with Fault Analyzer and Application Performance Analyzer with source mapping side files
- Workstation GUI plug-in

IBM Application Performance Analyzer for z/OS

3270 or GUI interfaces





Source-level support for:

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

Types of Observation Sessions

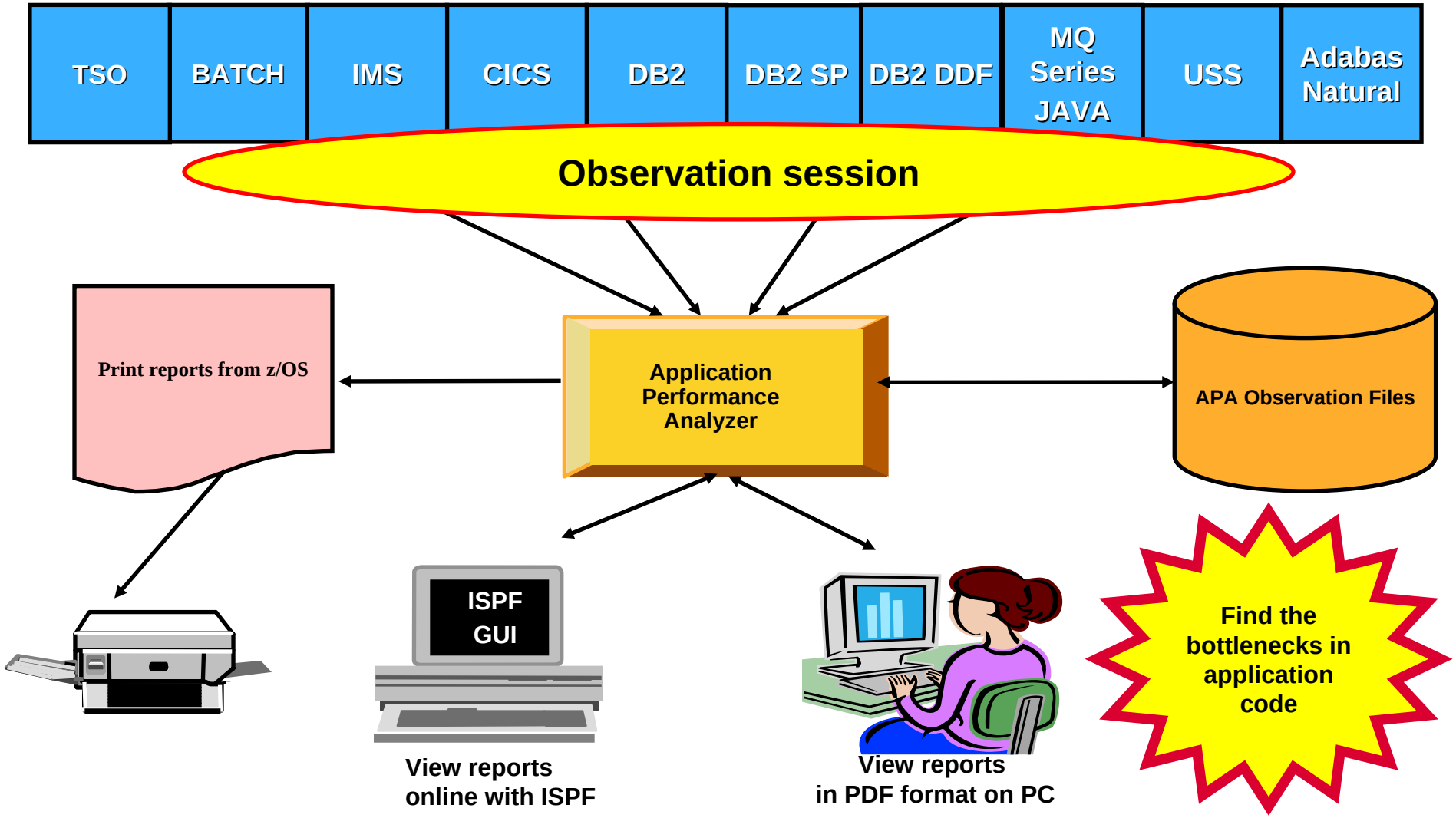
- Real-Time
- Scheduled
- Via batch submission

FREE!!

Eclipse Based GUI

IBM Application Performance Analyzer for z/OS

Provides rapid pinpointing of enterprise application bottlenecks



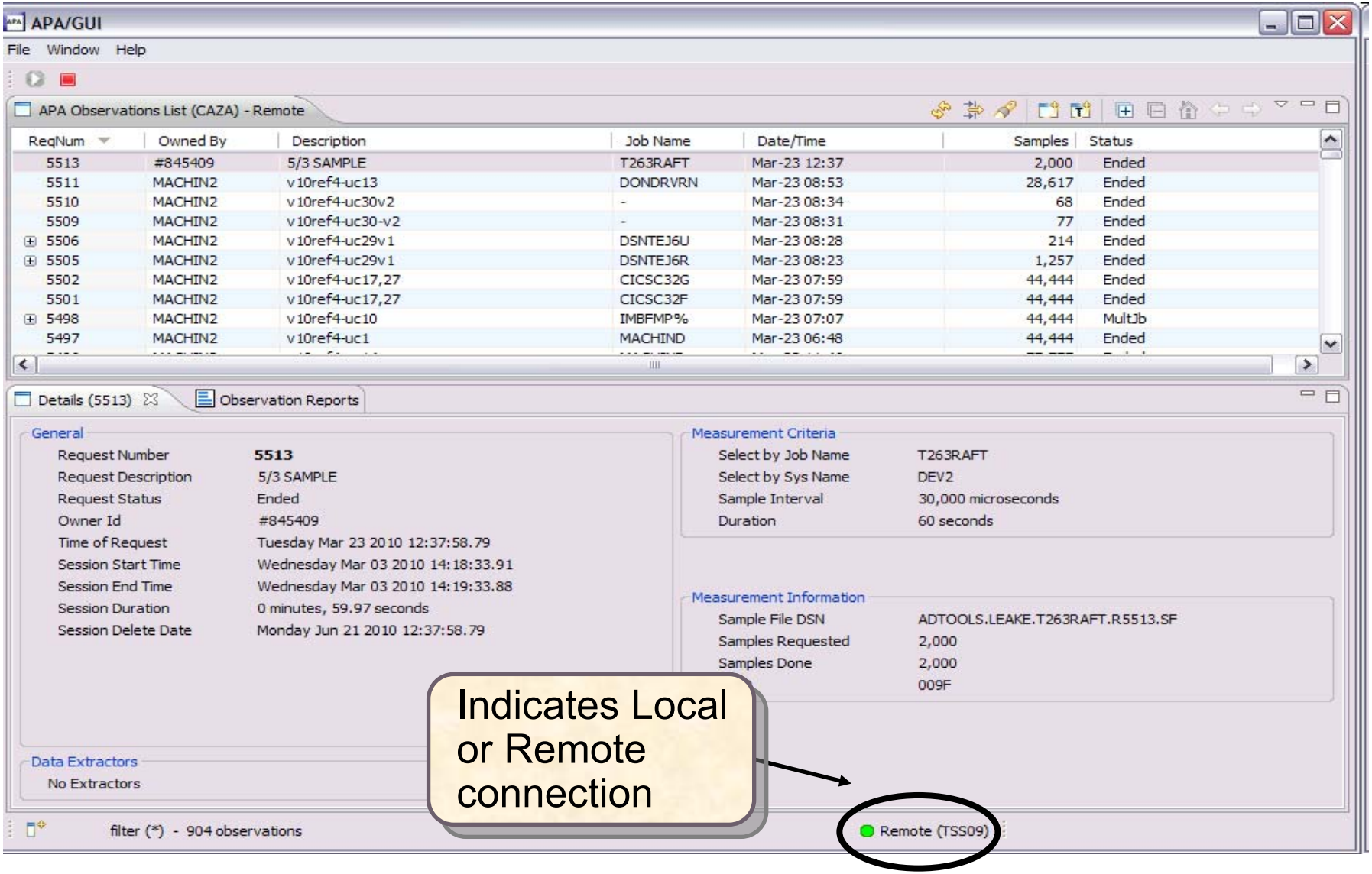
What is Application Performance Analyzer (APA) for z/OS ?

- Application Performance Analyzer for z/OS is an application performance-measurement tool that helps you perform *application performance tuning* for applications running on IBM z/OS systems
- APA will measure and report on how system resources are used by applications running in virtually any z/OS address space
- APA can minimize the time needed to resolve production performance problems by identifying the issue
- APA can also analyze transactions running under an online subsystem such as IBM CICS, IBM IMS, and WebSphere Application Server, as well as DB2 stored procedures
- Using APA helps you maximize the performance of your existing hardware resources and helps you improve the performance of your applications and subsystems
- APA aids application design, development and maintenance cycles. It helps evaluate application prototypes in the design phase, review the impact of increased data volume or changes in business requirements on performance

Application Performance Analyzer Features

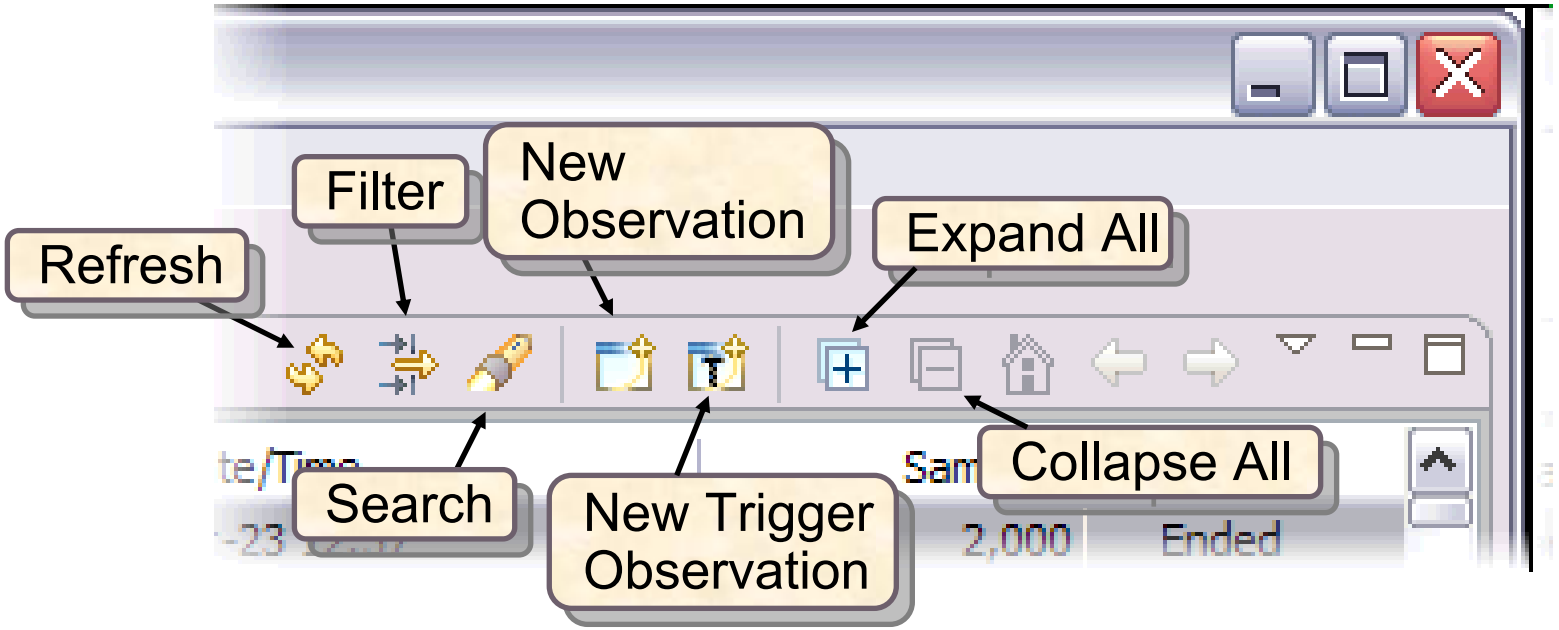
- Online analysis: Displays overall system activity, enabling you to check job execution online and select which active job to monitor.
- Monitoring: Automatically starts to monitor job performance when the job or program becomes active
- Reports: Provides multiple summary reports to assist in identifying key areas of performance bottlenecks. Analysis data is available in printed reports, which can be created as an Adobe PDF file or as an XML file
- Performance analysis: Provides CPU usage, as well as multiple DASD statistics including EXCP, VSAM statistics, and I/O wait time
- DB2 monitoring: Delivers relevant information for DB2 performance analysis and tuning, including SQL statements
- CICS monitoring: Includes monitoring by specific transaction or transaction prefix with wildcards. CICS+ provides tracing support for critical situations
- IMS support: Delivers IMS application performance data on call time and service-call time for DL/I. IMS+ can be used to trace all IMS calls.
- WebSphere MQ support: Provides CPU usage by queue, by request, and by transaction, as well as service time and wait time for the same

Connected to the Mainframe

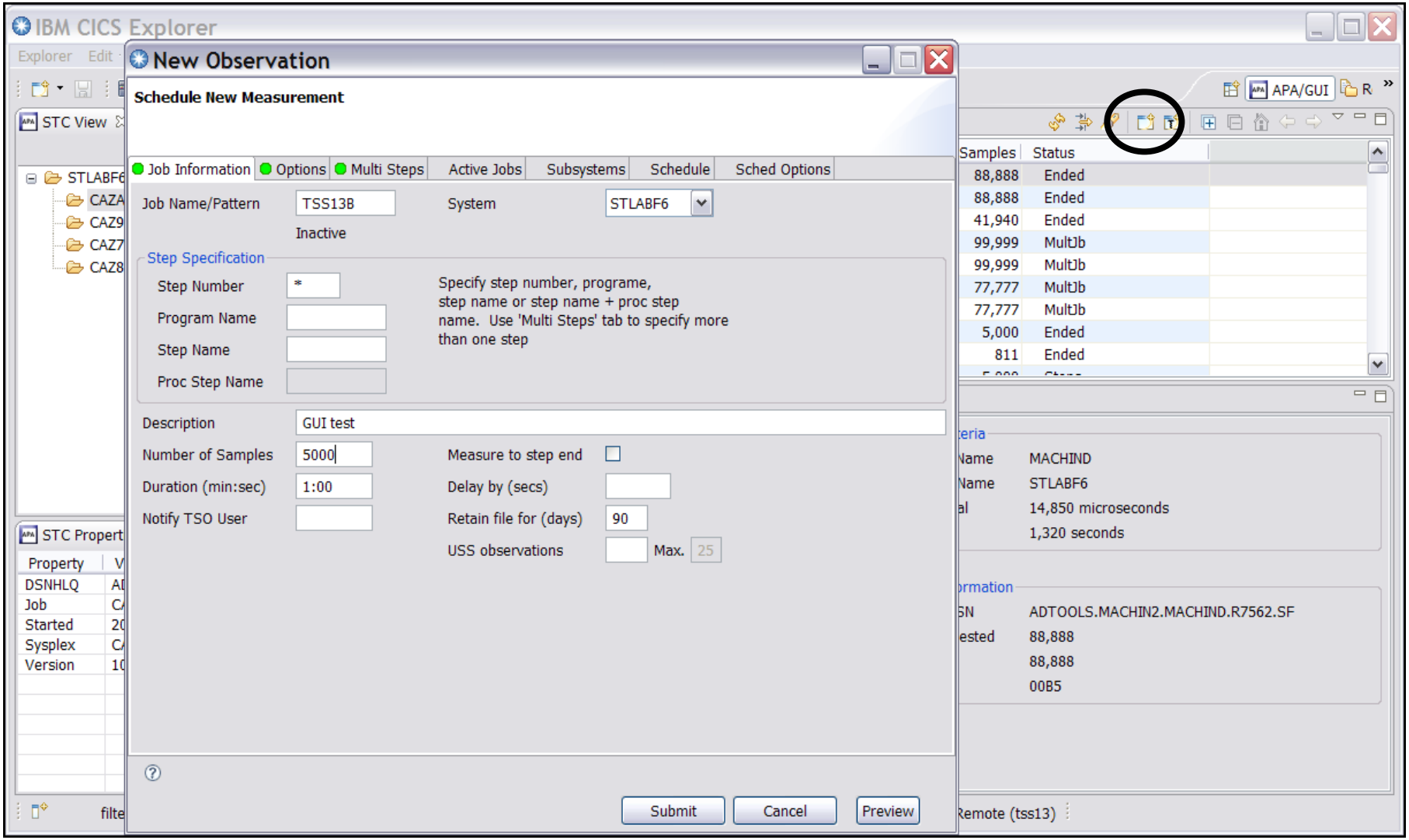


Observations List View Toolbar

- **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)**

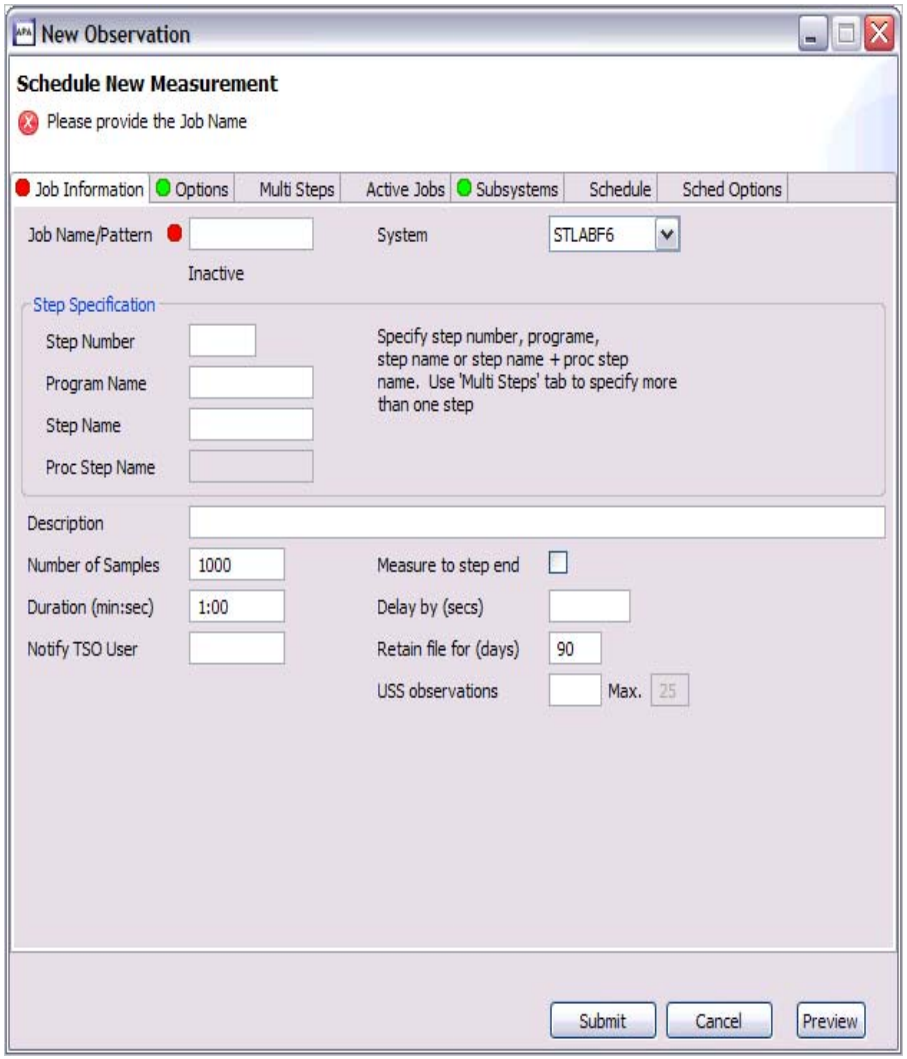


Click on new observation button
Create a new observation

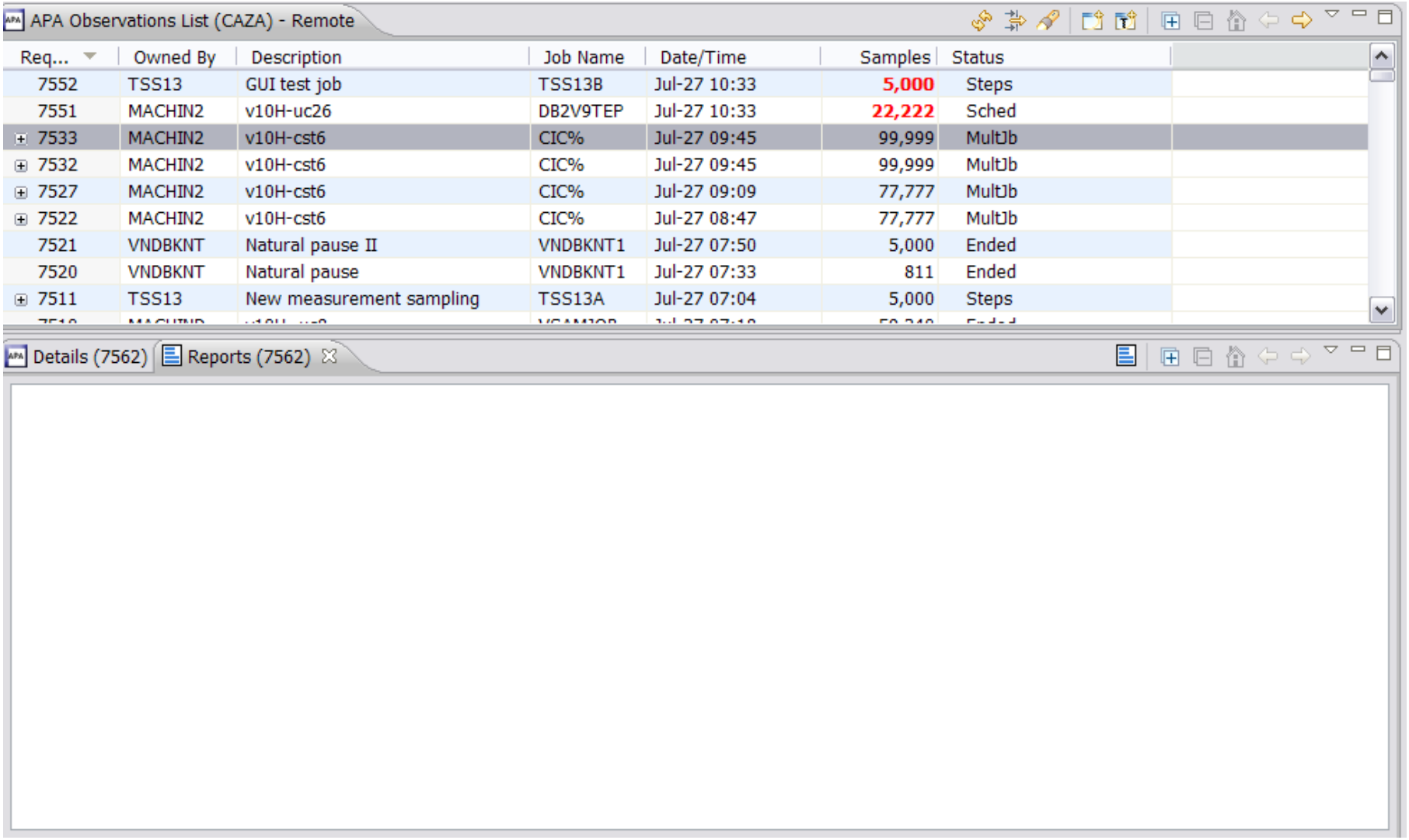


New observation details

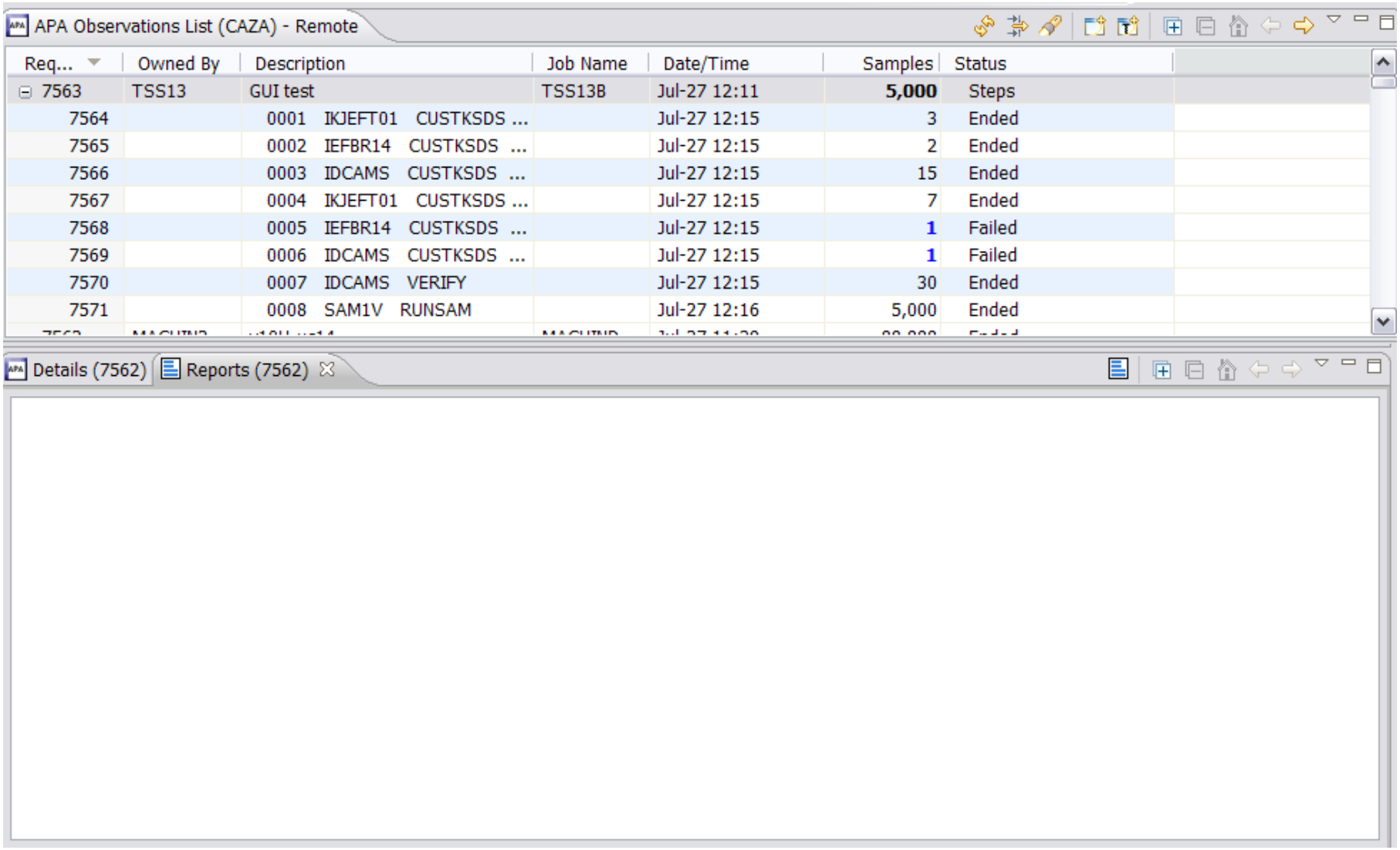
- **Create and submit a new observations**
- **Enter the specification details**
- **Seven tabs where request information may be entered**
- **Each tab name indicates if data has been entered**
  - **Green Dot – entered data is error free.**
  - **Yellow or Red Dot - warnings or errors in the entered data**



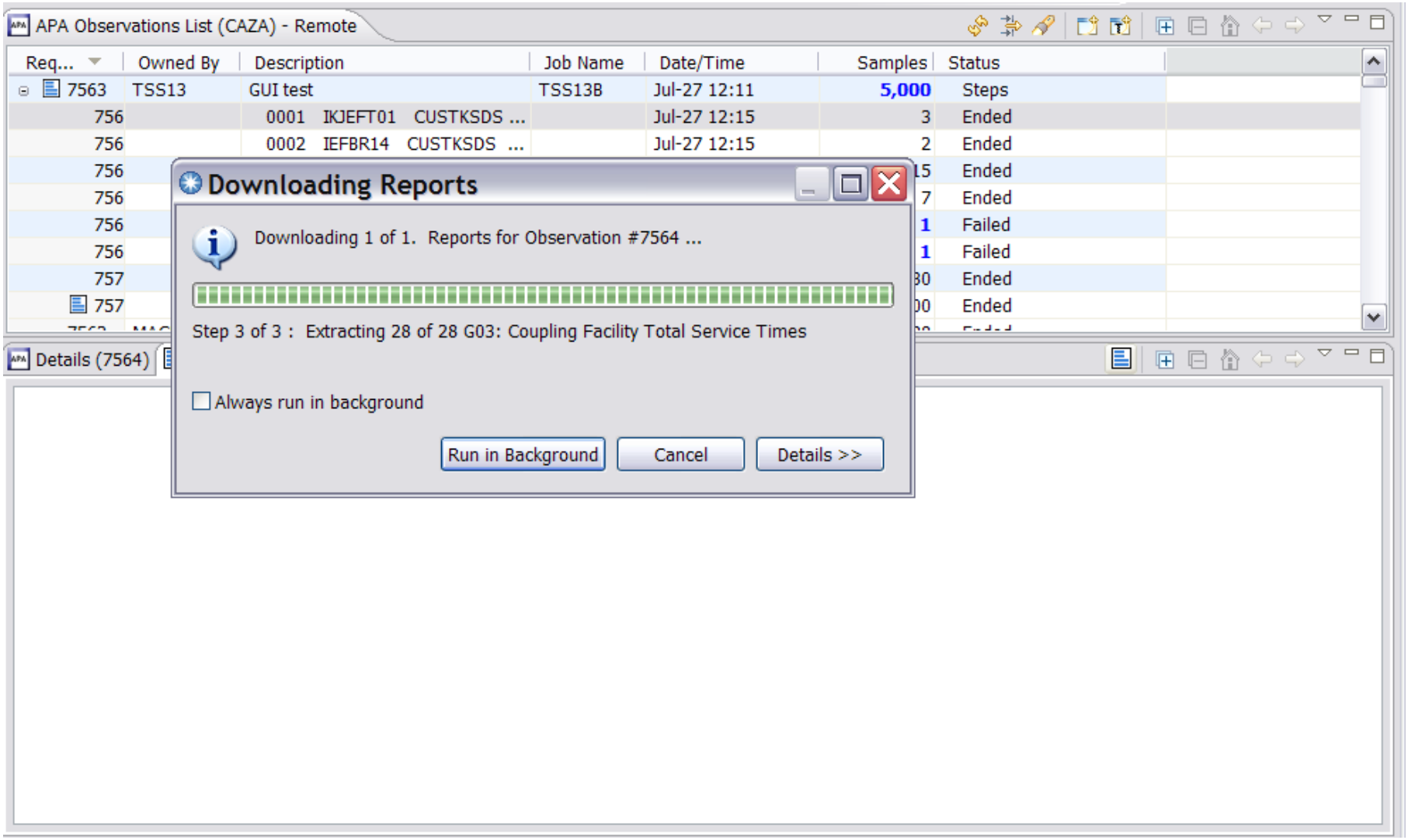
Observation is scheduled



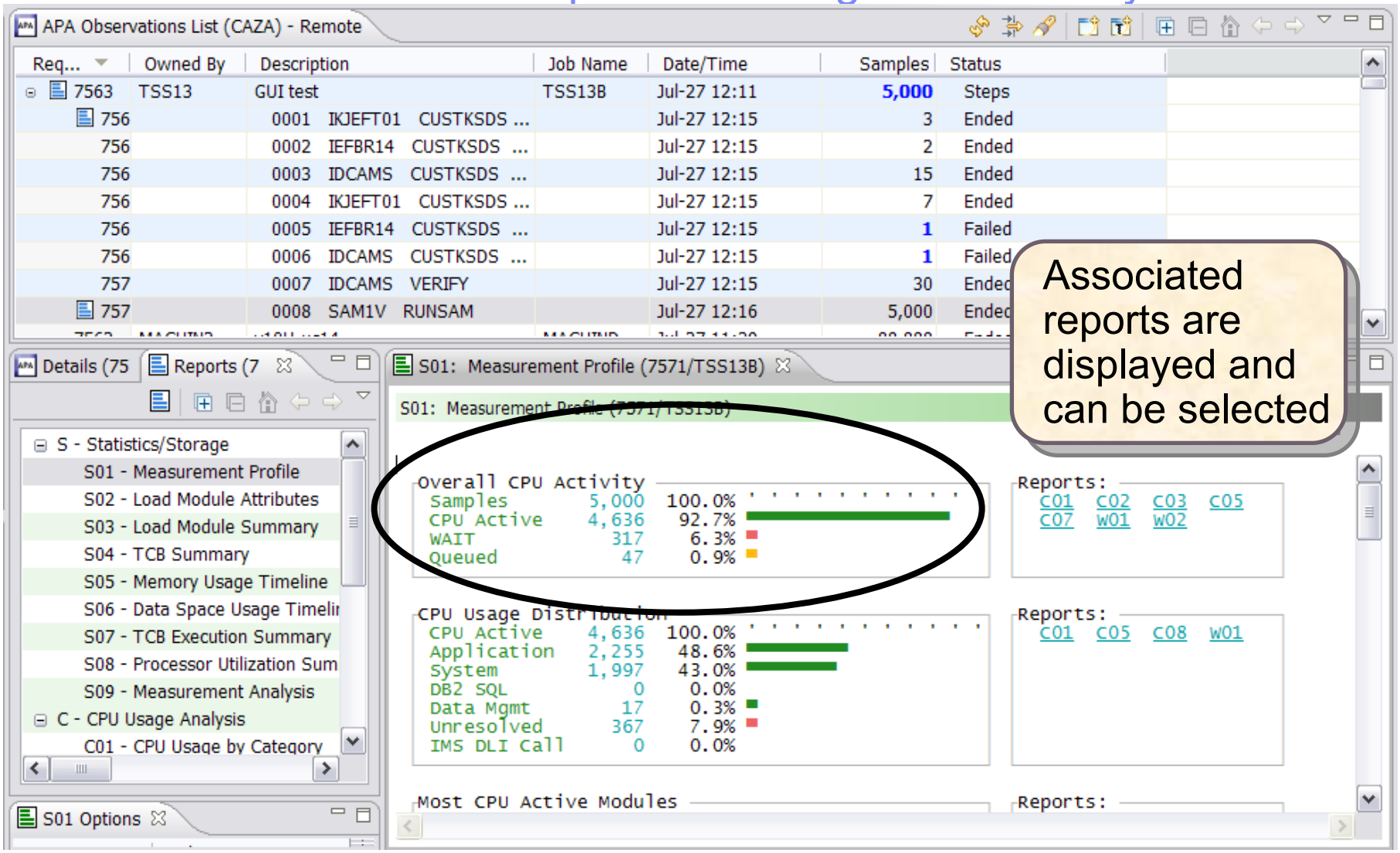
Observation has completed



Right click on report and select Download Reports

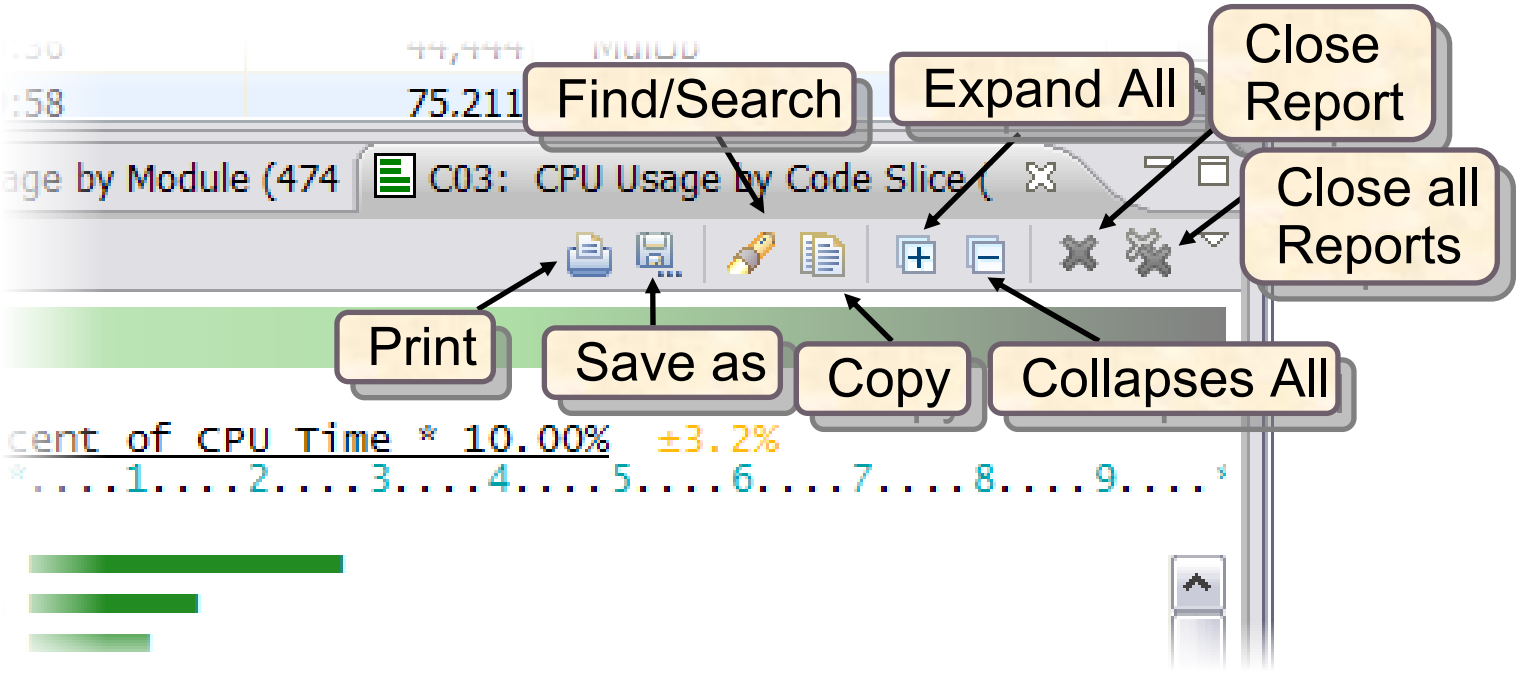


Report list is displayed and can be clicked on to select S01 Measurement Profile report shows high CPU activity

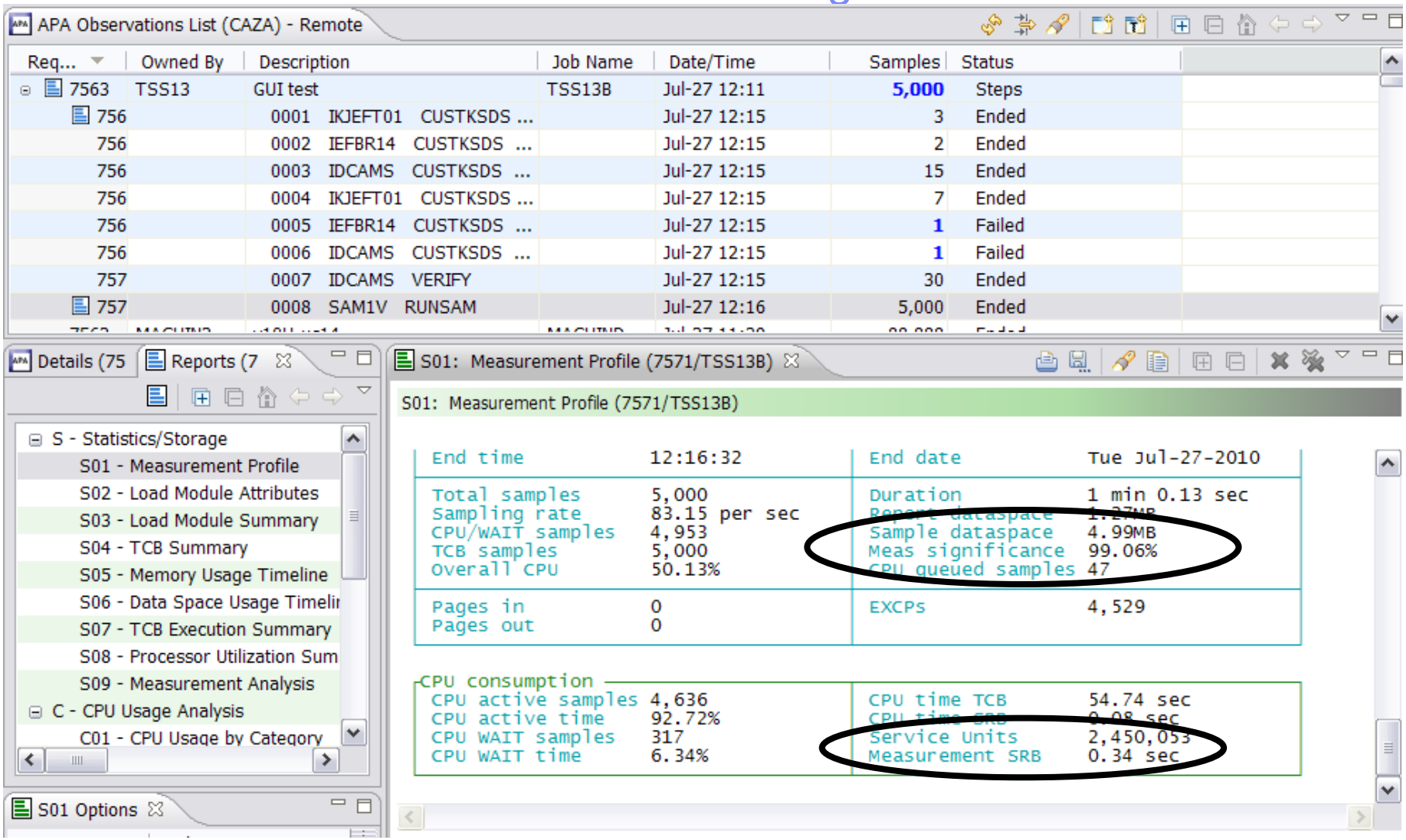


Report View (continued)

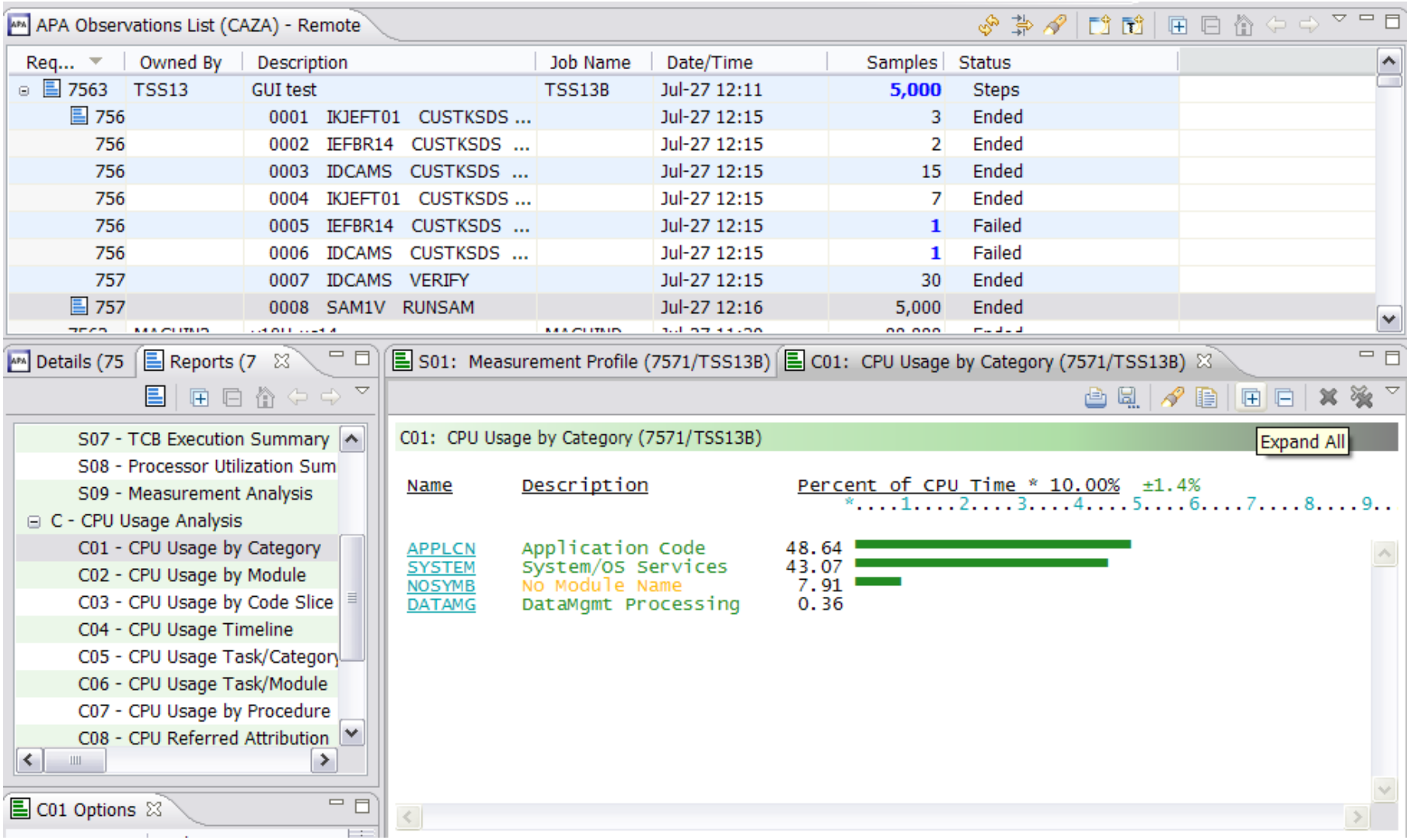
- **Toolbar**
  - **Provides buttons for report-level actions which include:**
    - **Print**
    - **Save As**
    - **Find**
    - **Copy**
    - **Close Report**
    - **Close All Reports**
    - **Expand All**
    - **Collapse All**



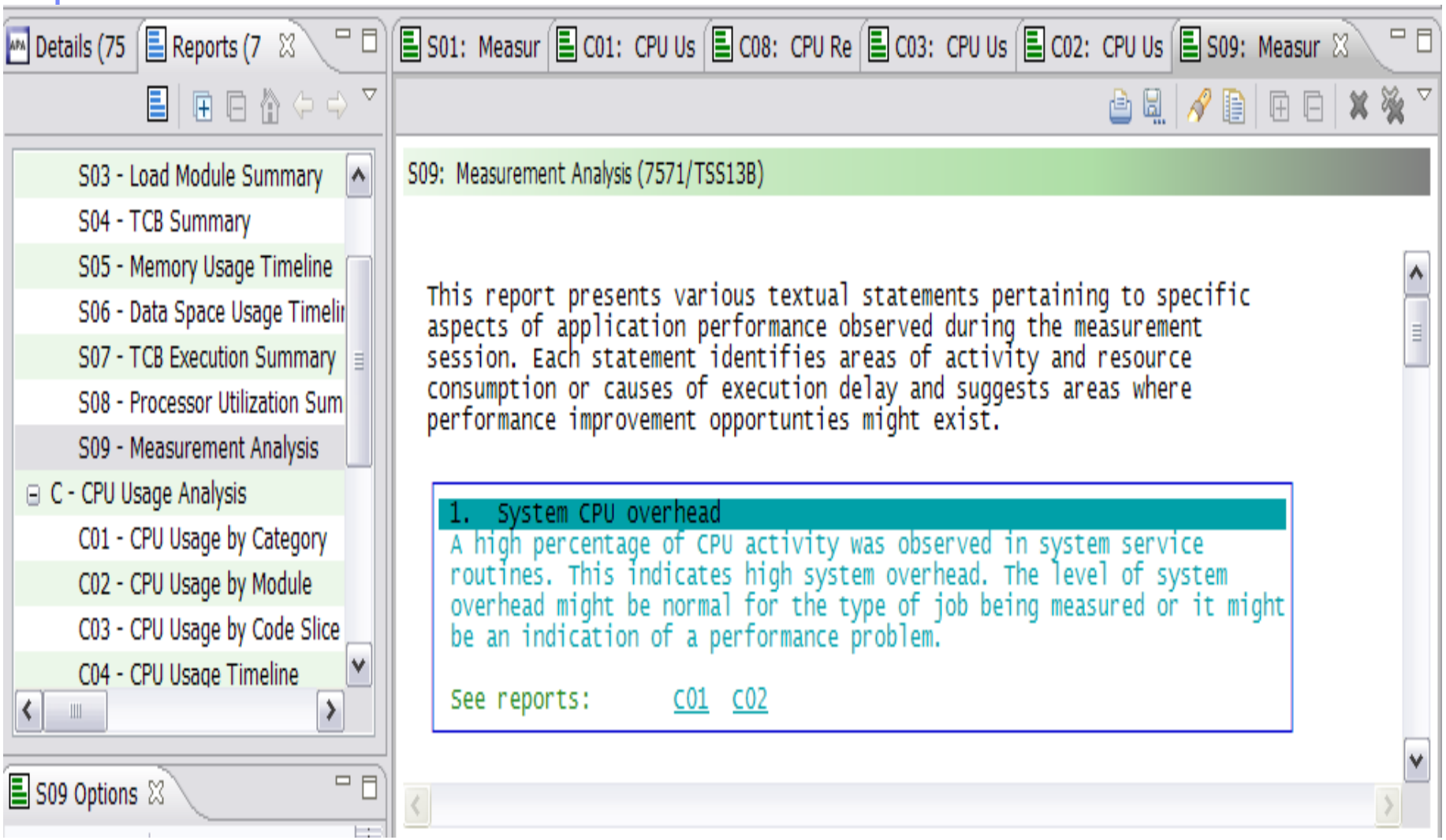
S01 report also shows measurement significance
Measurement SRB shows APA CPU usage



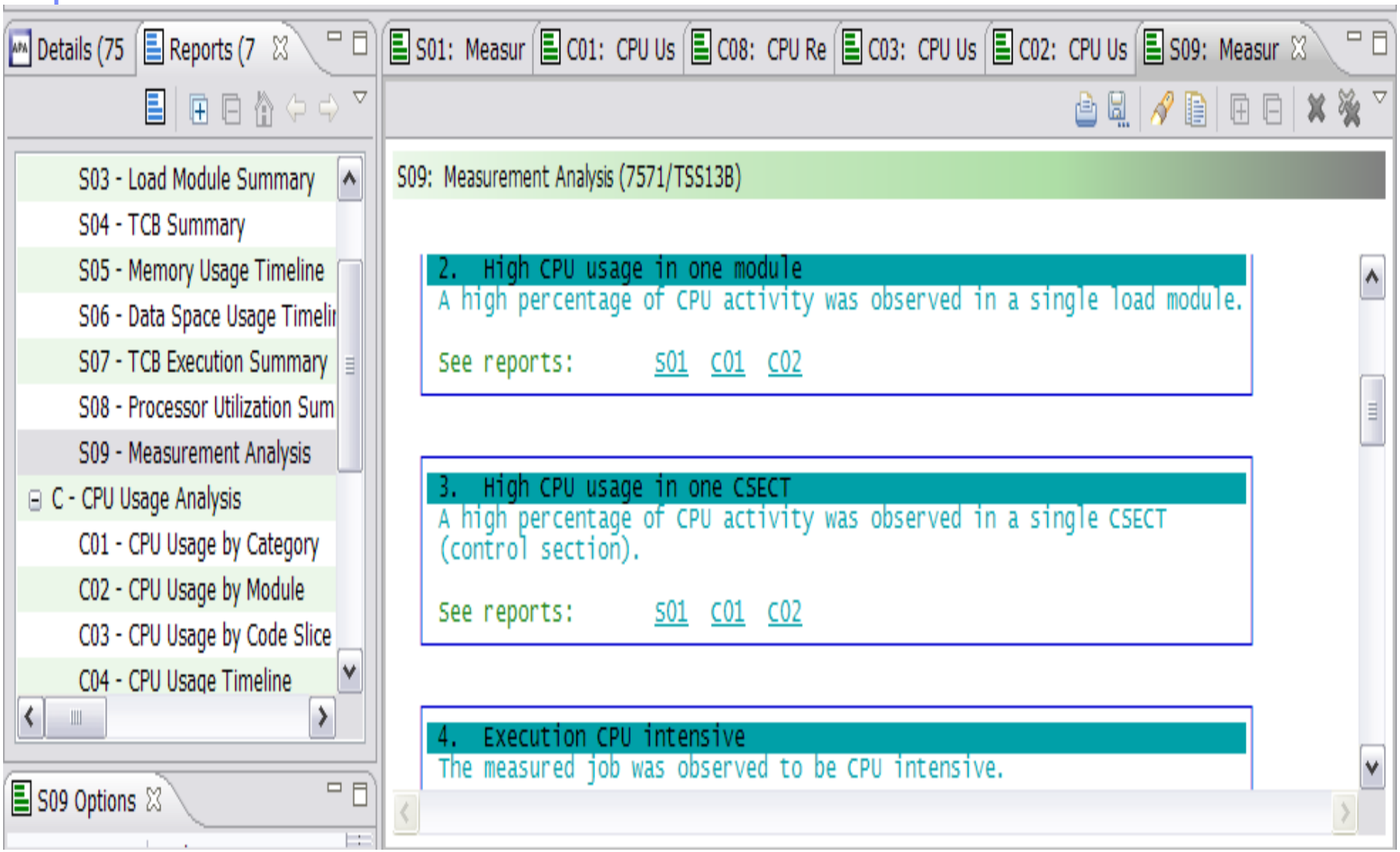
C01 CPU Usage by Category



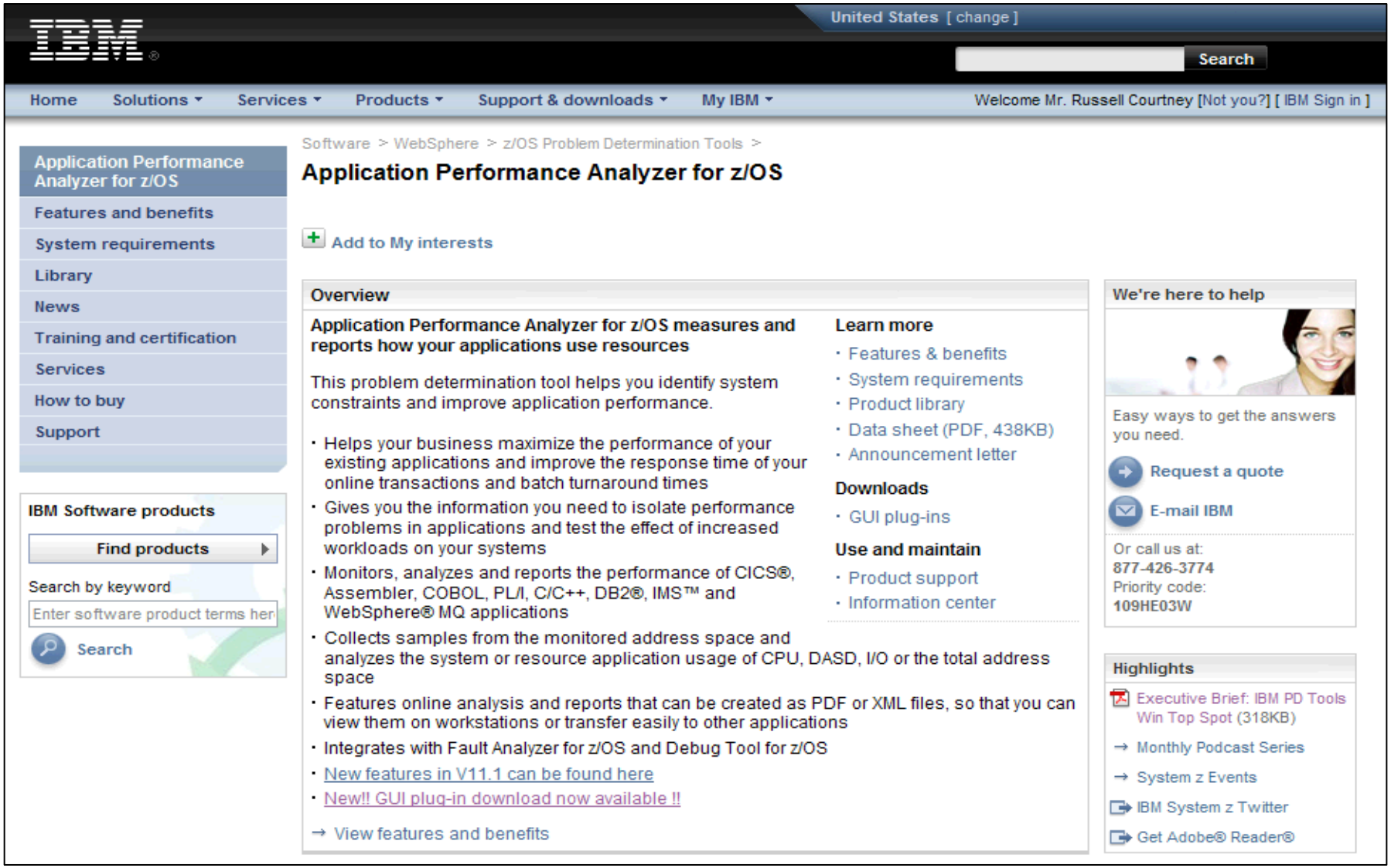
S09 Measurement Analysis report displays possible performance improvement



S09 Measurement Analysis report displays possible performance improvement



Visit our web site: www.ibm.com/software/awdtools/apa



IBM Workload Simulator for OS/390 and z/OS Version 2.1

IBM Workload Simulator for OS/390 and z/OS

Automated testing to simulate Load, Stress, Performance, and Regression tests

Problem

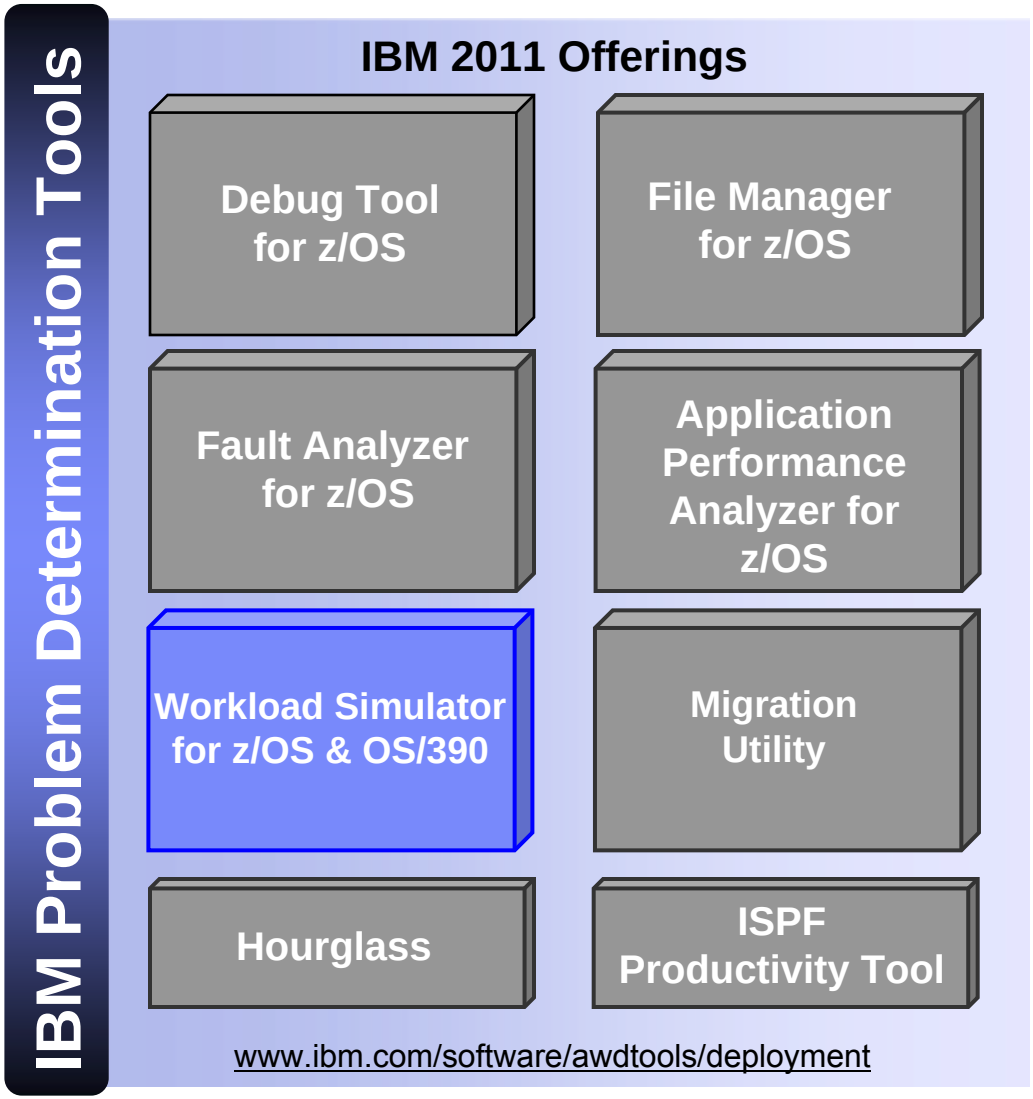
- **How do we get 100 users to hit the Enter Key at the same time?**
- **Can I find 300 people to do some work on this system to create some Load to see what the response time will be?**
- **Can this configuration support 2000 users? Or do I need more DASD or CPU?**

IBM Workload Simulator

Solution

- **Simulate 1 or 50,000 users**
- **Assign work to the simulated users**
- **Feed data from files or user tables**
- **Set criteria for pass / fail of an execution**
- **Capture and report on response time**

The IBM Problem Determination Tools Suite for z/OS



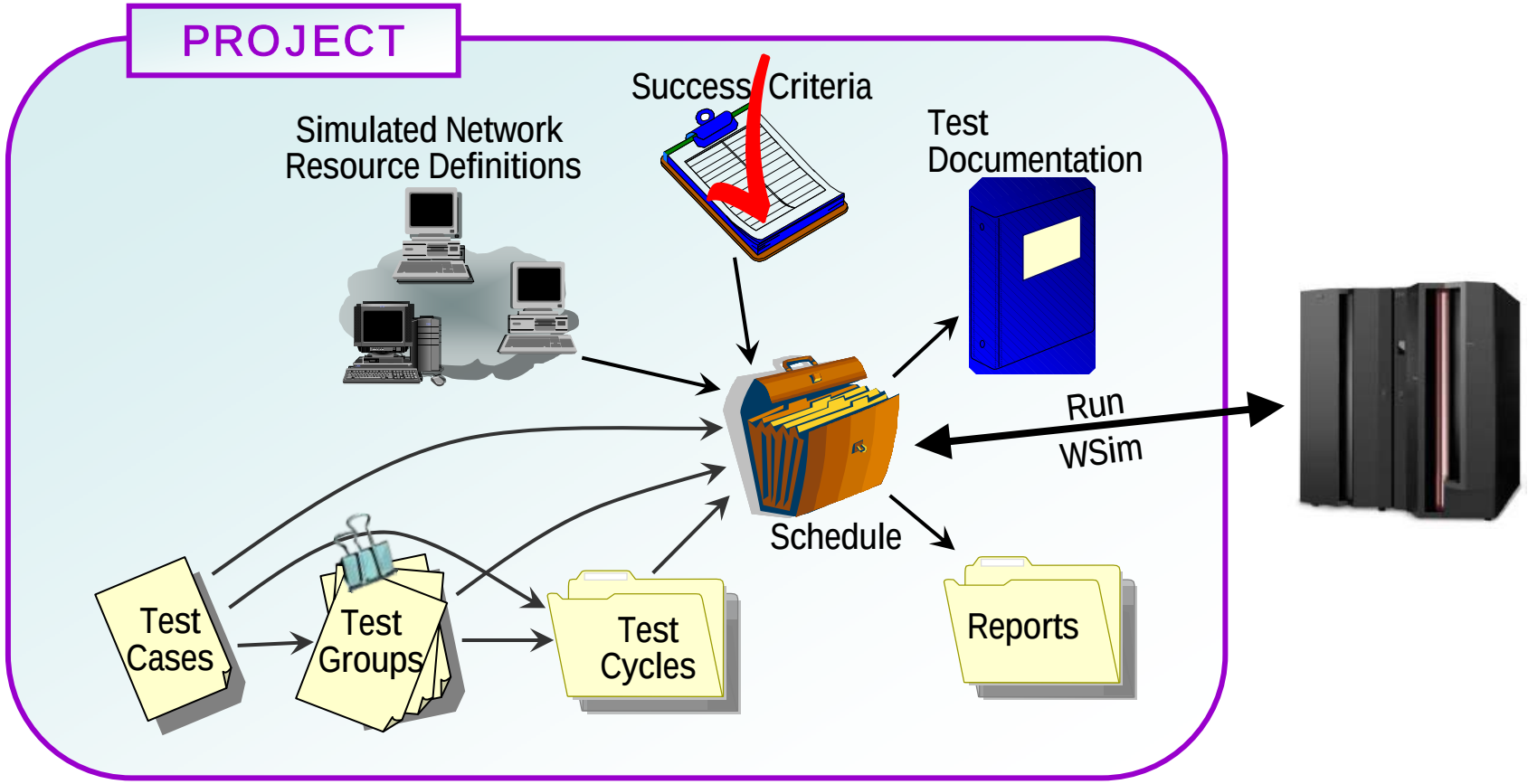
Workload Simulator

- Simulates network resources, such as VTAM terminals
  - WSim's "logical" network resources appear to be real to the live system
- Run test scripts to simulate network traffic against live systems and applications
  - Simulate a single terminal or resource to test application functionality
  - Define multiple resources to simulate a large number of users and high transaction volumes
- Report the status and results of tests

What can be Simulated?

- VTAM terminals
  - Simulate secondary VTAM Logical Units (LUs) to test VTAM applications such as CICS, IMS, and TSO
- VTAM Applications
  - Simulate primary VTAM LUs to simulate an existing application or to prototype a new application
- TCP/IP clients
  - Simulate Telnet 3270, 3270E, 5250, NVT, or FTP clients communicating with servers such as TCP/IP for MVS
  - Simulate simple TCP or UDP clients
- CPI-C (CPI-C: Common Programming Interface Communications)
  - Simulate client or server CPI-C (LU6.2) transaction programs

The WSim Test Manager (WTM)



- Manage and organize your tests with WTM
- WTM provides a “front-end” to the original WSim panels

The WTM ISPF Application

1-3: Build and manage the components of test scripts

4: Run a test

D: Write and organize test documentation

P: Define and manage multiple test projects

W: Jump to the original WSim panels

```
                              WSim Test Manager

Select one of the following.  Then press Enter.

     Command   Action
  1. CASE      Create and Process Testcases
  2. GROUP     Create and Process Testgroups
  3. CYCLE     Create and Process Testcycles
  4. RUN       Create WSim Networks and Schedule WSim Simulation Runs
  D. DOC       Create Test Documentation
  P. PROJECT   Add/Change Project or Alternate HLI
  U. UTIL      Run WSim Test Manager Utilities
  W. WII       Invoke WSim/ISPF Interface

Project:                                Alternate HLI:

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restricted by GSA ADP Schedule Contract with IBM Corporation.

Command ===>
 F1=Help      F2=Split     F3=End       F4=          F5=          F6=
 F7=Up        F8=Down      F9=Swap      F10=Left     F11=Right
```
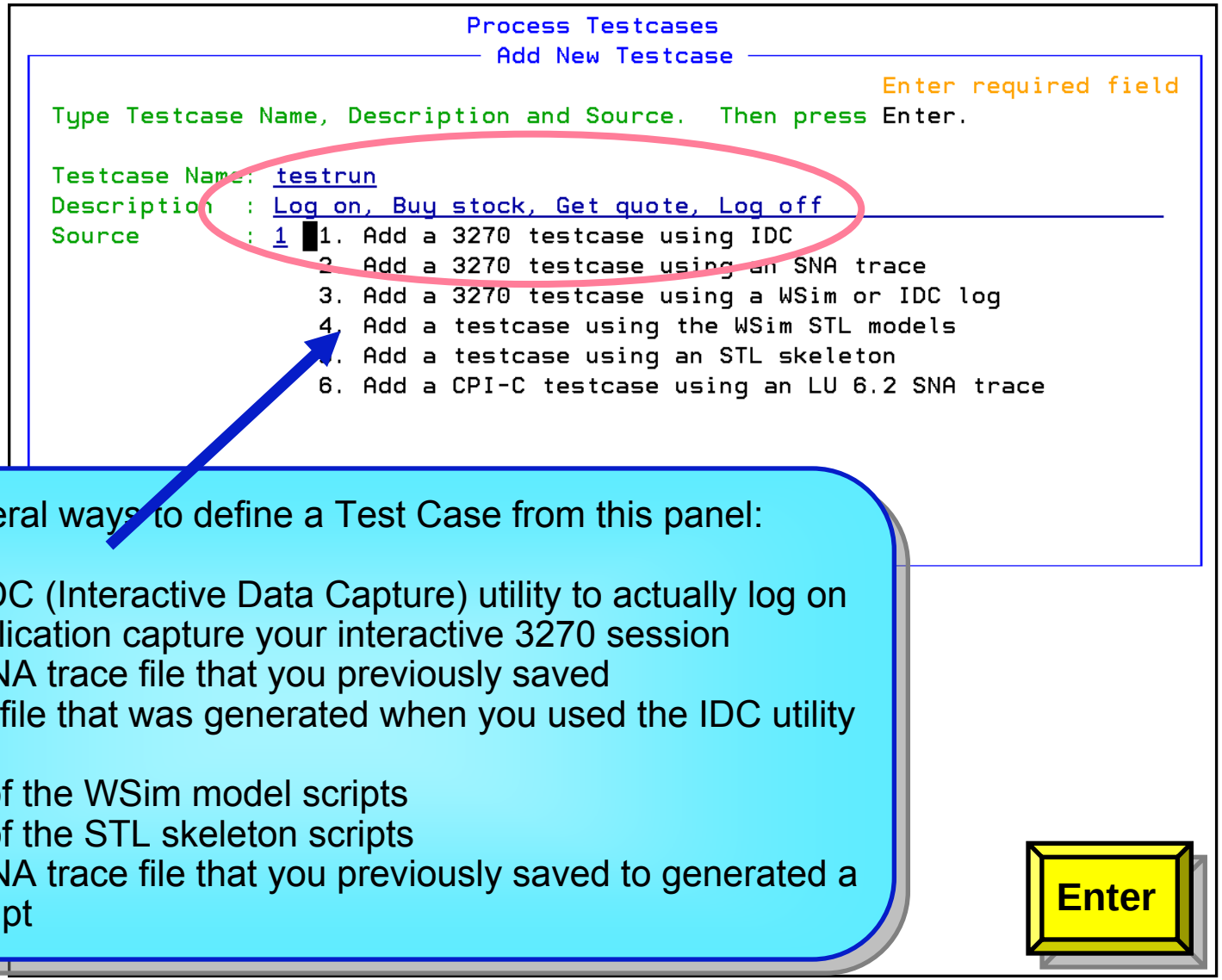

Enter

WSim Test Manager main menu

Includes the Interactive Data Capture to assist in creating scripts

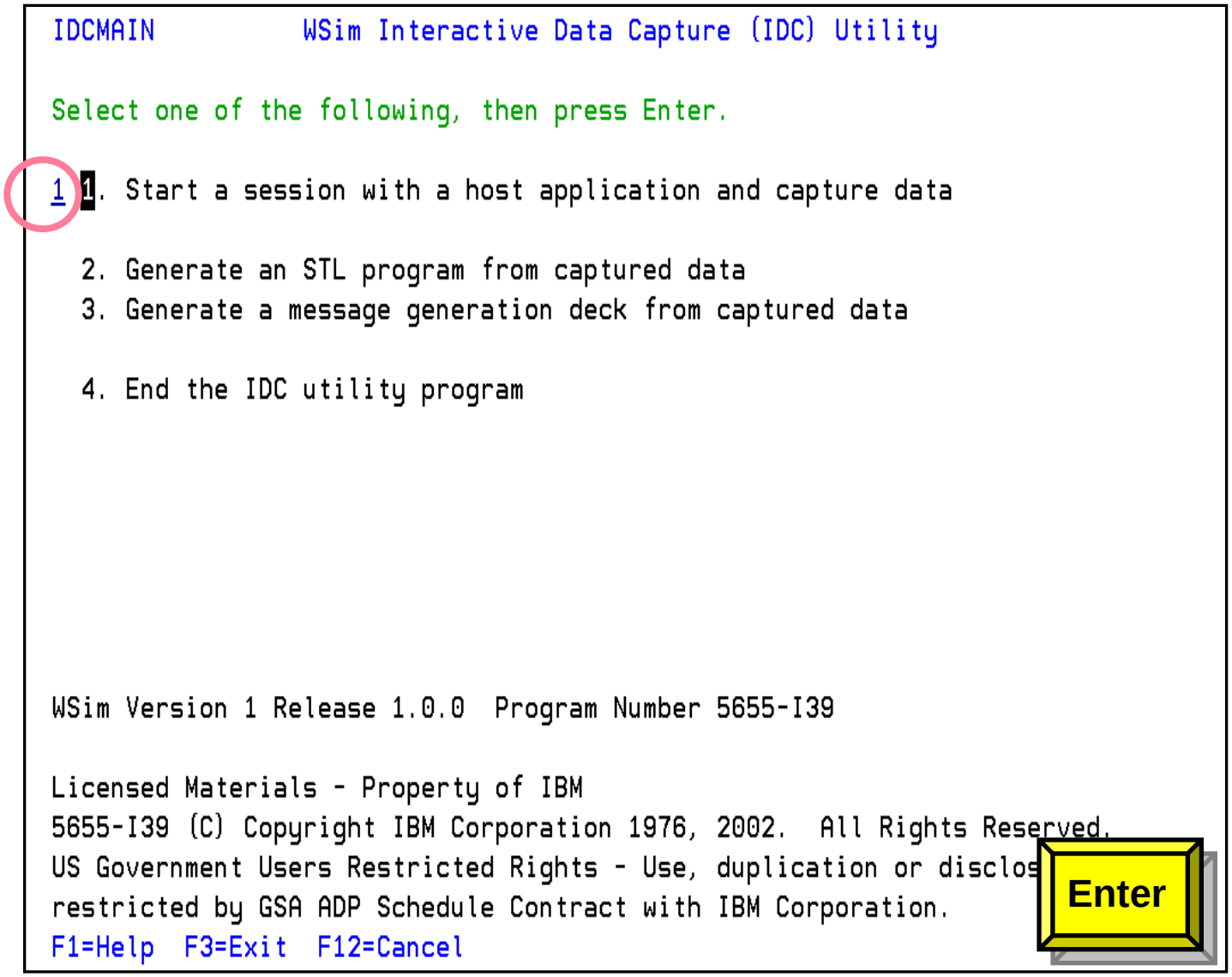
- Enter info about the new test case



Info for a new Test Case

Creating Test Cases

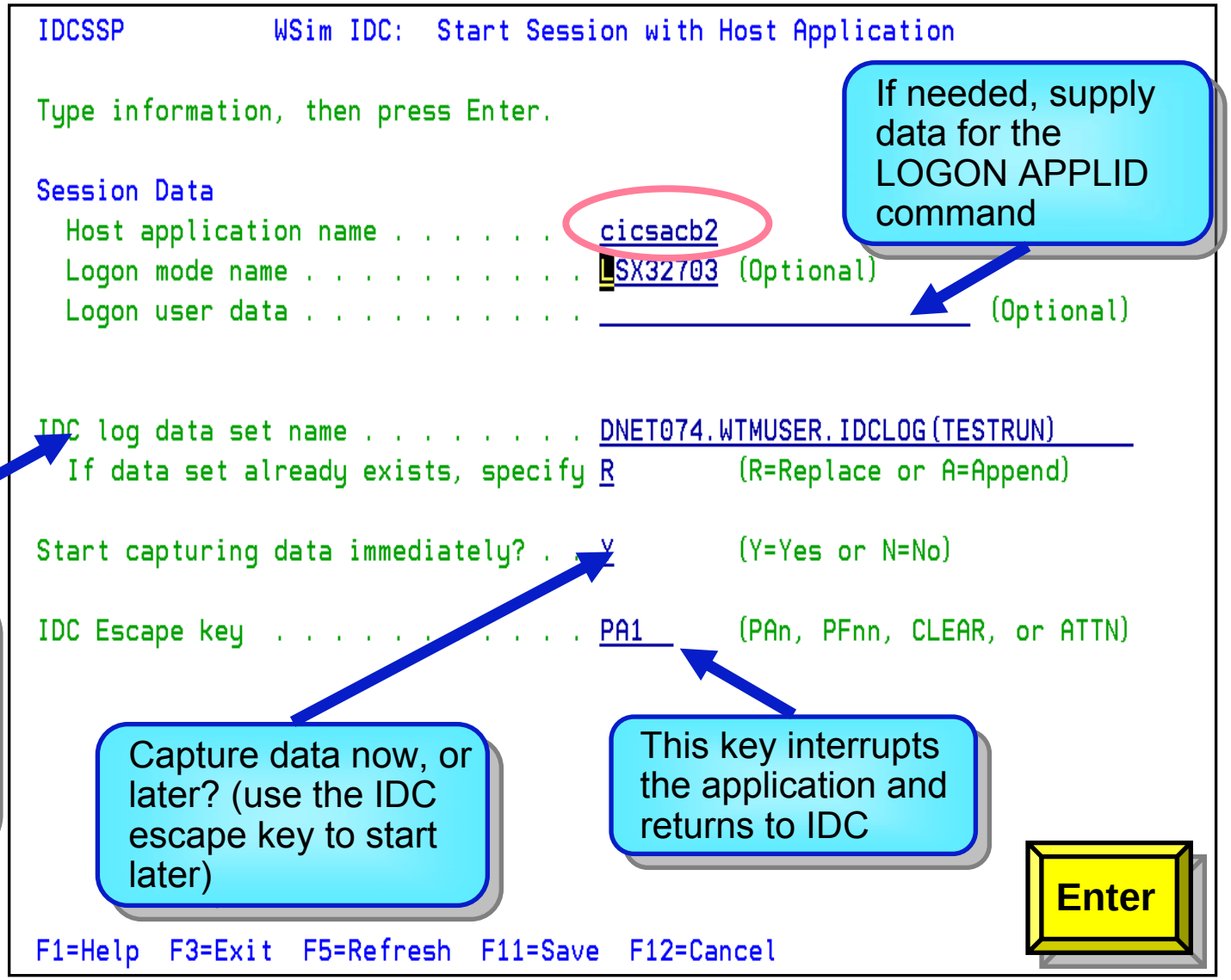
- Select 1 to start a 3270 session with a host application



IDC Utility panel

Creating Test Cases

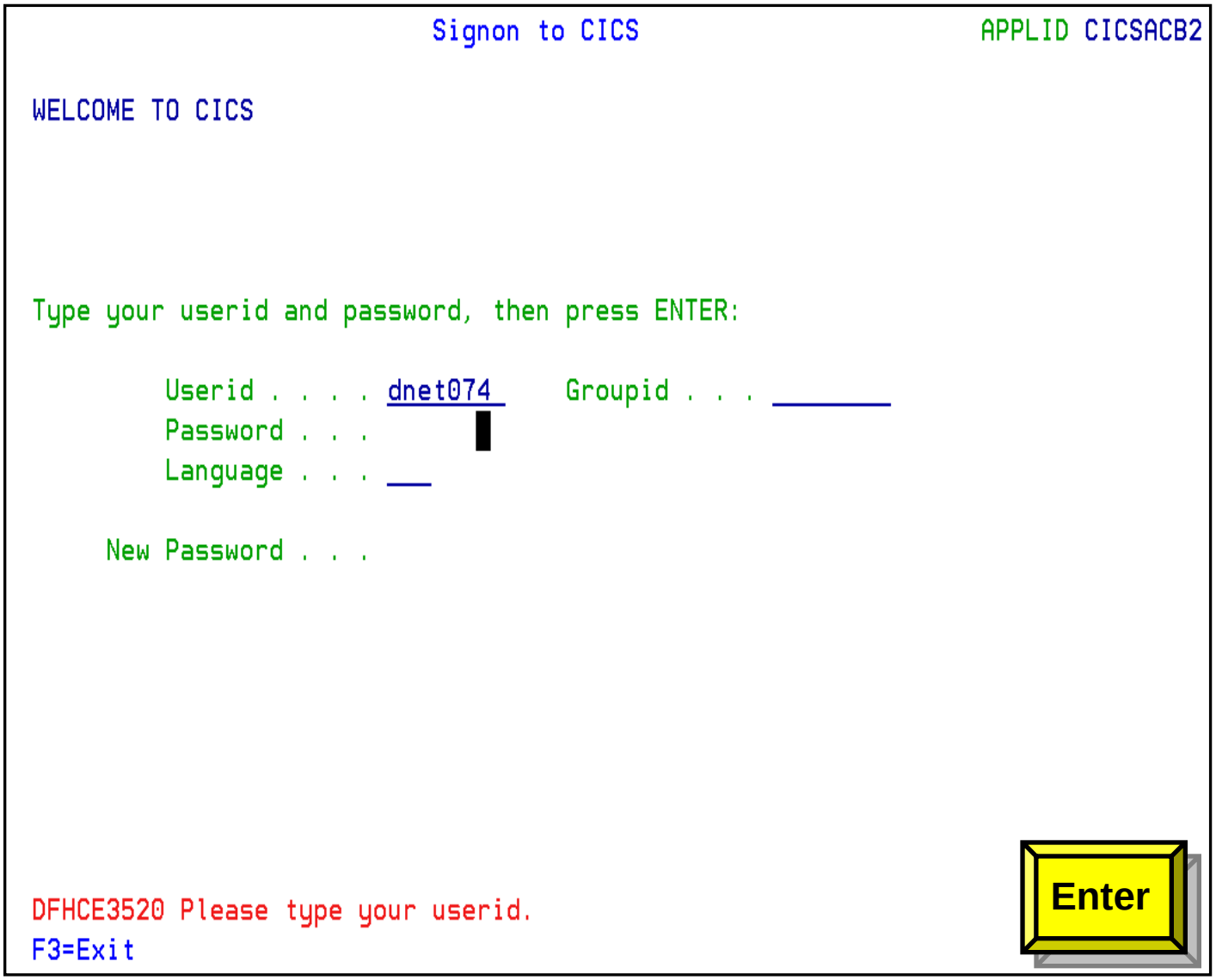
- Provide the name of the VTAM APPL id of the host application



IDC options panel

Creating Test Cases

- Perform the session actions that you want to capture in your script



Connected to the application (CICS in this example)

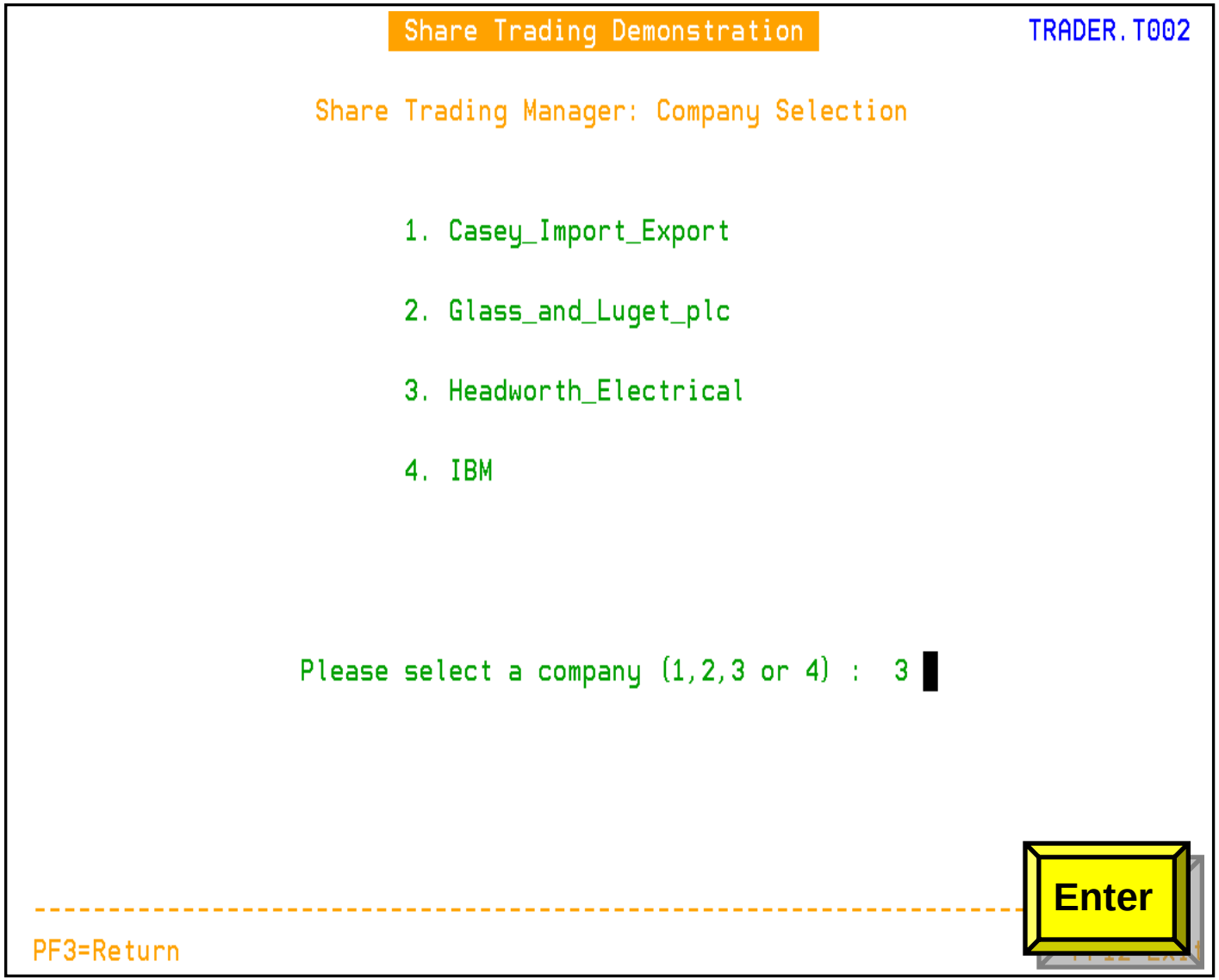
Creating Test Cases

- Perform the session actions that you want to capture in your script

Connected to the application (CICS in this example)

Creating Test Cases

- Perform the session actions that you want to capture in your script



Connected to the application (CICS in this example)

Reviewing Reports from a Simulation

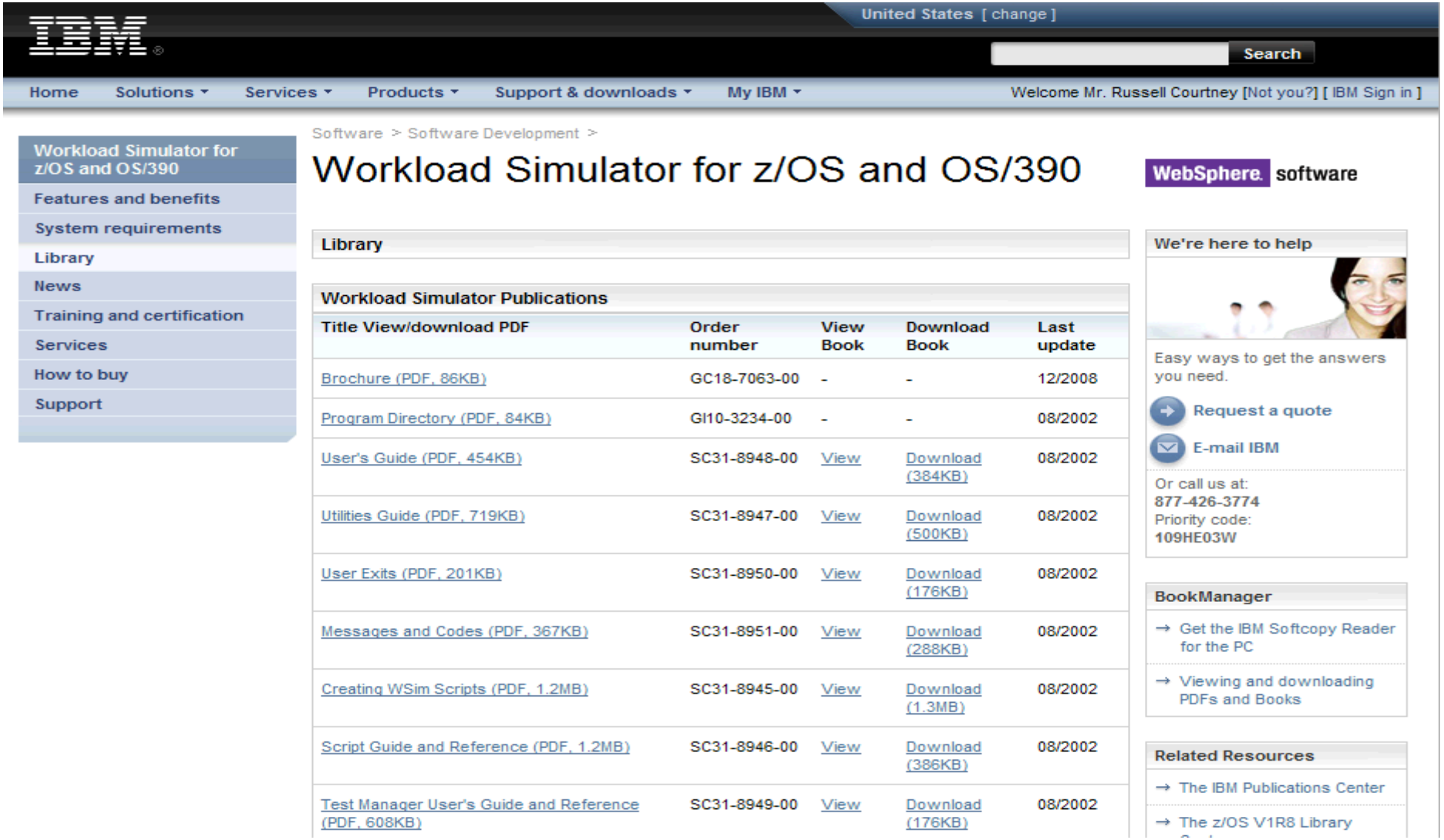
- Reports from the Current Run, Baseline Run, and Comparison Reports are available

```
                          Reports for schedule TRAD1

Select one of the following.  Then press Enter.

      Command   Action                                                More:  +
2  1. TLOG      View loglist report from the latest WSim run
   2. TRESP     View response time report from the latest WSim run
   3. TDM       Log display monitor for the latest WSim run
   4. TSP       View SYSPRINT from the latest WSim run

   5. MLOG      View baseline loglist report
   6. MRESP     View baseline response time report
   7. MDM       Log display monitor for the baseline log

   8. COMP      View screen compare report
   9. CDM       Log display comparator
  10. RTCOMP    Edit response time compare report

  11. COMPREP   Edit completion reports


Command===>
```

Back to the list of reports

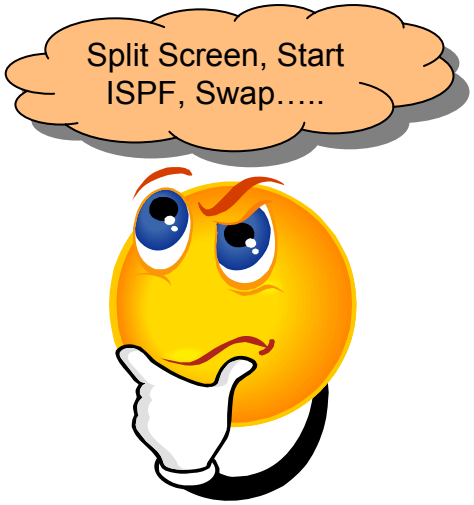
IBM Workload Simulator on the web

http://www.ibm.com/software/awdtools/deployment



IBM
ISPF Productivity Tool for z/OS
Version 6

IBM ISPF Productivity Tool
Productivity and Performance enhancement for TSO/ISPF



Problem

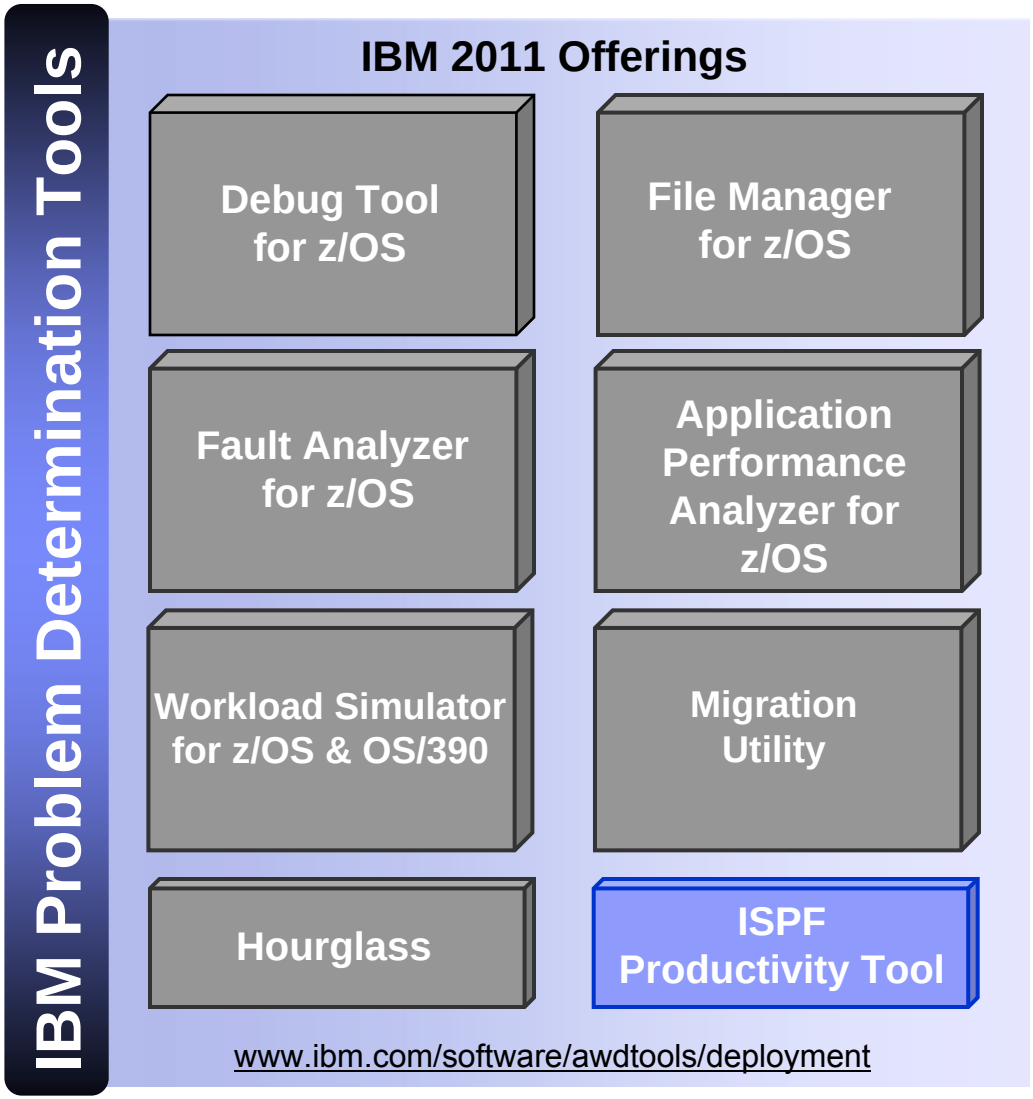
- **Files Qualified Differently**
- **Multiple ISPF Sessions**
- **Cut and Paste Files from panel to panel**

IBM IPT

Solution

- **Reduce Navigation of ISPF Panels**
- **Create, Save, Maintain multiple ISPF Clipboards**
- **Point and Shoot Capabilities in ISPF**
- **Multiple list of files with different qualifiers on the same panel**
- **Search for text-strings in multiple members – in Multiple Datasets**
- **Filter datasets lists**

The IBM Problem Determination Tools Suite for z/OS



ISPF Productivity Tool

- Productivity and Performance enhancement for TSO/ISP
- Use it to:
  - Save Keystrokes, time, effort
  - Reduce navigation of ISPF panels
  - Reduce number of steps to perform repetitive tasks
  - Organize files and work in customizable lists
    - Quickly work with any file in a list
    - Quickly find members or data in any file in a list
- New commands to:
  - Jump directly to edit, browse, view, and more
  - Display and work with a list of files and objects
- Point and shoot capabilities
  - If a file name appears on the screen, you can cursor-select it to edit, browse, view, copy, and more
  - Select files, members, and options on IPT panels with cursor selection

Object Lists

Object Lists can contain:
- z/OS Files
  - •UNIX System Services files
  - •VSAM files
  - •Sequential
  - •Tape
  - •Migrated
  - •Workstation files
  - •Panvalet or Librarian
  - •SCLM hierarchies
  - •Files on specific volumes
  - •Files referenced by DD name
- DB2 tables
- Dynamic list of APF libraries
- Linklist libraries
- LPA libraries

Object List example Multiple File Types and Qualifiers

```
Numbr Data Set Names / Objects
----- ------------------------------------
    1 !-------- LAB FILES ----
    2 :LISTS
    3 OLVS
    4 )/u/dnet424/test
    5 /u/dnet424/testfile
    6 ADLAB.JCL
    7 :LISTS APFLIB
    8 'DEBUG.V7R1.**'
    9 :LISTV DMPU2* DNET424.**
   10 -DSNC_DSN8710.EMP
   11 =DNET424 ADWORK ADLAB SOURCE
   12 =DNET424 DEV1 DEV2 TEST RELEASE SOURCE
```

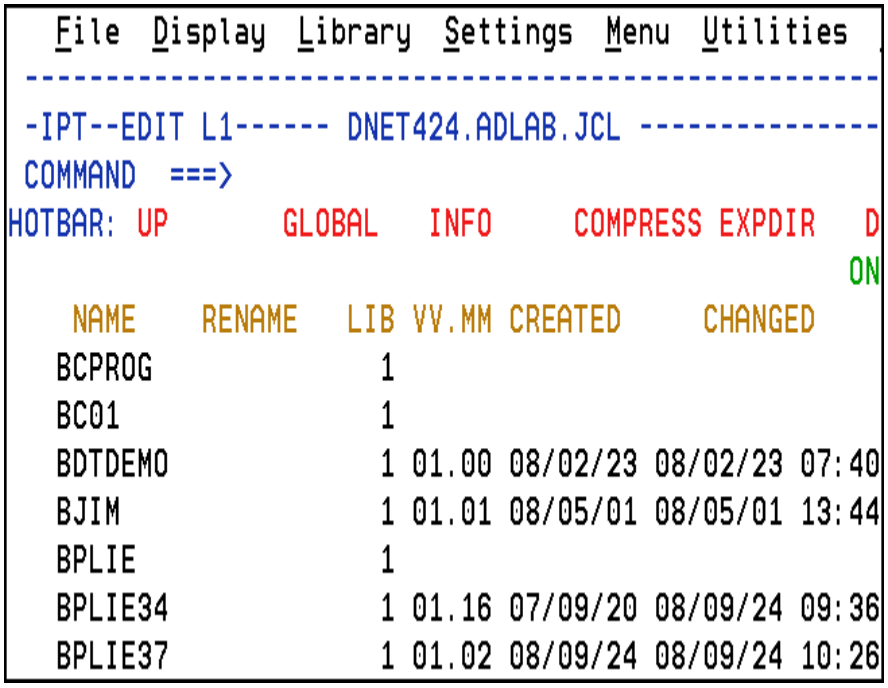
Member Selection Lists (MSLs)

MSL functions:

- Extended Search and Change Functions
- Extended Copy/Move Functions

- Expand directory blocks
- Extend size of PDS
- Empty a PDS
- Recover a deleted PDS member
- Sort and Filter Members
- Many more functions

Member Selection List



Example One: Find a member within an Object List (1/2)

```
 File  Edit  Find  Display  Populate  Settings  Menu  Util  Test  Help  Exit
-------------------------------------------------------------------------------
-IPT- OLIST (V) ---------- LEVEL DNET424.*.JCL ------------ Row 1 to 13 of 13
Command     ===> fm ldbcxt                                  SCROLL ===> CSR
Hotbar: REFRESH  CLRVOL   FILLVOL  UPDATE   CUT      FLIP     VALIDATE DOWN
                                                      *TEMPORARY LIST*

Command    Member    Numbr Data Set Names / Objects                    Class
---------  --------  ----- ------------------------------------------ -------
                         1 'DNET424.ADJIM.JCL'                        PDSE
                         2 'DNET424.ADLAB.JCL'                        PDSE
                         3 'DNET424.ADLAB.JCL.OUT'                    PDSE
                         4 'DNET424.DTCOBII.JCL'
                         5 'DNET424.KEYBANK.JCL'                      PDSE
                         6 'DNET424.OSVS.JCL'
                         7 'DNET424.PDPAK.JCL'
                         8 'DNET424.SP.JCL'                           PDSE
                         9 'DNET424.SP.JCL.OLD'
                        10 'DNET424.SP.JCL.TRIG'                      PDSE
                        11 'DNET424.TRADER.JCL'
                        12 'DNET424.WEB.JCL'                          PDSE
                        13 'DNET424.WILFRIED.JCL'
 F1=HELP      F2=SPLIT     F3=END       F4=IPT View  F5=RFIND     F6=RCHANGE
 F7=UP        F8=DOWN      F9=SWAP      F10=LEFT     F11=RIGHT    F12=RETRIEVE
```

Result of FM LDBCXT

```
Command    Member    Numbr Data Set Names / Objects                    Class
---------  --------  ----- ------------------------------------------ -------
--FOUND--  LDBCXT       13 'DNET424.WILFRIED.JCL'                     PDS
                          ---------------- END OF LIST ----------------
```

Example One: Find a member within an Object List (2/2)

ISPF – Find a member

- Steps Required:
  - •Use option 3.4 to locate files
  - •For each file:
  - •Repeat the steps above for each of the 13 files
  - •Steps required for 13 files:

ISPF Productivity Tool – Find a member in an OLIST

- Steps Required:
  - •Issue FM command in an OLIST
  - •Steps required: 1

Improve Productivity

Example Two: Find text within an Object List for 13 PDS or PDSE libraries

ISPF Productivity Tool – Find Text JCLLIB in all members

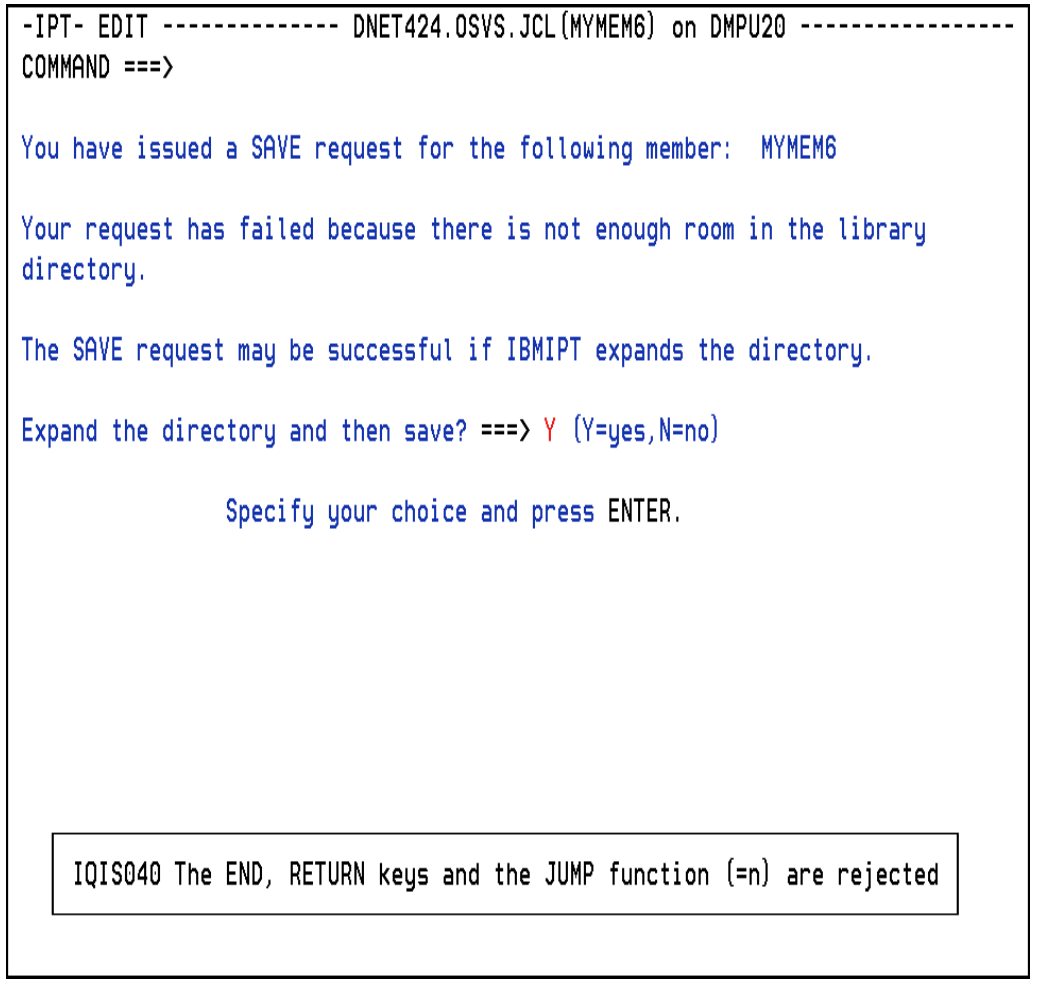
```
Command     ===> ft JCLLIB all
Hotbar: REFRESH  CLRVOL   FILLVOL  UPDATE   CUT


Command   Member   Numbr Data Set Names / Objects
--------- -------- ----- ----------------------
                      1 'DNET424.ADJIM.JCL'
                      2 'DNET424.ADLAB.JCL'
                      3 'DNET424.ADLAB.JCL.OUT'
                      4 'DNET424.DTCOBII.JCL'
                      5 'DNET424.KEYBANK.JCL'
                      6 'DNET424.OSVS.JCL'
                      7 'DNET424.PDPAK.JCL'
                      8 'DNET424.SP.JCL'
                      9 'DNET424.SP.JCL.OLD'
                     10 'DNET424.SP.JCL.TRIG'
                     11 'DNET424.TRADER.JCL'
                     12 'DNET424.WEB.JCL'
                     13 'DNET424.WILFRIED.JCL'
```

Result of Find Text JCLLIB

```
Command     ===>
Hotbar: REFRESH  CLRVOL   FILLVOL  UPDATE   CUT


Command   Member   Numbr Data Set Names / Objects
--------- -------- ----- ----------------------
-TXT FND- BATM01       1 'DNET424.ADJIM.JCL'
-TXT FND- BATM01       2 'DNET424.ADLAB.JCL'
-TXT FND- TEST         3 'DNET424.ADLAB.JCL.OUT'
                       4 'DNET424.DTCOBII.JCL'
                       5 'DNET424.KEYBANK.JCL'
-TXT FND- BASM01       6 'DNET424.OSVS.JCL'
-TXT FND- CICSDB2C     7 'DNET424.PDPAK.JCL'
                       8 'DNET424.SP.JCL'
                       9 'DNET424.SP.JCL.OLD'
                      10 'DNET424.SP.JCL.TRIG'
-TXT FND- CICSCOB      11 'DNET424.TRADER.JCL'
                      12 'DNET424.WEB.JCL'
                      13 'DNET424.WILFRIED.JCL'
```

Example Three: PDS error

- PDS full
  - Two conditions might occur:
    - •Insufficient PDS directory blocks to save member
    - •Insufficient space to save member
  - With ISPF Productivity Tool:
    - •Press “Enter” on the confirmation panel to correct the condition, and continue working



Example Four: Browse file in SDSF, find load module date **Point and Shoot**

1) Browse a file from SDSF

```
UTPUT DISPLAY DNET424V JOB09715  DSID     3 LINE 1       COLS 02- 81
D INPUT ===> browse                                     SCROLL ===> CSR
 1 //DNET424V JOB (LAB),'APA RUN',MSGCLASS=A,
   //         REGION=0K,NOTIFY=DNET864,CLASS=A
 2 //RUNSAM1 EXEC PGM=SAM1,
   //        REGION=4M
 3 //INSPLOG  DD SYSOUT=*
 4 //STEPLIB  DD DSN=&SYSUID..ADLAB.LOAD,DISP=SHR
   IEFC653I SUBSTITUTION JCL - DSN=DNET424.ADLAB.LOAD,DISP=SHR
 5 //CUSTFILE DD DSN=&SYSUID..ADLAB.FILES(CUST2FA),DISP=SHR
   IEFC653I SUBSTITUTION JCL - DSN=DNET424.ADLAB.FILES(CUST2FA),DISP=SHR
 6 //SYSPRINT DD SYSOUT=*
```

2) List program Map

```
 -IPT--BROWSE L1---- DNET424.ADLAB.LOAD ---
 COMMAND  ===>
HOTBAR: UP        GLOBAL    INFO      COMPRESS

    NAME     RENAME    LIB      SIZE     TTR AL
   SAMII1               1 00002D40 0000F5
 l SAM1                 1 00003048 000145
   SAM1V                1 000037C0 00014E
   SAM2                 1 00001388 000144
   SAM2V                1 00001568 00014D
```

3) Change view to “History”

```
Display mode ===> h  (M=Map, H=History)
```

4) Date SAM1 was last linked

```
--------------------------------------------------------------------------------
THIS PROGRAM OBJECT WAS ORIGINALLY PRODUCED ON 12/04/2008 AT 11:55:54
--------------------------------------------------------------------------------
```

Example Five: View a VSAM file (Interface with File Manager)

1) Browse VSAM file from SDSF

```
SDSF OUTPUT DISPLAY DNET424V JOB09793  DSID     3 LINE 129     COLS 02- 81
COMMAND INPUT ===> br                                        SCROLL ===>
      34 //RUNSAM1 EXEC PGM=SAM1V,REGION=4M
      35 //STEPLIB  DD DSN=&SYSUID..ADLAB.LOAD,DISP=SHR
         IEFC653I SUBSTITUTION JCL - DSN=DNET424.ADLAB.LOAD,DISP=SHR
      36 //         DD DSN=DEBUG.V8R1.SEQAMOD,DISP=SHR
      37 //SYSPRINT DD SYSOUT=*
      38 //CUSTRPT  DD SYSOUT=*
      39 //CUSTFILE DD DSN=&SYSUID..ADLAB.CUST2.KSDS,DISP=SHR
         IEFC653I SUBSTITUTION JCL - DSN=DNET424.ADLAB.CUST2.KSDS,DISP=SHR
```

2) Unformatted view - File Manager

```
Browse          DNET424.ADLAB.CUST2.KSDS
Command ===> _____________________________________________________
                                Type KSDS     RBA _________
Key _____________________________________      Col 1_____
<===+====10=>-+----2----+----3----+----4----+----5----+----6-
****  Top of data  ****
01001C       Lynn, Amanda     .......Spirit Lake    Musician
01001PAG00487Acoustic guitar          2004-05-13..2006-03-30
01001PVN00048Violin                   2004-03-25..2004-03-26
02200C       Graham, Anna     ../.*..Atwon          Cryptogra
02200PBG00459Bass Guitar              1996-04-30..2003-06-14
02200PDS00099Starter Drum Set         2001-09-04..2002-10-05
02200PEG00057Electric Guitar          2003-07-31..2004-03-30
```

3) Formatted view - File Manager

```
Browse          DNET424.ADLAB.CUST2.KSDS
Command ===> _____________________________________________________
SHAD Key _________________ + Type KSDS     RBA _________
CUST-ID RECORD-TYPE FILLER  NAME              ACCT-BALANCE
#3      #4          #5      #6                        #7
AN 1:5  AN 6:1      AN 7:7  AN 14:17               PD 31:5
<--->   -           <---+-> <---+----1----+-> <---+----1>
****  Top of data  ****
01001   C                   Lynn, Amanda            67.68
02200   C                   Graham, Anna           610.05
02202   C                   Major, Art            1234.56
```

ISPF Productivity Tool extends the productivity of ISPF

- Seamless integration with ISPF
- Organize files using Object Lists
- Use Member Selection Lists to work with PDS members
- Minimize panel navigation and improve productivity
  - Shortcuts
  - ISPF Productivity Tool commands
  - Extensive “Find” capabilities across multiple files
  - **Reduce keystrokes**

IBM HourGlass for z/OS
Version 11

IBM HourGlass for z/OS

Alter Date and Time to accommodate Application Testing

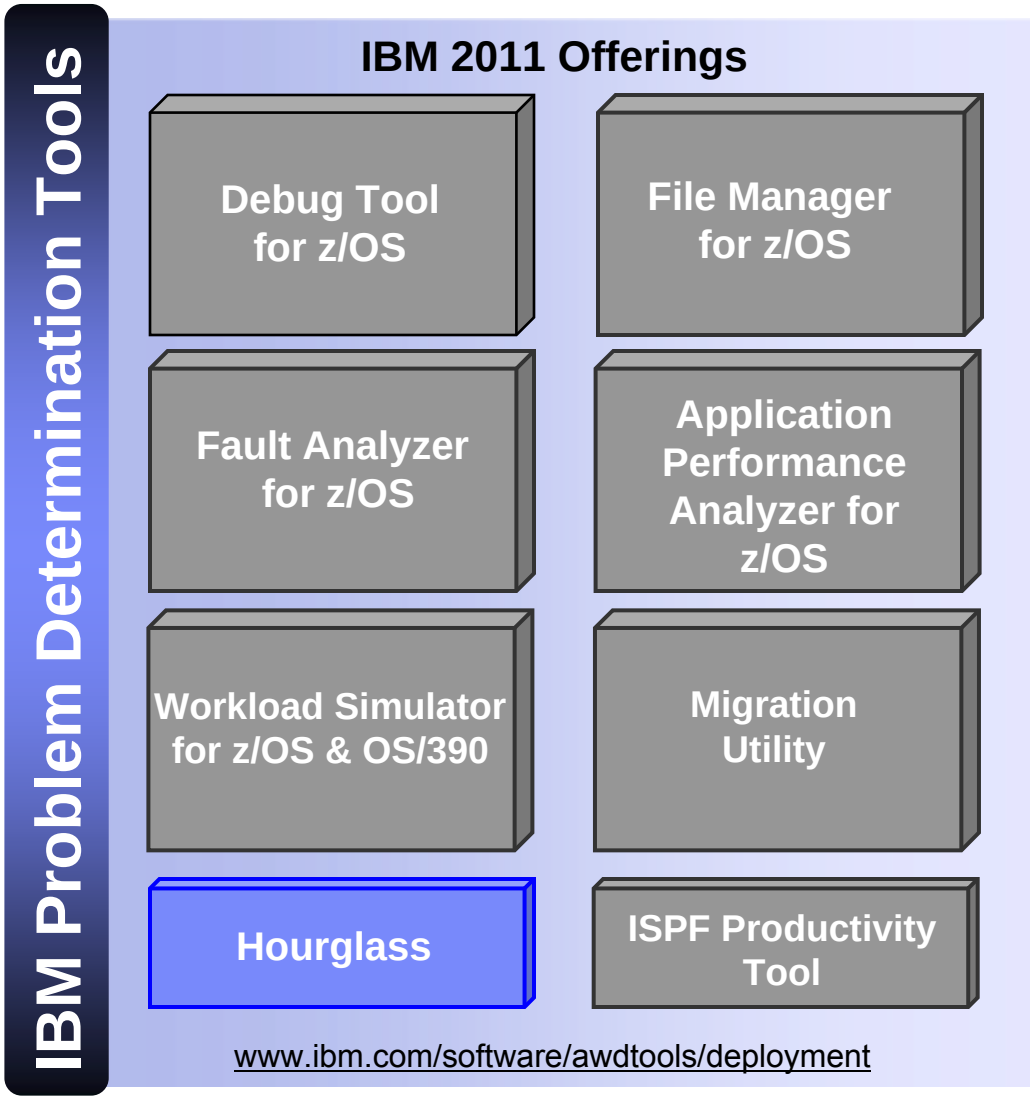
Problem

- **Test changes to date and time sensitive applications without creating new regions or resetting current System Date and Time**

Solution

- **Provide specific Date and Times to be used by applications in Batch, CICS, and IMS without creating new regions or altering the actual System Date and Time**
- **Test Regulatory Changes to applications**

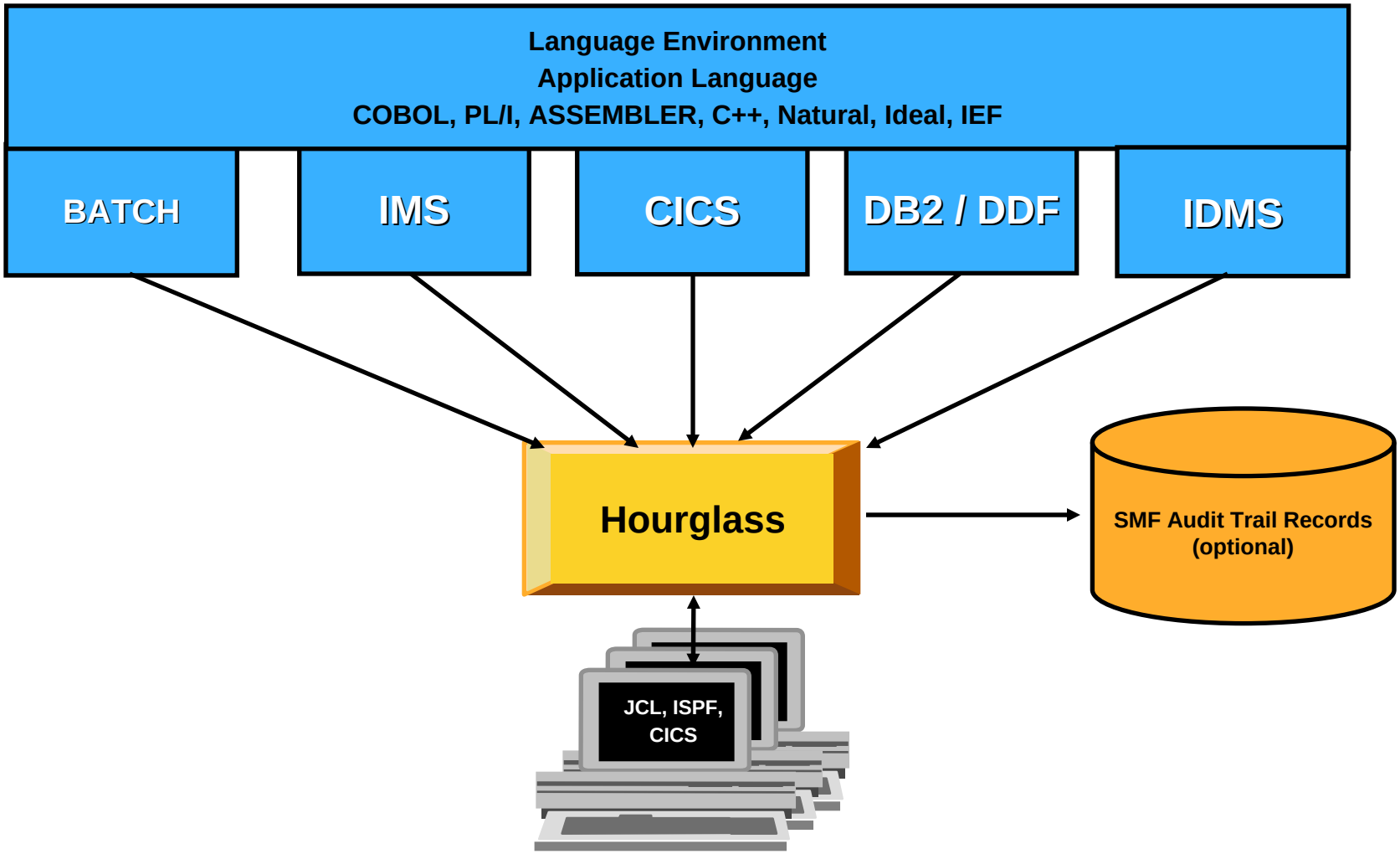
The IBM Problem Determination Tools Suite for z/OS



HourGlass

- Eligibility Checking
  - Security to identify applications that may use Hourglass
- Activate HourGlass via standard JCL
  - Override DD Statement for Date and/or Time
  - REXX Wizard to Accurately Generate Override DD Statement
  - Overrides for an entire JOB or a specific STEP
- Activate HourGlass using the provided ISPF Interface
  - Set Date and/or Time processing for JOBS
  - Restore Prior Settings
  - Review All JOB Settings
  - Review Hourglass Settings
- HourGlass Scheduling Facility
  - Continuously Roll Dates for JOBS or STEPS
  - Create/Drop Schedules
  - Up To 100 Active Schedules with Specifications for Up To 100 STEPS in each Schedule

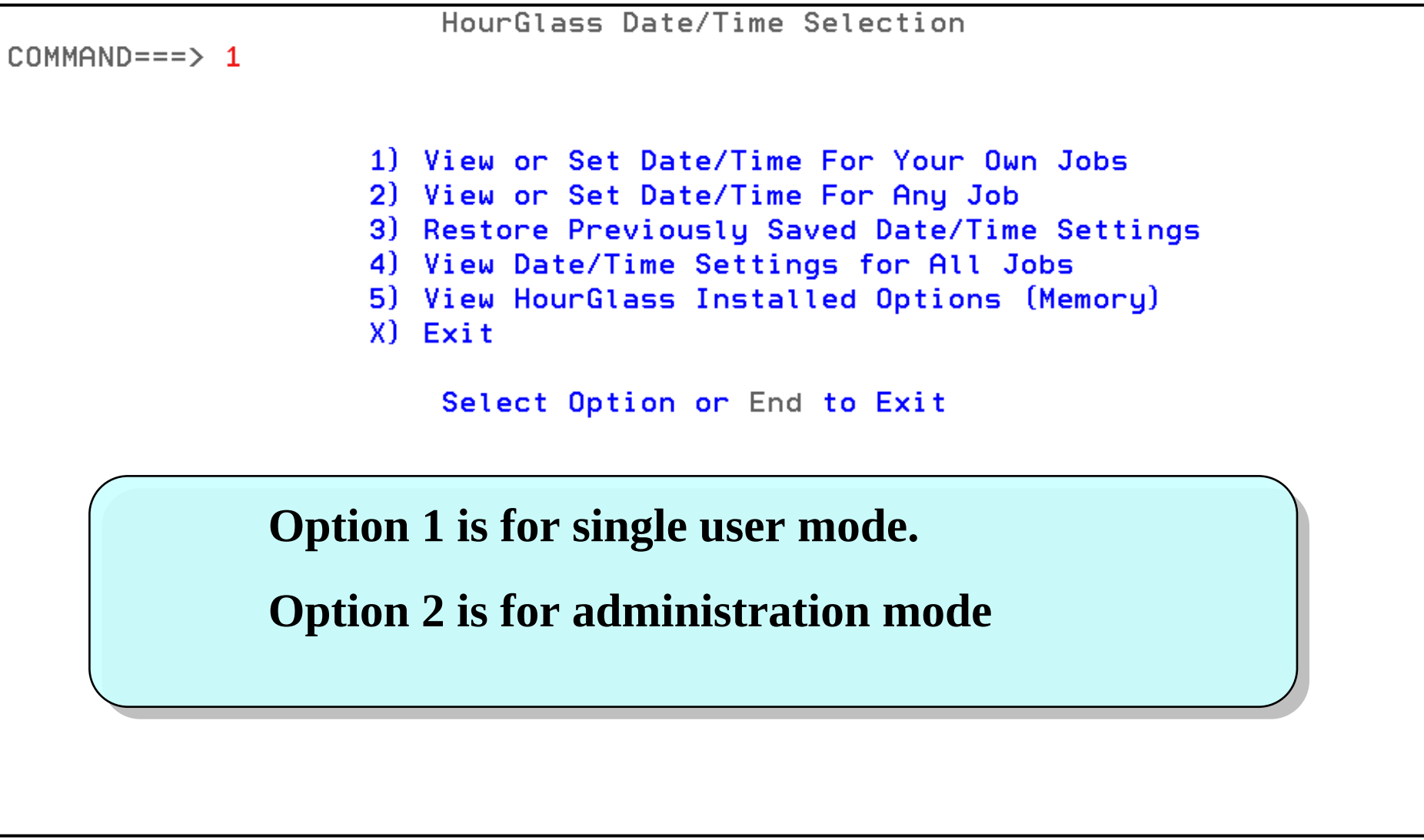
HourGlass – alter dates and times for application processing or testing



What does HourGlass Intercept

- z/OS System Time Requests
  - –LINKAGE=SVC (SVC11)
  - –LINKAGE=SYSTEM
- STCK (Store Clock Instruction)
- STCKSYNC Macro
- CICS
  - –EIBDATE
  - –EXEC CICS ASKTIME command
- DB2 DATE/TIME/TIMESTAMP
- Language Environment (LE) Date/Time Functions

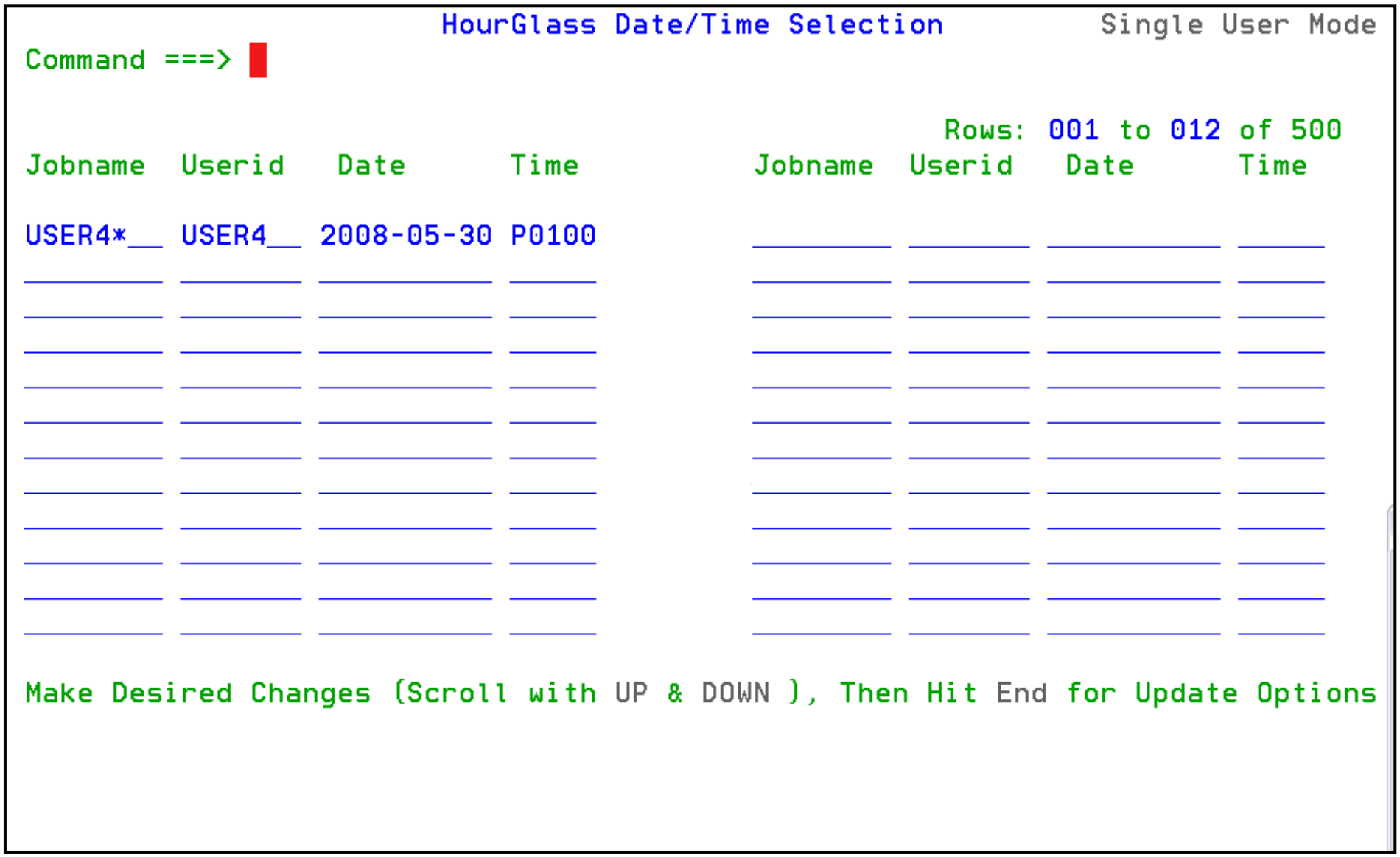
HourGlass Primary Menu



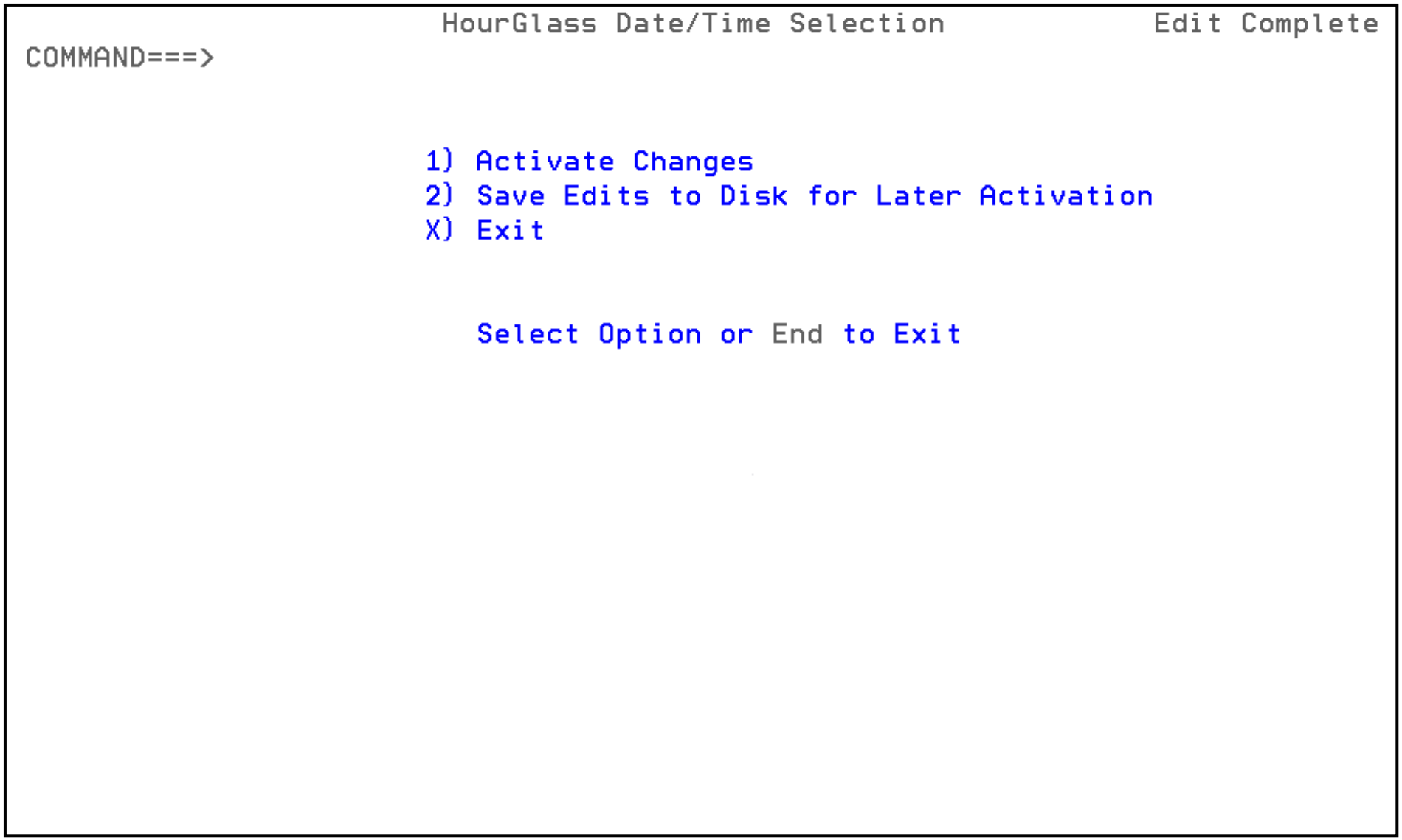
Option 1 is for single user mode.

Option 2 is for administration mode

A Closer Look At How It Works



A Closer Look At How It Works



HourGlass in Batch

A Closer Look At How It Works

```
 File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
-IPT- EDIT AGG.PROD.SAMPLIB(HGSAMPLE) - 01.00              Columns 00001 00072
Command ===> _____________________________________________ Scroll ===> CSR
000600 //STEP01   EXEC PGM=HGVRFY,REGION=2M
000700 //STEPLIB  DD   DISP=SHR,DSN=AGG.PROD.LOADLIB
000710 //*           DD    DSN=SYS1.SCEERUN.TEST,DISP=SHR   <== CHANGE
000720 //*           DD    DSN=SYS1.SCEERUN,DISP=SHR        <== CHANGE
000800 //SYSUDUMP DD   SYSOUT=*
000801 //*THE FOLLOWING CARD SETS THE SYSTEM DATE FOR THIS PGM TO FEB 5, 2000
000802 //HG100036 DD   DUMMY
000810 //*THE FOLLOWING CARD OFFSETS THE SYSTEM TIME AHEAD 1 HOUR
000900 //HGP0100  DD   DUMMY
****** ***************************** Bottom of Data ******************************
```

Specifying the date and time using DD statements

- Two formats for specifying the date
  - **//HG100001 DD DUMMY**
    - Specifies January 1, 2000.
    - **HG** Statement prefix.
    - **1** Indicates 21st century.
    - **00** Year value. Combined with century indicator designates year 2000.
    - **001** Julian day 001, or January 1st.
  - **//HGYP05 DD DUMMY**
    - Specifies that 5 years are to be added to the current date.
    - **HG** Statement prefix.
    - **Y** Required literal to designate year offset.
    - **P** Increment the current date.
    - **05** Number of years to offset the current date.

Time specification

- Single format with multiple options
  - **//HGP0230 DD DUMMY**
    - Specifies the current time is to be increased by 2 hours and 30 minutes.
    - **HG** Statement prefix.
    - **P (plus)** Increment the current time. (Could be M for minus)
    - **02** Number of hours to offset the current time.
    - **30** Number of minutes to offset the current time.
  - **//HGA1150 DD DUMMY**
    - Specifies an absolute or ″frozen″ time at 11:50 AM.
    - **HG** Statement prefix.
    - **A** Indicates an absolute time.
    - **Note:** This value is valid only for batch steps, CICS, and IMS.
    - **11** Set hour to 11.
    - **50** Set minutes to 50.

Bypassing a Jobstep

- User may choose to bypass a step without turning off Hourglass
  - **//HGBYPASS DD DUMMY**
  - Specifies the current jobstep is to be bypassed.

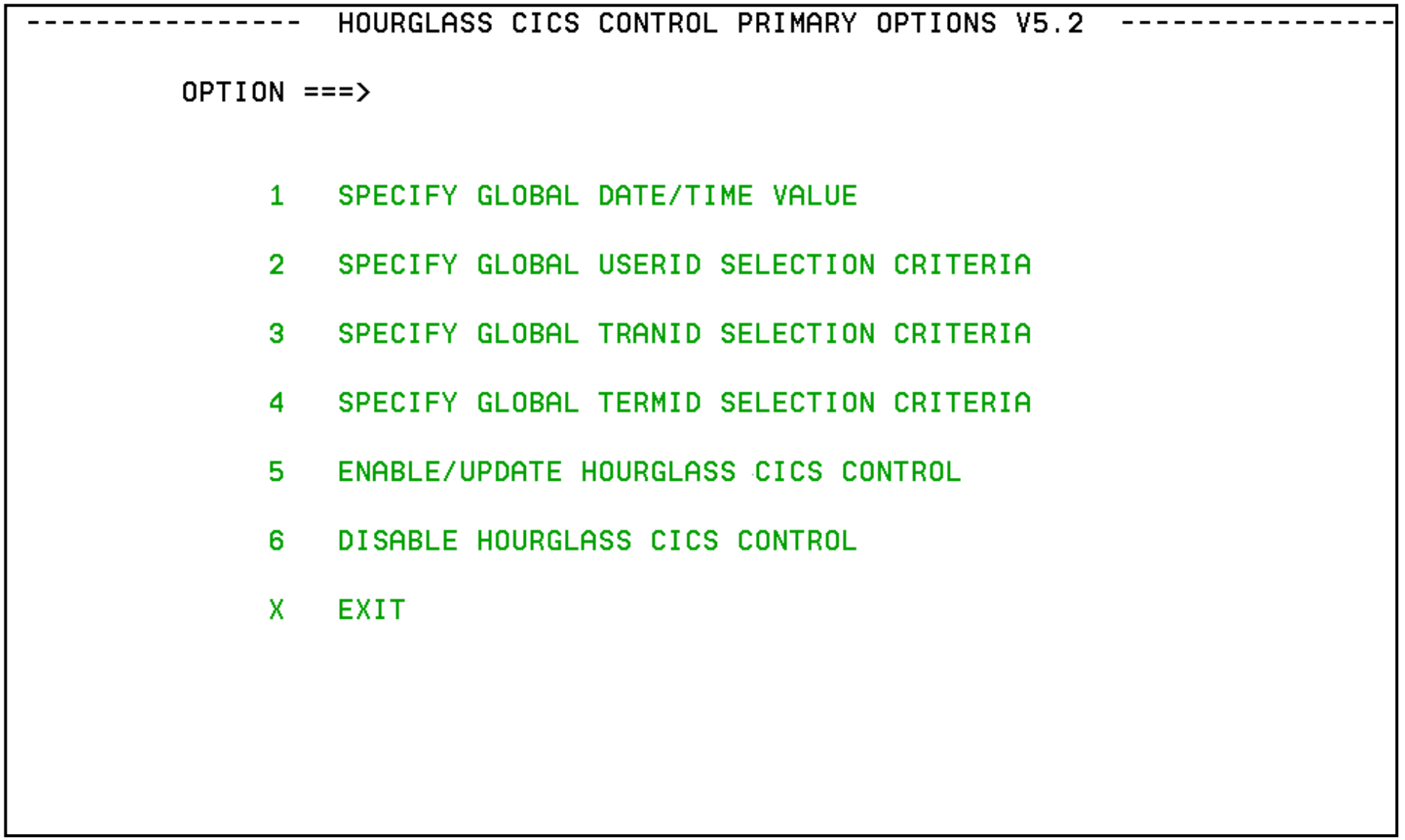
- **Specifying the date and time at the job level**
  - HourGlass date and time overrides can be specified at the job level by placing the DD statements within the JOB statement programmer name field.
    - //TESTA JOB 909680300,'//HG107015
      //HGP0100',CLASS=A,MSGCLASS=Q

HourGlass in CICS

A Closer Look At How It Works

hgcc

A Closer Look At How It Works



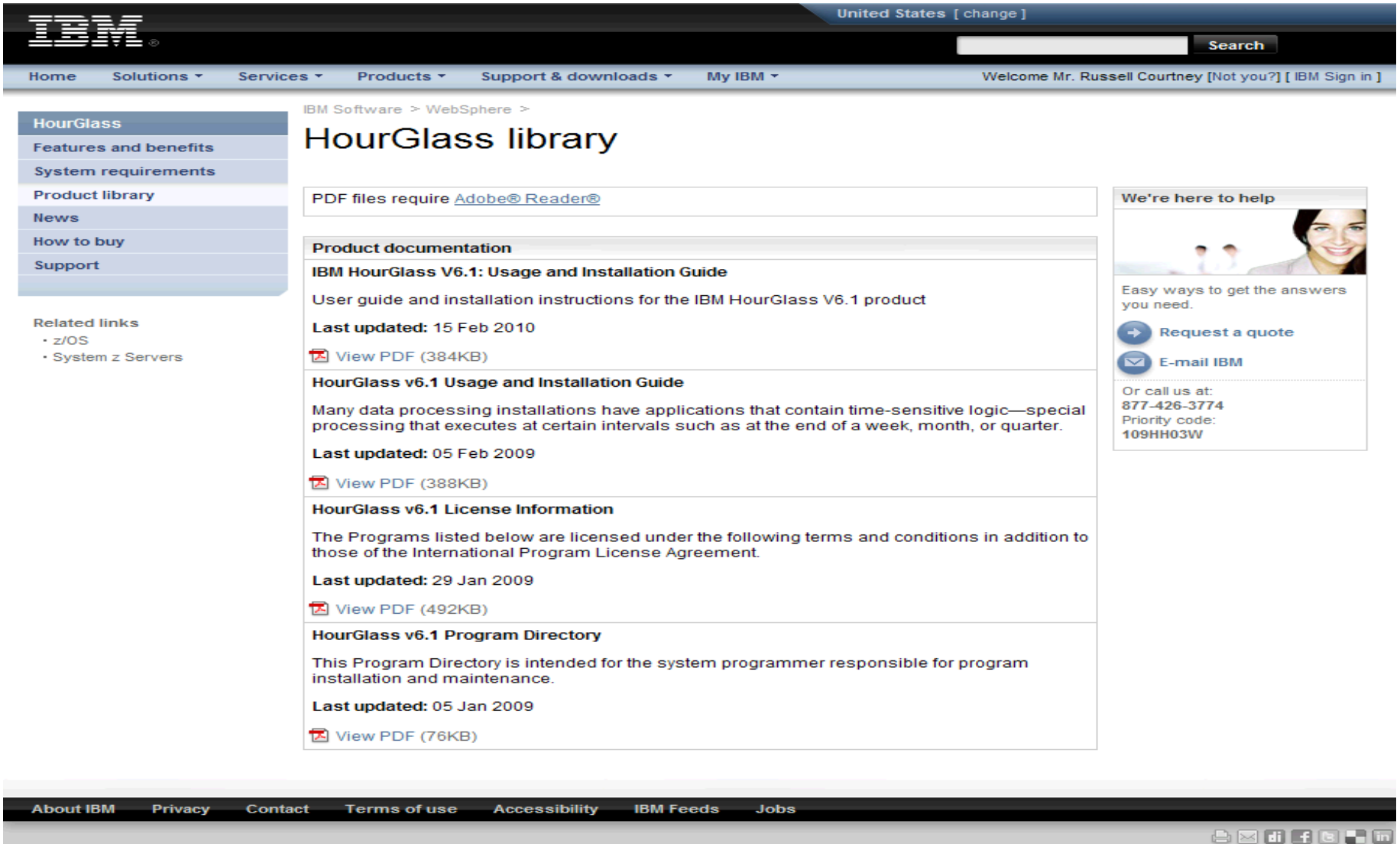
A Closer Look At How It Works

```
----------  HOURGLASS CICS CONTROL: SPECIFY GLOBAL DATE/TIME VALUE  ----------

      SPECIFY THE HOURGLASS GLOBAL DATE WITH TIME OFFSET. THE DATE APPLIES
      TO THE ENTIRE CICS REGION AND TIME VALUES (PLUS OR MINUS) OFFSET THE
      CURRENT TIME FOR ALL ELIGIBLE TRANSACTIONS.


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

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

A Closer Look At How It Works

```
-----  HOURGLASS CICS CONTROL: SPECIFY GLOBAL TRANID SELECTION CRITERIA  -----

       SPECIFY UP TO 42 ENTRIES, USING WILDCARDS AS NEEDED. TRANID ENTRIES
       ARE A MAXIMUM OF 4 CHARACTERS AND PREFIX ENTRIES ARE A MAXIMUM OF
       3 CHARACTERS FOLLOWED BY AN ASTERISK. TRANID ELIGIBILITY IS TESTED
       IN THE ORDER OF THE ENTRIES.

       ENTER GLOBAL TRANIDS AND/OR PREFIXES:

01:            02:            03:            04:            05:            06:

07:            08:            09:            10:            11:            12:

13:            14:            15:            16:            17:            18:

19:            20:            21:            22:            23:            24:

25:            26:            27:            28:            29:            30:

31:            32:            33:            34:            35:            36:

37:            38:            39:            40:            41:            42:
```

Get more information about these tools at:
http://www.ibm.com/software/awdtools/hourglass/library



The value of 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

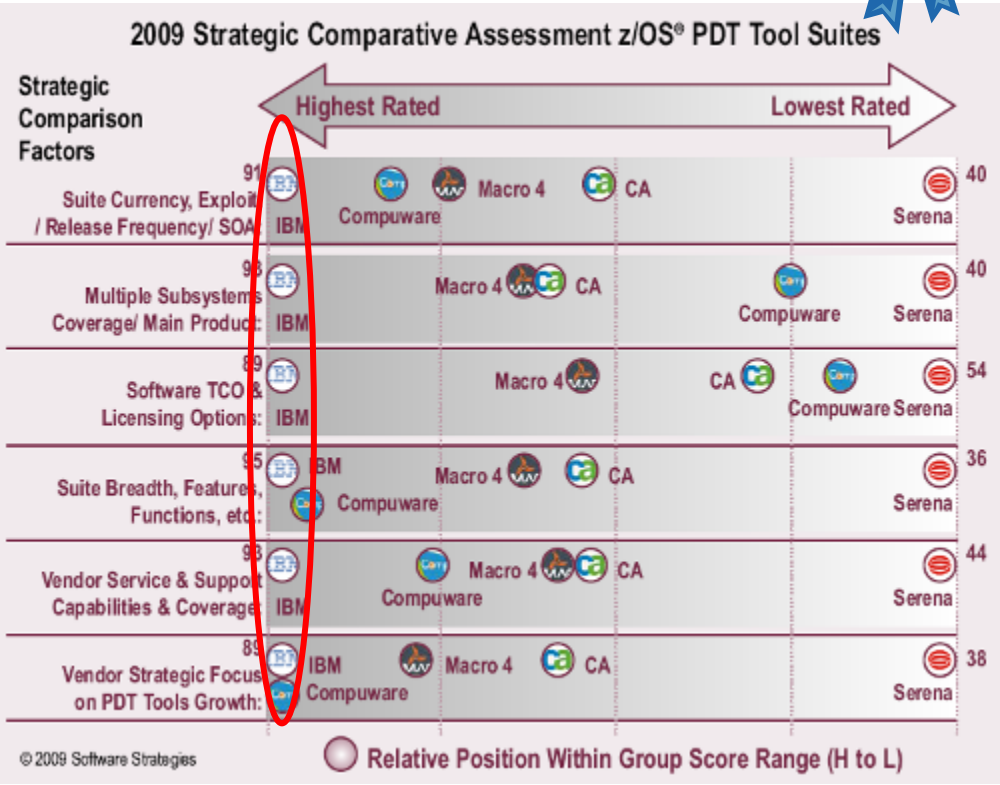
- **Provides an extensive collection of features and utilities to automate file and data management, copying and reformatting, data scrambling, comparison, etc.**
- Reduces loss of time and productivity spent writing in-house utilities

- **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

IBM Problem Determination Tools Wins Top Spot

Software Strategies Analyst Report, January 2009

- **IBM's PD Tools Suite Extends Technology Lead:**
  - IBM successfully challenged existing vendors in this segment since 2000
  - Modern, well-featured, fully integrated, inclusive, and good-value
  - The latest suite (V10) has now extended clear technology, feature and functional leadership



Problem Determination Tools "Live" Road Show

- **¾ Day Event**
  - **8:30 AM until 2:00 PM local time**
  - **Continental Breakfast and Lunch Served**
  - **Presentation and Live Demos of PD Tool Products**
  - **Please Register**
- **IBM Locations**
  - **Dallas, TX February 17, 2011**
    - 1503 Lyndon B. Johnson Freeway, Floor 4, Room 4015, Southwest Area
    - *http://www.ibm.com/events/DeveloperToolsLiveDallas2011*
  - **San Francisco (area), CA February 24, 2011**
    - 1001 Hillside Blvd, Floor 4, Ste 400, Foster City,
    - *http://www.ibm.com/events/DeveloperToolsLiveSanFrancisco2011*
  - **Washington, DC March 1, 2011**
    - 600 14th Street NW, Ste 300
    - *http://www.ibm.com/events/DeveloperToolsLiveWashingtonDC2011*
  - **Atlanta, GA March 3, 2011**
    - 4111 Northside Parkway NW, Hillside Building, Floor 3 Room 03C
    - *http://www.ibm.com/events/DeveloperToolsLiveAtlanta2011*
  - **Toronto, Canada March 8, 2011**
    - IBM, 120 Bloor Street, Toronto, Ontario Canada
    - *http://www.ibm.com/events/DeveloperToolsLiveToronto2011*