

# Rational Developer for System z

## Universität Leipzig

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**Rational** software

# RDz Roadmap

- RDz V7.1**
- Easier host configuration
  - Support for CICS V3.2
    - Support for IMS V10
  - Better editor support for COBOL and PL/I
  - Dataset search capability
    - Enhanced BMS/MFS creation
  - PL/I Web Service support
  - Enhanced SCM integration
    - Integration with IBM File Manager
    - Integration with IBM Fault Analyzer
  - New program generation wizards
  - Code snippet insertion

**RDz V7.1.1.2 iFix**

2008

**RDz 7.5  
2008 Release**

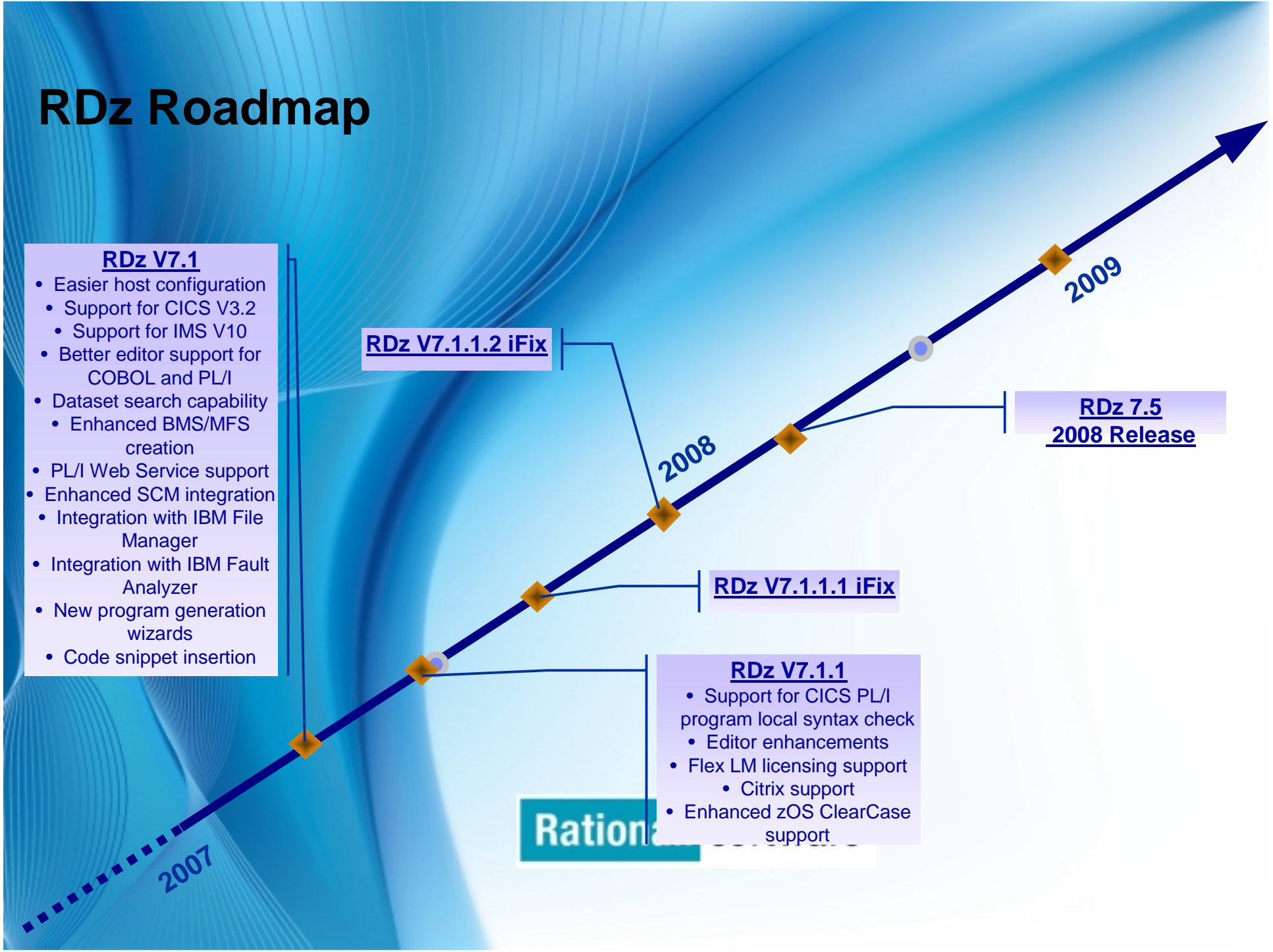
**RDz V7.1.1.1 iFix**

- RDz V7.1.1**
- Support for CICS PL/I program local syntax check
  - Editor enhancements
  - Flex LM licensing support
    - Citrix support
  - Enhanced zOS ClearCase support

Rational

2007

2009

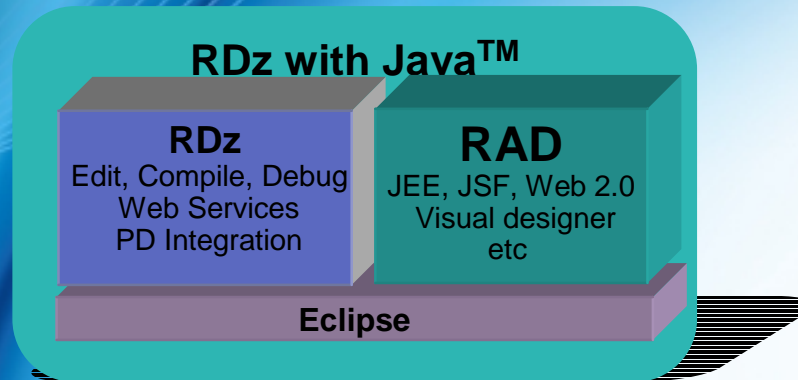


# Repackaging (RDz 7.5)

*2 package bundles are now being offered*

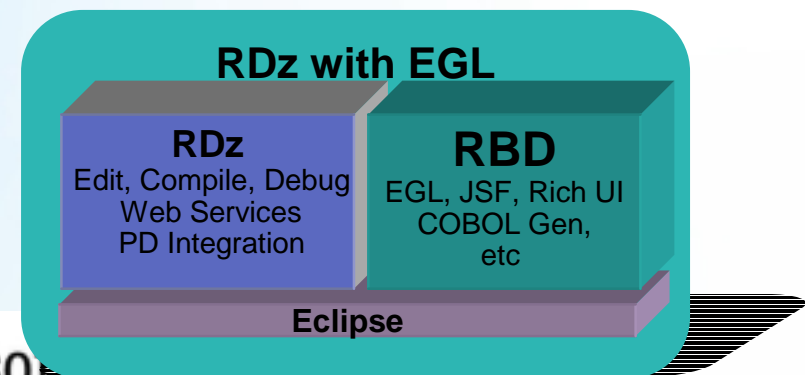
## RDz with Java™

Same package as  
RDz 7.1



## RDz with EGL

Offerings for traditional  
programmers creating  
Service Oriented  
Applications/Web UI





# IBM Rational Developer for System z V7.5

## JES and PD Tools

- Read/Write/Update VSAM datasets via integration with IBM File Manager
- Access IBM Fault analyzer reports for analyzing ABENDS and associating back to source code
- Interact with the Job Entry Subsystem (JES) to submit jobs, monitor jobs, and review job output
- Debug zOS applications from with workstation as they execute live in the remote runtime

## Integration with EGL using RBD

- Quick and easy development of modern enterprise applications for procedural programmers
- Simplify and speed up creation of Web applications and services without having to learn Java or J2EE

## Traditional Development

### Development Environment

- Connect to z/OS systems
- Work with z/OS resources like COBOL, PL/1, C, C++, JCL, etc.
- Perform dataset management actions like allocating datasets and migrating datasets
- Perform typical edit, compile, and debug tasks on remote z/OS resources from the workstation
- Create, build, and catalog DB2 stored procedures on zOS
- Compile and test programs locally to ensure correctness

### Screen design

- Visually create, modify, build, and deploy BMS maps sets or MFS/IMS maps remotely or on the local workstation

### Code Generation

- Generate CRUD DB2 program code from UML, which can also be easily integrated into web service applications

## IBM Rational Developer for System z

### Host Tooling Integration

[JES, FA, FM, Debug Tool]

### zOS Application Development

[COBOL, PL/1, C/C++, JCL, Screens, Stored Procedures, etc]

### Enterprise Service Tools

[Web Services For CICS/IMS]

### Host / Distributed SCM Integration

### IBM Rational Application Developer

RBD

## zOS Web Service and Flow Creation

- Implements SOA and Web Services
- SOA access to CICS V3.2 and IMS V10 COBOL, PLI applications
- Bottom-up/Top-down or meet-in-the-middle COBOL, PLI to XML mapping support
- Integrated COBOL, PLI XML converters, XML schemas, and WSDL generation
- Service Flow Modeler to build/deploy service flows out of your existing Commarea, Channel, MQ, and Terminal CICS applications.

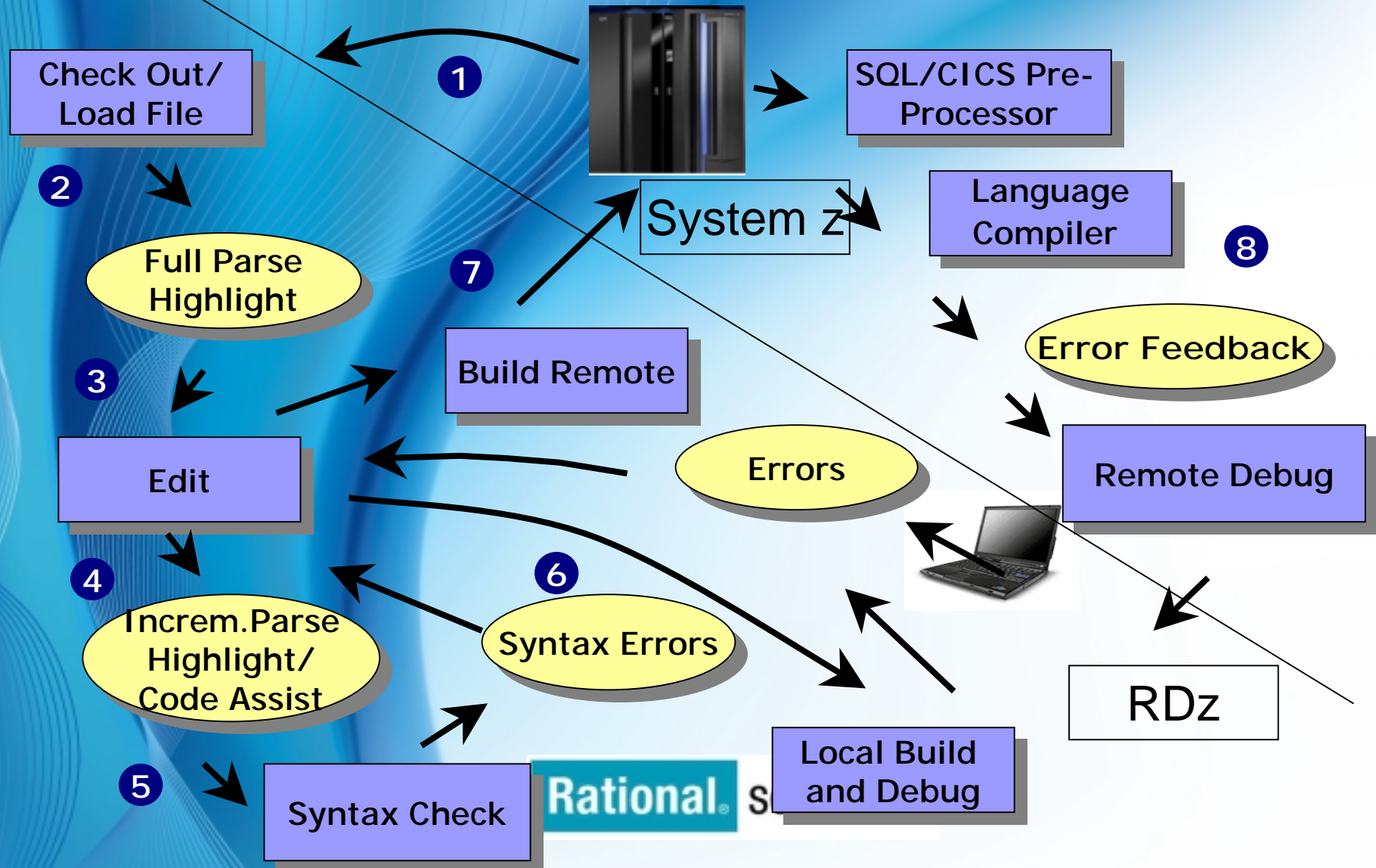
## SCM Support

- Access to host SCMs such as SCLM
- Framework for writing/deploying custom SCM integration code
- Support for storing zOS resources in distributed SCMs such as ClearCase

## Web and JEE Development

- Create Web Pages / JSF / Struts
- JEE/Java Development
- JCA Connectors
- Distributed debugger
- Web Services and Test environment

# RDz Local & Remote Development



# Remote development – so far

Start IBM Personal Communications

Log on to TSO

exit SDSF

Navigate to member

find code line  
(remember error)

find error msg

select job

swap to SDSF

Rational software

submit compile job

edit JCL

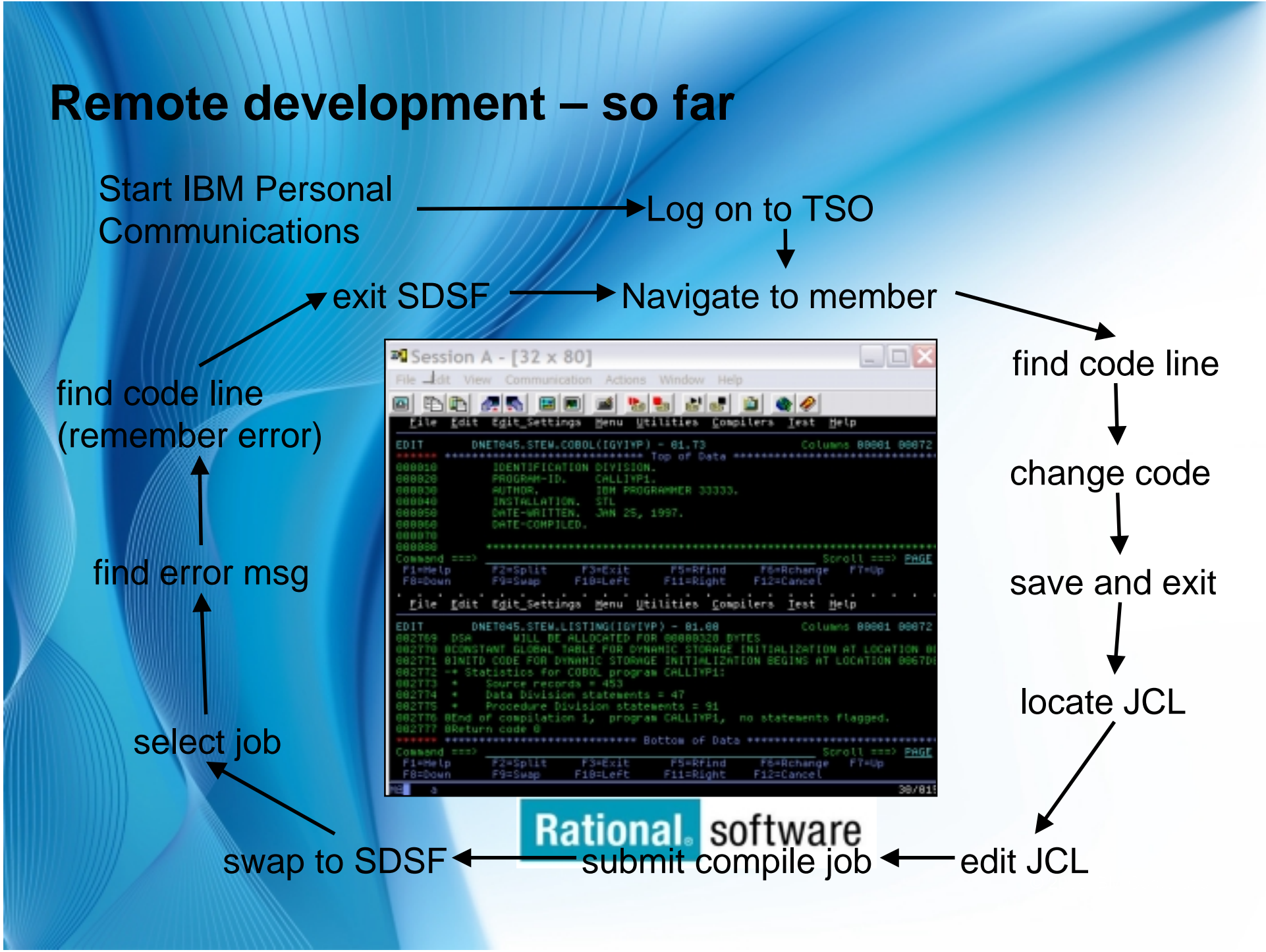
find code line

change code

save and exit

locate JCL

```
Session A - [32 x 80]
File Edit View Communication Actions Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT DNET045_STEW.COBL(IGY1VP) - 01.73 Columns 00001 00072
***** Top of Data *****
000010 IDENTIFICATION DIVISION.
000020 PROGRAM-ID. CALL1*P1.
000030 AUTHOR. IBM PROGRAMMER 33333.
000040 INSTALLATION. STL
000050 DATE-WRITTEN. JAN 25, 1997.
000060 DATE-COMPILED.
000070
000080
000090
Command ==>
F1=Help F2=Split F3=Exit F5=RFind F6=Rchange F7=Up
F8=Down F9=Swap F10=Left F11=Right F12=Cancel
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT DNET045_STEW.LISTING(IGY1VP) - 01.00 Columns 00001 00072
002769 DSA WILL BE ALLOCATED FOR 00000320 BYTES
002770 @CONSTANT GLOBAL TABLE FOR DYNAMIC STORAGE INITIALIZATION AT LOCATION 00
002771 @LIMITD CODE FOR DYNAMIC STORAGE INITIALIZATION BEGINS AT LOCATION 00670
002772 ++ Statistics for COBOL program CALL1*P1:
002773 + Source records = 453
002774 + Data Division statements = 47
002775 + Procedure Division statements = 91
002776 @End of compilation 1, program CALL1*P1, no statements flagged.
002777 @Return code 0
***** Bottom of Data *****
Command ==>
F1=Help F2=Split F3=Exit F5=RFind F6=Rchange F7=Up
F8=Down F9=Swap F10=Left F11=Right F12=Cancel
38/813
```

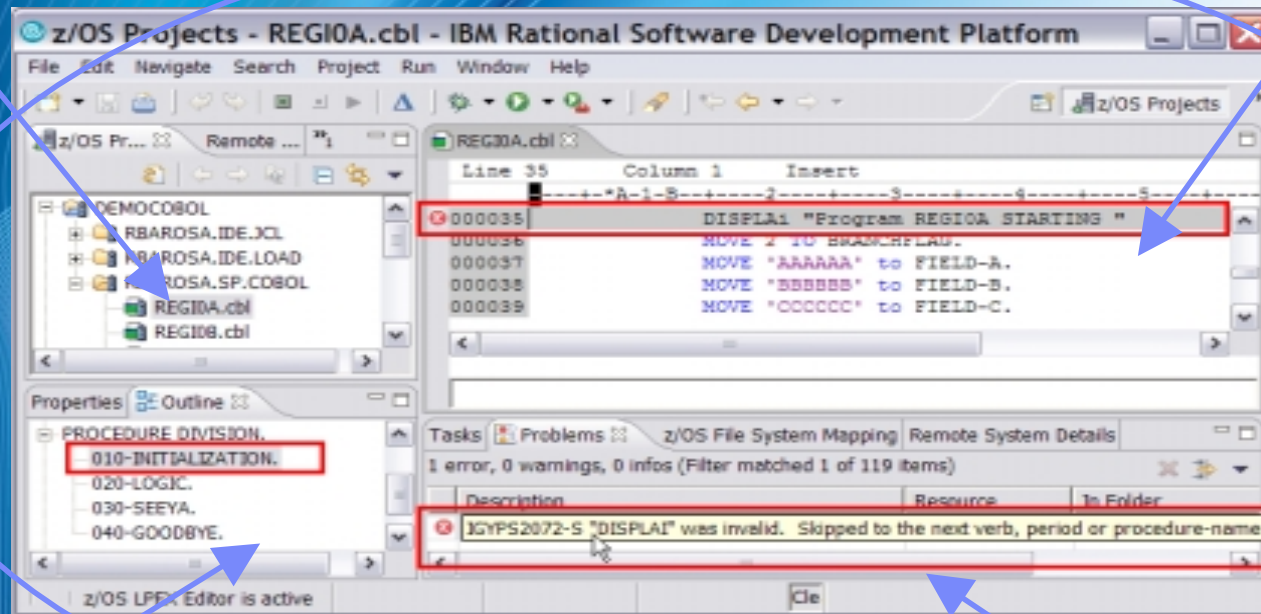




# RDz Development

Syntax check

Edit Source



Outline view

Error Feedback

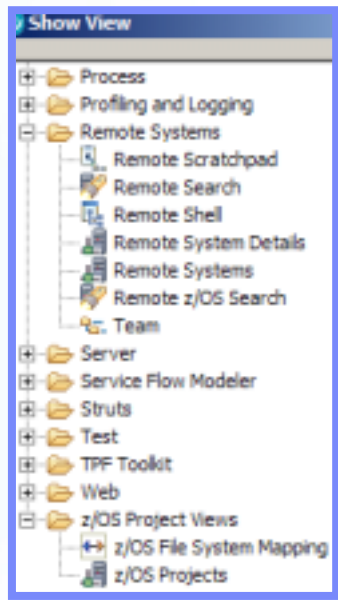
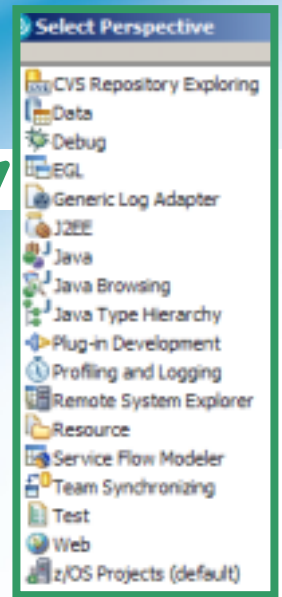
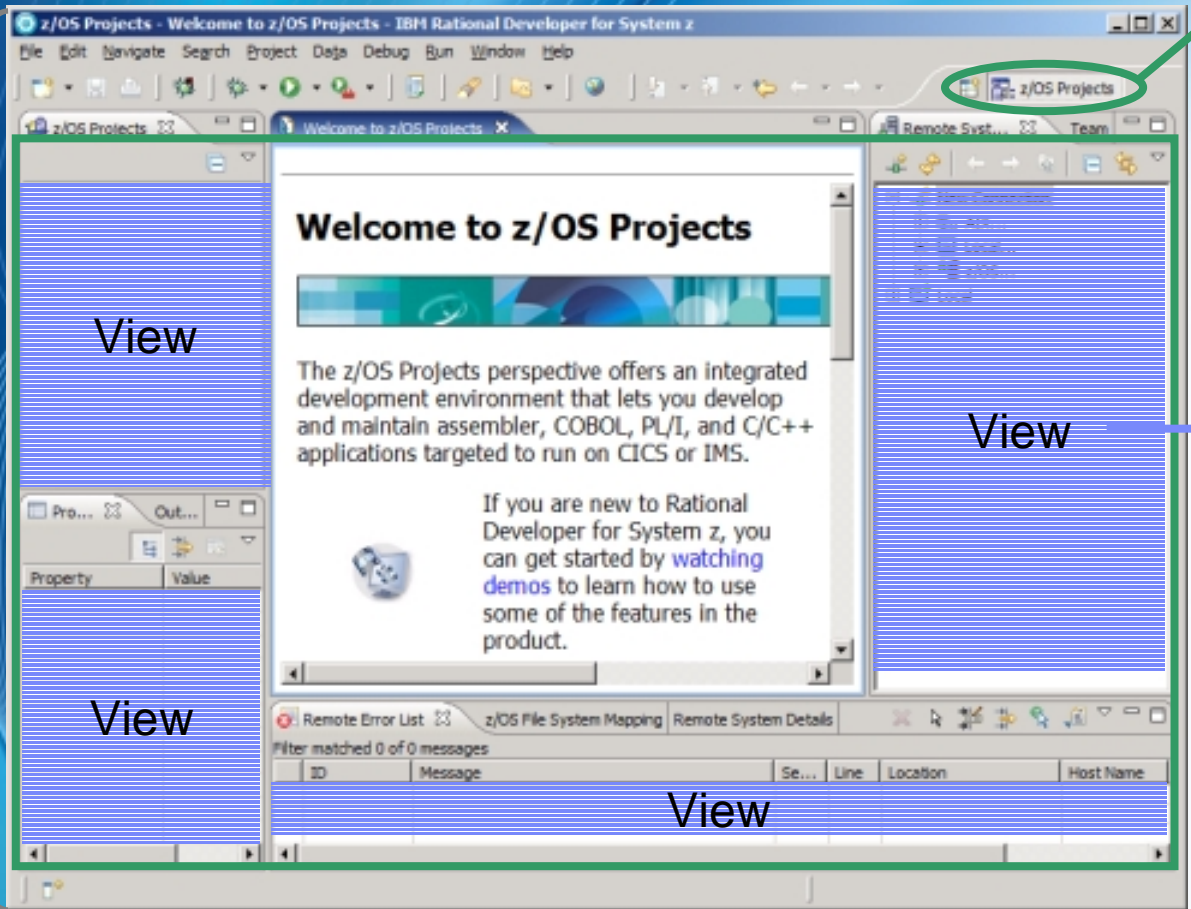
Rational software

Simplified development on a common development environment

# RDz Die Workbench

Workbench

Perspective:  
an arrangement  
of views







# RDz Developer Workbench

The screenshot shows the RDz Developer Workbench interface with the following components labeled:

- 1** Perspective: The overall layout of the IDE windows.
- 2** Editor: The central window displaying the COBOL source code.
- 3** Projects View: The left-hand pane showing the project structure.
- 4** Remote Systems View: The right-hand pane showing a tree view of remote systems and files.
- 5** Outline View: The bottom-left pane showing a hierarchical outline of the current program.
- 6** Remote Error List: The bottom-right pane displaying a table of error messages.

```
000001 *  
000002 *  
000003 * My first HelloWorld with Rdz  
000004 *  
000005 .....  
000006 IDENTIFICATION DIVISION.  
000007 PROGRAM-ID. HELLOW.  
000008 AUTHOR. STHOMAS.  
000009 ENVIRONMENT DIVISION.  
000010  
000011 DATA DIVISION.  
000012 WORKING-STORAGE SECTION.  
000013 01 hello-text PIC X(20).  
000014 LOCAL-STORAGE SECTION.  
000015 01 copy-struktur.  
000016 COPY HELLOWC.  
000017  
000018 PROCEDURE DIVISION .  
000019 DISPLAY "Hello World"  
000020 OVE "Hello WebSeminar" TO hello-  
000021  
000022 DISPLAY hello-text  
000023 STOP RUN.  
000024
```

ID	Message	Se...	Line	Location	Host Name
IGP52072	IGP52072-S "TO" ist ungültig. Der Teil bis zum ...	2	20	localCobol/Sample0L...	192.168.7... 31.0
IGP52121	IGP52121-S "OVE" ist nicht als Datename def...	2	20	localCobol/Sample0L...	192.168.7... 31.0

# RDz Remote Systems – Verbindung zum Host

**New**  
Remote z/OS System Connection  
Define connection information

Parent profile: Schnatterinchen for POK

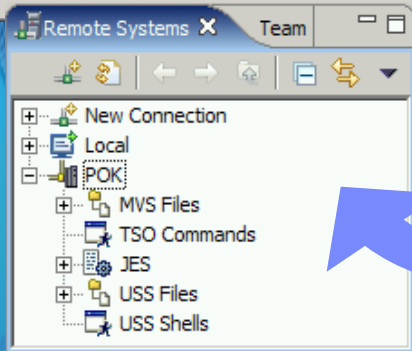
Connection name: POK

Host name: wtsnet.itso.ibm.com

Description: Poughkeepsie Host

Verify host name

< Back   Next >   Finish   Cancel



**New**  
MVS Files  
Define subsystem information

**New**  
JES  
Define subsystem information

**New**  
USS Files  
Define subsystem information

Server Launcher Settings

Indicate how the remote server should be launched

Remote daemon

Daemon Port (1-65535) 4035

REXEC

Path to installed server on host: dstore

Server launch command: server.zseries   Port (1-65535): 512

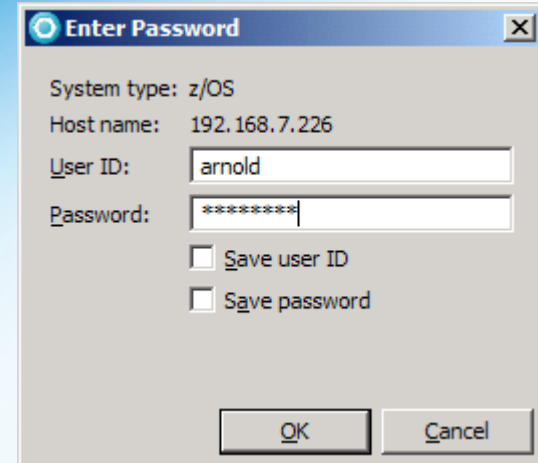
Connect to running server

< Back   Next >   Finish   Cancel



# RDz TSO Logon

```
----- TSO/E LOGON -----  
  
Enter LOGON parameters below:                                RACF LOGON parameters:  
  
Userid   ==> STHOMAS  
  
Password ==>  
  
Procedure ==> BASIC  
  
Acct Nmbr ==> 3300  
  
Size     ==> 2000000  
  
Perform  ==>  
  
Command  ==>  
  
Enter an 'S' before each option desired below:  
          -Nomail      -Nonotice      -Reconnect      -OIDcard  
  
PF1/PF13 ==> Help    PF3/PF15 ==> Logoff   PA1 ==> Attention  PA2 ==> Reshow  
You may request specific help information by entering a '?' in any entry field
```



The dialog box is titled "Enter Password" and has a close button (X) in the top right corner. It contains the following information and controls:

- System type: z/OS
- Host name: 192.168.7.226
- User ID:
- Password:
- Save user ID
- Save password
- OK button
- Cancel button

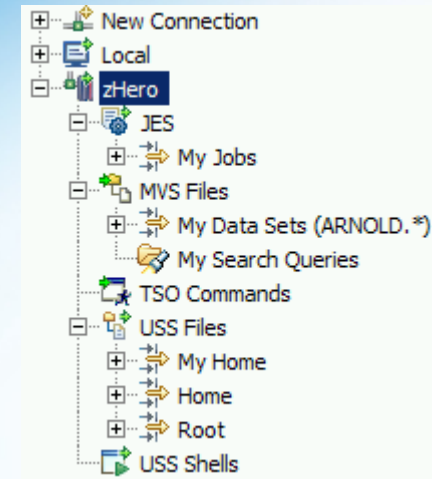
# RDz ISPF Primary Option Menu (ISPF)

```
Menu Utilities Compilers Options Status Help
-----
                                ISPF Primary Option Menu

0 Settings      Terminal and user parameters      User ID . : ARNOLD
1 View          Display source data or listings          Time. . . : 09:39
2 Edit          Create or change source data          Terminal. : 3278
3 Utilities     Perform utility functions                Screen. . : 1
4 Foreground    Interactive language processing          Language. : ENGLISH
5 Batch         Submit job for language processing        Appl ID . : ISR
6 Command       Enter TSO or Workstation commands        TSO logon : BASIC
7 Dialog Test   Perform dialog testing                  TSO prefix: ARNOLD
9 IBM Products  IBM program development products        System ID : SYS1
10 SCLM         SW Configuration Library Manager        MVS acct. : 3300
11 Workplace    ISPF Object/Action Workplace            Release . : ISPF 5.9
12 z/OS System  z/OS system programmer applications
13 z/OS User    z/OS user applications

Enter X to Terminate using log/list defaults

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



# RDz ISPF Command 3.2 – Data Set Utility

```
Menu RefList Utilities Help

                                Data Set Utility

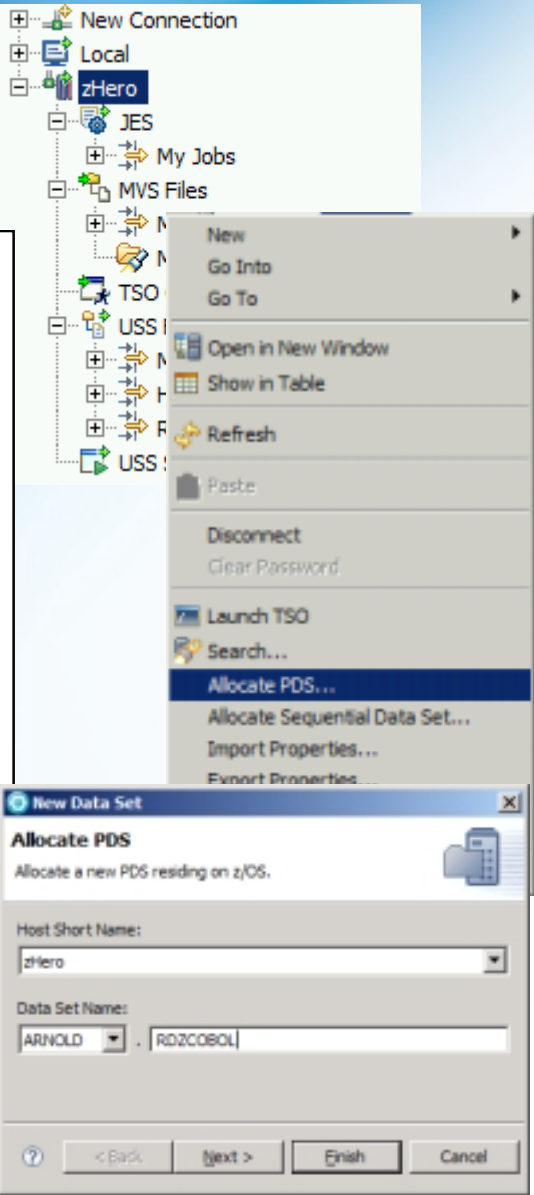
A Allocate new data set          C Catalog data set
R Rename entire data set        U Uncatalog data set
D Delete entire data set        S Short data set information
blank Data set information      V VSAM Utilities

ISPF Library:
Project . . . . . Enter "/" to select option
Group . . . . . / Confirm Data Set Delete
Type . . . . .

Other Partitioned, Sequential or VSAM Data Set:
Name . . . . . TSOCOBOL
Volume Serial . . . . . (If not cataloged, required for option "C")

Data Set Password . . . . . (If password protected)

Option ==> a
F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel
```





# RDz ISPF Command 3.2 – Data Set Utility

**New Data Set**

**Data Set Allocation**

Choose category and/or type.

Data Set Name: ARNOLD.RDZCOBOL

Copy characteristics from an existing data set:

Specify characteristics by usage type:

Category

Type

Specify characteristics (Advanced allocation).

# RDz ISPF Command 3.2 – Data Set Utility

```
Menu  RefList  Utilities  Help
                                     Allocate New Data Set
Data Set Name . . . : ARNOLD.TSOCOBOL
Management class . . . (Blank for default management class)
Storage class . . . . (Blank for default storage class)
Volume serial . . . . S1PROD (Blank for system default volume) **
Device type . . . . . (Generic unit or device address) **
Data class . . . . . (Blank for default data class)
Space units . . . . . TRACK (BLKS, TRKS, CYLS, KB, MB, BYTES
                             or RECORDS)
Average record unit (M, K, or U)
Primary quantity . . 300 (In above units)
Secondary quantity 100 (In above units)
Directory blocks . . 20 (Zero for sequential data set) *
Record format . . . . FB
Record length . . . . 80
Block size . . . . . 0
Data set name type LIBRARY (LIBRARY, HFS, PDS, LARGE, BASIC, *
                             EXTREQ, EXTPREF or blank)
Expiration date . . . (YY/MM/DD, YYYY/MM/DD
Enter "/" to select option YY.DDD, YYYY.DDD in Julian form
Allocate Multiple Volumes DDDD for retention period in days
                             or blank)
( * Specifying LIBRARY may override zero directory block)
Command ===>
```

**New Data Set**

**Data Set Characteristics**

Specify data set characteristics for the new PDS or sequential file.

Data Set Name: ARNOLD.RDZCOBOL

Volume Serial:

Generic Unit:

Space Units:

Primary Quantity:

Secondary Quantity:

Directory Blocks:

Record Format:

Record Length:

Block Size:

Data Set Type:

Expiration Date:

System Manage

**System Managed Storage**

Data Class:

Storage Class:

Management Class:

OK Cancel

# RDz ISPF Command 3.4 – Data Set Utility

```

Menu  RefList  RefMode  Utilities  Help

                        Data Set List Utility

blank Display data set list          P Print data set list
      V Display VTOC information      PV Print VTOC information

Enter one or both of the parameters below:
Dsname Level . . . ARNOLD.*COBOL
Volume serial . .

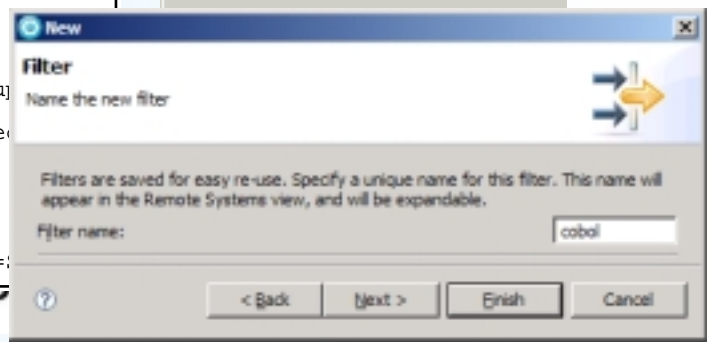
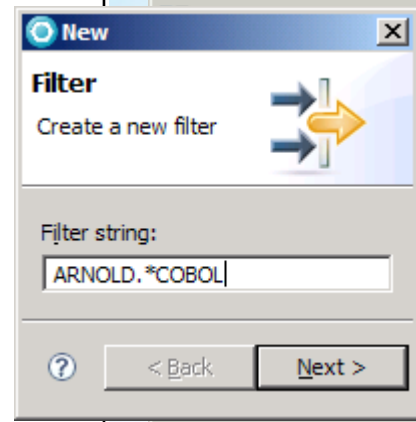
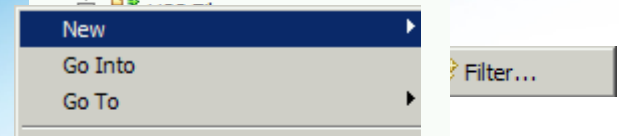
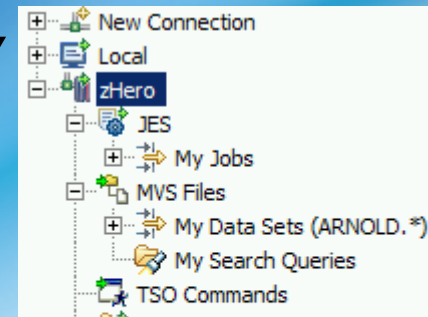
Data set list options

Initial View          Enter "/" to select option
1 1. Volume           / Confirm Data Set Delete
 2. Space              / Confirm Member Delete
 3. Attrib             / Include Additional Qualifiers
 4. Total              / Display Catalog Name
                        Display Total Tracks

When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up
an ISPF line command, the name of a TSO command, CLIST, or REXX exec
"=" to execute the previous command.

Option ==>
F1=Help      F2=Split    F3=Exit     F7=Backward  F8=Forward  F9=

```





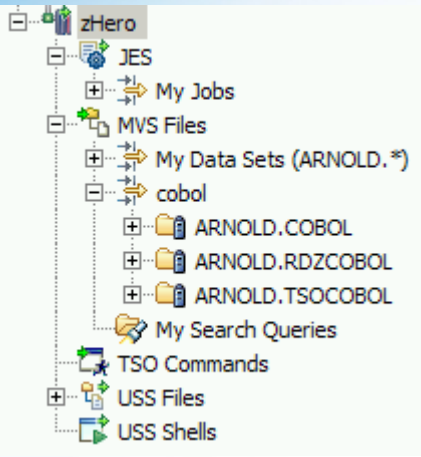
# RDz ISPF Command 3.4 – Data Set Utility

```
Menu  Options  View  Utilities  Compilers  Help
DSLIST - Data Sets Matching ARNOLD.*COBOL                               Row 1 of 9

Command - Enter "/" to select action                                Message                                Volume
-----
      ARNOLD.COBOL                                                S1USR1
      ARNOLD.COBOL.COPYLIB                                         S1USR2
      ARNOLD.COBOL.JCL                                             S1USR2
      ARNOLD.COBOL.LISTING                                         S1USR2
      ARNOLD.COBOL.LOAD                                             S1USR1
      ARNOLD.COBOL.OBJ                                             S1USR1
      ARNOLD.COBOL.SYSDEBUG                                         S1USR1
      ARNOLD.RDZCOBOL                                              S1USR2
      ARNOLD.TSOCOBOL                                              S1USR2

***** End of Data Set list *****

Command ==>                                                    Scroll ==> PAGE
      F1=Help    F2=Split    F3=Exit    F5=Rfind    F7=Up    F8=Down    F9=Swap
      F10=Left   F11=Right   F12=Cancel
```



# RDz ISPF Command 3.1 – Library Utility

```

Menu  RefList  Utilities  Help

                                Library Utility

blank Display member list      I Data set information      B Browse member
  C Compress data set          S Short data set information  D Delete member
  X Print index listing         E Edit member                 R Rename member
  L Print entire data set       V View member                 P Print member

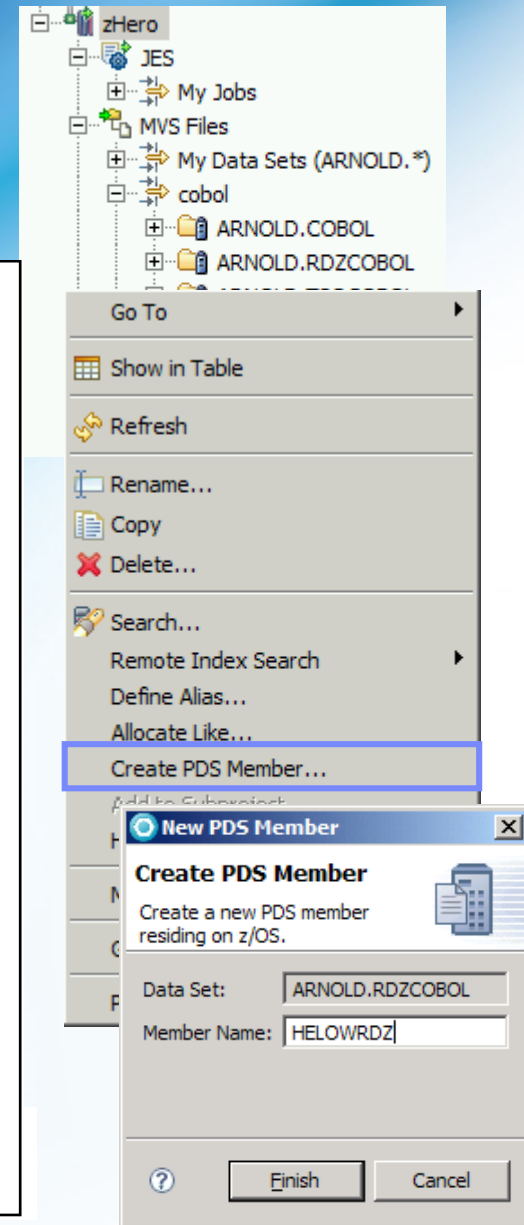
                                Enter "/" to select option

ISPF Library:                  / Confirm Member Delete
Project . . .                  Enhanced Member List
Group . . . . .                . . . . .
Type . . . . .
Member . . .                   (If B, D, E, P, R, V, or blank selected)
New name . .                   (If R selected)

Other Partitioned or Sequential Data Set:
Name . . . . . 'ARNOLD.TSOCOBOL(HELOWTSO)'
Volume Serial . . . S1USR2      (If not cataloged)
Data Set Password . . .        (If password protected)

Option ==> E

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



# RDz Member – Edit TSO

```
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          ARNOLD.TSOBOL(HELOWTSO) - 01.05          Columns 00001 00072
***** ***** Top of Data *****
000001      *****
000002      *
000003      *
000004      *****
000005
000006
000007
000008      IDENTIFICATION DIVISION.
000009      PROGRAM-ID. HELOWTSO.
000010      AUTHOR. Arnold.
000011
000012      ENVIRONMENT DIVISION.
000013
000014      DATA DIVISION.
000015
000016      PROCEDURE DIVISION .
000017          DISPLAY "Hello World"
000018          STOP RUN .
***** ***** Bottom of Data *****
Command ==>                               Scroll ==> CSR
```

are



# RDz Member – Compile, Link, Go

Menu Functions Confirm Utilities Help

```
EDIT                ARNOLD.COBOL.JCL                Row 00001 of 00013
      Name      Prompt      Size  Created      Changed      ID
_____ CALLNAME          36  2008/03/06  2008/04/25  22:53:52  ARNOLD
_____ CDS701             36  2007/12/21  2007/12/21  09:17:59  ARNOLD
_____ ECIPROG           36  2008/04/22  2008/04/22  17:23:20  ARNOLD
_____ HELLO            37  2008/02/29  2008/02/29  13:12:11  ARNOLD
_____ HELLOW           38  2008/04/03  2008/04/28  15:16:50  ARNOLD
_____ HELLOWCI         36  2008/02/27  2008/04/25  22:50:15  ARNOLD
_____ HELOWAPG         36  2008/05/05  2008/05/05  15:35:12  ARNOLD
_sub_____ HELOWTSO       40  2008/05/05  2008/05/05  15:41:48  ARNOLD
_____ HICWS            37  2007/12/13  2007/12/13  21:23:46  ARNOLD
_____ ISA0XCMN         36  2008/04/14  2008/04/14  21:39:57  ARNOLD
_____ MMJCL            39  2007/12/18  2007/12/18  01:16:03  ARNOLD
_____ TIMEZONE         40  2008/02/27  2008/02/27  21:43:37  ARNOLD
_____ X998             36  2008/04/26  2008/04/28  09:33:54  ARNOLD
      **End**
```

IKJ56250I JOB HELOWTSO(JOB07412) SUBMITTED

\*\*\*

# RDz Member – check output

## SDSF Job Status – ST

```
SDSF STATUS DISPLAY ALL CLASSES                LINE 1-3 (3)
NP  JOBNAME  JobID   Owner   Prty Queue      C  Pos  SAff  ASys Status
   ARNOLD   TSU07403 ARNOLD    15 EXECUTION      SYS1  SYS1
   GENJCL   JOB07411 ARNOLD     1 PRINT      A    54
   ? HELOWTSO JOB07412 ARNOLD     1 PRINT      A    55
```

```
SDSF JOB DATA SET DISPLAY - JOB HELOWTSO (JOB07412)  LINE 1-5 (5)
NP  DDNAME    StepName ProcStep DSID Owner   C  Dest           Rec-Cnt Page
   JESMSG LG JES2          2 ARNOLD  H LOCAL           22
   JESJCL   JES2          3 ARNOLD  H LOCAL           223
   JESYSMSG JES2          4 ARNOLD  H LOCAL           123
   SYSPRINT LKED      LINK    102 ARNOLD  H LOCAL           182
s  SYSOUT    GO          RUN    104 ARNOLD  H LOCAL            1
```

```
SDSF OUTPUT DISPLAY HELOWTSO JOB07412  DSID  104 LINE 0          COLUMNS 02- 81
COMMAND INPUT ==>                SCROLL ==> CSR
***** TOP OF DATA *****
Hello World
***** BOTTOM OF DATA *****
```

# RDz Member – Cobol Application Pattern Generator

File → New → Other | COBOL → COBOL Program

**New COBOL Program**

**COBOL Program**  
Create a new COBOL program

Program Name:

Author:

Target

- Partitioned Data Set
- Sequential Data Set
- Local file

Partitioned Data Set

Location:

Host Code Page:

Data Set name:

Member:

Allocate POS if new

Add comments to generated program

Open Snippets view when finished

**New COBOL Program**

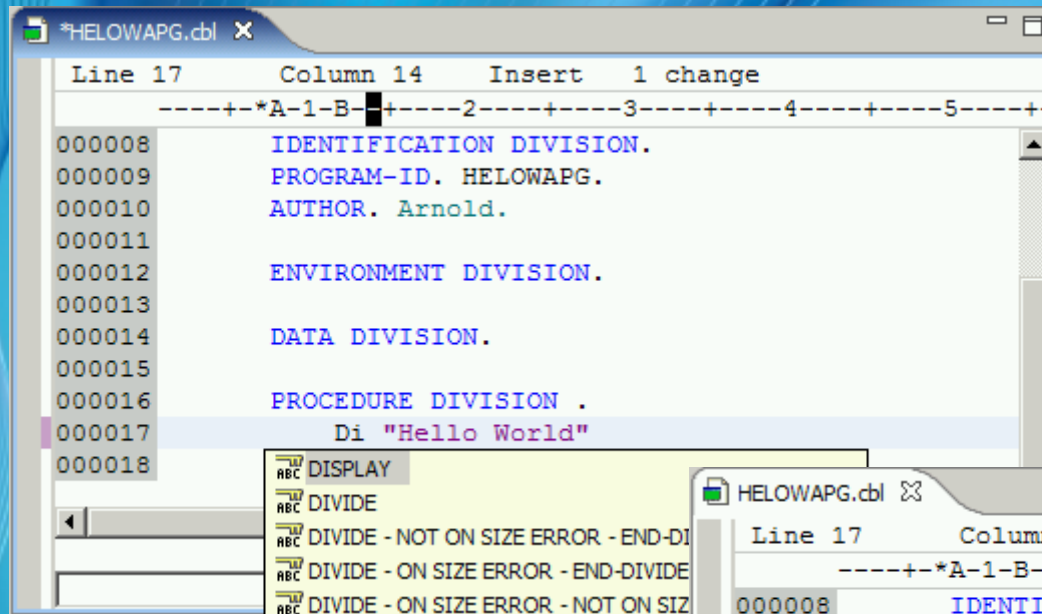
**COBOL Program Features**  
Specify features that will be used in the COBOL program.

Which features would you like to add to the program?

- Use BMS Maps
- Invoke CICS commands
- Use SQL statements
- Handle SQL error return codes



# RDz Member – Edit & Syntax Check RDz



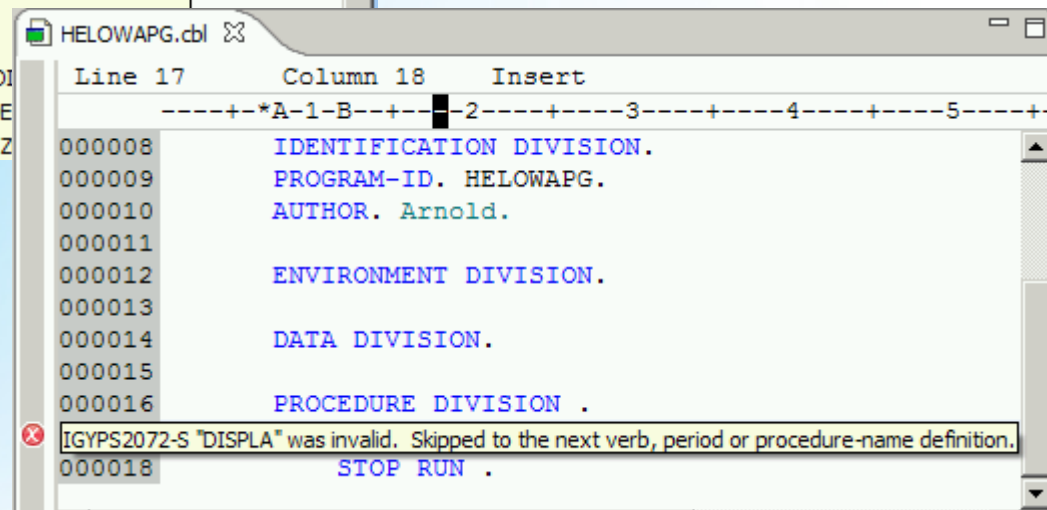
\*HELOWAPG.cbl x

Line 17 Column 14 Insert 1 change

-----\*A-1-B-----2-----3-----4-----5-----+

```
000008 IDENTIFICATION DIVISION.  
000009 PROGRAM-ID. HELOWAPG.  
000010 AUTHOR. Arnold.  
000011  
000012 ENVIRONMENT DIVISION.  
000013  
000014 DATA DIVISION.  
000015  
000016 PROCEDURE DIVISION .  
000017     Di "Hello World"  
000018
```

ABC DISPLAY  
ABC DIVIDE  
ABC DIVIDE - NOT ON SIZE ERROR - END-DI  
ABC DIVIDE - ON SIZE ERROR - END-DIVIDE  
ABC DIVIDE - ON SIZE ERROR - NOT ON SIZ



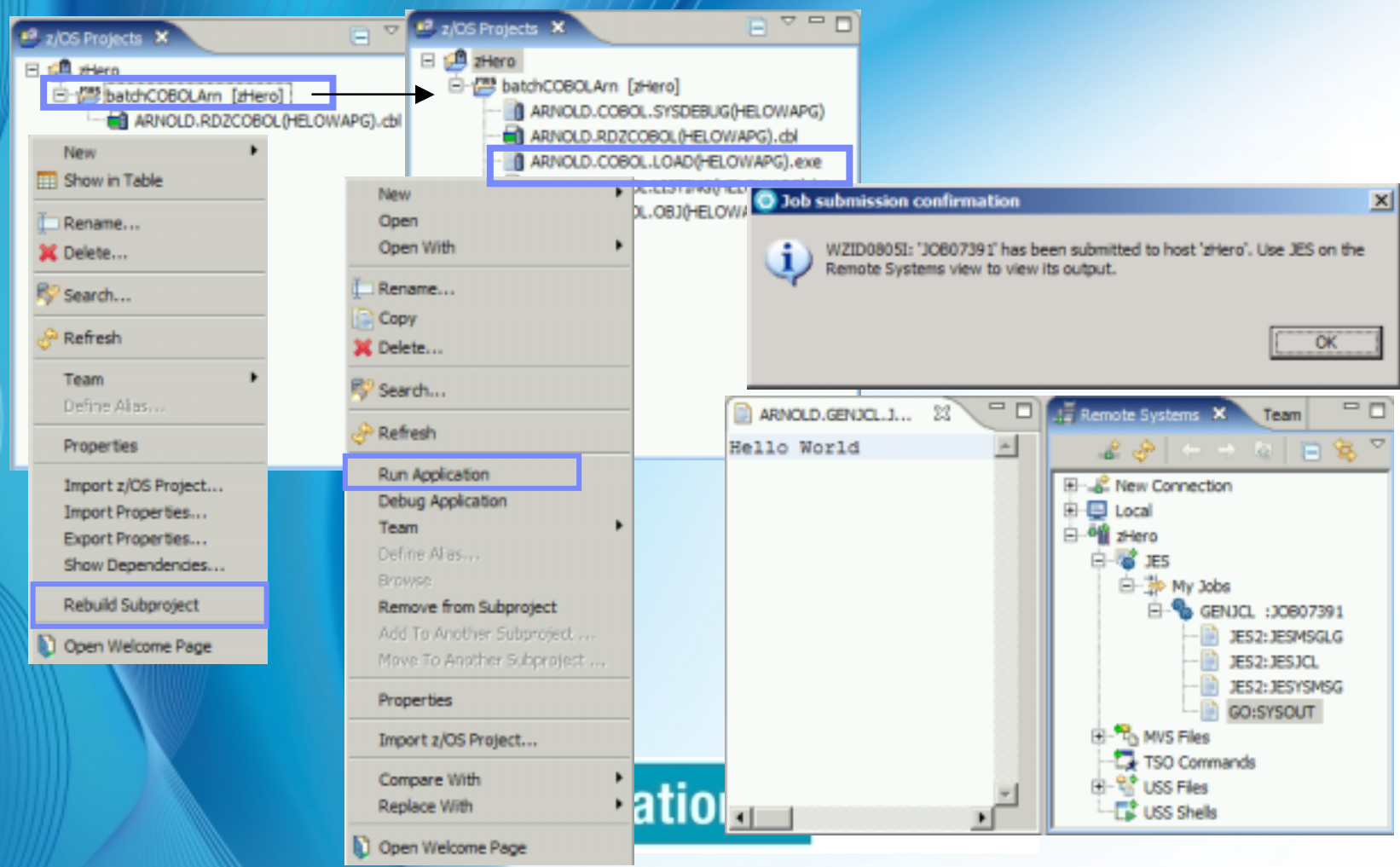
HELOWAPG.cbl x

Line 17 Column 18 Insert

-----\*A-1-B-----2-----3-----4-----5-----+

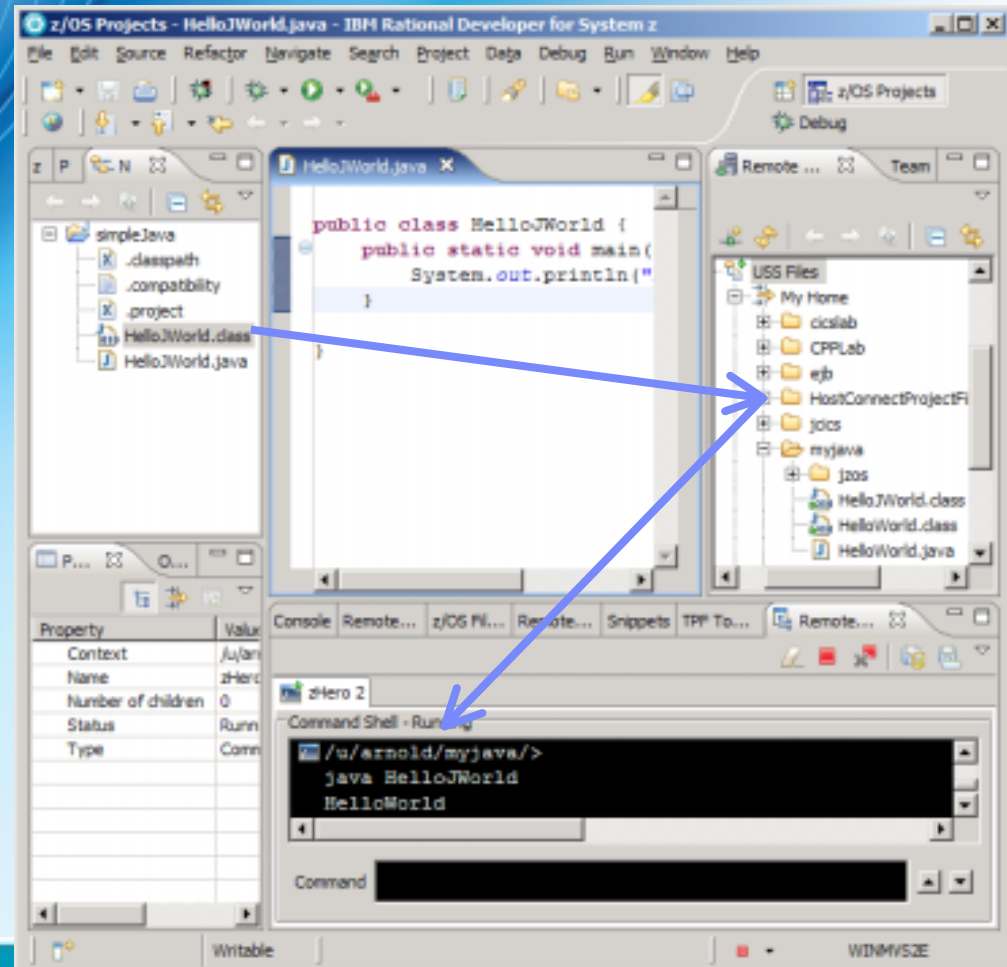
```
000008 IDENTIFICATION DIVISION.  
000009 PROGRAM-ID. HELOWAPG.  
000010 AUTHOR. Arnold.  
000011  
000012 ENVIRONMENT DIVISION.  
000013  
000014 DATA DIVISION.  
000015  
000016 PROCEDURE DIVISION .  
000017     [IGYPS2072-S "DISPLA" was invalid. Skipped to the next verb, period or procedure-name definition.]  
000018     STOP RUN .
```

# RDz Member – Compile, Link, Go



# RDz *Und was ist mit Java?*

- **Compile once, run anywhere**
- **Drag and Drop Class file to Host and execute**



Rational software



# RDz Member – Debug

The image shows a sequence of steps in the IBM Rational Developer for z/OS environment:

- z/OS Projects Explorer:** A project named 'zHero' is expanded to show a subproject 'batchCOBOLArn [zHero]'. Inside, the file 'ARNOLD.COBOL.LOAD(HELOWAPG).exe' is selected.
- Context Menu:** A right-click menu is open over the selected file. The 'Debug Application' option is highlighted.
- Confirm Perspective Switch Dialog:** A dialog box with a question mark icon asks: 'This kind of launch is configured to open the suspends. This Debug perspective is designed to support incorporates views for displaying the debug management. Do you want to open this perspective now?'. There is a checkbox labeled 'Remember my decision'.
- Debug Console:** The 'Debug' perspective is active. The console shows the following code:

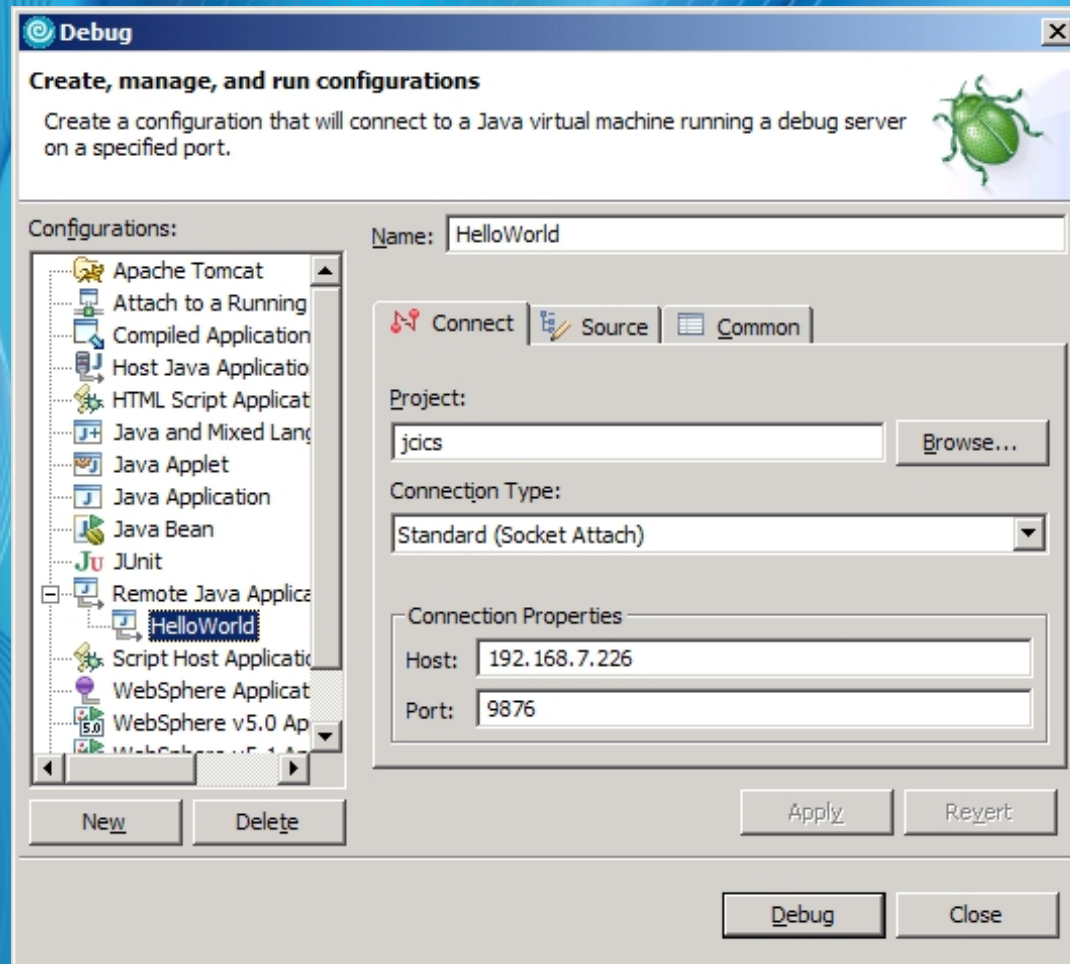
Line	Column	Insert	Browse
000014	14	DATA DIVISION.	
000015	15		
000016	16	PROCEDURE DIVISION .	
000017	17	DISPLAY "Hello World"	
000018	18	STOP RUN .	

# RDz End 2 End Debugging with IBM Debug Tool

The screenshot displays the IBM Debug Tool interface. The top toolbar includes icons for file operations, execution, and debugging. The 'Servers' pane shows a connection to 'OS/390(R) (9.12.6.84:2481)' with a state of '<stopped>'. The 'Variables' pane lists several variables, with 'WS-CONTAINER-NAME = 'DFHWS-OPERATION'' highlighted in red. The 'Code Editor' shows a list of lines with line 106 highlighted in blue. The code on line 106 is 'EXEC CICS GET CONTAINER (WS-CONTAINER-NAME)'. The 'Outline' pane on the right indicates 'An outline is not available.'

Line	Column	Insert	Browse
000103	103	*	
000104	104	MOVE 'DFHWS-OPERATION'	
000105	105	TO WS-CONTAINER-NAME	
000106	106	EXEC CICS GET CONTAINER (WS-CONTAINER-NAME)	
000107	107	INTO (WS-OPERATION-NAME)	WS-CONTAINER-NAME = 'DFHWS-OPERATION'
000108	108	RESP (COMMAND-RESP) RESP2 (COMMAND-RESP2)	

# RDz End 2 End Debugging with JPDA (Java Platform Debugger Architecture)

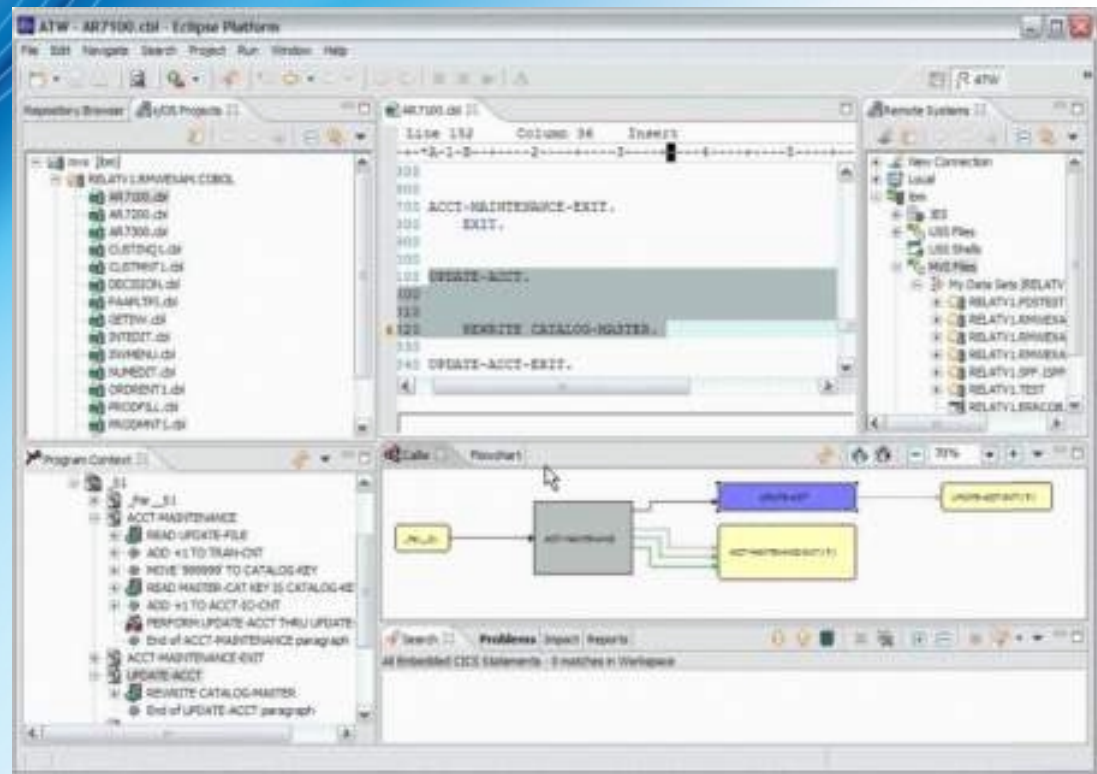


ware

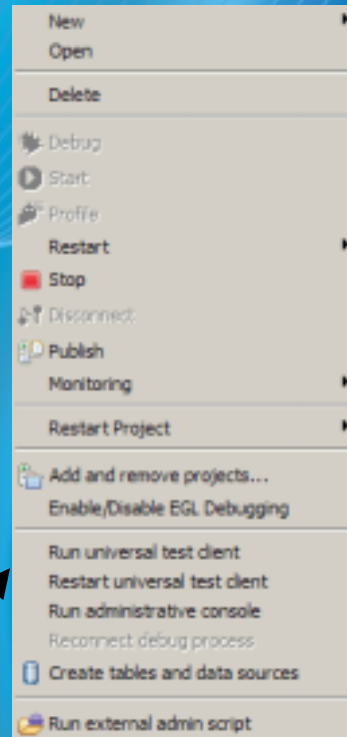


# RDz RTW Analyzer for Eclipse

- **Additional RDz views**
- **Eases**
  - Understand relationships within programs and between programs and data
  - Visualize program structure
  - Identify potential impacts of proposed changes
  - Search for relevant patterns in source code

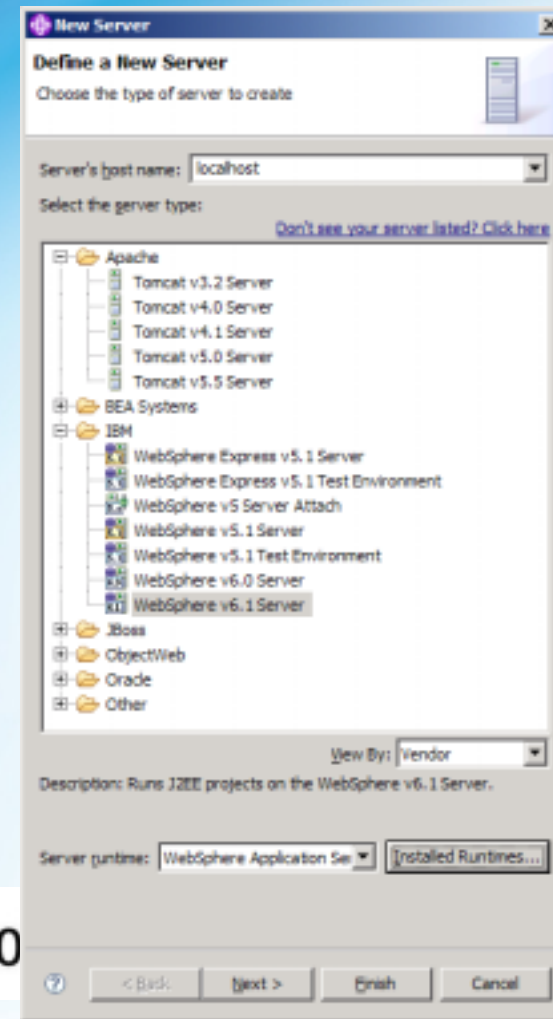


# RDz *Integrated Test environments*



The 'Servers' console window shows a table of server instances. The table has columns for 'Server', 'Status', and 'State'. Two servers are listed: 'WebSphere v6.1 Server @ localhost' and 'CTGWebClientEAR', both with a 'Started' status and 'Synchronized' state.

Server	Status	State
WebSphere v6.1 Server @ localhost	Started	Synchronized
CTGWebClientEAR	Started	



SO

# RDz DLIModelUtility-Plugin für Visualisierung von IMS DB

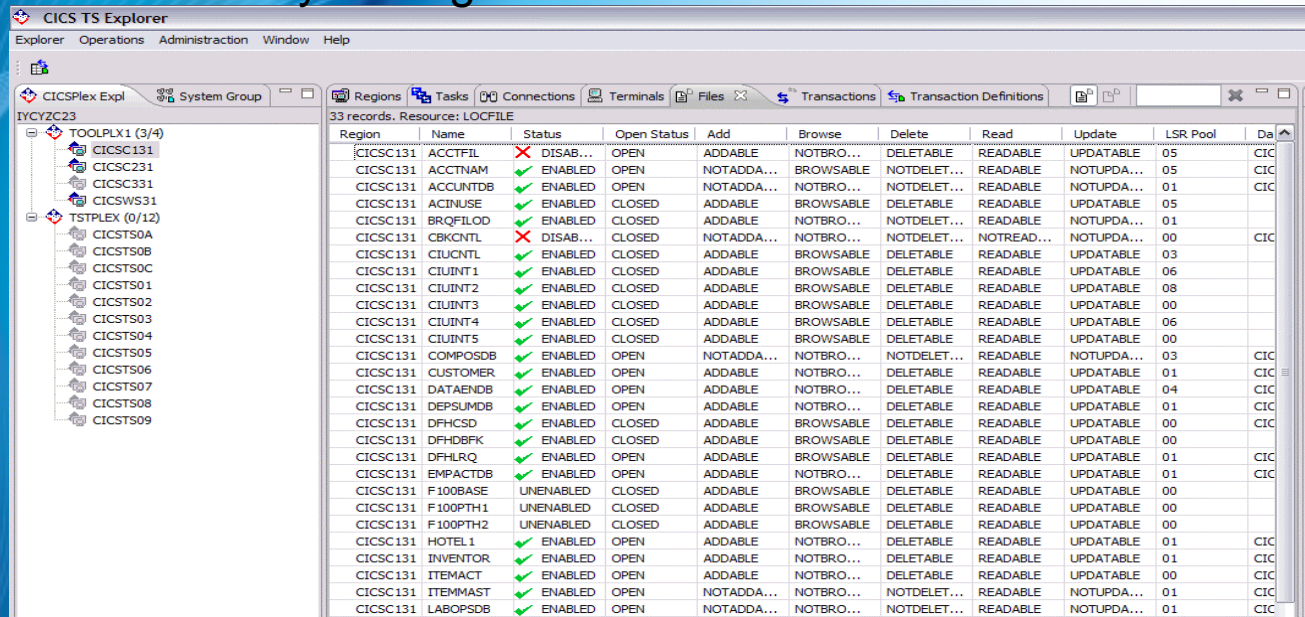
The screenshot shows the Eclipse IDE interface with the DLIModelUtility plugin. The main window displays a tree view of database fields for two tables: 'DEALER' and 'MODEL'. The 'DEALER' table has fields: DURNO, DURNAME, CDIV, ZIP, PHONE, EXCH, and NUMB. The 'MODEL' table has fields: MODTYPE, MODKEY, and MAKE. A context menu is open over the 'DURNO' field, with a tooltip that reads: 'To edit the field, right click on the field and select Edit'. The Properties view at the bottom shows details for the selected field.

Property	Value
Field	
Alias	DURNO
Data type	CHAR
IMS name	DURNO
Length (bytes)	4
Start (byte)	1
Type qualifier	
XML type	element



# CICS Explorer...

- Navigate resources defined in CICS Regions
- Verify Program and Transaction resources exist before deployment
- Use existing definitions to create new resources
- Adheres to CICS security settings for users



The screenshot shows the CICS TS Explorer interface. On the left, a tree view displays the resource hierarchy under 'TOOLPLX1 (3/4)', including CICS regions (CICSC131, CICSC231, CICSC331, CICSW531) and a TSTPLEX (0/12) containing various CICS resources like ACCTFIL, ACCTNAM, ACCTNDB, ACNUSE, BRQFIL0D, CBKCNTRL, CIUCNTRL, CIUJINT1-5, COMPOSDB, CUSTOMER, DATAENDB, DEFSUMDB, DFHCSDB, DFHDBFK, DFHLRQ, EMPACTDB, F100BASE, F100PTH1, F100PTH2, HOTEL1, INVENTOR, ITEMACT, ITEMMAST, and LABOPSD8.

The main pane displays a table of 33 records for the resource 'LOCFILE'. The table columns are: Region, Name, Status, Open Status, Add, Browse, Delete, Read, Update, LSR Pool, and Da. The table contains the following data:

Region	Name	Status	Open Status	Add	Browse	Delete	Read	Update	LSR Pool	Da
CICSC131	ACCTFIL	DISABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	05	CIC
CICSC131	ACCTNAM	ENABLED	OPEN	NOTADDA...	BROWSABLE	NOTDELET...	READABLE	NOTUPDA...	05	CIC
CICSC131	ACCTNDB	ENABLED	OPEN	NOTADDA...	NOTBRO...	NOTDELET...	READABLE	NOTUPDA...	01	CIC
CICSC131	ACNUSE	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	05	
CICSC131	BRQFIL0D	ENABLED	CLOSED	ADDABLE	NOTBRO...	NOTDELET...	READABLE	NOTUPDA...	01	
CICSC131	CBKCNTRL	DISABLED	CLOSED	NOTADDA...	NOTBRO...	NOTDELET...	NOTREAD...	NOTUPDA...	00	CIC
CICSC131	CIUCNTRL	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	03	
CICSC131	CIUJINT1	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	06	
CICSC131	CIUJINT2	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	08	
CICSC131	CIUJINT3	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	00	
CICSC131	CIUJINT4	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	06	
CICSC131	CIUJINT5	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	00	
CICSC131	COMPOSDB	ENABLED	OPEN	NOTADDA...	NOTBRO...	NOTDELET...	READABLE	NOTUPDA...	03	CIC
CICSC131	CUSTOMER	ENABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	01	CIC
CICSC131	DATAENDB	ENABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	04	CIC
CICSC131	DEFSUMDB	ENABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	01	CIC
CICSC131	DFHCSDB	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	00	CIC
CICSC131	DFHDBFK	ENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	00	
CICSC131	DFHLRQ	ENABLED	OPEN	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	01	CIC
CICSC131	EMPACTDB	ENABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	01	CIC
CICSC131	F100BASE	UNENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	00	
CICSC131	F100PTH1	UNENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	00	
CICSC131	F100PTH2	UNENABLED	CLOSED	ADDABLE	BROWSABLE	DELETABLE	READABLE	UPDATABLE	00	
CICSC131	HOTEL1	ENABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	01	CIC
CICSC131	INVENTOR	ENABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	01	CIC
CICSC131	ITEMACT	ENABLED	OPEN	ADDABLE	NOTBRO...	DELETABLE	READABLE	UPDATABLE	00	CIC
CICSC131	ITEMMAST	ENABLED	OPEN	NOTADDA...	NOTBRO...	NOTDELET...	READABLE	NOTUPDA...	01	CIC
CICSC131	LABOPSD8	ENABLED	OPEN	NOTADDA...	NOTBRO...	NOTDELET...	READABLE	NOTUPDA...	01	CIC



# CICS Resource definition editor

- Define program resource requirements in a file included in a RDz project
- Install program code and resource definitions into test region(s) from RDz
- Easily and repeatedly verify and enable resources during code development

The screenshot displays the CICS Resource Definition Editor interface. The main editor area is divided into three sections: Resource Definition, Installation, and Export Definition. The Resource Definition section shows a table of resources with columns for Selection, Resource Name, Resource Type, Description, and State. The Installation section has an 'Install Definitions' button and a checkbox for 'Overwrite if resources already exist'. The Export Definition section has an 'Export Definitions' button. The Properties view at the bottom shows a list of resources and their status.

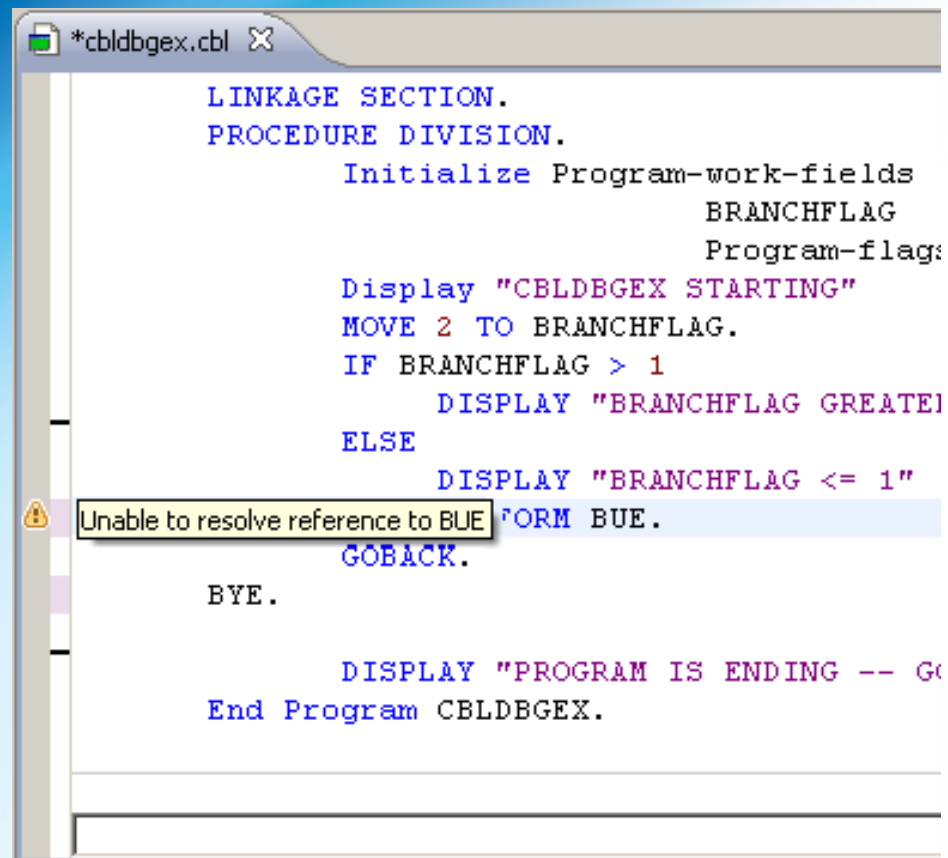
Selection	Resource Name	Resource Type	Description	State
	SPMFlow	SPMFlow		Enable only
	SPMFlow	Pipeline	SPM pipeline	Enable only
	FLOWPROC	ProcessType	Stock flow process	Edited
	STOCKFLOW	Program	Stock flow program	Edited
	STP	Transaction	Stock flow	Edited

Name	Status
ACCTHAR	ENABLED
ACCTEST	ENABLED
ADCRDR	ENABLED
ADCRD6	ENABLED
ADRTSG08	ENABLED
BAGDAP	ENABLED
BAGDAP	ENABLED
BALBSP	ENABLED
BARVHQ	ENABLED
BARVHQ	ENABLED
BAZPSP	ENABLED
CRDRUG	ENABLED
CHANELLE	ENABLED

# Advanced COBOL Editing

- Validation without compilation
- Data Element refactor
- Perform Hierarchy view
- Improved source navigation



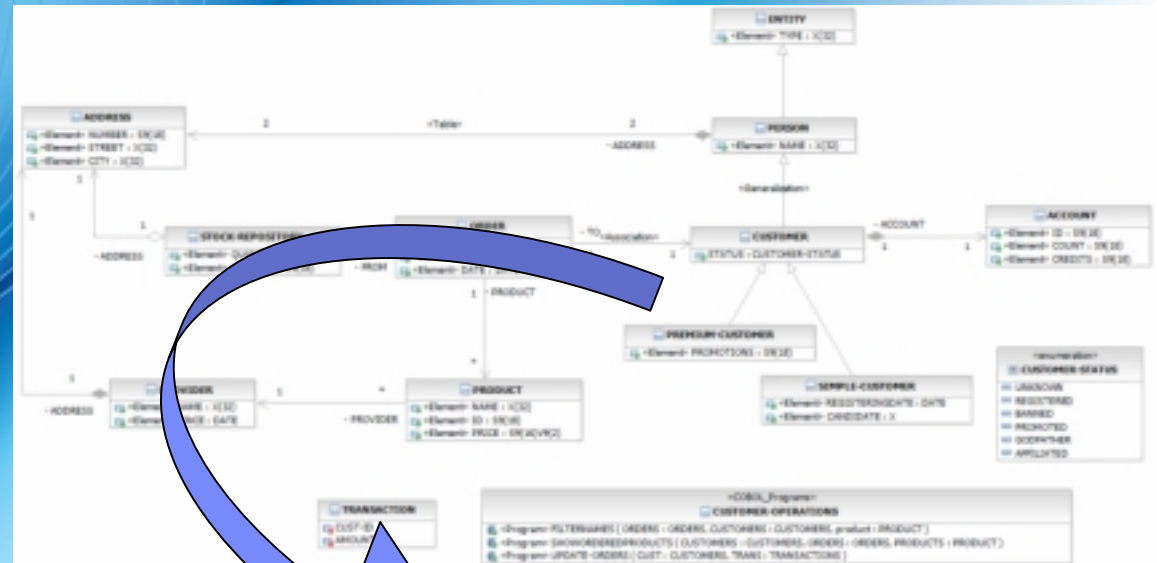
The screenshot shows a window titled '\*cbldbgex.cbl' containing COBOL code. The code includes a LINKAGE SECTION, a PROCEDURE DIVISION with several statements, and a GOBACK statement. A tooltip is displayed over the GOBACK statement, indicating a compilation error: 'Unable to resolve reference to BUE'. The error message is highlighted in a light blue box.

```
LINKAGE SECTION.  
PROCEDURE DIVISION.  
    Initialize Program-work-fields  
        BRANCHFLAG  
        Program-flags  
    Display "CBLDBGEX STARTING"  
    MOVE 2 TO BRANCHFLAG.  
    IF BRANCHFLAG > 1  
        DISPLAY "BRANCHFLAG GREATER 1"  
    ELSE  
        DISPLAY "BRANCHFLAG <= 1"  
    GOBACK.  
BYE.  
  
    DISPLAY "PROGRAM IS ENDING -- GO"  
End Program CBLDBGEX.
```

Unable to resolve reference to BUE. FORM BUE.

# UML to COBOL

- Introduces COBOL Specific Profile
- Class Diagrams are used to generate COBOL Data Elements
- Activity Diagrams used to generate Procedure Division



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```
*****
* COPYBOOK: CUSTOMER
*
* AUTHOR:
* GENERATED: Fri 2007-10-12 09:59:15
*****
01 CUSTOMER USAGE COMP-4.
05 STATUS PIC X(5).
   88 STATUS-UNKNOWN VALUE IS 'U'.
   88 STATUS-REGISTERED VALUE IS 'RGD'.
   88 STATUS-BANNED VALUE IS 'BND'.
   88 STATUS-PROMOTED VALUE IS 'PRM'.
   88 STATUS-GODFATHER VALUE IS 'GDFTR'.
   88 STATUS-AFFILIATED VALUE IS 'AFLT'D'.
05 ENTITY .
   10 TYPE PIC X(32).
05 PERSON USAGE COMP-4.
   10 NAME PIC X(32).
   10 ADDRESS .
       15 NUMBER PIC 59(18).
       15 STREET PIC X(32).
       15 CITY PIC X(32).
05 ACCOUNT .
   10 ID PIC 89(18).
   10 COUNT PIC 59(18) VALUE IS '0'.
   10 CREDITS PIC 89(18) VALUE IS '1000'.
```



# Integration des Fault Analyzers

- Bietet die Möglichkeit, einen Abbruch-Analyse-Bericht, welcher zum Abbruchzeitpunkt eines Programmes erstellt wurde, anzusehen.
- Unterstützte Umgebungen: COBOL, PL/1, Assembler, C/C++, Java, CICS, MQ, IMS und DB2.
- 'COBOL Working Storage' wird angezeigt unter Verwendung von 'Mini-Dumps' und 'Side Files'.
- Voraussetzung: IBM Fault Analyzer for z/OS auf dem Mainframe.

Liste aller  
bisherigen  
Abbrüche

The screenshot displays the IBM Fault Analyzer interface. The main window shows a 'Fault-Summary' for a system abend 00B. The summary text reads: 'A system abend 00B occurred in module MYCOB1 program MYCOB1 at offset X'300'. A program-interruption code 00B (Decimal-Divide Exception) is associated with this abend and indicates that the divisor was zero in a signed decimal divisor. The cause of the failure was program MYCOB1 in module MYCOB1. The 00B01 source code that immediately preceded the failure was: 'Non Report System Stop Information MacInfoMember'.

Below the summary is a table of fault records:

Fault_ID	Program	Offset	Abend	User_ID	Sys/Job	Job_ID	Jobname
SAP0288	CSO0088	88C	SNAP	ZPA01	CSO0088	J080088	CSO0088
SAP0289	MYCOB1	00B	00B	ZPA01	MYCOB1	J0801793	MYCOB1
SAP0297	PWWP007	7A	SD2	ZPA01	MYCOB1	TSL0018	MYCOB1
SAP0298	MYCOB1	00B	00B	ZPA01	MYCOB1	J080484	MYCOB1
SAP0299	MYCOB1	88C	SNAP	ZPA01	MYCOB1	J080484	MYCOB1

Analysebericht

Zusammenfassung  
der  
Entwicklungsdatei

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# Integration des File Managers

- Erlaubt das formatierte Editieren vieler Datentypen. Darunter sind:

- ▶ VSAM - KSDS, ESDS, RRDS, VRRDS
- ▶ QSAM – PDS, SDS

- Zur Verfügung stehen unterschiedliche Betrachtungsmöglichkeiten zum formatierten Bearbeiten dieser Daten:

- Tabelle
- Einzelansicht

- Ansehen und Ändern von VSAM-Daten ist ohne Verlassen der Entwicklungsumgebung möglich!

- Voraussetzung: IBM File Manager auf dem Mainframe

```
Process Options Help
Edit SKD0NCE.FMI.DATA (DATA) Rec 0 of 48
Command ==> Scroll PAGE
Col 1 Insert length 80 Format CHAR
-----1-----2-----3-----4-----5-----6-----7-----
000000 **** Top of data ****
```

Template Associated: SKD0NCE.FMI.TEMPLATE(CRA390) HEX On

Name	Employee Number	Age	Salary	Month
Grant Smith	771235	7	5000	6
Andrew Apple	664553	7	8500	30
Graham Prescott	558328	4	8000	7
15 records excluded				
Bill Somers	441883	6	8000	5
24 records not selected				
2 records suppressed				
Ted Dexter	332752	6	0250	14

Single Mode  
Record 4 of 10, Top Line is 1 of 2

Field	Data
Name	Bill Somers
Employee Num...	441883
Age	6
Salary	8000
Month	5

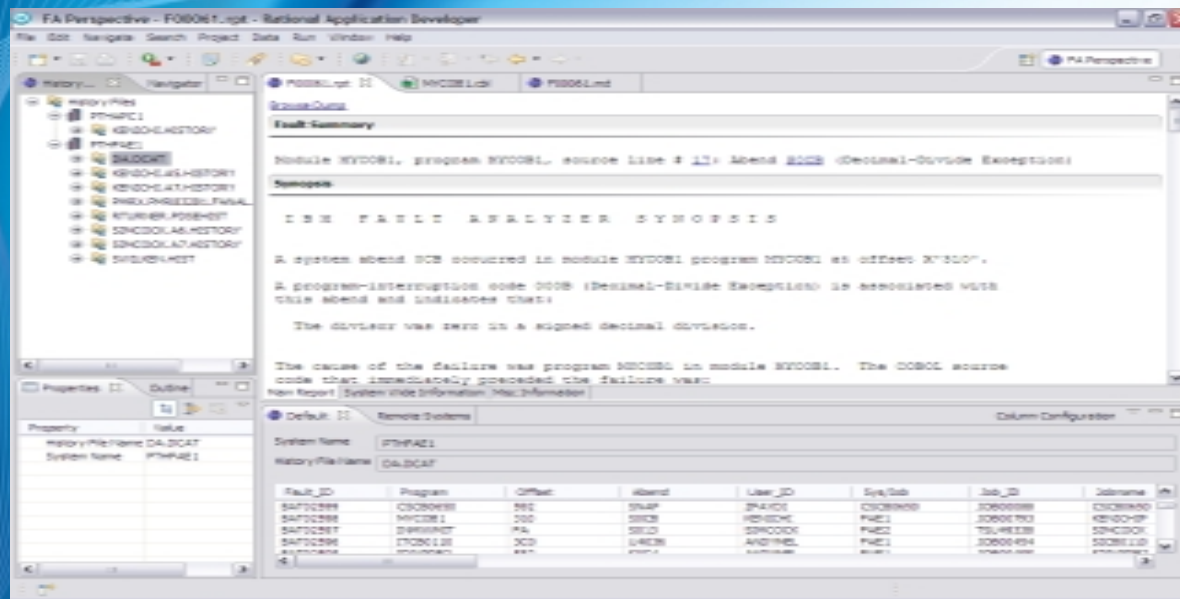
Single Mode allows you to edit a particular record that is selected from the Table above. You can also move up and down records in the Table by selecting each arrow button to the right.

Table / Single Character

# Integration des Fault Analyzers

- Bietet die Möglichkeit, einen Abbruch-Analyse-Bericht, welcher zum Abbruchzeitpunkt eines Programmes erstellt wurde, anzusehen.
- Unterstützte Umgebungen: COBOL, PL/1, Assembler, C/C++, Java, CICS, MQ, IMS und DB2.
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Liste aller  
bisherigen  
Abbrüche



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Below the summary is a table of fault records:

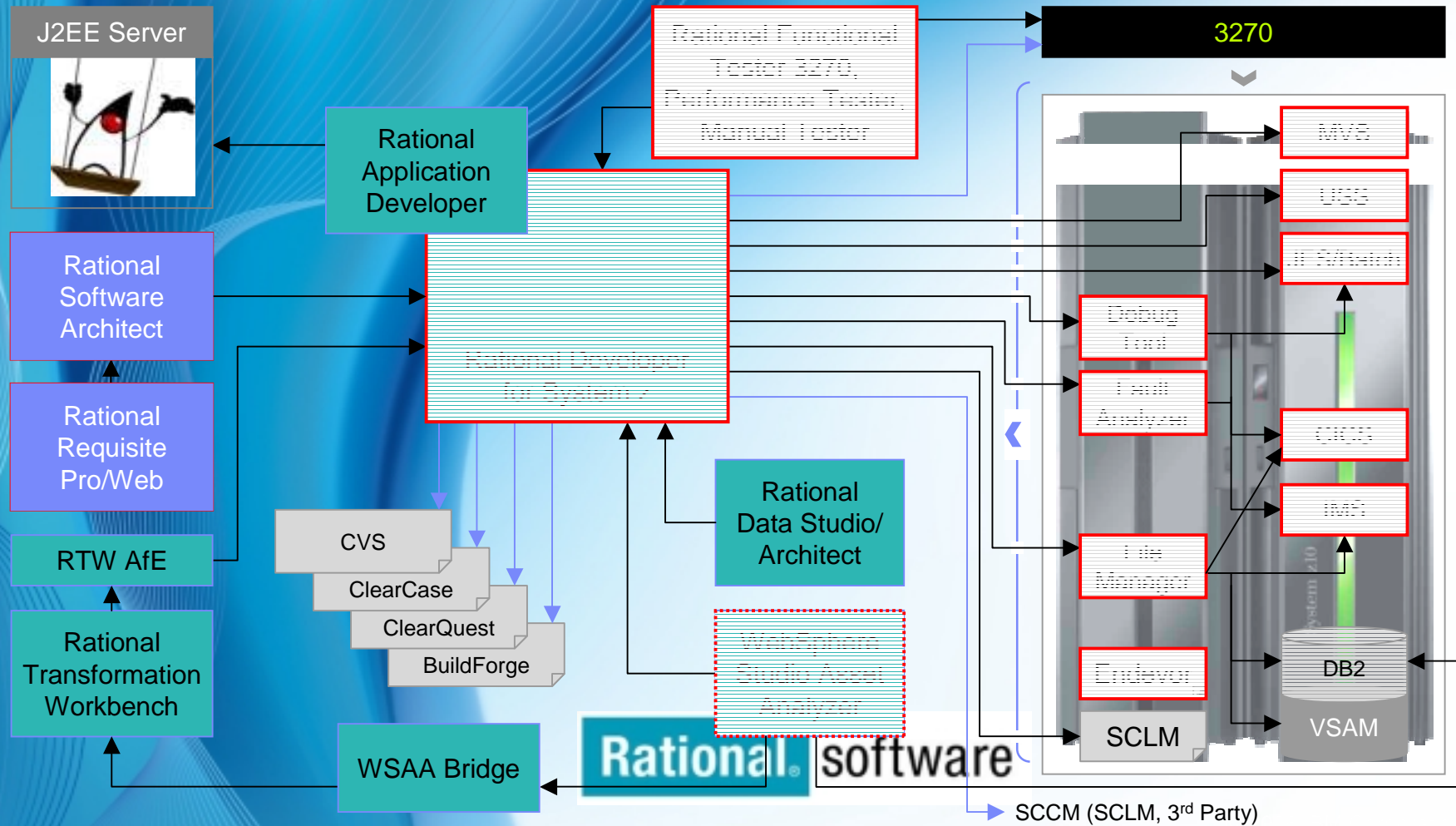
Fault_ID	Program	Offset	Abend	User_ID	Sys/Job	Job_ID	Jobname
SAP0288	CSOBN01	001	SNAP	ZPA01	CSOBN01	J060008	CSOBN01
SAP0289	MYCOB1	000	00B	00000	PL01	J0601703	MYCOB1
SAP0297	PIRPH01	04	000	00000	PL01	T060118	PIRPH01
SAP0298	MYCOB1	000	00B	AND01	PL01	J060484	MYCOB1
SAP0299	MYCOB1	001	00B	00000	PL01	J060484	MYCOB1

Analysebericht

Zusammenfassung  
der  
Entwicklungsdatei

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# RDz Integrationsmöglichkeiten für RDz



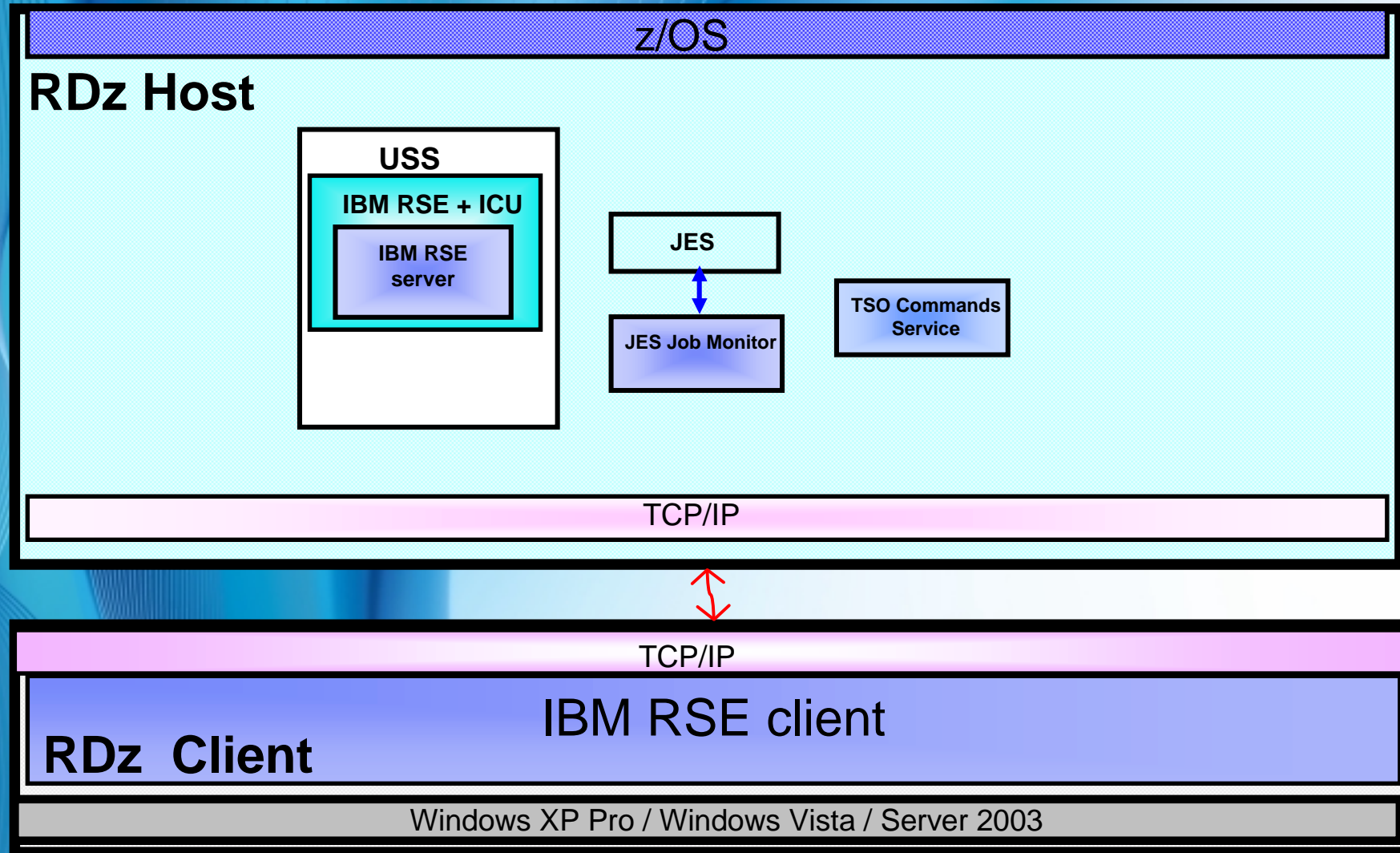


# RDz Host Architecture

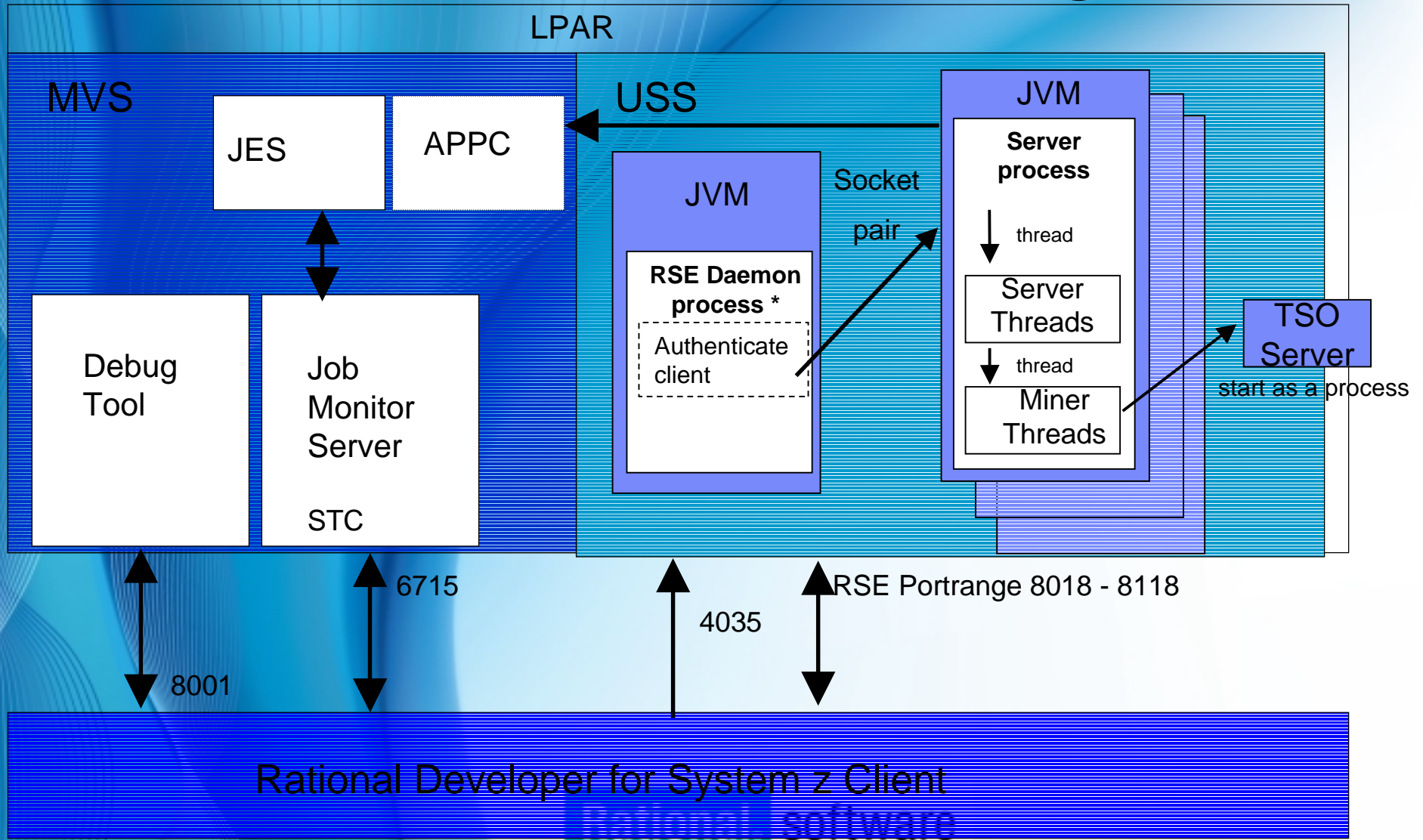
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# RSE Client - Host Architecture pre RDz 7.5

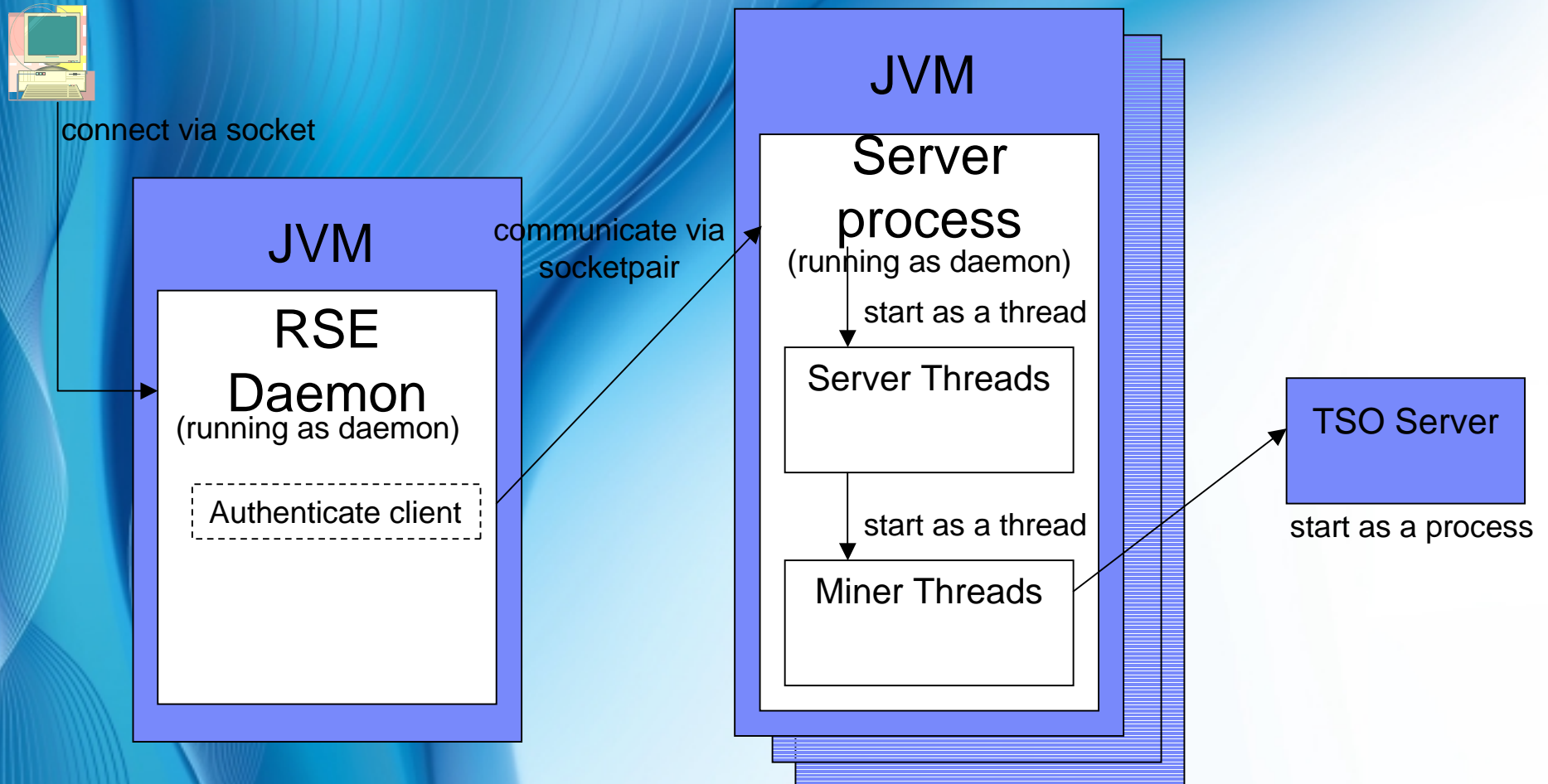


# RSE Client - Host Architecture starting RDz 7.5



RSE – Remote System Explorer

# RDz 7.5 Host startup flow



- A single RSE Daemon is running and provides daemon socket for each client
- Multiple Server processes are running as a daemon and accommodate clients until its heap usage ratio will reach some threshold.

## Details of the new server model

- **RSE Daemon runs in a JVM and starts the Server processes**
  - There will be one daemon per installation
  - Responsible for doing the load balancing and routing requests to various server processes
  - System admin can specify the number of server processes to start by default
  - Daemon starts a new server process if needed
- **Each server process runs in a JVM and handles a set of client connections**
  - Number of client connections each server process handles depends on the maximum heap storage size
  - Heap Storage size is something the system admin can specify during the host customization



# Memory Comparison between old and new architecture

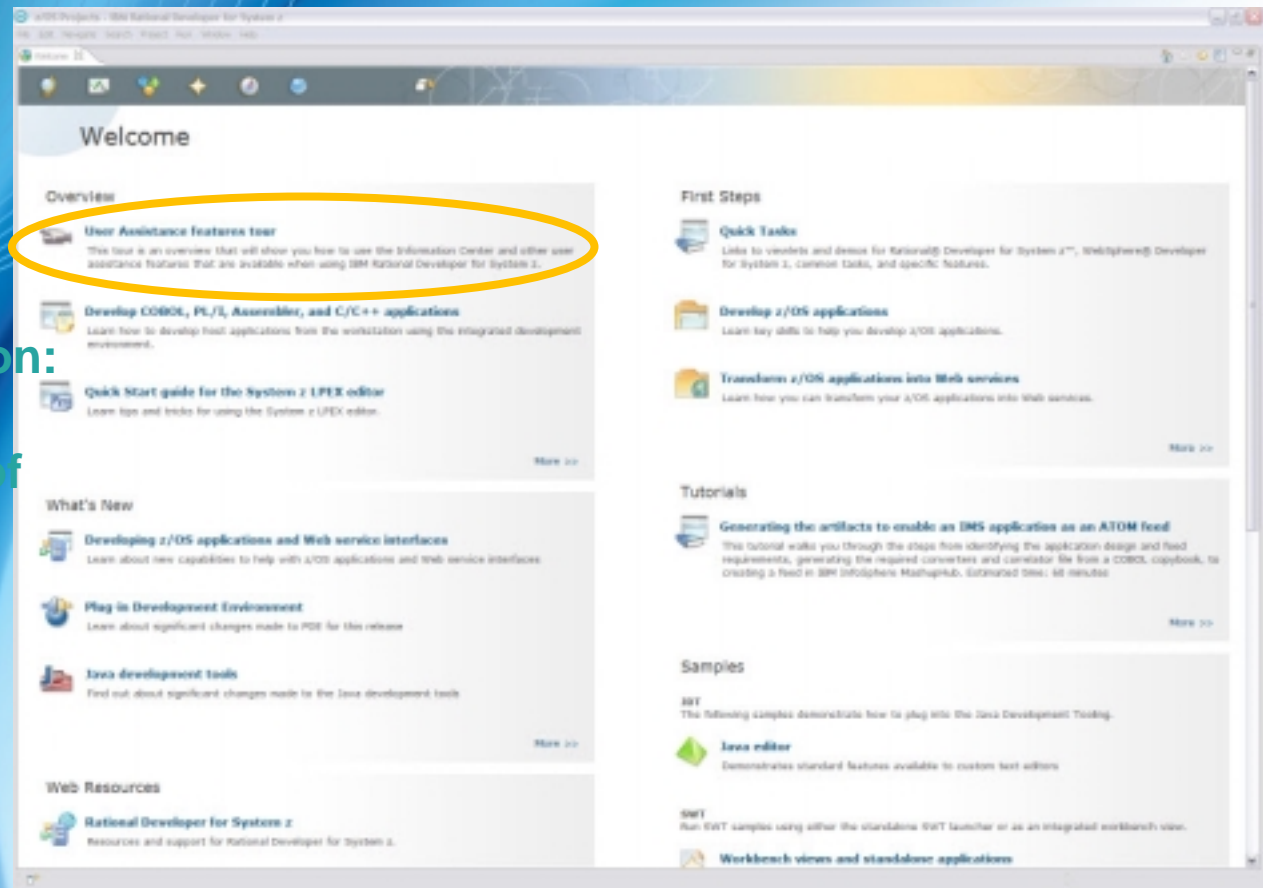
- **Consider an example of a shop having 1000 users using RDz**
  - Using the old server architecture, memory consumption is:  
 $1000 * 37.8 \text{ MB} = 37800 \text{ MB}$
  - Using the new server architecture
    - Assuming 128 MB heap size for each server processes, every user consumes 1.3 MB
    - TCP/IP performance optimization dictates controlling the # of threads per address space
      - RDz 7.5 default = 50 threads/address space
    - Number of user processes needed for 1000 users =  $1000/50 = \sim 20$
    - Memory consumption by all server processes is:  
 $20 * (128 \text{ MB} + 22 \text{ MB (JVM overhead)}) = 3000 \text{ MB}$
    - Memory consumption by 1000 TSO server processes is:  
 $1000 * 2.3 \text{ MB} = 2300 \text{ MB}$
    - Memory consumption =  $35 \text{ MB} + 3000 \text{ MB} + 2300 \text{ MB} = 5335 \text{ MB (total)}$

# RDz User Assistance Innovations and Impact

- **Welcome**

- Get up and running quickly with prioritized getting started and out of the box content

- New multimedia addition: User Assistance Tour provides an overview of RD/z user assistance features



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**Rational.** Rational Developer for System z;  
Accessing the Information Center and User Assistance Features

Developed by Kim Maselli and Dana Wilson  
Copyright 2008, Licensed Materials - Property of IBM Corp.

This is a self-running demonstration. Controls are available at the bottom of the screen.

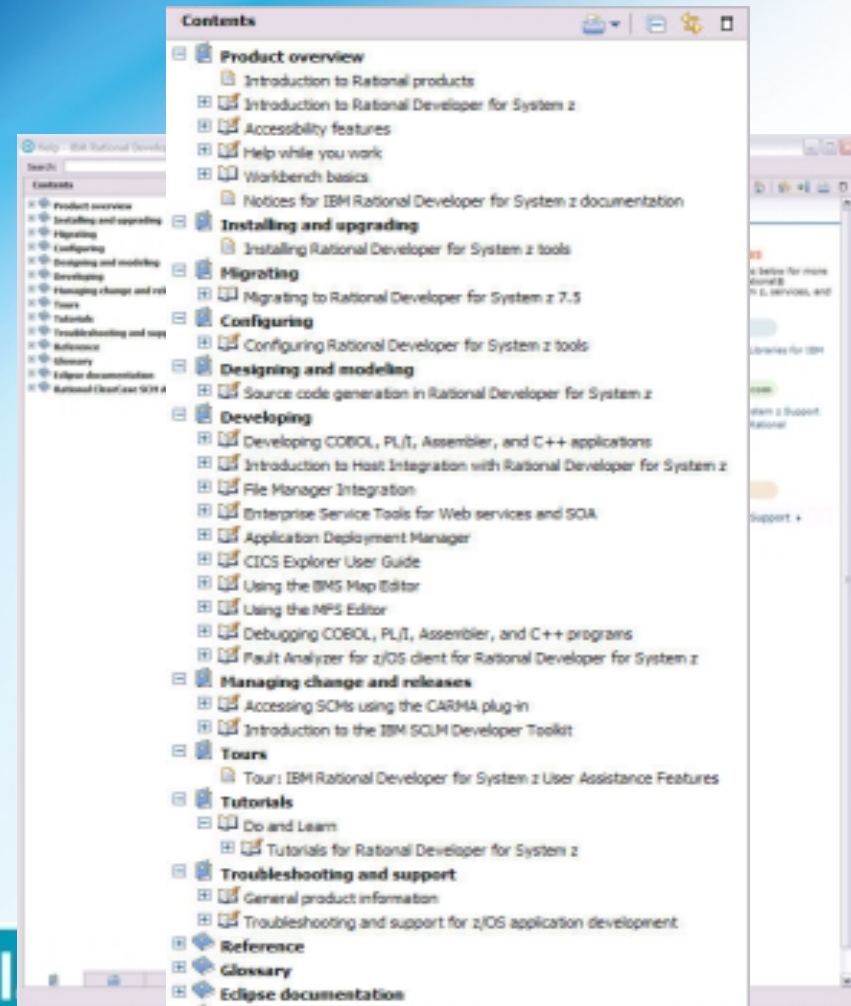




# RDz User Assistance Innovations and Impact

- **New Welcome Experience**
- **New InfoCenter common navigation**
  - Consistent high-level topics across Rational product InfoCenters
  - When multiple Rational products are installed together, InfoCenters merge under the common topics

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# What's (potentially) new for RDz (2009)

- RTCz Integration
- CICS runtime related enhancements
- IMS runtime related enhancements
- COBOL Editor Enhancements
- Integration
  - Clear Case integration
  - Data Power Integration
  - RAA Integration
- Various 'customer' requirements coming in?
  - APIs - GA
  - Others
- Cobol data diagram

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# RDz demos and forum

- **Demos on Education Assistant**

- Learn the features of RDz

- RDz:

- <http://publib.boulder.ibm.com/infocenter/ieduasst/rtnv1r0/index.jsp>

- V7.5 demos coming soon!

- CICS TS:

- <http://publib.boulder.ibm.com/infocenter/ieduasst/stgv1r0/index.jsp>

- **Online community**

- Q&A, best practices, news, and discussions

- [http://www.ibm.com/developerworks/forums/dw\\_forum.jsp?forum=1131](http://www.ibm.com/developerworks/forums/dw_forum.jsp?forum=1131)

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# Some RDz Themes for 2008 - continued

- **Tooling performance**
  - Continued decrease in resource usage on client and host
  - Faster startup and editor load times
  
- **Web Services**
  - Greater support for IMS
  - Greater support for PL/I
  - Ease-of-use enhancements
  
- **Miscellaneous enhancements**
  - Project structure improvements
  - API hardening
  - BMS map editor
  - Menu Manager functions/ease-of-use
  - LPEX enhancements

**Rational** software

# Maximize application performance with the latest compilers

## *IBM Compilers on System z*

### *New and enhanced products and resources*

#### ▶ z/OS XL C/C++ V1R10 (Available now)

- ▶ Exploit the new z10 processor including the Decimal Floating Point module.
- ▶ Middleware (DB2, CICS, IMS) integration
- ▶ METAL C Compiler option

#### ▶ XL C/C++ for z/VM V1.2 (Available now)

- ▶ C/C++ development for z/VM programmers
- ▶ Supports the C99 programming standard
- ▶ New optimization levels to improve performance

#### ▶ Enterprise COBOL for z/OS, V4.1 (Available now)

- ▶ Supports high speed XML parsing and generation.
- ▶ COBOL XML parsing supports offloading to zAAP specialty engine
- ▶ Enhanced DB2 support through new SQL data types and syntax
- ▶ Integrated CICS translator and provide access to IBM IMS™ system
- ▶ Supports integration of COBOL and web-based business processes in Web services, XML, and Java™ applications

#### ▶ Enterprise PL/I for z/OS, V3.8 (Coming Soon in 4Q 2008)

- ▶ Exploit the new z10 processor including the Decimal Floating Point module
- ▶ PL/I XML parsing can be offloaded to zAAP specialty engine
- ▶ Powerful set of functions for the UTF-sensitive processing
- ▶ Support integration of PL/I and web-based business processes in Web services, XML, and Java™ applications
- ▶ Access to IBM DB2®, IBM CICS®, and IBM IMS™ systems

\* Exploitation depends on language

#### ▶ **Maximize System z10 Performance \***

Exploitation new z10 instructions and architecture. Exploit new DFP instructions.

#### ▶ **New Metal C support for System z**

Provides ability to generate code without Language Environment run-time dependencies and supports HLASM embedded source within C statements.

#### ▶ **Support latest IBM XML parsing technology**

Enables offloading of COBOL and PL/I XML parsing to zAAP specialty engine

#### ▶ **Support Application Modernization**

Legacy COBOL and PL/I can now be integrated to web-based business processes in XML, Web services, and Java applications.

Rational software

# RDz References



HypoVereinsbank



Danske Bank

kreditwerk

Rational. software





***GENERATION z. GENERATION ZUKUNFT.***