IBM Developer for z Systems – for ISPF Developers

Module 9 – Debugging COBOL with IDz

DevOps

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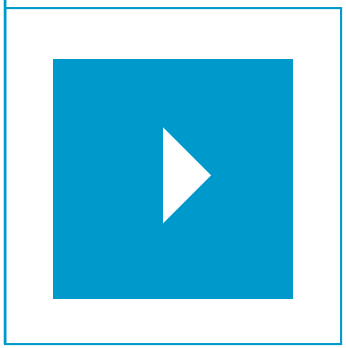
UNIT

The IDz Workbench



Topics:

- Debugging z/OS COBOL Batch Applications
- **Debugging z/OS COBOL Online Applications**

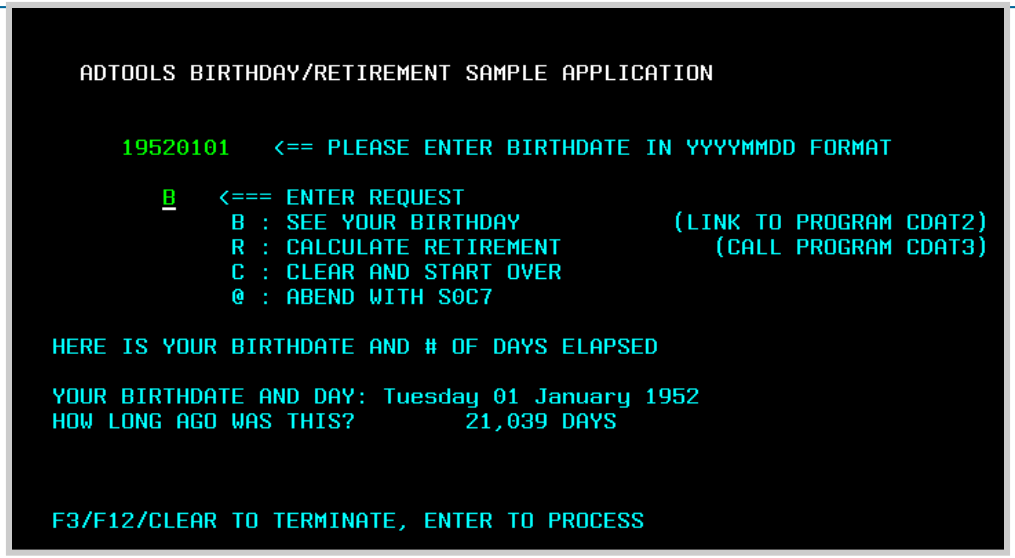
Topic Objectives

After completing this unit, you should be able to:

- Using the Problem Determination Tools, Debug Option and IDz:
  - Debug a mainframe online transaction
- Describe the online transaction features for configuring your 3270 sessions with Debug Option
- Debug a CICS 3270 Application

Online Debugging Overview

- Guess what?
  No one gets it right the first time coding online programs either ☺



- Lucky for you:
  - Debug tool handles:
    - CICS 3270 online transactions
    - IMS TM online transactions
  - Without any different debugging techniques
    - The only difference from batch is the debug setup procedure for the online environment

Steps for **Online** (CICS) Application Debug Session

1. Ensure that your compile proc has the necessary TEST parameter, and Compile/Link to create load module – and that your CICS application is setup for Debug Option testing
2. Discover workstation TCP/IP parameters:
   - IP Address
   - Listener port#
3. Access and login to your CICS region – Green Screen
4. Use the DTCN view, or execute the DTCN transaction and specify:
   - Terminal ID
   - Transaction code and programs – to put under Debug control
   - User-ID
   - TCP/IP parameters:
     - IP Address
     - Port#
   - Save the DTCN transaction specification
5. Debug your CICS application

1. Compile JCL Requirements for Using Debug Tool

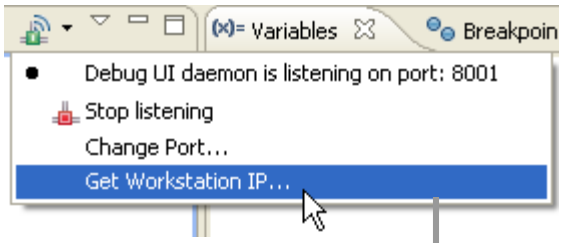
- Use the **TEST** compiler option to prepare your executable COBOL program for use with the debugger.
  - The TEST option is *required* for remote debugging. It produces symbol and statement information that enables the debugger to perform symbolic source-level debugging
    - **Enterprise COBOL 3.4:** TEST(NONE,SYM,SEP)
    - **Enterprise COBOL V4.1 +:** TEST(NOHOOK,SEP,EJPD)
  - Include the DD card for your **SYSDEBUG** dataset in the COBOL Compile step
    - In traditional compile JCL – this would be in the **IGYCTRL** step

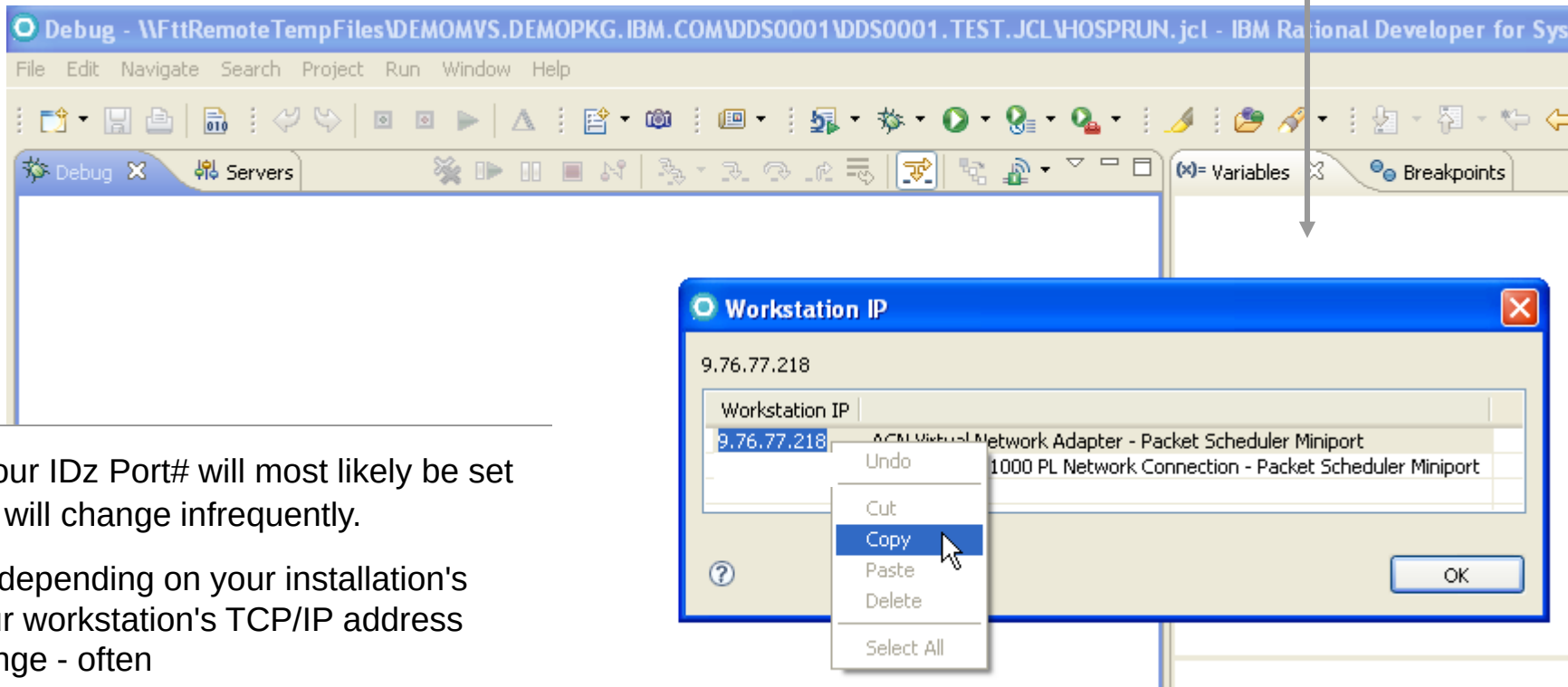
```
//STP0000 EXEC PROC=ELAXFCOC,
//  CICS=,
//  DB2=,
//  COMP=,
//  PARM.COBOL=('SQL',
//  'LIB','TEST(NONE,SYM,SEP)')
//COBOL.SYSPRINT DD DISP=SHR,
//         DSN=DDS0001.TEST.LISTING(TRTMNT)
//COBOL.SYSDEBUG DD DISP=SHR,
//         DSN=DDS0001.TEST.SYSDEBUG(TRTMNT)
//COBOL.SYSLIN DD DISP=SHR,
//         DSN=DDS0001.TEST.OBJ(TRTMNT)
//COBOL.DBRMLIB  DD  DISP=SHR,
//         DSN=DDS0001.TEST.DBRMLIB(TRTMNT)
//COBOL.SYSLIB DD DISP=SHR,
//         DSN=DDS0001.TEST.COPYLIB
//         DD DISP=SHR
//COBOL.SYSXMLSD DD DUMMY
//COBOL.SYSIN DD DISP=SHR,
//         DSN=DDS0001.TEST.COBOL(TRTMNT)
//*
//LKED EXEC PROC=ELAXFLNK
//LINK.SYSLIB DD DSN=DDS0001.TEST.OBJ,
//             DISP=SHR
//             DD DSN=CEE.SCEELKED,
//             DISP=SHR
//LINK.OBJ0000 DD DISP=SHR,
//         DSN=DDS0001.TEST.OBJ(TRTMNT)
//LINK.SYSLIN DD *
     INCLUDE OBJ0000
/*
```

- If you are not using the IBM/IDz compile PROCs for building your applications, be sure to override the compiler option and add TEST - as shown

2. Discover TCP/IP address and IDz Port - Review

- Open the Debug Perspective
  - Click the small downward pointing triangle next to the debug-daemon icon
    - **Note the Port#**
    - Select: **Get Workstation IP…**
    - **Copy the IP address**
    - **Either paste the IP address into Notepad, or write it down**





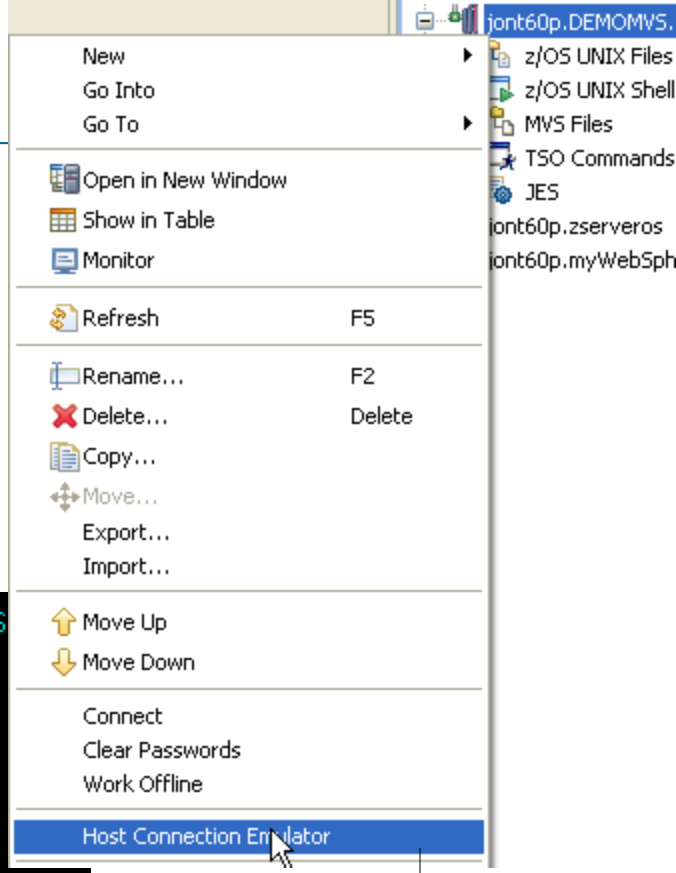
Note: Your IDz Port# will most likely be set once, and will change infrequently.

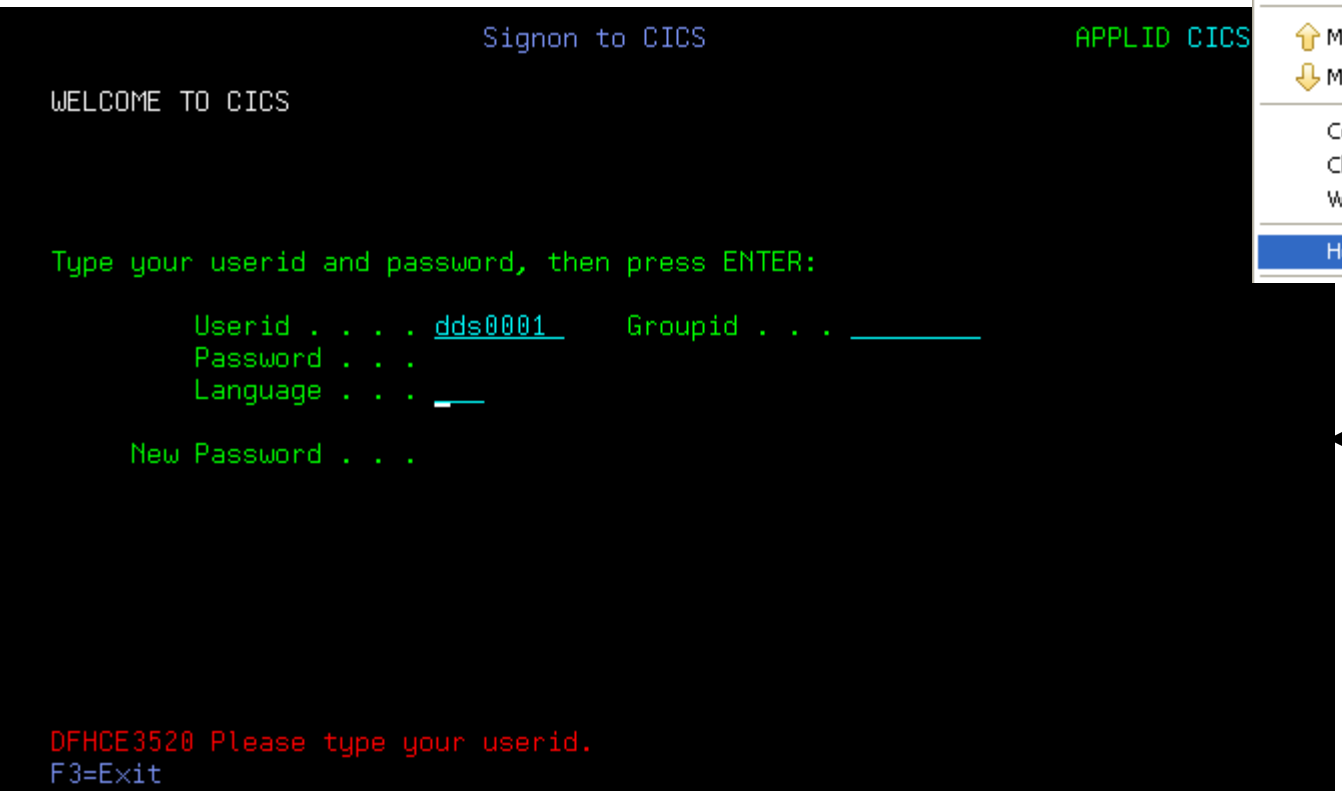
However, depending on your installation's setup, your workstation's TCP/IP address could change - often

3. Login to your CICS Region

From Remote Systems Explorer:

- Right-click
- Select: Host Connection Emulator
- Select your CICS application
- Enter your Userid and Password and sign in





3. Setup the Debug Option Parameters using DTCN Transaction – 1 of 3

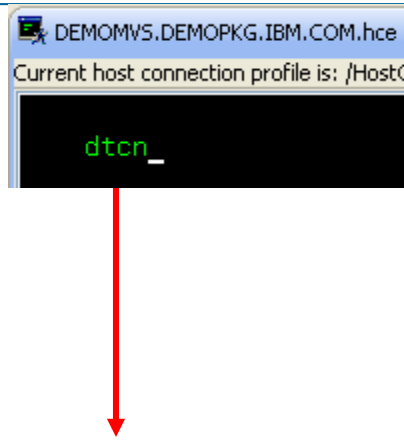
If you did NOT use the DTCN view to enter your DTCN properties you can do so using a CICS Transaction (green screen)

From CICS (after signing in):

- Clear the screen, Enter: **DTCN** – and press ↵**Enter**

From the DTCN screen

- **Press F10** – this will fill in the Terminal Id for your workstation



Note that you can also type an asterisk: * …as the Terminal Id

```
DTCN              Debug Tool CICS Control - Primary Menu            CICSACB1
                          * VSAM storage method *
Select the combination of resources to debug (see Help for more information)
 Terminal Id      ==> 0098
 Transaction Id   ==>
 LoadMod::>CU(s)  ==> CD*       ::> *            ==>          ::>
                  ==>           ::>              ==>          ::>
                  ==>           ::>              ==>          ::>
                  ==>           ::>              ==>          ::>
 User Id          ==> DDS0001
 NetName          ==>
 IP Name/Address  ==>
Select type and ID of debug display device
 Session Type     ==> TCP                  MFI, TCP
 Port Number      ==> 8001                 TCP Port
 Display Id       ==> 9.65.190.169

Generated String:  TEST(ALL,'*',PROMPT,'TCPIP&9.65.190.169%8001:*')

Repository String: TEST(ALL,'*',PROMPT,'TCPIP&9.65.190.169%8001:*')

Profile Status:    Active. Press PF5 to Inactivate.
EQA2520W Terminal mismatch. Press PF10 to set to current terminal.
PF1=HELP 2=GHELP 3=EXIT 4=SAVE 5=ACT/INACT 6=DEL 7=SHOW 8=ADV 9=OPT 10=CUR TRM
MA    a                                                          04/023
```

Note: You would only use the DTCN transaction to specify your Debug Option properties if you could not use the DTCN view (prior slides)

3. Setup the Debug Option Parameters using DTCN Transaction – 2 of 3

DTCN transaction data entry screen

- **Enter the Tran-code**
  - **Transaction ID**
- **Enter up to eight specific Program Id(s) you wish to debug through …or…**

```
Select the combination of resources to debug (see Help for more information)
 Terminal Id      ==> 0903
 Transaction Id   ==>
 LoadMod::>CU(s)  ==> CD*       ::> *              ==>          ::>
                  ==>           ::>                ==>          ::>
                  ==>           ::>                ==>          ::>
```

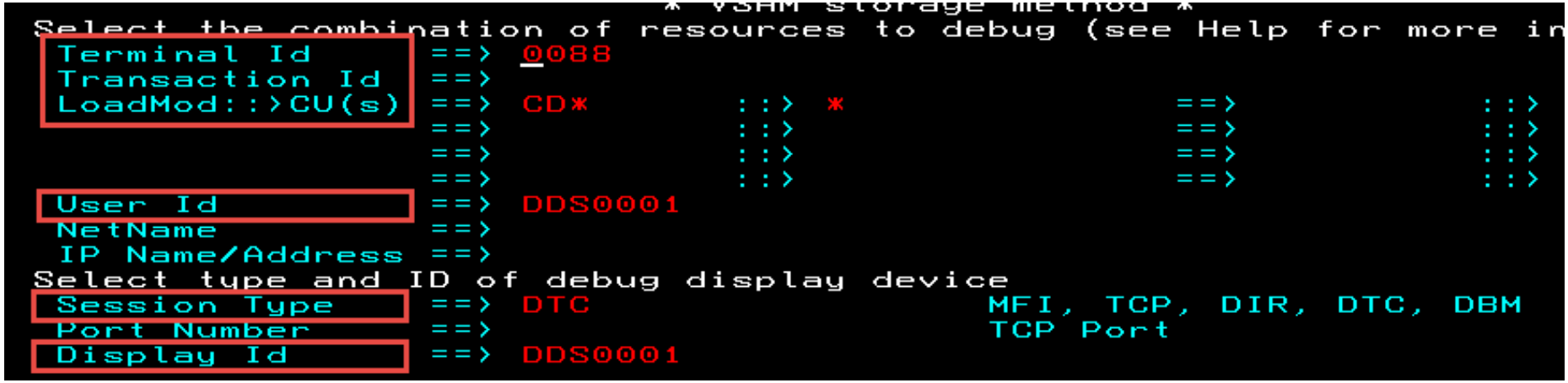
- **Enter wildcard text for the Program Id(s)**
  - Ex. CD*
- Enter your User-ID
- Session Type: **TCP**
- **Port Number:**
  from your Debugger look-up
- **Display ID:**
  Your TCP/IP address,
  from your Debugger look-up (note that you can not paste into this 3270, screen)

```
Select type and ID of debug display device
 Session Type     ==> TCP                 MFI, TCP
 Port Number      ==> 8001                TCP Port
 Display Id       ==> 9.76.89.169
```

- **Press F4** to save your debug profile
- **Press F3** to clear the screen

3. Setup the Debug Option Parameters using DTC Session Type – 3 of 3

DTC Session Type – Assumes that IDz's DBGMGR started task is running



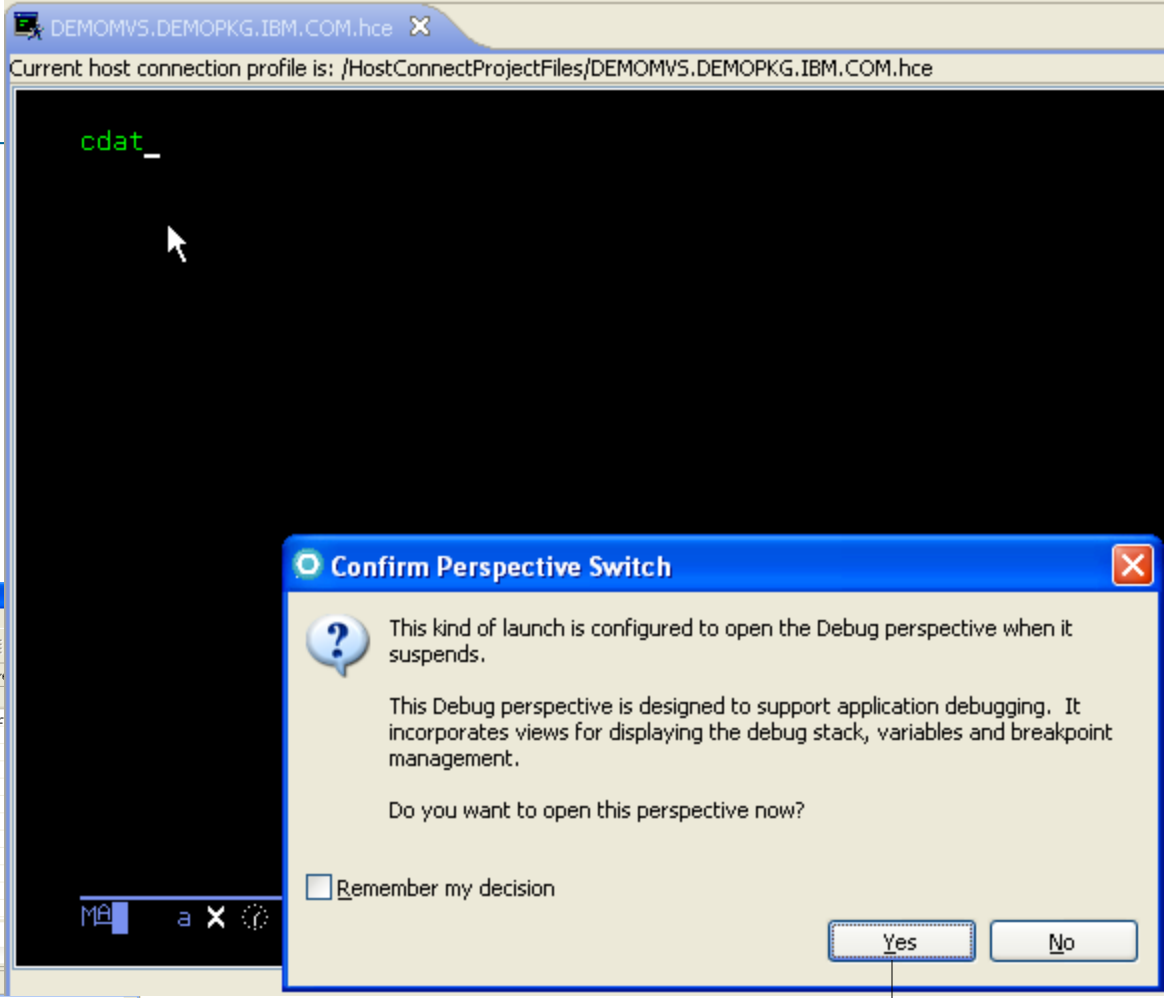
- **Press F10 to generate a unique Terminal ID**
- **(Optionally) Enter a Tran-code**
- **Enter up to eight specific load modules you'd like to debug**
- User Id ➔ **TSO-ID**
- Session Type ➔ **DTC**
- Display Id ➔ **TSO-ID**

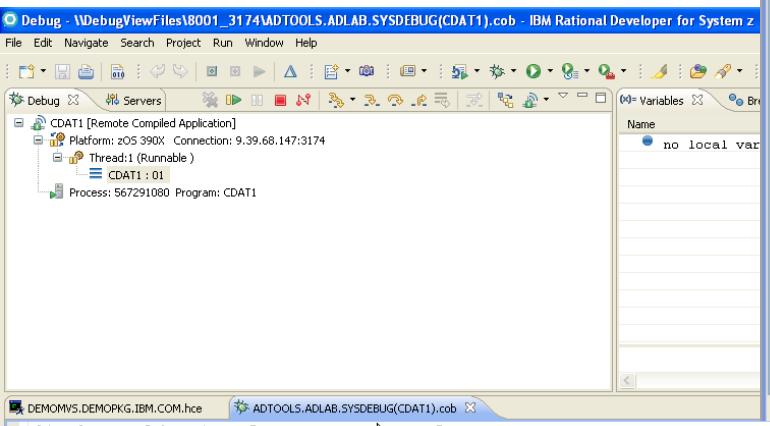
- **Press F4** to save your debug profile
- **Press F3** to clear the screen

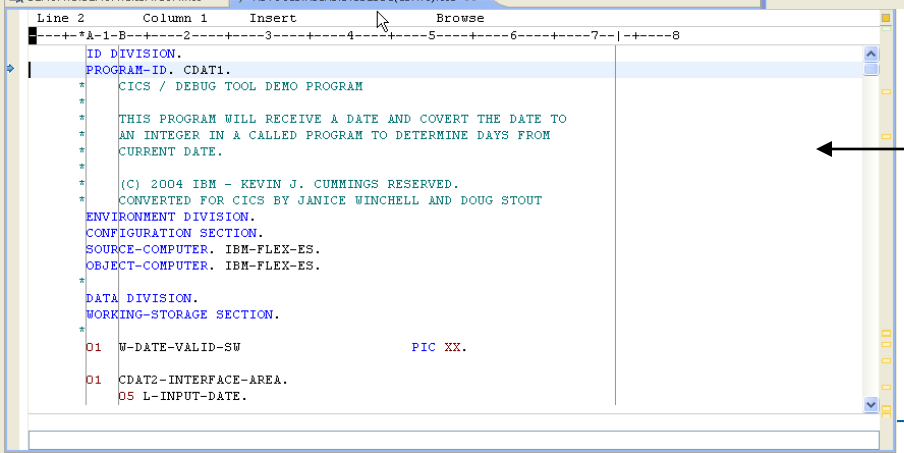
4. Start Debugging

From the CICS region

- Enter the Tran-code
- Press ↵Enter
- Click: Yes at the Confirm Perspective Switch

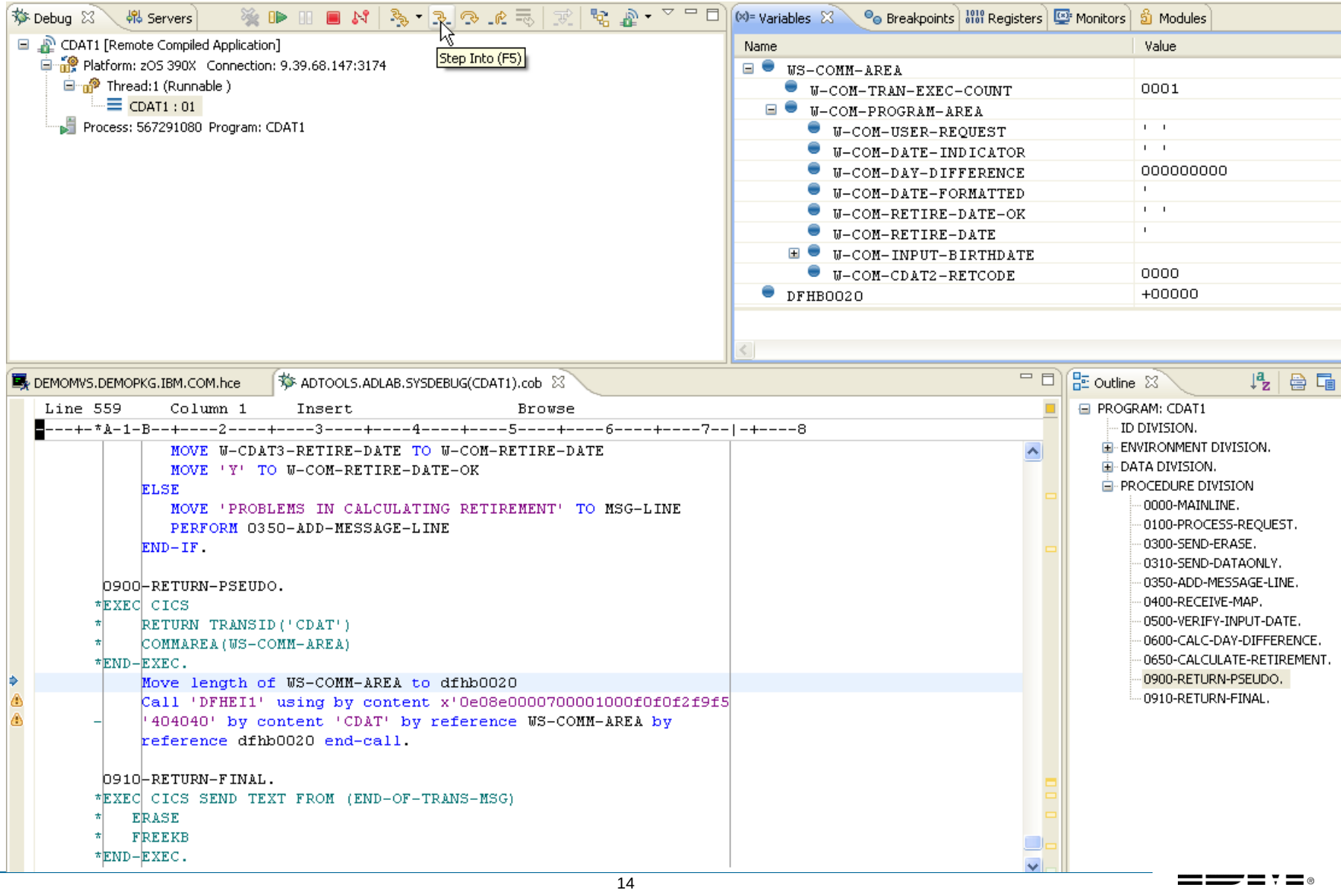






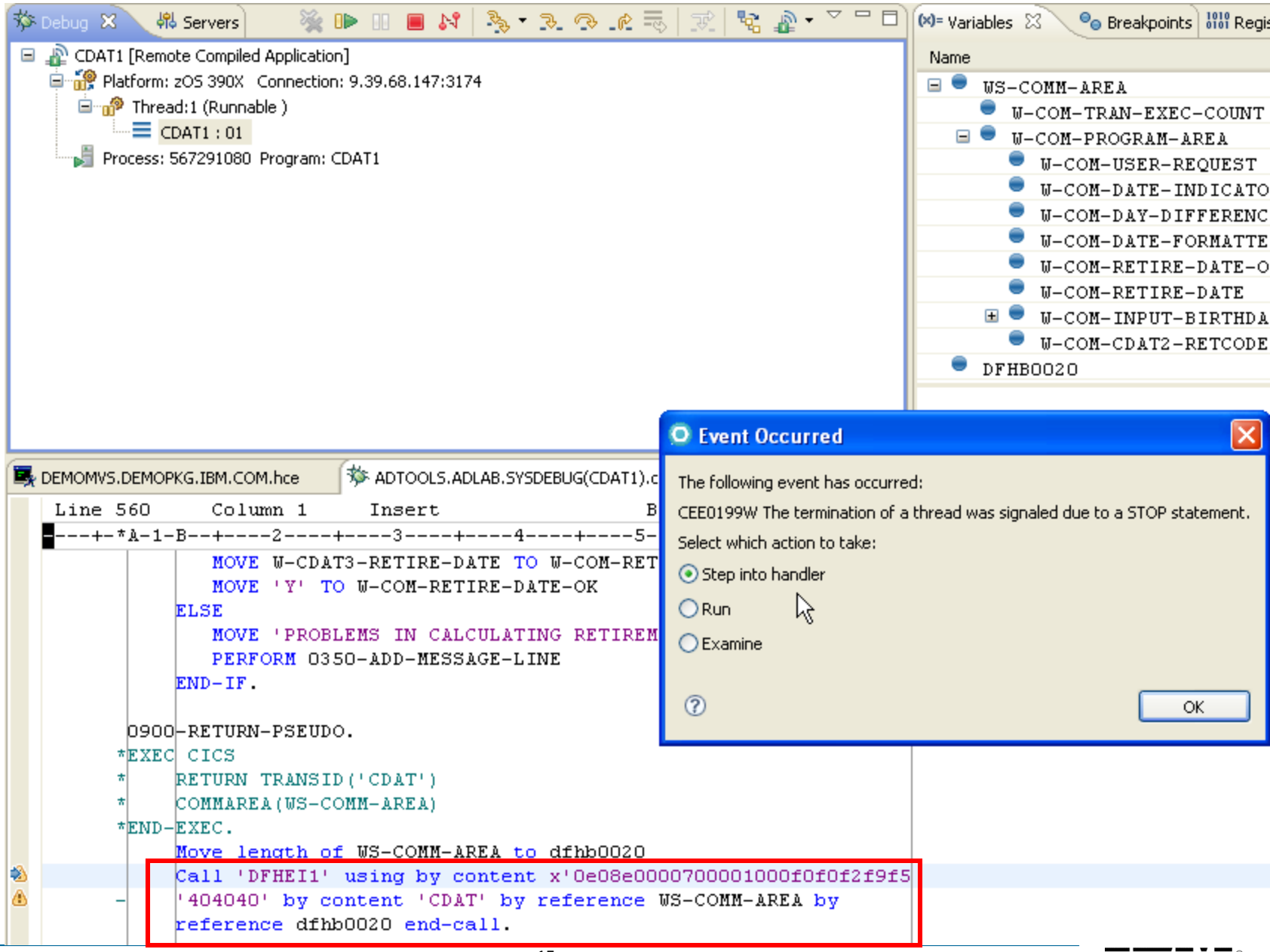
4. Start Debugging

Debug as previously learned in the batch/remote and Local debug units.



What Happens during CICS calls and screen-io – 1 of 2

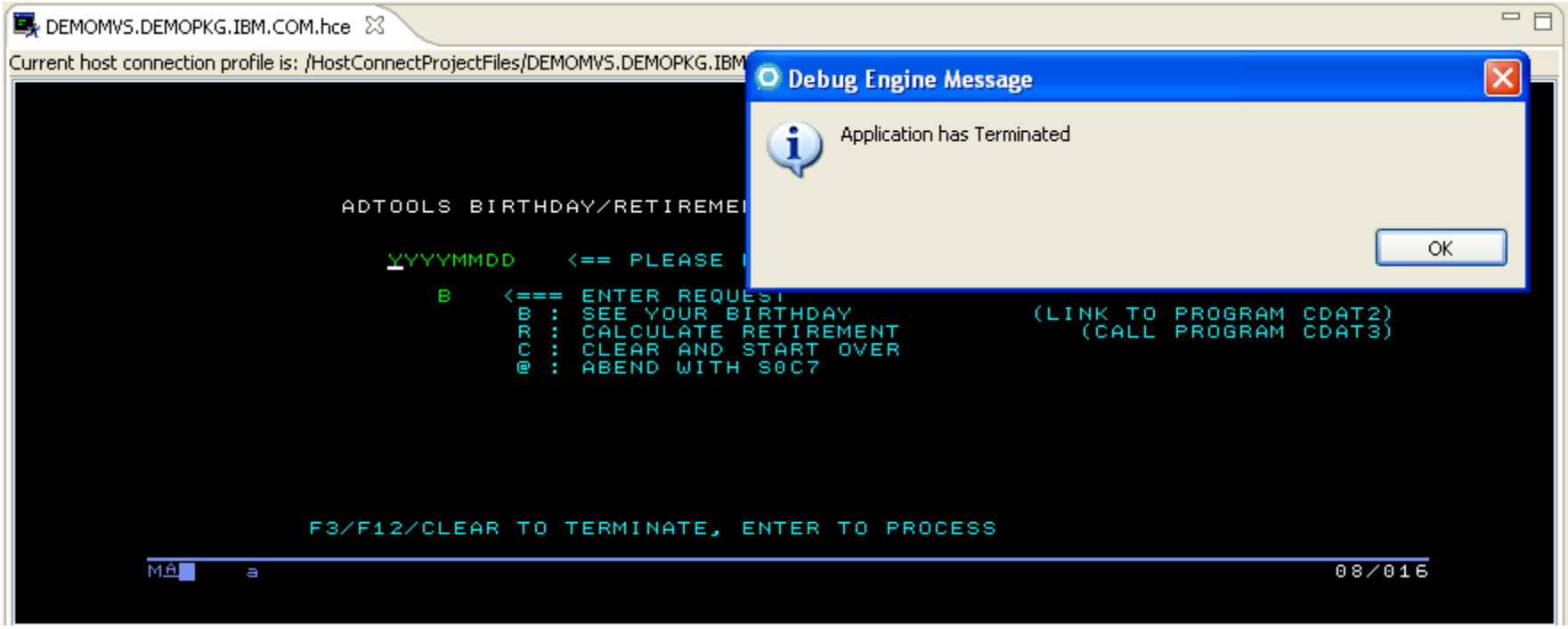
You will be prompted, and presented with debug-run-time options



What Happens during CICS calls and screen-io – 2 of 2

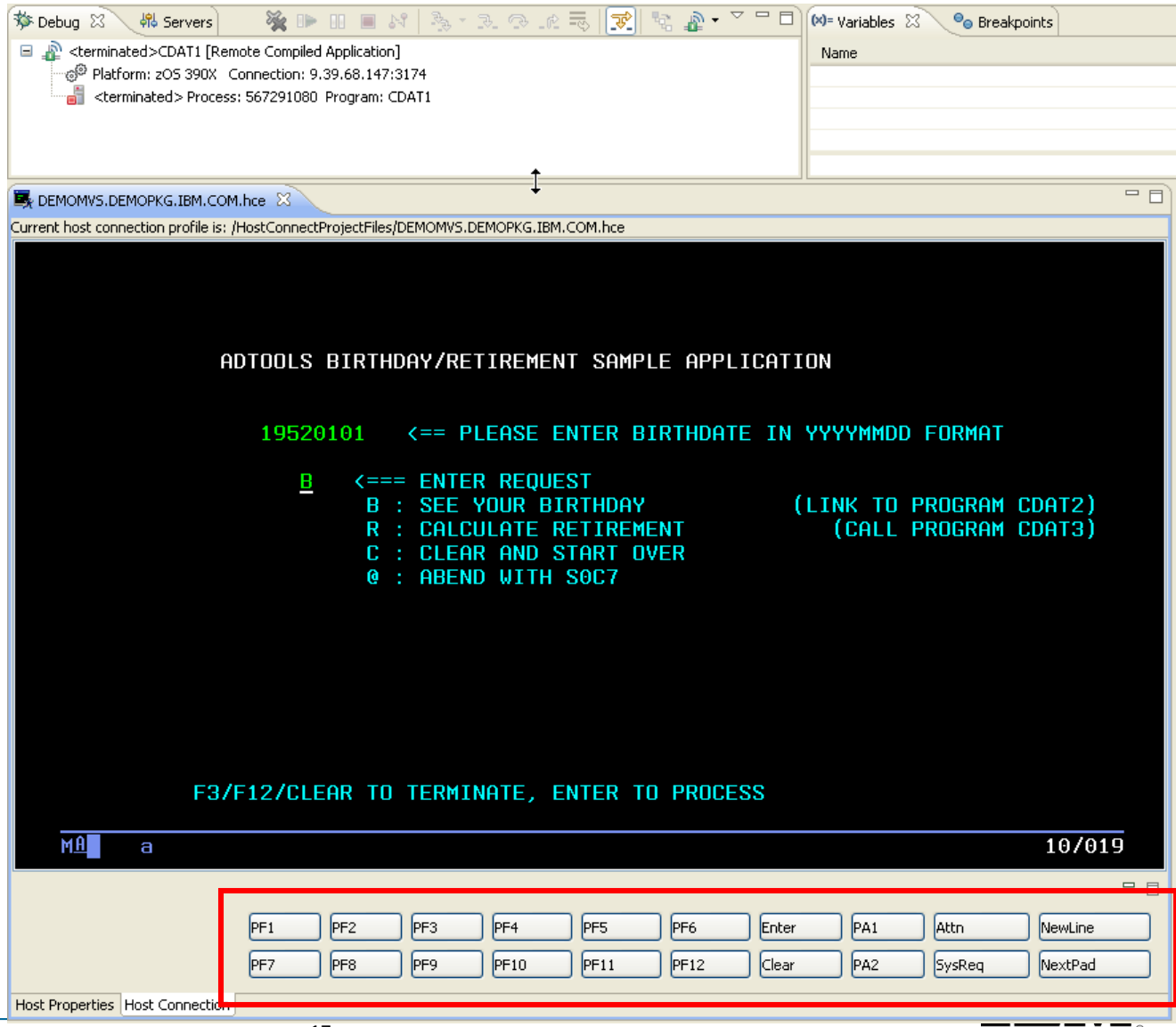
If your current transaction ends, and a BMS or 3270 screen is sent:

- You will be notified (prompted) by the debug engine
- If a screen is sent, the 3270 will display in the content area



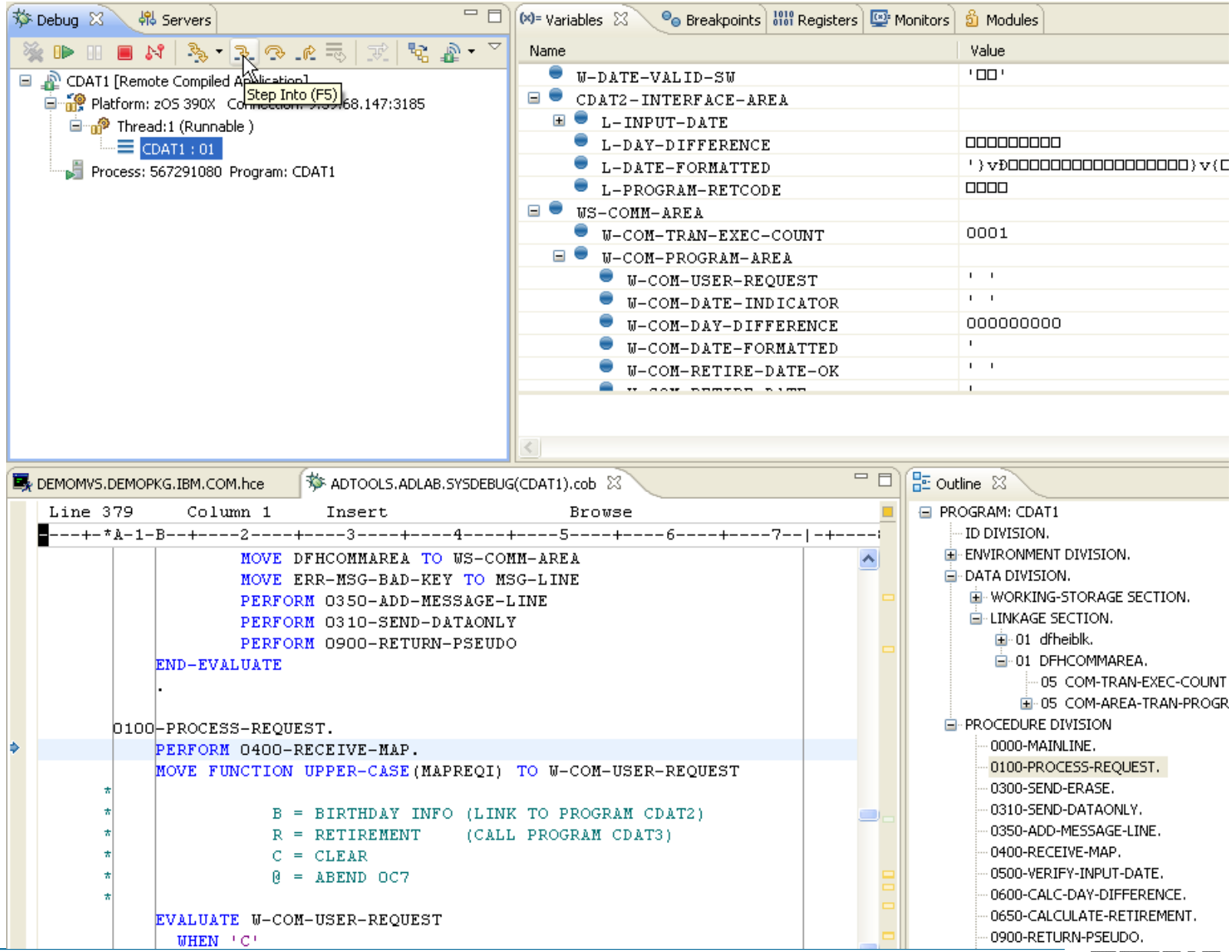
What About PF-Keys and Other Data Entry?

- You can resize the screen portion of the debugger
- And use the PF-Key emulation options in the Host Connection



Same Debug Option Functionality!

All of the debugging features and functions are available when debugging online CICS or IMS TM applications.



Topic Objectives

After having completed this unit, you now should be able to:

- Using the Problem Determination Tools, Debug Option and IDz:
  - Debug a mainframe online transaction
- Describe the online transaction features for configuring your 3270 sessions with Debug Option
- Debug a CICS 3270 Application