



IBM Software Group

PDM and SEU to RSE and LPEX Transition

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WebSphere software



@business on demand software

Agenda

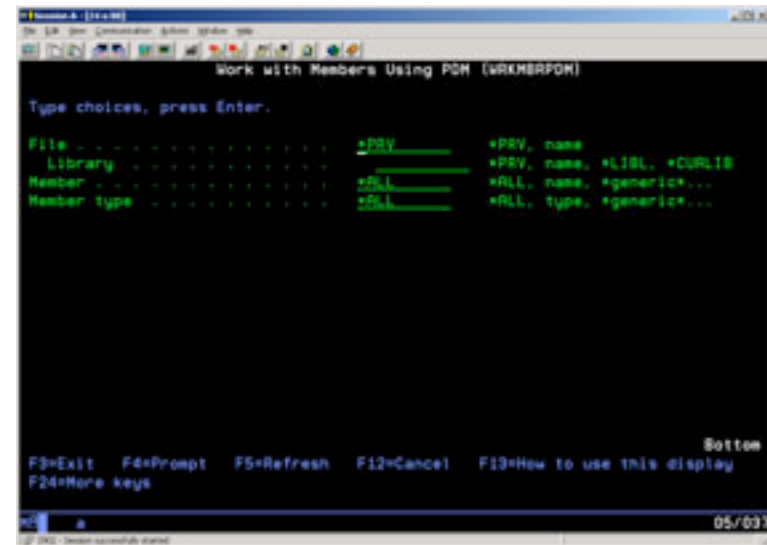
- ♣ PDM Beginnings & How to start in RSE
- ♣ Table View
- ♣ Running commands
- ♣ Compiling
- ♣ Searching iSeries files
- ♣ Basic editing with SEU & LPEX
- ♣ LPEX Syntax checkers, verifiers and outline views
- ♣ Other LPEX tricks & features
- ♣ Comparing source

- ♣ Questions



Starting with PDM

- ♣ There are two ways to start PDM:
 - ▶ STRPDM, or
 - ▶ WRKxxxPDM commands
- ♣ Only the last entries are remembered
- ♣ Work with multiple programs, libraries etc, you might have more than one emulator running so you can work with all your items at the same time



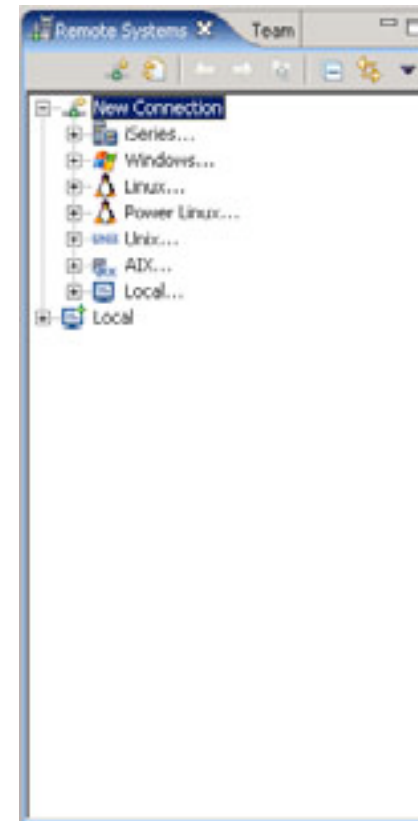
```
Work with Members Using PDM (WRKMERPDM)
Type choices, press Enter.
File ..... +PRV ..... +PRV, name
Library ..... +PRV, name, +LIBL, +CURLIB
Member ..... +DLI ..... +ALL, name, +generic*...
Member type ..... +DLI ..... +ALL, type, +generic*...

Bottom
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys

05/03/07
```

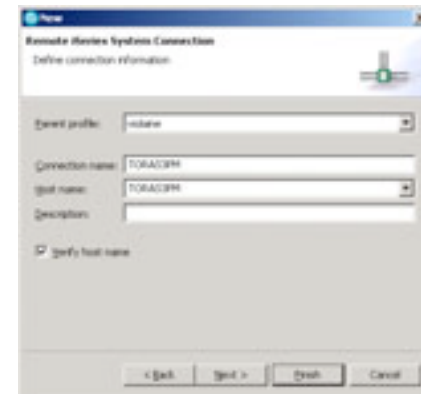
How to begin in RSE

- ♣ When you first start WDSC workbench, you will be prompted for a workspace. This is where all the definitions of your RSE preferences and workbench configuration information and files will reside.
- ♣ Once the workbench is started, ensure that you are in the Remote System Explorer Perspective
 - ▶ Window->Open Perspective->Remote System Explorer
- ♣ Next you will need a connection...



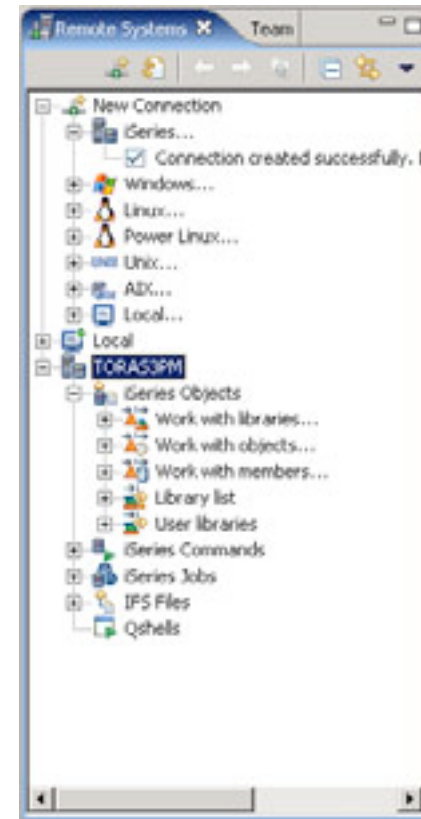
Creating a connection

- ♣ Expand the iSeries icon in the New Connection Filter
- ♣ Leave the default profile name
- ♣ Specify host name and connection name
- ♣ Ensure Verify connection is selected
- ♣ Push Finish



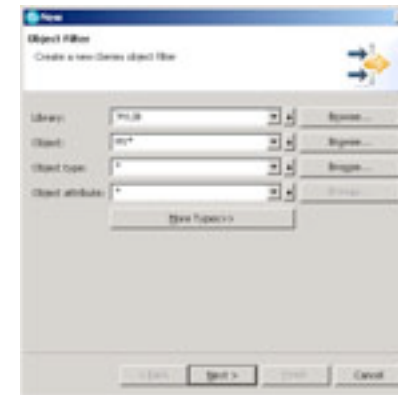
Subsystems

- ♣ Expanding a connection lists the subsystems within that connection:
 - ▶ Objects: used to access libraries, objects and members
 - ▶ Commands: predefined commands you can use to run against remote objects. You can also define command sets. Results are logged in the Commands log view
 - ▶ Jobs: display various jobs, subset by job attributes, and perform job operations
 - ▶ IFS Files: explore IFS file and folder structure and perform actions on them.
 - ▶ Qshells: lists the active running qshells for the connection



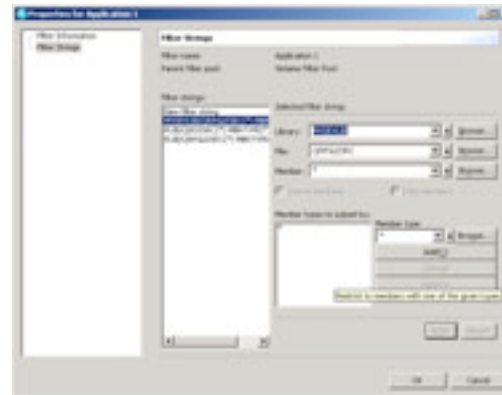
Filters

- ❖ Filters are named lists of items that you can specify, reuse and share.
- ❖ Expanding the Work with... items opens the appropriate filter creation dialog
- ❖ Specify the list of libraries, objects, or members you want RSE to retrieve.
- ❖ Give the filter a name
- ❖ Choose whether or not you want the filter to be only for the specified connection
- ❖ Choose whether or not you would like to share the filter with others



Filter Strings

- ♣ When first created, a filter is created with only one filter string
- ♣ By modifying the properties of a filter, you can add additional filter strings
 - ▶ In PDM you could only list the members in one source physical file in one library.
 - ▶ In RSE you can use filters and filter strings to list members in different files and even in different libraries.
- ♣ In PDM only the last WRKxxxPDM setting is remembered. In RSE all filters are persisted between sessions.



RSE Tree View

- ♣ Filters appear in the tree view
- ♣ Drill down like File Explorer in Windows
- ♣ Drag & drop, copy, paste, delete rename actions
- ♣ Actions appear in popup (right-click)

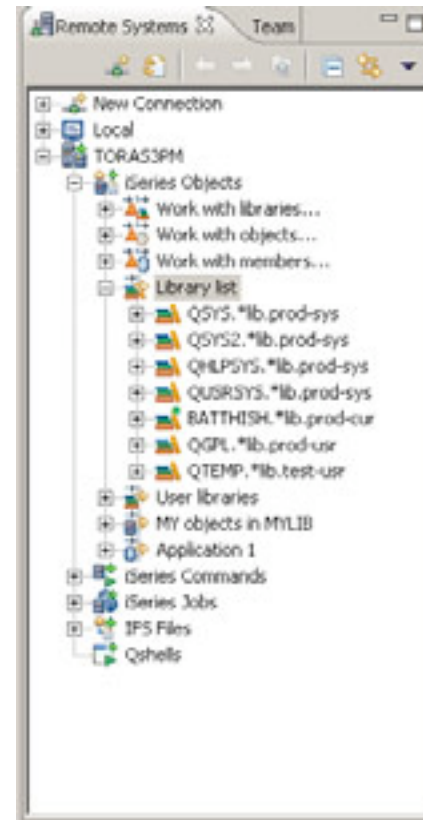


Table View

- ♣ More comfortable interface for PDM users
- ♣ Launch table view from RSE Tree view by using the **Show in Table View** action
- ♣ Use the Work with menu option to access list same way as you would using the WRKxxxPDM commands
- ♣ Work with menu keeps a small list of previously displayed lists specifications

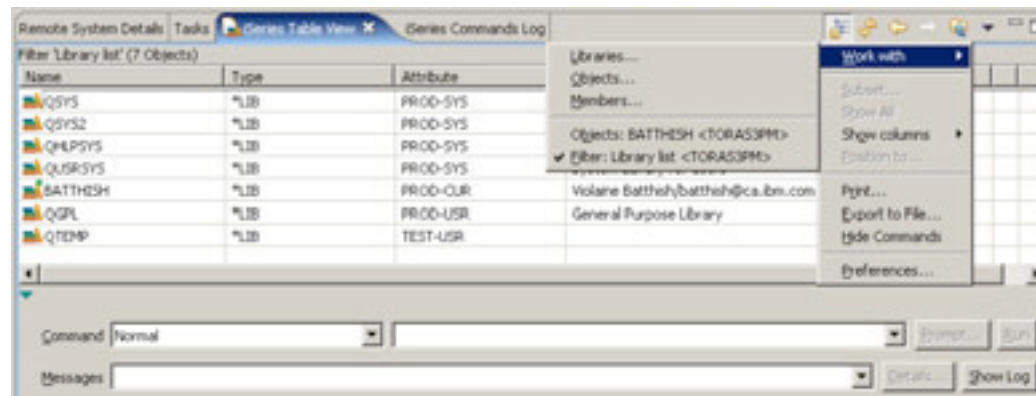
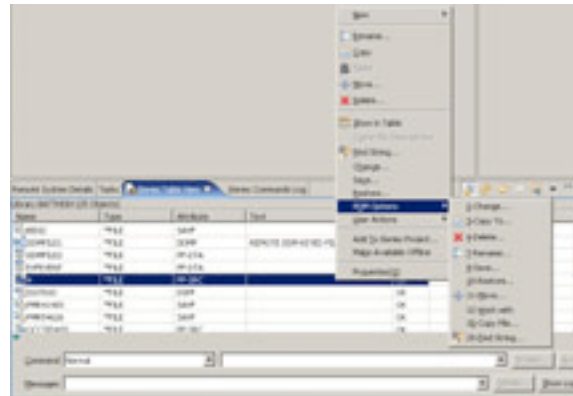


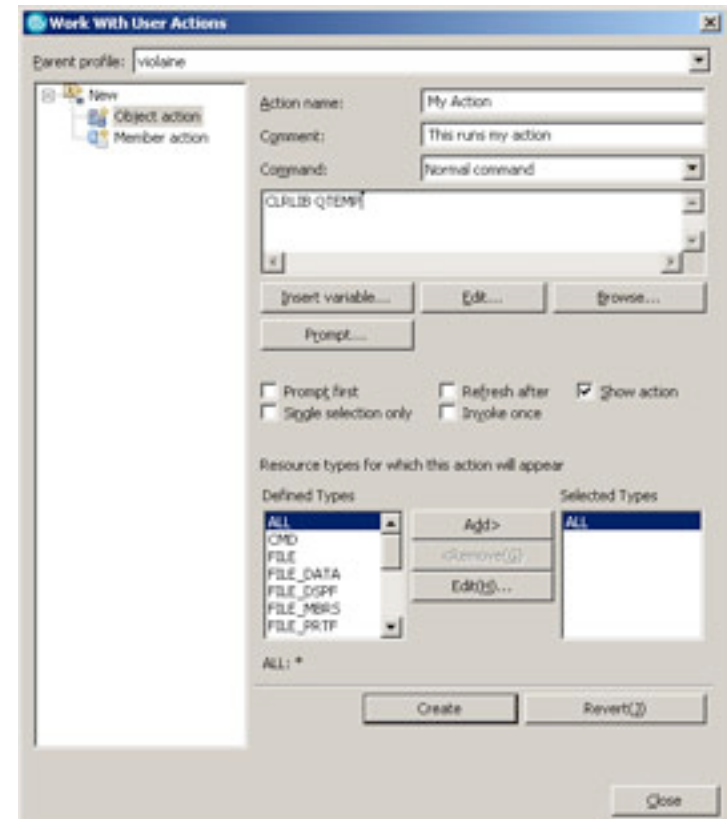
Table View Actions

- ♣ Use the Show in Table action from inside Table View to go from a list of libraries to a list of objects etc.
- ♣ A list of familiar PDM Options
- ♣ Use the User actions menu to create and add your own actions
- ♣ Double click on member to edit it

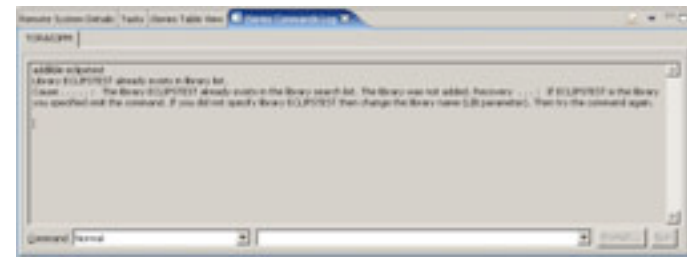
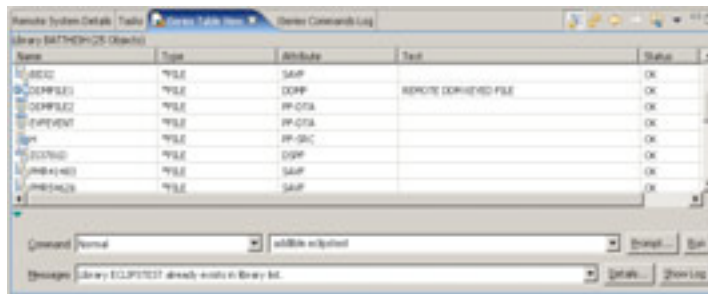


User Actions (F16)

- ♣ Define your own action
- ♣ Prompt the command to define and also optionally when executing
- ♣ Use the same substitution variables as PDM and several more
- ♣ Specify if the action should refresh the views
- ♣ Specify when action applies when a single object is selected
- ♣ Specify Invoke once to group the items into one command execution
- ♣ Refine them to apply to the appropriate types (add your own)



Command Line

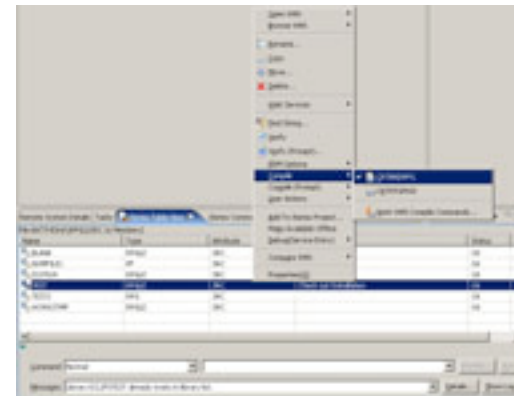


- ♣ Use the command line to run any command
- ♣ Specify additional parameters for PDM Options
- ♣ Results displayed in the messages field
- ♣ Use familiar keys:
 - ▶ F9: repeat last command
 - ▶ F4: prompt command
- ♣ Use the Show Log button to view iSeries commands Log view.
- ♣ Use the STRRSESVR command to handle interactive commands
- ♣ Batch option uses the SBMJOB command



Compiling (option 14,15)

- ♣ Compile actions are grouped in two menus (with and without prompting)
- ♣ Users can add their own commands to the compile commands
- ♣ Compile actions are different from other actions:
 - ▶ Results of the command itself appear in the Command Log
 - ▶ Errors appear in the Error List view
- ♣ Additional command execution preferences can be found in the Window->Preferences->Remote Systems->iSeries->Command Execution preference page (F18)

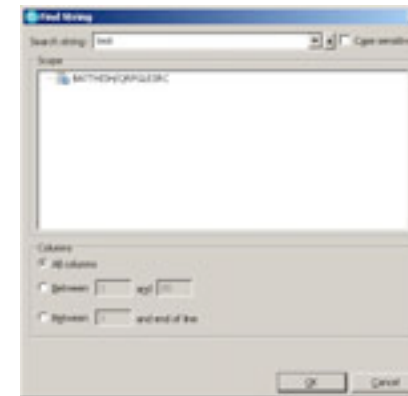


ID	Message	Sev...	Line	Location	Correction
INF0000	Compilation stopped. Severity 20 errors found in program.	00	0	BATTHOYCPPLGLESICTE...	TORACPM
INF0007	Form Type entry for main procedure not valid or out of seq...	00	11	BATTHOYCPPLGLESICTE...	TORACPM
INF0008	Overflow indicator "DACA" is assigned to PREDEFER No GDS...	00	2	BATTHOYCPPLGLESICTE...	TORACPM
INF0009	The name or indicator "BBAAT" is not referenced.	00	4	BATTHOYCPPLGLESICTE...	TORACPM
INF0009	The name or indicator "D" is not referenced.	00	5	BATTHOYCPPLGLESICTE...	TORACPM



Searching (Option 25)

- ♣ Two ways to search:
 - ▶ Search->iSeries menu
 - ▶ Find String... action
- ♣ Search filters, not just libraries, files, members. This means that you can create very flexible search patterns.
- ♣ Results appear in the Remote Search view.
- ♣ Double click on a result to open the member in Remote Systems LPEX Editor and position to the match
- ♣ The popup menu for the members in the list has similar actions to the table view (rename, move, etc)
- ♣ View has a history of searches



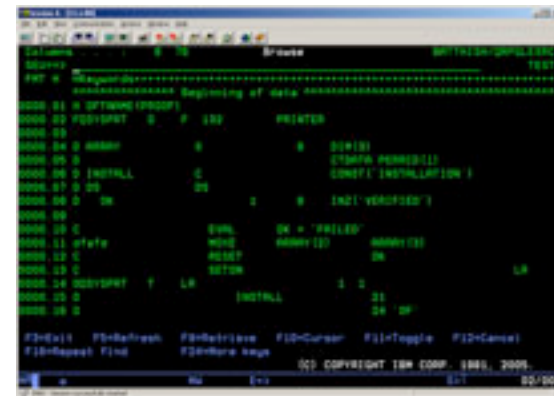
Launching Remote Systems LPEX Editor

- ♣ From RSE, or Table view:
 - ▶ Double-click
 - ▶ Open (option 2), or
 - ▶ Browse (option 5) using menus
- ♣ Tokenization: the colouring of language tokens
- ♣ Prefix area: can use all the SEU commands
- ♣ Show date: use the context menu
- ♣ Outline view: shows the outline of your program. Used to navigate within your program



```

Line ID      Column 1      Replace 2      changed
-----
000001      S SPTNARS (PROOF)
000002      FQSTSPRT      F 152        PRINTER
000003
000004      S ARRAT      S          S 00151
000005      S          S          S 00151
000006      S INSTALL      C          S 00151
000007      S DS          S          S 00151
000008      S OK          S          S 00151
000009
000010      C          S 00151      OK = 'FAILED'
000011
000012      S lines excluded.
000013
000014      O          S 00151      24 'TOP'
000015      O          S 00151      28 'TRF'
000016      O          S 00151      34 'FILE 300'
000017      O          S 00151      40 'COMPILES'
000018      O          S 00151      + 1 'IS'
000019      O          S 00151      + 1
000020      **
000021      COMPILER
000022      TIME
000023      ARRAT
  
```



```

Line ID      Column 1      Replace 2      changed
-----
000001      S SPTNARS (PROOF)
000002      FQSTSPRT      F 152        PRINTER
000003
000004      S ARRAT      S          S 00151
000005      S          S          S 00151
000006      S INSTALL      C          S 00151
000007      S DS          S          S 00151
000008      S OK          S          S 00151
000009
000010      C          S 00151      OK = 'FAILED'
000011
000012      S lines excluded.
000013
000014      O          S 00151      24 'TOP'
000015      O          S 00151      28 'TRF'
000016      O          S 00151      34 'FILE 300'
000017      O          S 00151      40 'COMPILES'
000018      O          S 00151      + 1 'IS'
000019      O          S 00151      + 1
000020      **
000021      COMPILER
000022      TIME
000023      ARRAT
  
```


Remote Systems LPEX Editor vs SEU Basics

♣ SEU

- ▶ Full screen mode when browsing (F13)
- ▶ Split screen and browse

- ▶ Date area: at the right

- ▶ Print: STRSEU and Option 6

♣ Remote Systems LPEX Editor

- ▶ Full screen mode for both edit and browse: double click on editor tab
- ▶ Split screen for edit and browse: there are two options
 - Drag and drop the editor tab to view two different members
 - Use editor popup or Ctrl+2 to split the current LPEX view to work with different parts of the same member (up to 5 splits)
- ▶ Date appears next to sequence numbers. Can be enabled by a preference or by popup
- ▶ Print: from File Menu or Ctrl+P



Split Screens And Date Area

The screenshot displays the IBM Rational Developer for System z interface with three main windows:

- TEST.RPGLE 13**: A split-screen editor showing two panels of code. The left panel (Line 3, Column 16) contains code for fields like DFTNAME, PQSYSPRT, ARRAY, INSTALL, and DS. The right panel (Line 19, Column 20) contains code for fields like NO1NO2NO3F, and operations like COMPILER and TIME.
- DOMFILE1.PF 23**: A single editor window showing a table of field definitions with a date area at the top.

Line	Date	Operation	Name	Length	TDp	Functions
000100	05/12/20	R	FMT1			
000101	05/12/20		FIELD1	10		
000102	05/12/20		FIELD2	10		
000103	05/12/20		FIELD3	10		
000104	05/12/20		FIELD4	10		
000105	05/12/20	K	FIELD			
- Outline X**: A tree view on the right showing the project structure for DOMFILE1.PF, including FMT1 and its associated fields (FIELD1 10, FIELD2 10, FIELD3 10, FIELD4 10, FIELD).



Syntax Checking, Help & Prompting

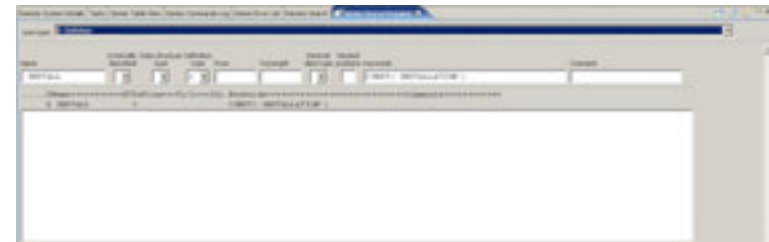
- ♣ RSE, like SEU has auto-syntax checking
 - ▶ See all the errors, not just the first one
- ♣ Help (F1) is available for the errors, but also for the source!
 - ▶ Context sensitive help directly linked to the reference manuals
 - ▶ Manuals quickly accessible from the Source menu
- ♣ Prompting (F4) appears either in the iSeries Source Prompter view or (for CL) in a dialog. F1 context sensitive help available from the prompt view or the CL prompter.



```

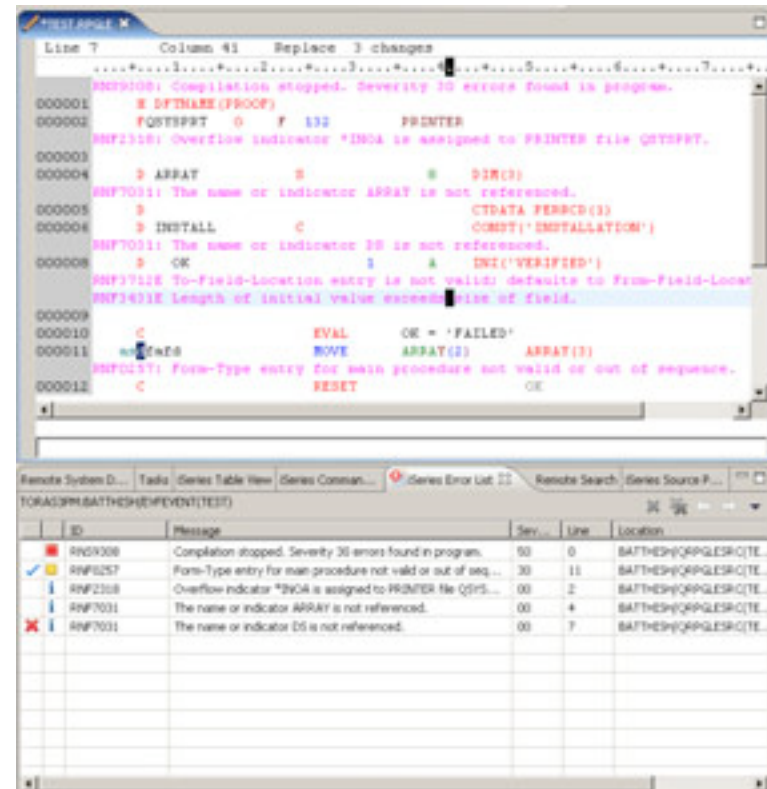
000004  D  APPAT      E      DIM(3)
000005  D           C  DATA PERIOD(1)
000006  D  INSTALL    C      CONST('INSTALLATION')
000007  D  DD        DD
000008  D  CE        I      DMI('VERIFIED')
RMF5712E To-Field-Location entry is not valid; defaults to From-F.
RMF5432E length of initial value exceeds size of field.
000009
000010  C           EVAL      CE = 'FAILED'
000011  *add       MOVE      APPAT(2)  APPAT(3)
RMF5702E Entry is not blank for a subfield definition; defaults to
RMF5302E The Data-Type entry is not valid; defaults to blank.
RMF5708E From-Field-Location entry is not valid; defaults to 1.
RMF5712E To-Field-Location entry is not valid; defaults to From-F.
RMF5412E The Decimal-Positions entry is not valid; defaults to 6.
RMF5302E Keyword name is not valid; the keyword is ignored.

```



Verifiers & Error List

- ♣ COBOL, RPG & DDS have a program verifier (Ctrl+Shift+V)
- ♣ Syntax & semantic checking (no code generation)
- ♣ Verifiers generate the same error messages as the compiler
- ♣ Use Source->Verify (Prompt) to specify additional options or modify default verify preferences.
- ♣ Errors appear in the Error List View as for compile.
 - ▶ Insert errors into source
 - ▶ F1 help for errors
 - ▶ Filter errors
 - ▶ Use as a TODO list
 - ▶ In editor,
 - use Ctrl+F5 to Refresh (removes all errors, clears any excluded lines), or
 - Source->Remove messages to remove errors



The screenshot shows a COBOL program in an IDE with several error messages. The program code is as follows:

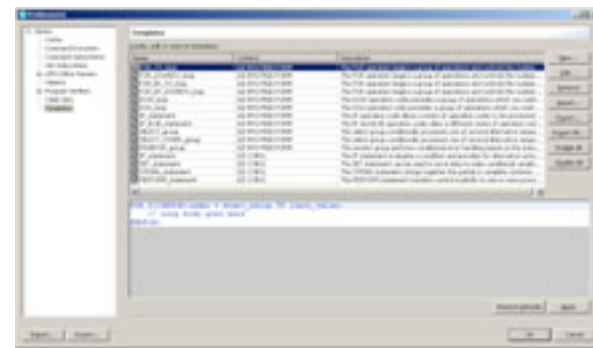
```

000001  * DFTNAME(PSOOP)
000002  POSTSPRT  O  F 132  PRINTER
000003
000004  * ARRAT  D  DIR(3)
000005  * INSTALL  C  CTDATA PERPCD(3)
000006  * OK  I  INI('VERIFIED')
000007  * EVAL  OK = 'FAILED'
000008  * MOVE  ARRAT(2)  ARRAT(3)
000009  * RESET  OK
  
```

The Error List view at the bottom shows the following errors:

ID	Message	Sev.	Line	Location
RNF000	Compilation stopped. Severity 30 errors found in program.	30	0	BATTHESHQPPGLESRC\TE...
RNF0257	Form-Type entry for main procedure not valid or out of seq...	30	11	BATTHESHQPPGLESRC\TE...
RNF2108	Overflow indicator *IN04 is assigned to PRINTER file QSRS...	00	2	BATTHESHQPPGLESRC\TE...
RNF7031	The name or indicator ARRAT is not referenced.	00	4	BATTHESHQPPGLESRC\TE...
RNF7031	The name or indicator DS is not referenced.	00	7	BATTHESHQPPGLESRC\TE...

Content assist and Templates

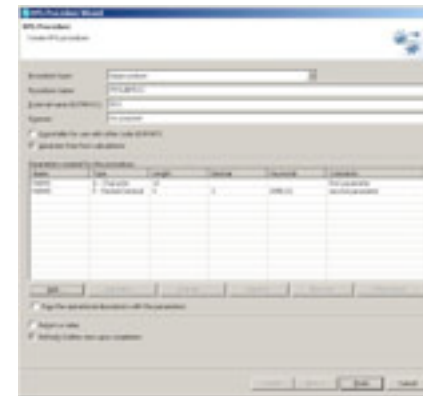


- ♣ Content assist (Ctrl+Space): propose, display and insert code completions at the cursor position
 - ▶ Can be used to provide context information
 - ▶ RPG: Refresh the outline view
- ♣ Templates: type the name of the template and press Ctrl+Space
 - ▶ Add your own templates



RPG Wizards

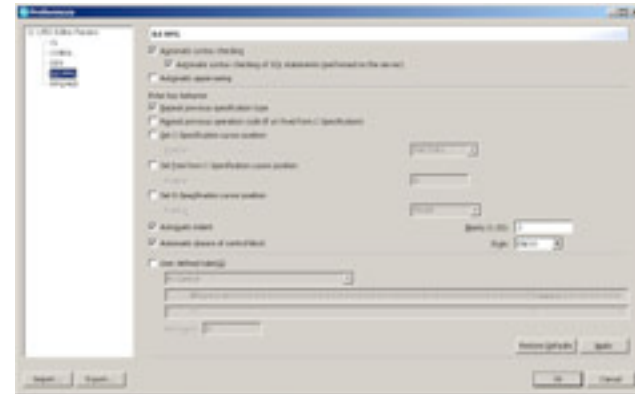
- ♣ Three RPG wizards available to facilitate programming:
 - ▶ D Specification Wizard
 - ▶ Procedure Wizard
 - ▶ Java Method Call Wizard
- ♣ Accessed via Source menu or by popup in source and selecting appropriate option in the New submenu
- ♣ Specify all needed information using a graphical interface and source is then generated



Additional LPEX parser options and features

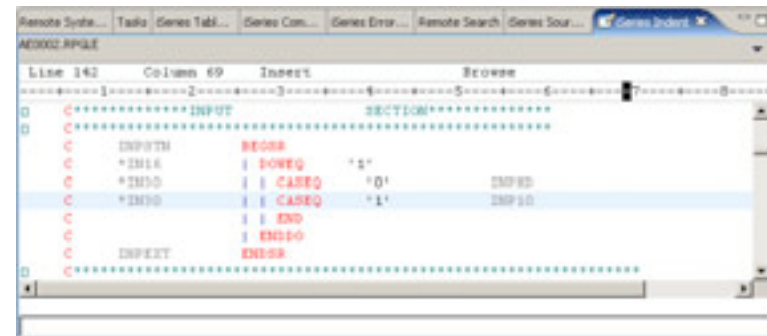
♣ Preferences

- ▶ Column sensitive editing
- ▶ Signatures
- ▶ Auto-uppercasing
- ▶ Auto-indent
- ▶ Auto-formatting
- ▶ Enter Key behaviour



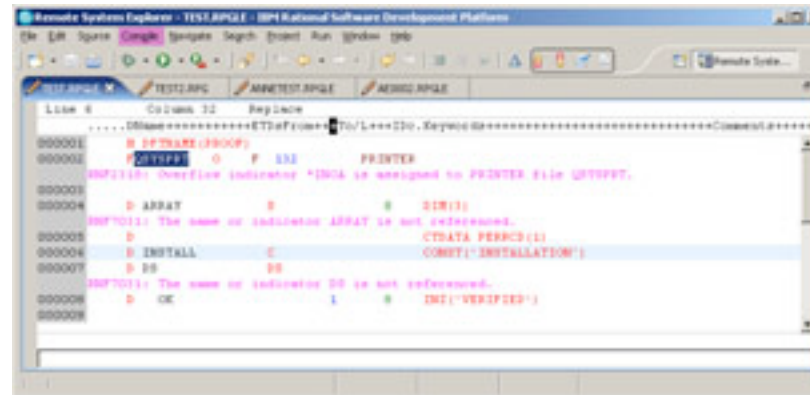
♣ Parser specific functions:

- ▶ Open copy member/book
- ▶ Convert to free form (RPG)
- ▶ Convert to ILE (RPG)
- ▶ Show indentation (RPG)



Compiling from Remote Systems LPEX

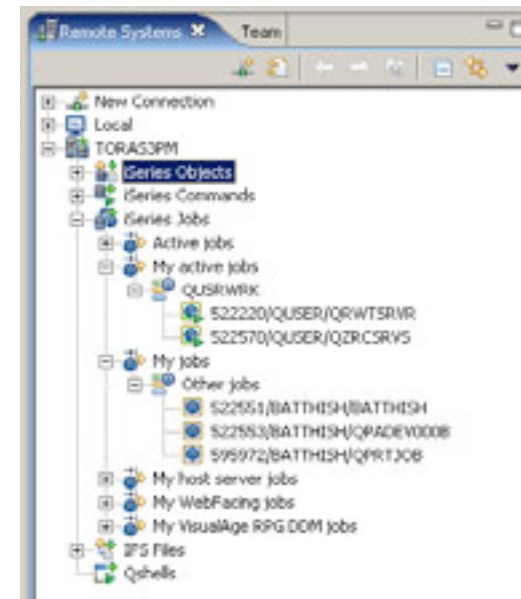
- ♣ Ctrl+Shift+C runs the default compile command
- ♣ Toolbar button for compiling
- ♣ Toolbar buttons for next (Ctrl+Shift+H) and previous error (Ctrl+Shift+Y)
- ♣ Compile menu is available to select
- ♣ Must be connected to compile



```
Remote System Explorer - TEST.RPGLE - IBM Rational Software Development Platform
File Edit Source Compile Search Project Run Window Help
Remote System Explorer
TEST.RPGLE TEST.RPGLE AMNTEST.RPGLE AERRTEST.RPGLE
Line # Column # Replace
.....
000001  D  DFTRM(DF00F)
000002  D  DFTRM(DF00F)  O  F  L31  PRINTER
INFO11: Overflow indicator *INCA is assigned to PRINTER file QSTPPT.
000003
000004  D  ARRAY  D  S  DIM(1)
INFO11: The name or indicator ARRAY is not referenced.
000005  D  CTDATA PERPC(1)
000006  D  INSTALL  C  COMPT('INSTALLATION')
000007  D  DS  DS
INFO11: The name or indicator DS is not referenced.
000008  D  DC  I  INT('VERIFIED')
```


Jobs

- ♣ Use the tree view to see jobs
- ♣ Add to the iSeries Job Status view by job, or by default using the preferences
- ♣ Access job information, properties using popup
- ♣ Perform other basic operations such as end, display job log
- ♣ Debug and add user actions too

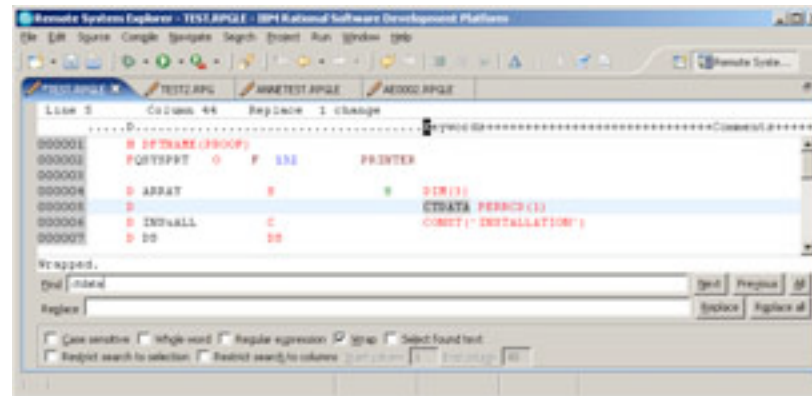
A screenshot of the 'Series Job Status' table. The table has columns for 'Date/Time Submitted', 'Job', 'Connection', 'Status', and 'Task'. One row is visible with the following data: '10-Apr-2006 10:55:06 AM', '522220/QUSER/QRWTSRVR', 'TORAS3PM', 'ACTIVE', and an empty task field. Below the table is a 'Refresh Interval: 30sec' button.

Date/Time Submitted	Job	Connection	Status	Task
10-Apr-2006 10:55:06 AM	522220/QUSER/QRWTSRVR	TORAS3PM	ACTIVE	



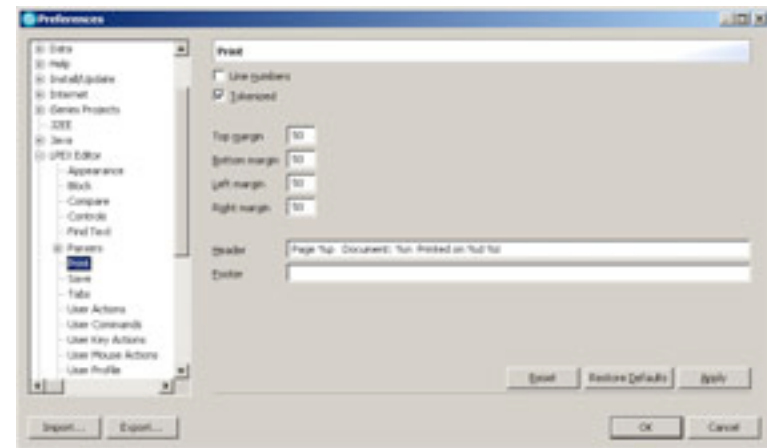
Search and Replace in LPEX

- ♣ Ctrl+F bring up the Find function in LPEX (ctrl
- ♣ Specify search string, and optionally replace string
- ♣ Specify Regular expression to allow you to search for a pattern:
 - ▶ **this|that** (search for **this** or **that**)
- ♣ Ensure column sensitive editing is on, if you don't want your text shifted
- ♣ Use Ctrl+N or Shift+F4 to find next match



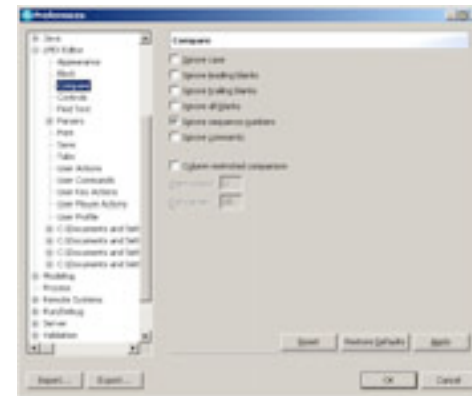
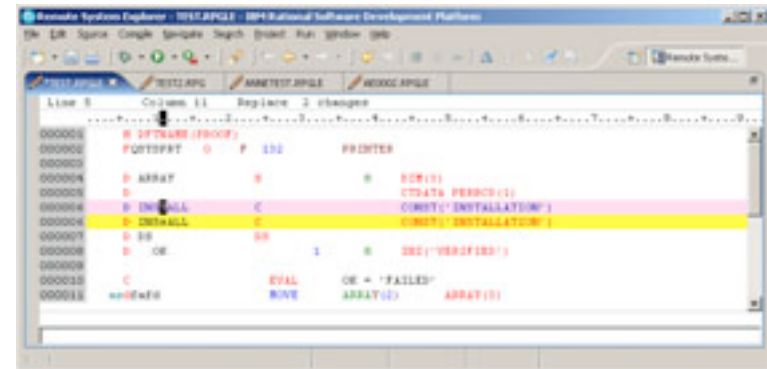
Printing (Option 6)

- ♣ Ctrl+P, print button, File->Print
- ♣ Various print options can be found in
 - ▶ Window->Preferences->LPEX Editor->Print
- ♣ Note that line numbers are not the same thing as sequence numbers
- ♣ Substitution variable allowed in the header & footer:
 - ▶ %p: page number
 - ▶ %n: source name, base file name, or document name
 - ▶ %f: full-path file name or document name
 - ▶ %d: date
 - ▶ %t: time



Compare (Option 54)

- ♣ Open member
 - ▶ Edit->Compare->Compare to file
 - ▶ Compare button in toolbar
- ♣ Source appears merged with differences flagged in different colours
- ♣ Only permitted to modify the source that is opened
- ♣ Ctrl+Shift+N for next mismatch
- ♣ Ctrl+Shift+P for previous mismatch
- ♣ Specify any preferences in LPEX:
 - ▶ Columns to include
 - ▶ Ignore sequence numbers
 - ▶ Ignore blanks
- ♣ Ctrl+Sift+R to refresh the compare
- ♣ Edit->Compare->Clear to end



Additional Useful LPEX Keys

Ctrl+Home	Go to the top
Ctrl+End	Go to the end
Ctrl+L	Go to line number
Alt+S	Split a line
Alt+J	Join a line
Alt+L	Select a line
Alt+R	Select a rectangle
Ctrl+Z	Undo
Ctrl+Y	Redo
Ctrl+S	Save
Ctrl+M	Match
Ctrl+Shift+M	Find match



Internet Resources

♣ Web page:

- ▶ www.ibm.com/software/awdtools/wdt400

♣ Newsgroup:

- ▶ news.software.ibm.com/ibm.software.websphere.studio400

♣ Mailing list:

- ▶ To subscribe, unsubscribe, or change list options, visit:
 - <http://lists.midrange.com/mailman/listinfo/wdsci-l>
- ▶ or email: WDSCI-L-request@midrange.com
- ▶ Before posting, please take a moment to review the archives at <http://archive.midrange.com/wdsci-l>

