Eclipse Tooling For RPG and COBOL Development

in WDSC

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WDS for iSeries

New World

New Servers

New Tools

ITSO iSeries Technical Forum
SP15

Disclaimer

Acknowledgement:

- This presentation is a collaborative effort of the IBM Toronto AS/400 Application Development presentation team, including work done by:
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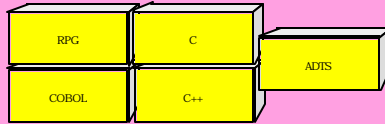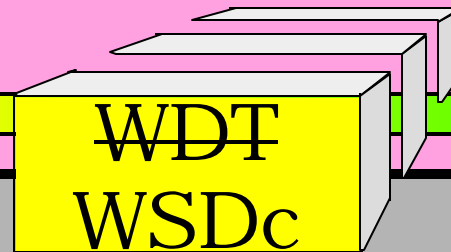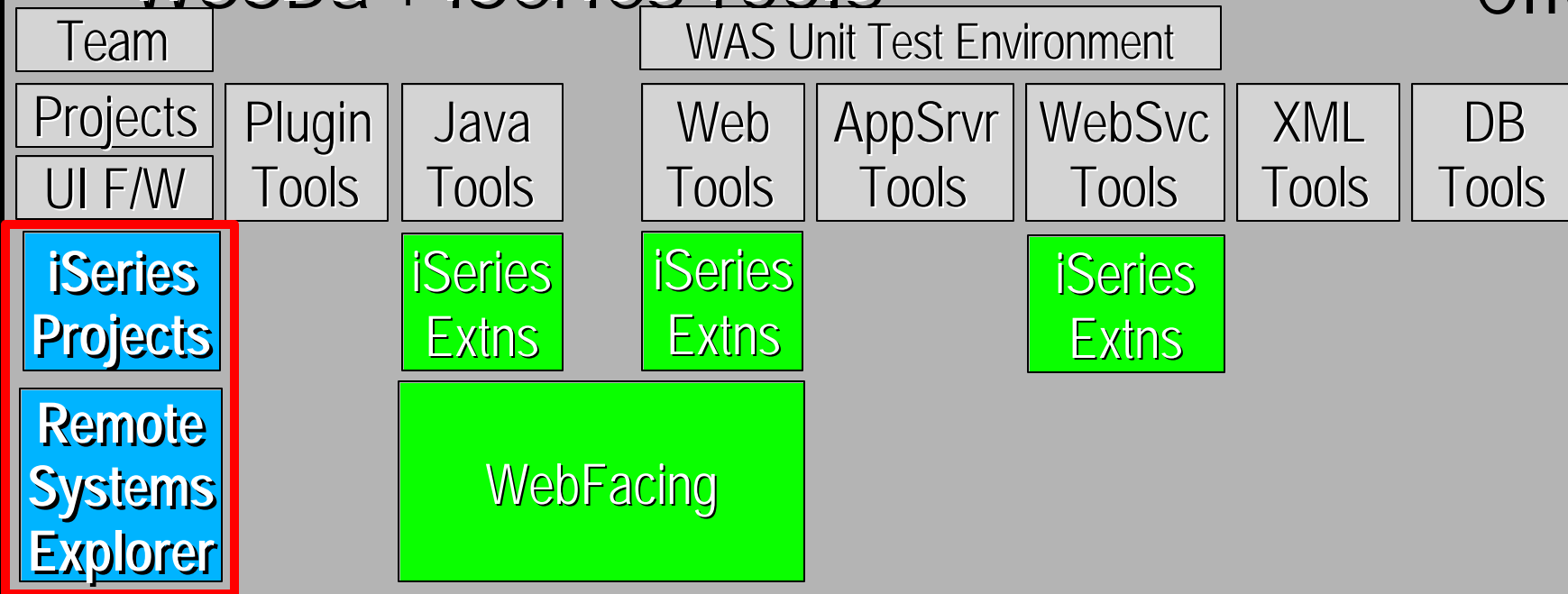
WDSc 4.0!

WebSphere Development Studio for iSeries

| RPG | C |
| COBOL | C++ |

ADTS

WDT
WSDc

Host

WSSDa + iSeries Tools

Client

Team			WAS Unit Test Environment				
Projects	Plugin	Java	Web	AppSrvr	WebSvc	XML	DB
UI F/W	Tools	Tools	Tools	Tools	Tools	Tools	Tools

iSeries
Projects

Remote
Systems
Explorer

iSeries
Extns

iSeries
Extns

iSeries
Extns

WebFacing

CODE VARPG VAJava Studio

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Eclipse

3

WDSc: RPG/CBL Tools

► RPG and COBOL Tools

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Remote Systems Explorer

iSeries Tools for RPG and COBOL

1. Remote Systems Explorer

► **PDM-like drill-down or filtered access to:**
- ✓ **iSeries** libraries, objects, members, records, fields
- ✓ **iSeries** Jobs
- ✓ **iSeries IFS** Folders and Files
- ✓ **Linux** (including iSeries **LPAR**) Folders and Files
- ✓ **Unix** and **Windows** Folders and Files
- ✓ **Local** Folders and Files

2. iSeries Projects

► **Project-based, team-sharable, development**

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Remote Systems Explorer

1. Remote Systems Explorer (RSE)

● **A perspective with many views**

► **Remote Systems**
  ✔ the primary "tree" view for exploring

► **Commands**
  ✔ the view for running and logging commands

► **Properties**
  ✔ the view for showing information about selected object(s)

► **iSeries Error List**
  ✔ the view for showing errors returned by compilers

► **many more views...**

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Remote Systems Explorer

RSE: Connections

✓ What is a "connection"?
- **Information identifying a remote system**
- **Given an arbitrary name**
- **Contains environment info such as lib list**
- **Used in many WDSc tools**
  - ► RSE, iSeries Projects, Java Tools, Web Tools, WebFacing

✓ RSE manages connections
- **Create connections here (using wizard)**
- **Change, rename, copy, delete them here**
- **Expand them to work with resources here**

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Remote Systems Explorer

Remote Systems Explorer - Development Studio

File Edit Perspective Project Window Help

Remote Systems

- New Connection...
  - ☑ Connection created successfully.
- Local
- My iSeries
  - iSeries Objects
  - iSeries Commands
  - iSeries Jobs
  - IFS Files

Remote Systems View

Welcome

Welcome

4.0

(To get ba
This page
To learn m

New Connection

Remote System Connection
Define connection information

Parent profile:	coulthar
Connection name:	My iSeries
System type:	iSeries
Host name:	TORONTO
Default User ID:	COULTHAR
Description:	Connection to Toronto system

Arbitrary name

Host name

User ID

New Connection Wizard

< Back   Next >   Finish   Cancel

Remote system type:
- ►iSeries
- ►Windows
- ►Unix
- ►Linux
- ►Local

iSeries
The R
(and o
a tree
view,
(If you
To sta

Webl
With t   ome after you click here.)
DDS display files and creates a browser based version of the user interface. To see the WebFacing Tool perspectiv

Properties

Property	Value
Connected	No
Name	iSeries Objects
Number of children	0
Port	0
Type	Subsystem
User ID	COULTHAR (Inherit
Version	Not available

Properties of selected object

Commands

My iSeries   iSeries Commands   Run

Commands Tasks Outline Series Job Log

Various helper views

eToolingForRPGandCOBOLPart1.prz

Connection Actions

Rename Connection

Copy Connection

Move Connection

Delete Connection

ReOrder Connections

Popup Menu for Connections

Remote Systems Explorer

► Connections expand to

- **"subsystems"**
  - ✓ Named grouping of functionality

► Subsystems for iSeries:

- **iSeries Objects**
  - ✓ For working with Libraries, Objects and Members
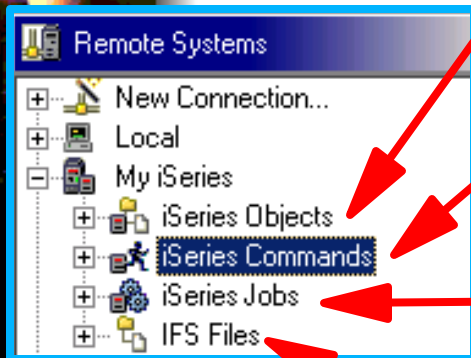- **iSeries Commands**
  - ✓ For pre-defining and running QSYS command sets
- **iSeries Jobs**
  - ✓ For working with jobs
- **IFS Files**
  - ✓ For working with Integrated File System files

Remote Systems
- New Connection...
- Local
- My iSeries
  - iSeries Objects
  - iSeries Commands
  - iSeries Jobs
  - IFS Files

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10

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Remote Systems Explorer

iSeries Commands Properties

- ► Library list
- ► Current library
- ► Initial command

Use Properties of "iSeries Commands" to set connection information

Remote Systems

- New Connection...
- Local
- My iSeries
  - iSeries Objects
  - iSeries Commands
  - iSeries Jobs
  - IFS Files

New ▶
Open 5250 emulator
Open in New Perspective
Refresh
Change Password
Release Interactive Job
Verify Connection
Connect
Disconnect
Clear Password Cache
Properties

Properties for iSeries Commands   ✕

- Batch
- Communications
- Info

Communications

Library list
Library [   ] Add(B)

Library	Library Position

Remove
Move Up
Move Down

Current library [*USRPRF]

Initial command [   ]

Restore Defaults   Apply

OK   Cancel

► Tip: you can import CODE Connections!

iSeries Objects SubSystem

iSeries AD, IBM Toronto

► iSeries Objects SubSystem

● **For drill-down or filtered access to QSYS**

Remote Systems Explorer - Development Studio Client

File Edit Perspective Project Window Help

Remote Systems

- New Connection...
- Local
- My iSeries
  - iSeries Objects
    - Your libraries...
    - Your objects...
    - Your members...
    - Library list
  - iSeries Commands
  - iSeries Jobs
  - IFS Files

Expand "Library List"

Enter Password

System type:	iSeries
Host name:	TORAS14M.TOROLAB.IBM.COM
User ID:	COULTHAR
☐ Permanently change user ID	
Password:	********

Prompted to signon

OK   Cancel

Create library filter

Create object filter

Create member filter

List libraries on library list

Properties

Property	Value
Connection...	No subsystems connected
Default Us...	COULTHAR (Inherited)
Description	
Host name	TORAS14M.TOROLAB.IB...
Name	My iSeries
Number of ...	4
Parent profile	coulthar
Remote sy...	iSeries
Type	Connection

Connection

Commands

My iSeries   iSeries Comman

Commands | Outline | Tasks | iSeries Job Log

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iSeries Objects SubSystem

► "Library list" is only pre-defined filter

Icon changes when "connected"

Library popup menu

Lists libraries in *LIBL

Expand a library

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iSeries Objects SubSystem

► Expanding a library lists all objects

Remote Systems Explorer - Development Studio Client

File Edit Perspective Project Window Help

Remote Systems

- COULTHAR
  - GETDATA.*pgm.rpgle
  - HELLOW.*pgm.rpgle
  - CALLPGM.*module.rpgle
  - HELLOW.*module.rpgle
  - PHILMSGS.*msgf
  - CUSTOMERO.*file.pf-dta
  - CUSTOML3O.*file.lf
  - DATADICTO.*file.pf-dta
  - EVFEVENT.*file.pf-dta
  - QDDSSRC.*file.pf-src
  - QRPGLESRC.*file.pf-src
  - QRPGSRC.*file.pf-src
  - SIMPLEDSPF.*file.dspf
  - TEST.*file.savf
  - TESTTYPES.*file.pf-dta

Expanding a library lists all objects in the library

New ▶ Member
Refresh
Rename
Copy
Move
Delete
Show in table ▶ Members / Fields
Properties

Src File popup menu

Expand a source file

Properties

Property	Value
Name	QRPGLESRC
Number of children	0
Source	COULTHAR
Status	OK
Subtype	PF-SRC
Text	
Type	*FILE

Commands

My iSeries   iSeries Command

Commands | Outline | Tasks | iSeries Job Log

*FILE

iSeries Objects SubSystem

► Expanding a src file lists all members

Src Member popup menu

Expanding a DB file lists all members in the file

Source Member Edit Actions

Launch built-in Lpex editor

Launch external CODE editor

Open With ▶
- LPEX Editor
- CODE Editor

Src Member popup menu

- Rename
- Copy
- Move
- Delete

Compile ▶
Compile (No Prompt) ▶

Properties

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Editing

► Lpex ("JLpex") built-in IDE editor

Tab for each open mbr

F4

insert / replace toggle

Built-in prompter view

LPEX Editor Actions

Popup menu within
Lpex editor

Cut
Copy
Paste

Find selection
Select line
Select character
Select rectangle
Deselect
Copy selected text
Overlay with selected text
Move selected text
Delete selected text

Filter selection
Exclude selection
Show all
Add

Save

Show Date Area

clipboard actions

selection actions

include / exclude actions

show dates in prefix area

```
*CALLPGM.RPGLE X    HELLOW2.RPGLE
Row 7        Column 6      Replace   1 change.
.....CLON01Factor1+++++++Opcod
000100 01/11/13   FCUSTOML3   IF    E
000200 01/11/13   DCustnoi          s
000300 01/11/13   D*
000400 01/11/13   D CSTRUC        E DS
000500 01/11/13   D return           s
000600 01/11/13   D*----------------------
000700 02/03/22   C                      EVAL
000701 02/06/30
000800 02/03/22   c                      CALL
000801 01/11/13   c
000900 01/11/13   c                      parm
001000 01/11/13   c                      parm
001100 01/11/13   c                      parm
001200 01/11/13   c                      eval
```

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18

LPEX Editor Actions

Edit Menu when Lpex editor has focus

Find and filter actions

Selection actions

Tools

● Compares two members visually

● Records keystrokes for repetitive tasks

Remote Systems Explorer - Development Studio Client

File Edit Perspective Project Window Help

Undo	Ctrl+Z
Redo	Ctrl+Y
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Delete	Delete
Select All	Ctrl+A
Find/Replace...	Ctrl+F
Search...	Ctrl+H
Find Next	Shift+F4
Find Previous	Ctrl+U
Find Other	►
Filter Selection	
Exclude Selection	
Show All	Ctrl+W
Add Bookmark	
Select	►
Selected	►
Deselect	Alt+U
Mark	►
Compare	►
Keystroke Recorder	►

Find Selection
Find Start of Selection/Block   Alt+Page up
Find End of Selection/Block   Alt+Page down
Find Last Change   Ctrl+J
Find Quick Mark   Alt+Q
Find Mark...

*CALLPGM.RPGLE   HELLOW2.RPGLE

Row 7   Column 30   Replace   1 change.
.....CLONO1Factor1+++++++Opcode(E)+Extended-factor

000100 01/11/13   FCUSTOML3   IF   E   K Disk
000200 01/11/13   DCustnoi   s   like(CU
000300 01/11/13   D*
000400 01/11/13   D CSTRUC   E DS   extname
000500 01/11/13   D return   s   20
000600 01/11/13   D*-----------------
000700 02/03/22   C   EVAL   custnii='001010
000701 02/06/30
000800 02/03/22   c   CALL   'GETDATA'
000801 01/11/13   c
000900 01/11/13   c   parm
001000 01/11/13   c   parm
001100 01/11/13   c   parm
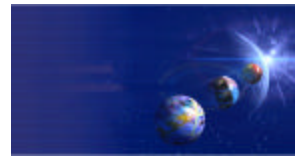001200 01/11/13   c   eval   *INLR = *ON

My Linux   Commands

Commands | iSeries Job Log | Outline | Tasks

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Eclipse

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LPEX vs CODE Editor

► Lpex Editor
- **Re-write of CODE Editor for Eclipse**

► What it has today:
- **All base support from CODE Editor, such as:**
  - ► Alt+L/C/M/D/U/S/J to select/copy/move/delete/unselect/split/join
  - ► Select streams, lines, blocks and rectangles (Edit menu)
  - ► Command-line for directly entering editor commands
  - ► Keystroke recording for repetitive tasks
  - ► Compare utility
  - ► Rich search, find and replace
  - ► Bookmarks and quick marks
  - ► Ctrl+L to locate a line
  - ► Line-number and datestamp maintenance + prefix area
  - ► File->Get File to import a file
  - ► Filter Selection to only show lines containing selected text
  - ► Printing

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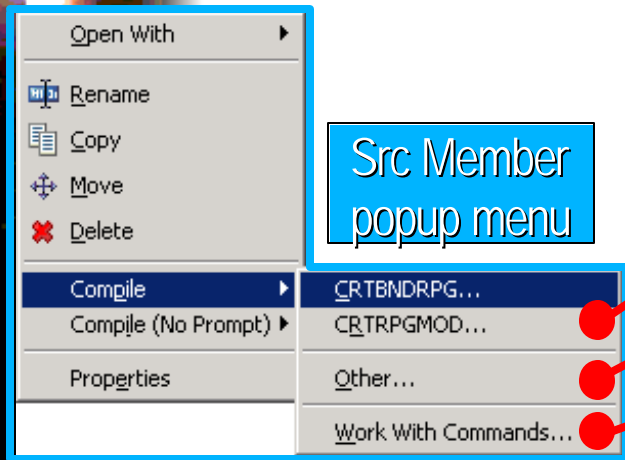# LPEX vs CODE Editor

► Lpex iSeries Support

- ► Color highlighting for RPG, COBOL, CL, DDS
- ► Maintenance of 12-byte line number and datestamp
- ► F4 Prompting
- ► SEU prefix area commands (eg I, II, D, DD)
- ► RPG/DDS ruler

► What is yet to come:

- ● **REXX macros (Java macros are supported)**
- ● **Outline View support**
- ● **F1 context sensitive help**
  - ► but all reference manuals are available in Help perspective
- ● **Syntax checking and Program Verify**
- ● **Miscellaneous CODE tools and extensions**
  - ► RPG SmartGuides, Field Reference tool, Navigator Tool, Zoom...

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Source Member Compile Actions

Open With ▶

🔲 Rename
📋 Copy
✛ Move
✖ Delete

Compile ▶   CRTBNDRPG...
Compile (No Prompt) ▶   CRTRPGMOD...

Properties   Other...

Work With Commands...

Src Member
popup menu

Compile using typical command

Compile using your pre-defined command

Create your own pre-defined command

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Compile With Prompt

iSeries Objects SubSystem

Compile Commands

Profile: coulthar

Member type: RPGLE

Compile Names

CRTBNDRPG
CRTRPGMOD

- Add...
- Change...
- Delete
- Duplicate
- Move Up
- Move Down

Command string: CRTBNDRPG PGM(&L/&M) SRCFILE(&L/&F) SRCMBR(&M) OPTION(*EVENTF)

OK   Cancel

Select member type to scope command to

Work With Compile Commands

New

Compile Name

Create a new compile name.

Compile name: My Compile Command

Command string: MYCOMP SRCFILE(&L/&F) SRCMBR(&M) MODULE(&L/&M) OF

List...   Prompt...

☑ Show in menu of promptable compile names
☑ Show in menu of non-promptable compile names

Finish   Cancel

**Enter compile command string**

If these checkboxes not selected, you must use Other... to select command

Open With ▶
Rename
Copy
Move
Delete
Compile ▶   CRTBNDRPG...
Compile (No Prompt) ▶   CRTRPGMOD...
MY COMPILE COMMAND...
Properties
Other...
Work With Commands...

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Other...

Open With ▶
🔲 Rename
📋 Copy
✛ Move
✖ Delete

Compile ▶
Compile (No Prompt) ▶
Properties

CRTBNDRPG...
CRTRPGMOD...
MY COMPILE COMMAND...

Other...

Work With Commands...

Select Compile Command ✕

Profile: coulthar ▼

Member type: RPGLE ▼

Compile name:
CRTBNDRPG
CRTRPGMOD
MY COMPILE COMMAND

Command string: MYCOMP SRCFILE(&L/&F) SRCMBR(&M) MODULE(&L/&M) OPTION(*EVENTF)

OK   Cancel
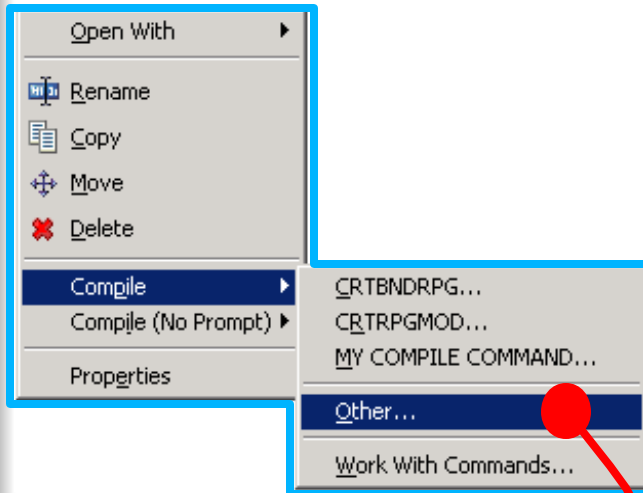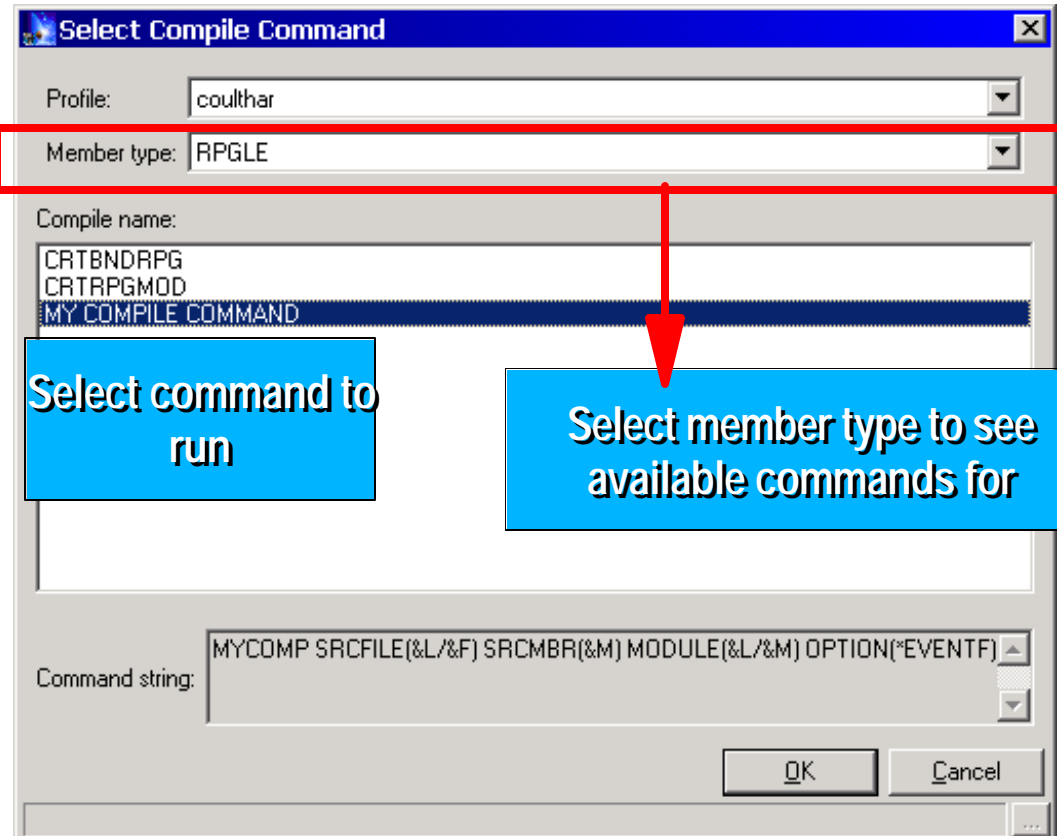
Select command to run

Select member type to see available commands for

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Compiling

► Compile Action...

Compile errors shown in iSeries Error List view

Filter errors by severity

Double click on error

Actions on QSYS Objects

► Pre-defined right-click actions

- **Common actions**
  - ► Rename, Delete, Copy, Move, Properties
  - ► Rename checks for name uniqueness as you type!

- **Library actions**
  - ► Create Source Physical File
  - ► Show in table (Basic or Extra)

- **Program actions**
  - ► Run (normal, batch, interactive)
  - ► Debug
  - ► Update

- **Module actions**
  - ► Create Program, Service Program
  - ► Update Program, Service Program

- **Data and Source Physical File actions**
  - ► Show in table (Members or Fields)

...continued...

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Actions on QSYS Objects

► Pre-defined right-click actions

- **Display and Printer File actions**
  - ► Show in Table (fields)
- **Member actions**
  - ► Open with->Lpex Editor, CODE Editor, CODE Designer
  - ► Compile (with and without prompt)
    - ✔ Can specify what compile command to execute per member type
    - ✔ Compilers errors displayed in iSeries Error List view
      - ✔ Double click on error to position editor at offending line
- **Job actions**
  - ► End (Immediate or Controlled)
  - ► Hold
  - ► Release
  - ► Display Job Log
  - ► Properties

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Table Views

Table Views
- ► Columner views
- ► Sortable by column

Library COULTHAR table view

Name	Type	Attribute	Text	Status	
GETDATA	*PGM	RPGLE		OK	
HELLOW	*PGM	RPGLE			
CALLPGM	*MODULE	RPGLE			
HELLOW	*MODULE	RPGLE			
PHILMSGS	*MSGF				
CARDB	*FILE	PF-DTA			

Objects: Basic

Library COULTHAR table view

Name	Type	Attribute	Text	Status	Last modified	Created	Size
GETDATA	*PGM	RPGLE		OK	October 4, 2000 8:53:12 AM EDT	October 4, 2000 8:53:12 AM EDT	118784
HELLOW	*PGM	RPGLE		OK	October 4, 2000 8:53:13 AM EDT	October 4, 2000 8:53:13 AM EDT	98304
CALLPGM	*MODULE	RPGLE		OK	November 9, 2000 9:50:37 AM EST	November 9, 2000 9:50:37 AM EST	90112
HELLOW	*MODULE	RPGLE		OK	October 4, 2000 8:53:13 AM EDT	October 4, 20	
PHILMSGS	*MSGF			OK	March 22, 2001 8:59:52 AM EST	March 22, 200	
CARDB	*FILE	PF-DTA		OK	October 4, 2000 9:13:21 AM EDT	October 4, 20	2
CUSTOMERO	*FILE	PF-DTA		OK	March 23, 2001 8:09:43 AM EST	October 4, 20	
CUSTOML30	*FILE	LF		OK	March 23, 2001 8:09:44 AM EST	October 4, 20	
DATADICTO	*FILE	PF-DTA	DATA ...	OK	March 23, 2001 8:09:44 AM EST	October 11, 2	

Objects: Extra

Series Table View (Extra)

File COULTHAR/QDDSSRC member table view

Name	Type	Attribute	Text	Status	
ABCDEF	DSPF	SRC		OK	
CUSTOMER	PF	SRC		OK	
CUSTOML3	LF	SRC		OK	
MYSTUFF	DSPF	SRC		OK	
SIMPLEDSPF	DSPF	SRC		OK	
TESTTYPES	PF	SRC		OK	

Members

Outline | iSeries Job... | Tasks | Source Pro... | Commands | Properties | iSeries Tab... | iSeries Tab...

DATADICTO field table view

Record	Type	Length	Text	
CT	Character	1	Active Record Code	
CT	Character	40	Address	
CT	Character	40	Customer Address Line 1	
CT	Character	40	Customer Address Line 2	
CT	Character	40	Customer Address Line 3	
CT	Chara		Customer Address Line 4	
CT	Chara		Customer Address Line 5	
CT	Character	40	Customer Address Line 5	
CT	Packed Decimal	9.2	Amount	
CT	Packed Decimal	9.2	Customer Amount Due	
DICT	Packed Decimal	9.2	Amount Received	

Fields

AMTRC

Eclipse

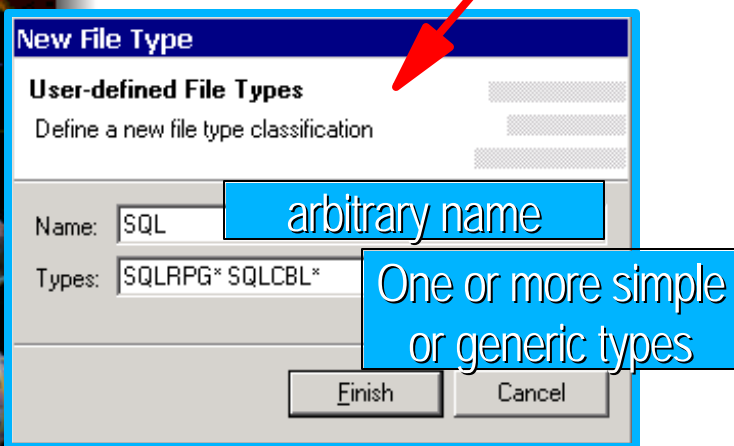IBM @server. For the next generation of e-business.
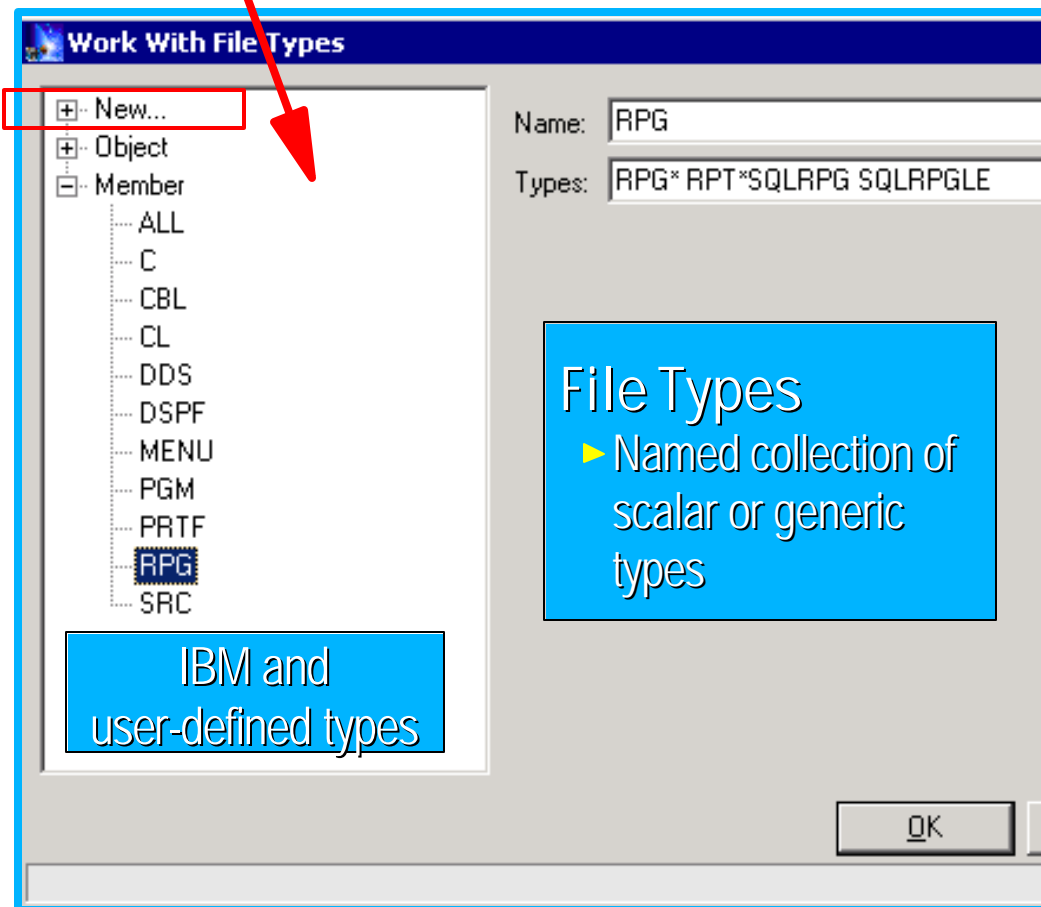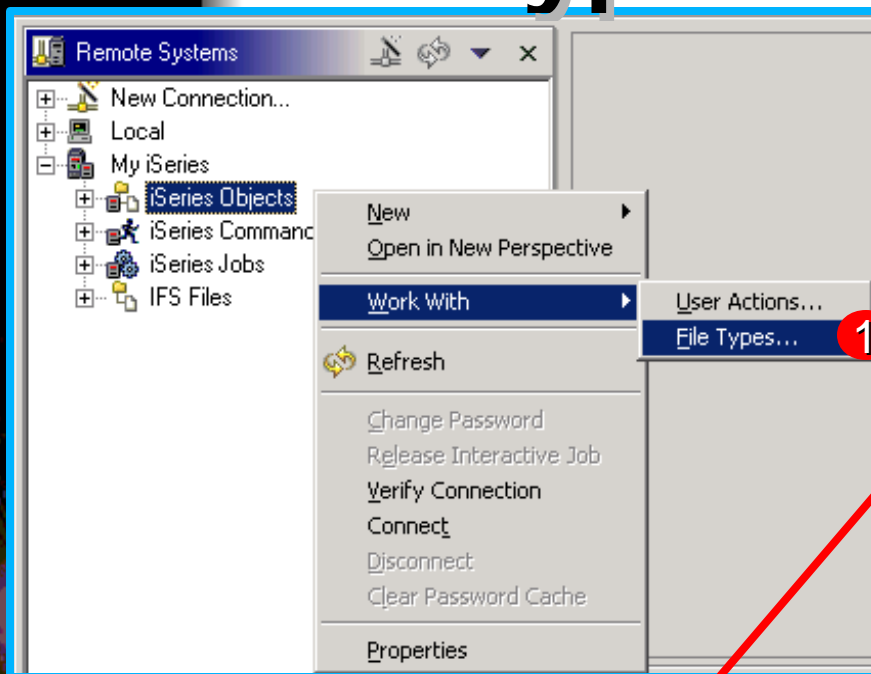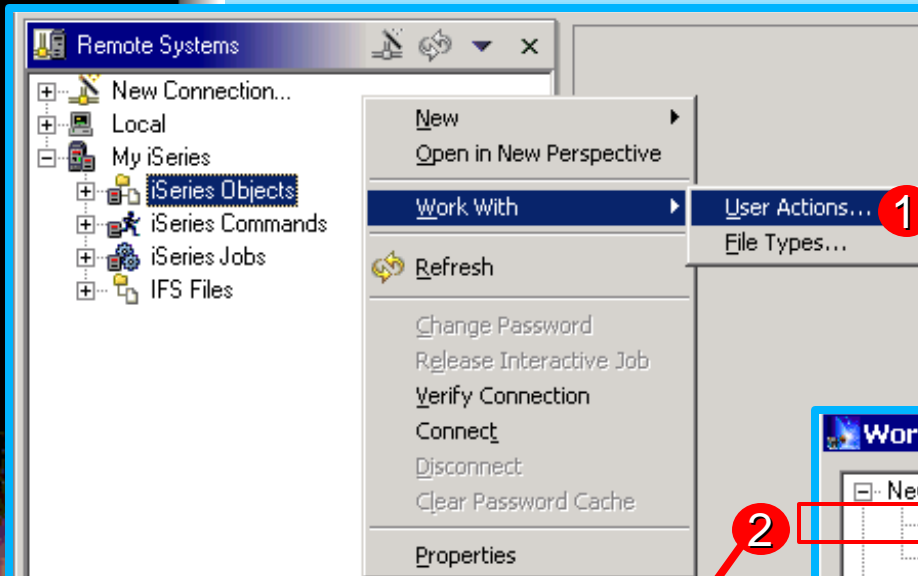
User Defined Actions
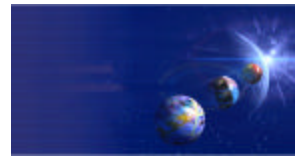
RSE: User Actions

► User-Defined Actions (like PDM!)

- **Right-click on iSeries Objects**
  - ► **Work With File Types**
    - ✓ Create named types to scope actions against
    - ✓ Eg. "RPG" might be RPG + RPGLE + SQLRPGLE
  - ► **Work With Actions**
    - ✓ Create, delete or change user-defined actions
    - ✓ Scope them by File Type
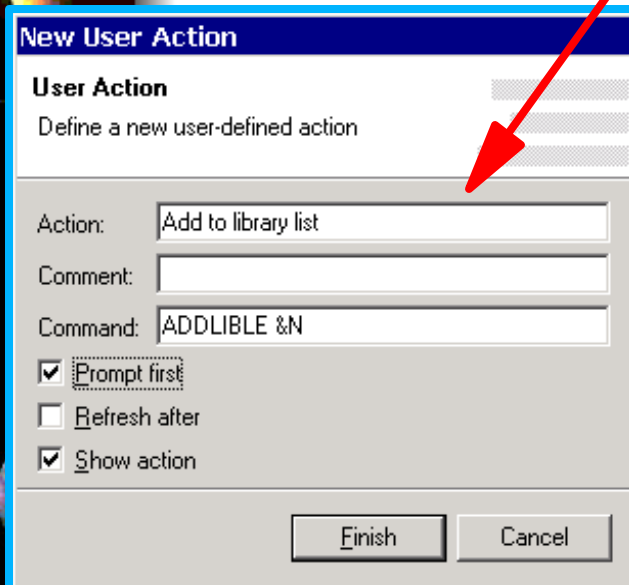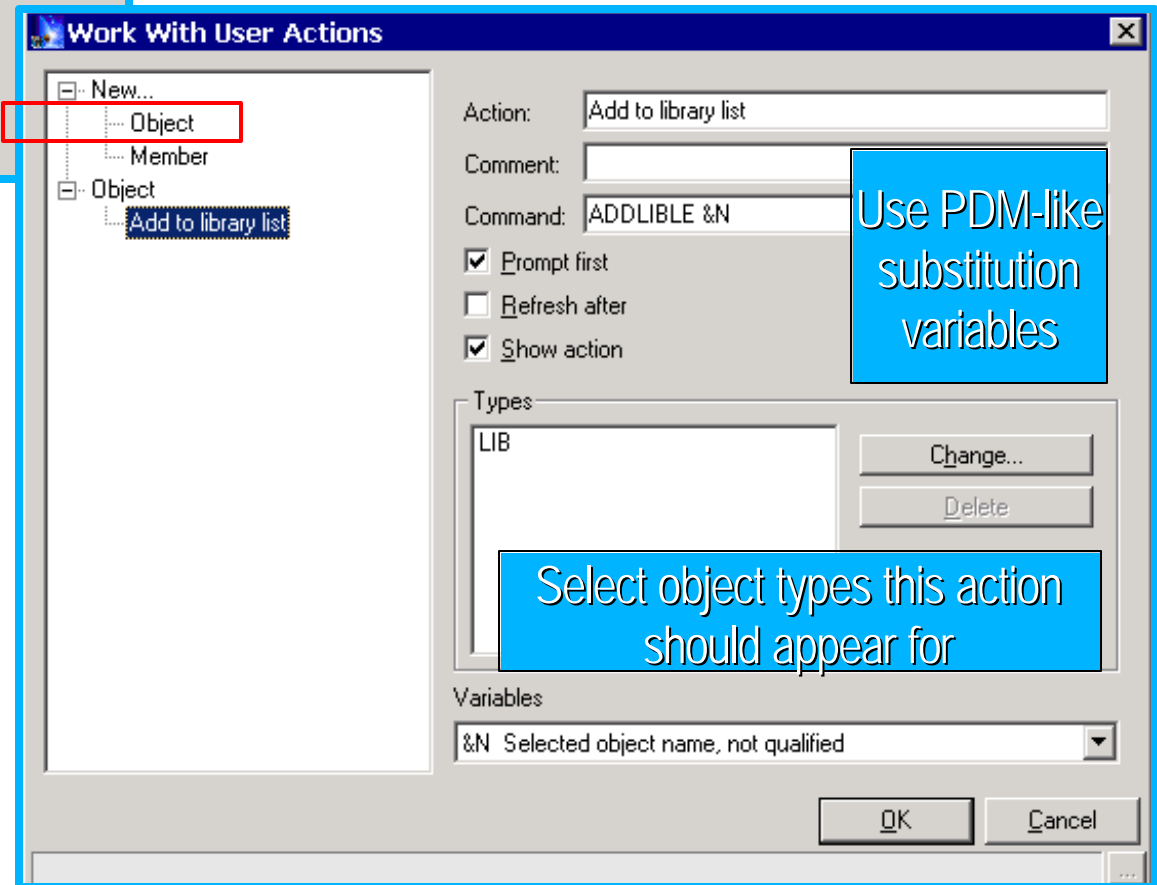
► Tip: you can import CPO Actions!

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File Types for User Actions

Remote Systems

- New Connection...
- Local
- My iSeries
  - iSeries Objects
  - iSeries Command
  - iSeries Jobs
  - IFS Files

Menu:
- New ▶
- Open in New Perspective
- Work With ▶
  - User Actions...
  - File Types... **1**
- Refresh
- Change Password
- Release Interactive Job
- Verify Connection
- Connect
- Disconnect
- Clear Password Cache
- Properties

2

Work With File Types

- New...
- Object
- Member
  - ALL
  - C
  - CBL
  - CL
  - DDS
  - DSPF
  - MENU
  - PGM
  - PRTF
  - RPG
  - SRC

Name: RPG

Types: RPG* RPT*SQLRPG SQLRPGLE

IBM and
user-defined types

File Types
► Named collection of scalar or generic types

New File Type

User-defined File Types

Define a new file type classification

Name: SQL

arbitrary name

Types: SQLRPG* SQLCBL*

One or more simple or generic types

Finish   Cancel

OK

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Defining User Actions

User Actions
► Define object and member actions
► Edit existing actions

Remote Systems
- New Connection...
- Local
- My iSeries
  - iSeries Objects
  - iSeries Commands
  - iSeries Jobs
  - IFS Files

New ▶
Open in New Perspective
Work With ▶   User Actions... ①
      File Types...
Refresh
Change Password
Release Interactive Job
Verify Connection
Connect
Disconnect
Clear Password Cache
Properties

②

Work With User Actions
- New...
  - Object
  - Member
- Object
  - Add to library list

Action: Add to library list
Comment:
Command: ADDLIBLE &N
☑ Prompt first
☐ Refresh after
☑ Show action

Use PDM-like substitution variables

Types
LIB   Change...
    Delete

Select object types this action should appear for

Variables
&N Selected object name, not qualified

OK   Cancel

New User Action

User Action

Define a new user-defined action

Action: Add to library list
Comment:
Command: ADDLIBLE &N
☑ Prompt first
☐ Refresh after
☑ Show action

Finish   Cancel

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Eclipse

Using User Actions

RSE Filters

RSE: Filters

► Expand a subsystem to see "filters"

- **Like WRKXXXPDM generic name filters but**
    - ►Are named and saved
- **There are some predefined**
    - ►Such as Library List to see *LIBL libraries in iSeries Objects
    - ►Such as popular commands in iSeries Commands
- **To create your own, right click on subsystem object**
    - ►Or select "Your XXXX..."
- **Each filter can contain multiple filter strings**
    - ►So you can list all libraries that start with A *and* B

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RSE QSYS Filters

► **Library filters**

  ► **Specify simple, generic or special library names**

   ✓ Library name can be simple, generic or special

► **Object filters**

  ► **Specify simple / generic object names, lib-qualified**

   ✓ Library name can be simple, generic or special
   ✓ Object name can be simple or generic

  ► **Specify simple / generic object types and attributes**

   ✓ Can specify one or more type:attribute pairs (OR operation)

► **Member filters**

  ► **Specify simple / generic mbr names, lib/file-qual'fd**

  ► **Specify simple / generic member types**

   ✓ Can specify one or more member types (OR operation)

► Tip: you can import CPO Filters!

RSE Filters

► Library Filters

All filters are named and persisted

Remote Systems Explorer - Development Studio Client

File   Edit   Perspective   Project   Window   Help

Remote Systems
- New Connection...
- Local
- My iSeries
  - iSeries Objects
    - Your libraries...
    - Your objects...
    - Your members...
    - Library list
  - iSeries Commands
  - iSeries Jobs
  - IFS Files

1.Expand

New Library Filter

Library Filter
Create a new iSeries library filter

Parent filter pool: Default Filter Pool

Filter name: My Libraries

Filter Strings
- COUL*
- CAR*

Add...
Change...
Delete
Duplicate
Move Up
Move Down

2

New

Library Filter String
Create a new library filtering string

Library: CAR*   Browse...

Test

Finish   Cancel

Specify simple, special or generic library name

2. Filters contain one or more "filter strings"
► Results are OR 'd

Finish   Cancel

Properties

Property	Value
Name	Your li...
Number of children	1
Number of filter st...	1
Parent filter	Not applicable
Parent filter pool	Default Filter Pool
Type	iSeries prompting library filter

My iSeries   iSeries Commands

Commands | Outline | Tasks | iSeries Job Log | Source Prompter

iSeries prompting library filter

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Eclipse

RSE Filters

► Expanding Library Filters

Filter created. When expanded, lists all libs matching filter string(s) criteria

► **Object Filters**

Expand **1**

Specify simple, special or generic library name

Specify simple or generic object name

Optionally subset by object type and attribute

► Object Filters: Filtering by type+attr

New

Object Filter String
Create a new object filtering string

Library: PHILDEMO   Browse...

Object: *   Browse...

Type and attributes to subset by
```
*PGM:RPGLE
*FILE:*SRC
```
Add...   ④

Change...

Delete

Duplicate

Move Up

Move Down

Test

Finish   Cancel
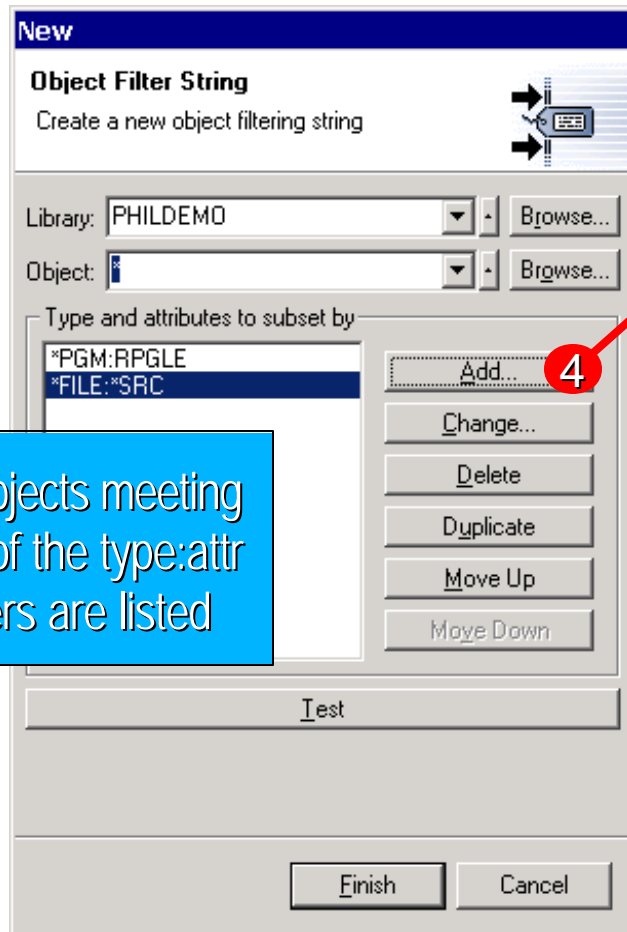
All objects meeting any of the type:attr filters are listed

Add Object Type And Attribute

Object type: Object attribute:
*FILE   *SRC

Types to choose from   Attributes to choose from
```
*                        *
*BNDDIR                   *BLANK
*CMD                      *DATABASE (LF DDMF PF-DTA)
*DTAARA                   *SRC (PF-SRC PF38-SRC)
*DTAQ                     *DTA (PF-DTA)
*EDTD                     C
*FILE                     CBL
*JOBD                     CBLLE
*JOBQ                     CLE
*MODULE                   CLLE
*MSGF                     CLP
*MSGQ                     CMD
*OUTQ                     CPPLE
*PGM                      DDMF
*PNLGRP                   DFU
*PRDAVL                   DFUEXEC
*PRDDFN                   DFUNOTEXC
*PRDLOD                   DSPF
*SQLPKG                   ICFF
*SRVPGM                   LF
```
OK   Cancel

Select from lists or type in simple or generic type and attribute

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RSE Filters

► **Expanding Object Filters**

Filter created. When expanded, lists all objects matching filter string(s) criteria

RSE Filters

► Member Filters

Expand

1

Specify simple, special or generic library name

Specify simple or generic file name

Specify simple or generic member name

2

3

Subset by data or source mbrs

Optionally subset by member type

RSE Filters

► Member Filters: filtering by mbr type

New

Member Filter String
Create a new member filtering string

Library: COULTHAR   Browse...
File: *SRC   Browse...
Member: *   Browse...

☑ Source members   ☐ Data members

Member types to subset by
RPG*
CBLLE

Add...
Change...
Delete
Duplicate
Move Up
Move Down

Test

Finish   Cancel

Add Member Type

Member type: CBLLE

Types to choose from
*BLANK
C
CBL
CBLLE
CLD
CLE
CLLE
CLP
CMD
CPP
CPPLE
DSPF
ICFF

OK   Cancel

4

All members meeting any of the type filters are listed

Select from list or type in simple or generic member type

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Eclipse

RSE Filters

► Expanding Member Filters

Filter created. When expanded, lists all members matching filter string(s) criteria

Filter Pools

RSE: Filter Pools

► Eventually, you'll have too many filters
- **Time to turn on "Show Filter Pools" via preferences or pulldown in RSE title bar**
  - ►Expanding subsystems will then first show filter pools
- **Filters are grouped into named pools**
  - ►By default they are added to the single default filter pool named Default Filter Pool
- **You can create your own filter pools**
  - ►Then add filters to it
  - ►Expand a filter pool to see just the filters in it
- **Filters pools group filters**
  - ►Group by project, release, connection, task, etc etc

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► **Filter pools are shared**
- **Subsystem don't "contain" filters!**
  - ►They "contain" *references* to filter pools
  - ►All filters in all referenced pools are shown in list
  - ►All subsystems reference a default pool initially
  - ►Changes to a pool's contents are reflected in all subsystems that reference that filter pool

Connection 1

iSeries Objects SubSystem

references

Connection 2

iSeries Objects SubSystem

Default Filter Pool

| Filter 1 | Filter 2 | Filter 3 |

Filter Pool 1

| Filter 1 | Filter 2 | Filter 3 |

Filter Pool 2

| Filter 1 | Filter 2 | Filter 3 |

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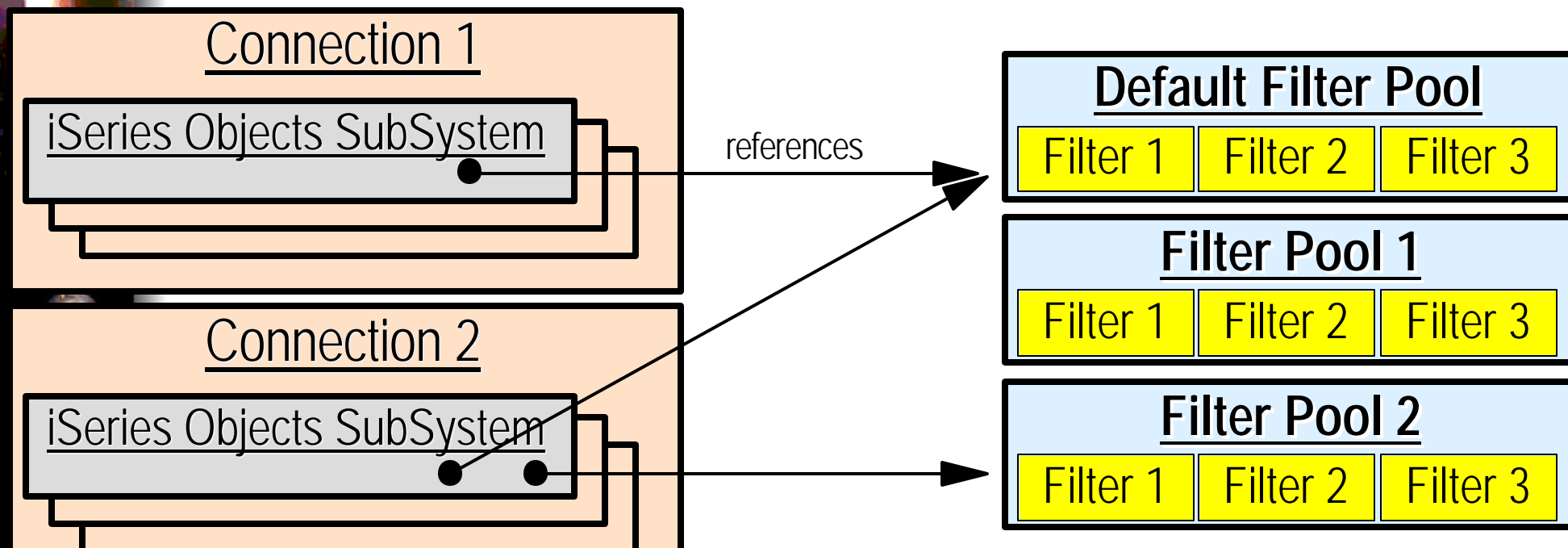
Filter Pools

►Why share filter pools?

1. Filters shared across connections
   - ►Filter created in connection A can be re-used in connection B
     - ✔By placing the filter in a filter pool shared by both connections

2. Filters private per connection
   - ►Create a unique filter pool per connection if sharing not desired

3. Filters both shared and private per connection
   - ►Some filter pools can be private, some shared

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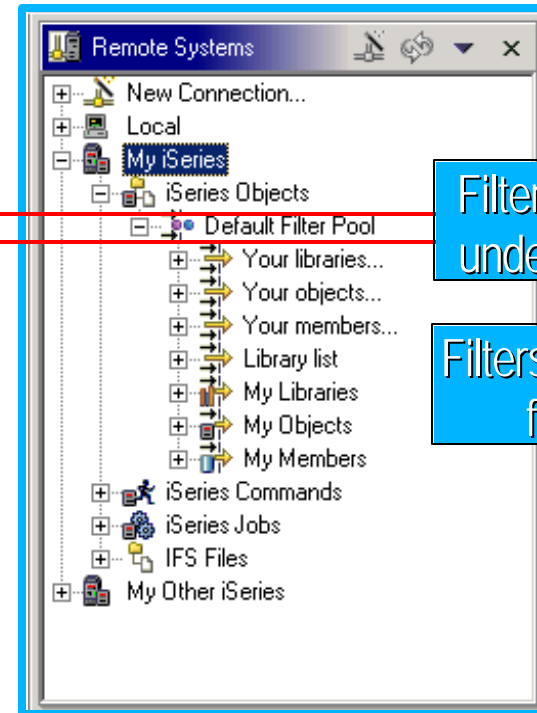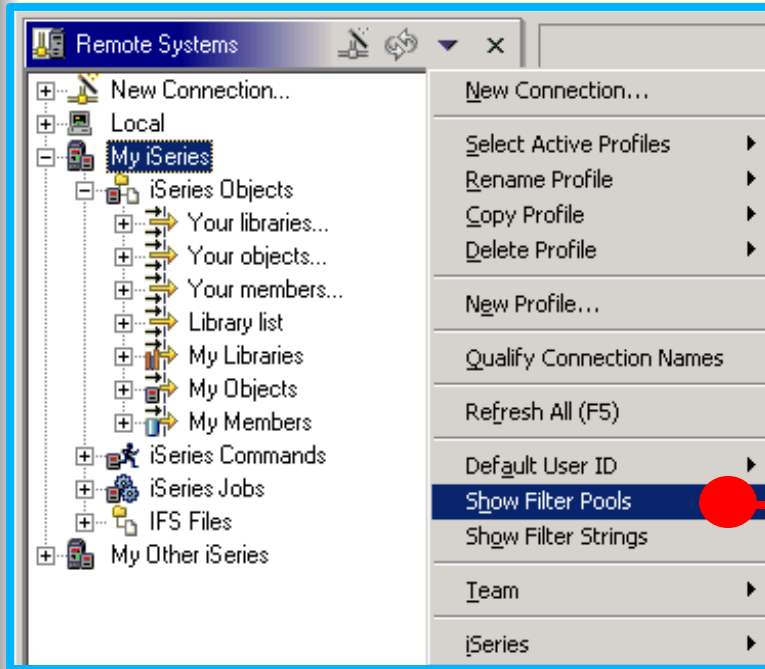
Filter Pools

Filter pools shown under subsystems

Filters shown under filter pools

"Show Filter Pools" changes RSE tree-view to display filter pools underneath subsystems

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Filter Pools

Right-click for subsystem popup

Remote Systems

- New Connection...
- Local
- My iSeries
  - iSeries Objects ①
    - Default Filter Pool
      - Your libraries...
      - Your objects...
      - Your members..
      - Library list
      - My Libraries
      - My Objects
      - My Members
  - iSeries Commands
  - iSeries Jobs
  - IFS Files
- My Other iSeries

Popup menu:
- New ▶
  - Filter Pool... ②
  - Filter Pool Reference ▶
- Select Filter Pools...
- Open in New Perspective
- Work With ▶
- Refresh
- Change Password
- Release Interactive Job
- Verify Connection
- Connect
- Disconnect
- Clear Password Cache
- Properties

New Filter Pool

System Filter Pool
Define a new pool for filters

Pool name My Pool

Profile coulthar

③ Finish   Cancel

"Show Filter Pools" enables user-defined filter pools and filter pool actions in subsystem popup menu

Remote Systems

- New Connection...
- Local
- My iSeries
  - iSeries Objects
    - Default Filter Pool
      - Your libraries...
      - Your objects...
      - Your members...
      - Library list
      - My Libraries
      - My Objects
      - My Members
    - My Pool
  - iSeries Commands
  - iSeries Jobs
  - IFS Files
- My Other iSeries

"New Filter Pool" creates a filter pool and adds a reference to it in the selected subsystem

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Eclipse

Filter Pool References
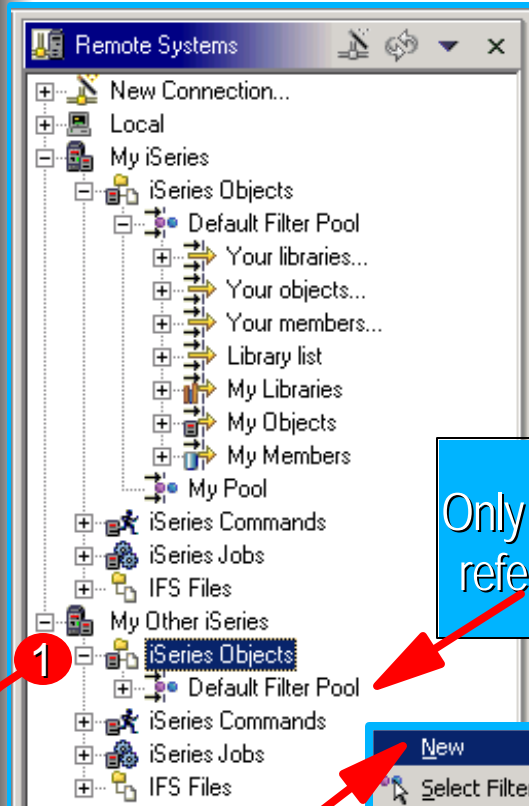
Only default filter pool is referenced by default!

Right-click for subsystem popup
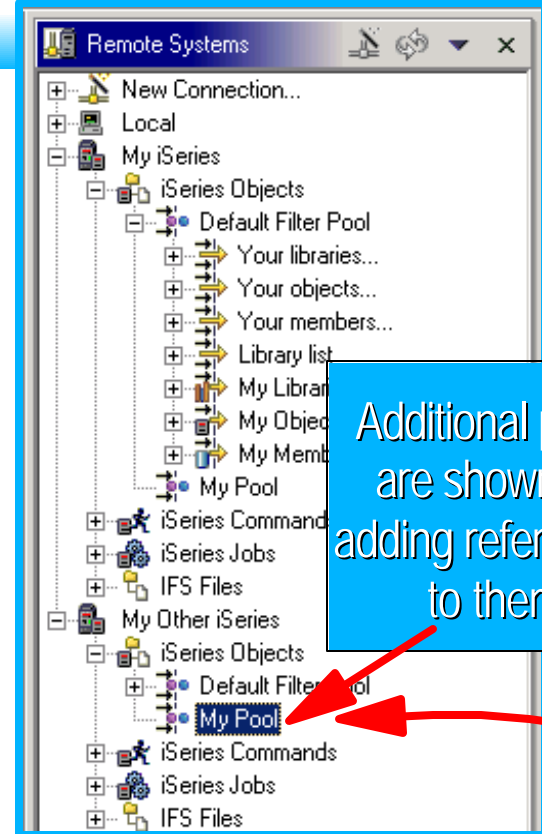
Additional pools are shown by adding references to them
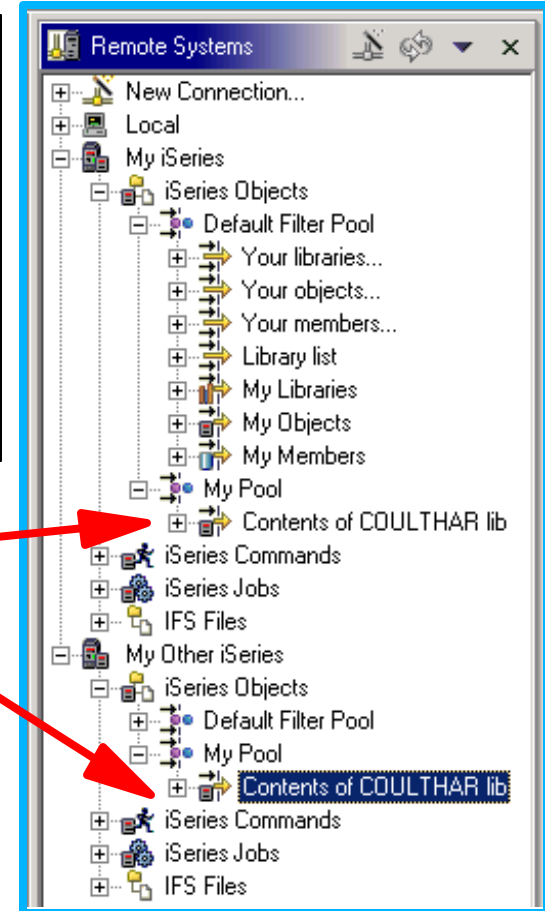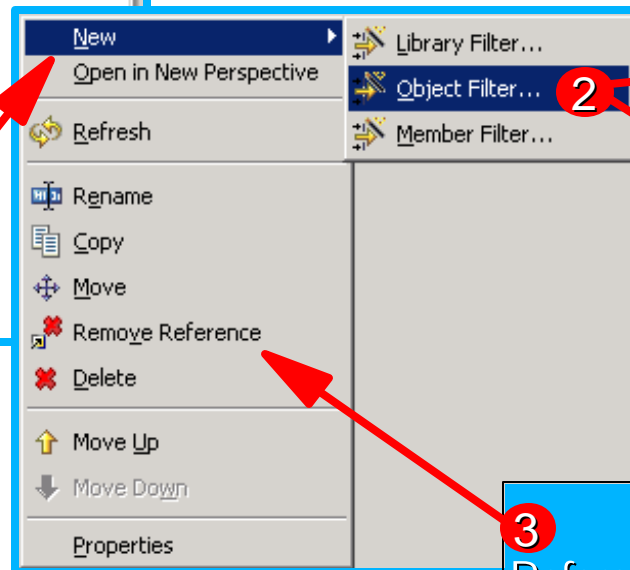
1

2

business.
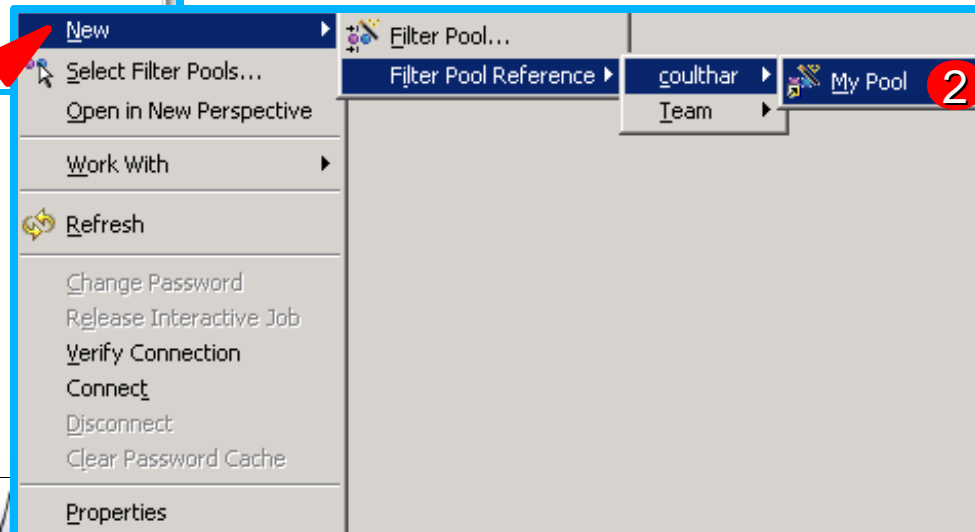
Filter Pool References
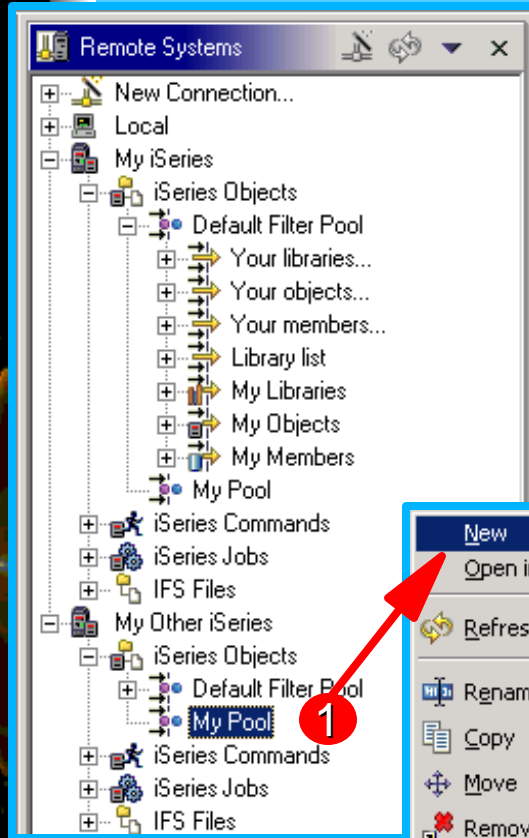
All references to a filter pool, within subsystems, are updated to reflect any changes to that filter pool:
- ► **new** filters
- ► **deleted** filters
- ► **renamed** filters
- ► **reordered** filters

3 References to filter pools can be removed

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Eclipse

Filter Actions

► Popup menu actions for filters:
- Update parent filter pool that contains the filter
- Reflected in all subsystems that reference pool

Filter actions

Edit filter

Rename filter

Copy filter to another filter pool

Move filter to another filter pool

Delete filter

Reorder filters

of e-business.

Profiles

RSE: Profiles

► The RSE is designed for team sharing
- **of connections**
- **of filter pools**
- **of user-defined actions**

► Team sharing is enabled via profiles
- **All connections, filter pools, user actions are scoped per profile**
  - ► Each profile is a folder within the RSE project
  - ► All data stored within subfolders
- **When RSE project is team-synched**
  - ► All out-going changes sent to team repository
  - ► All in-coming changes received from team repository

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Profiles and Teams

► All persistent data in the RSE is stored in an Eclipse project "under the covers"

- Project is named RemoteSystemsConnections
  - ► Visible in Eclipse-supplied Navigator view
- This project is team-sharable by the common Eclipse team support for projects
  - ► Using the Navigator view
  - ► Or using Team cascading menu of the RSE pulldown
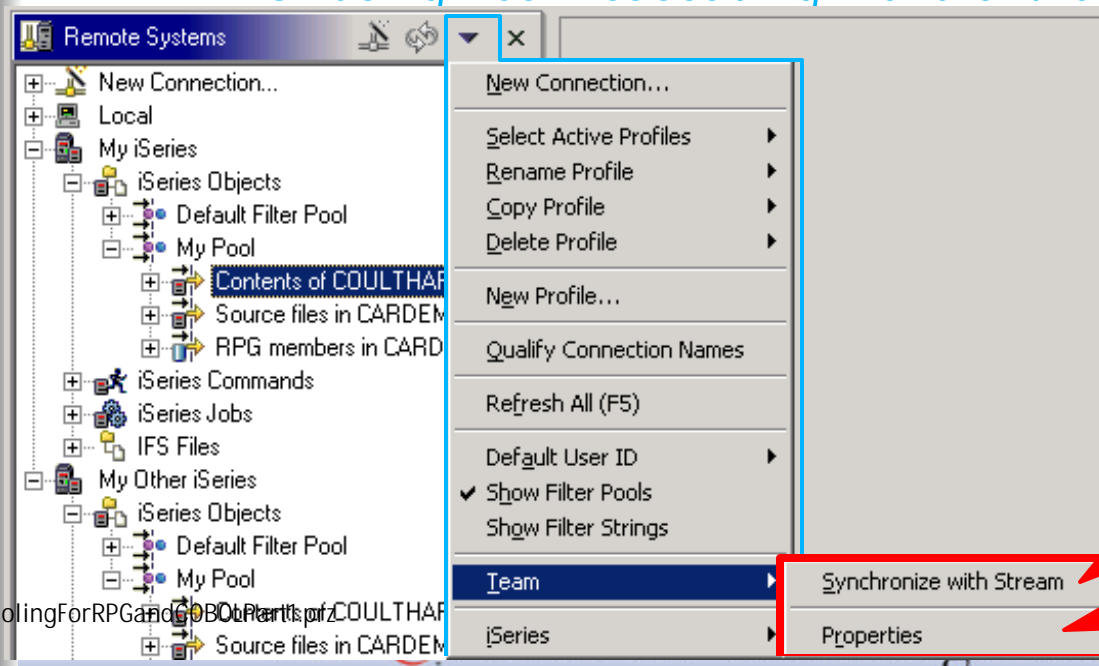
Synchronize with team repository

Identify team repository

ToolingForRPGandCOBOLPart1.prz

53

Profiles and Teams

RSE Project

"coulthar" profile folder

all connections defined for profile coulthar

all filter pools defined for profile coulthar

all user actions defined for profile coulthar

all compile commands for profile coulthar

"farr" profile folder

"team" profile folder

Navigator view

Profiles and Teams

Team Repository
RSE project
team synch
team synch
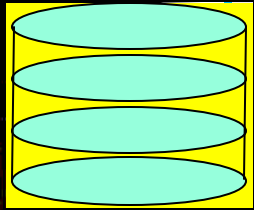
- ▶ Team profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions
- ▶ Developer1 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions
- ▶ Developer2 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions

Developer1 IDE
RSE project
- ▶ Team profile
- ▶ Developer1 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions
- ▶ Developer2 profile
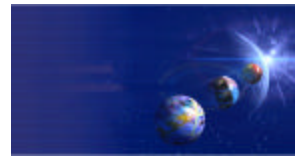
Developer2 IDE
RSE project
- ▶ Team profile
- ▶ Developer1 profile
- ▶ Developer2 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions

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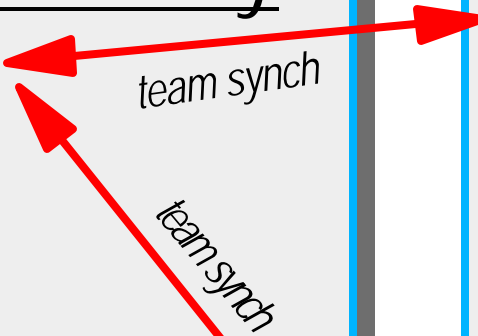
Active Profiles

► After a team-synch on the RSE project, a developer's IDE will have all the profiles for the whole team

- However, they only see connections, filter pools and user defined actions for their "active" profiles

- By default, the "team" and the user's private profile are the only active profiles
  - ► So developer only sees all connections, filter pools and user actions that are in the team and developer-unique profiles

- It is easy to make addition profiles active
  - ► Use the menu items in the RSE title bar pulldown menu

Profiles Actions

Profile actions

Select this to show connections qualified by profile name

Profiles and Teams
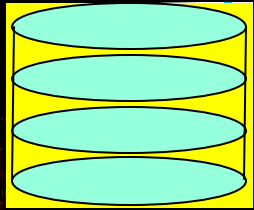
Team Repository
RSE project

team synch

team synch

- ► Team profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions
- ► Developer1 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions
- ► Developer2 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions

Developer1 IDE
RSE project

- ► Team profile
- ► Developer1 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions
- ► Developer2 profile

Active profiles for Developer 1

Developer2 IDE
RSE project

- ► Team profile
- ► Developer1 profile
- ► Developer2 profile
  - ‣ connections
  - ‣ filter pools
  - ‣ user actions

Active profiles for Developer 2

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Why Profiles?

1. Team-shared connections and filter pools

► So everyone on the team sees common connections for with common library list, environment settings and filter pools

  ✔ For common development work. Eg: define profiles such as "team", "fix team", "project1 team", "release 1", "emergency fix", etc,etc

    ✔ Ask each team member to make these profiles active

2. Developer-unique connections and filter pools

► So developers can have connections with unique library list, evironment settings and filter pools

  ✔ For developer-unique work via their unique profiles

    ✔ Each such private profile only made active by one developer

3. Team-shared and developer-unique

► Each developers "sees" connections and filter pools from both shared and private profiles: whatever is "active"

4. Roaming developer

► On PC 1: Developer synchronizes with team repository

  ✔ Sends all connections, filter pools, actions to repository

► On PC 2: Developer synchronizes RSE with team repository

  ✔ Gets all connections, filter pools, actions from repository

  ✔ Makes his profile "active"

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Eclipse

Active Profiles

► When creating connections and filter pools you must specify the active profile to contain the new connection or profile

Active Profiles

► Connections and filter pools can be copied or moved to other profiles

Work With Filter Pools

► For one-stop shopping for working with filter pools, select Work With->Filter Pools from subsystem popup menu

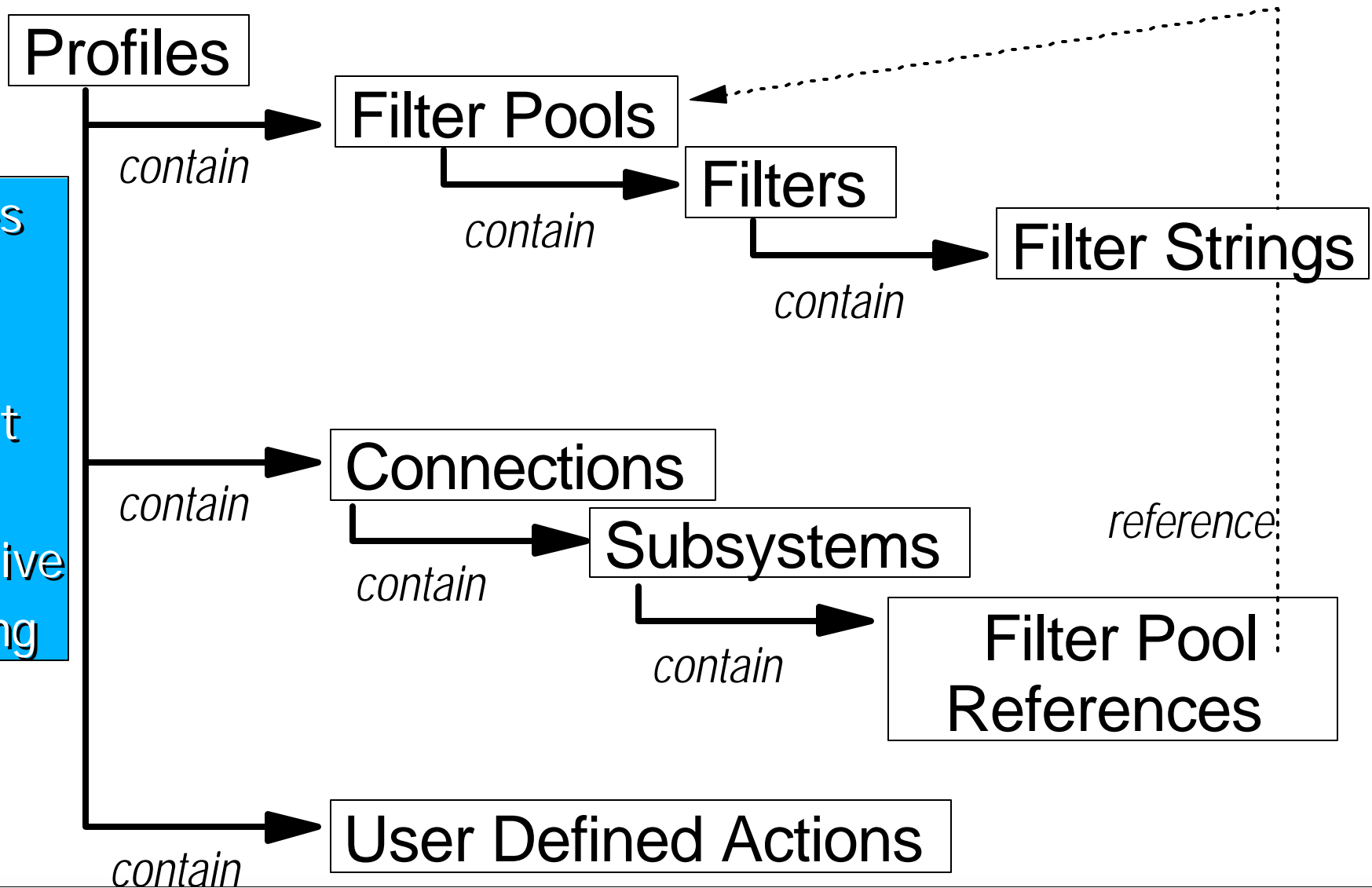 ► You must be in "Show filter pools" mode

Active profiles

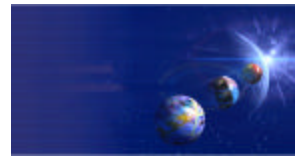**Filter Pools per profile**

Filter pool actions

ToolingForRPGandCOBOLPart2.prz

62

Remote Systems Explorer

► Underlying Model of RSE

Profiles

Filter Pools

Filters

Filter Strings

Connections

Subsystems

Filter Pool References

User Defined Actions

contain

contain

contain

contain

contain

contain

reference

Profiles enable team support and effective grouping

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iSeries Projects

2. iSeries Projects

- **A special project type**
  - ► For holding source destined to be compiled on iSeries

- **A dedicated perspective**
  - ► For working with all, and only, iSeries projects
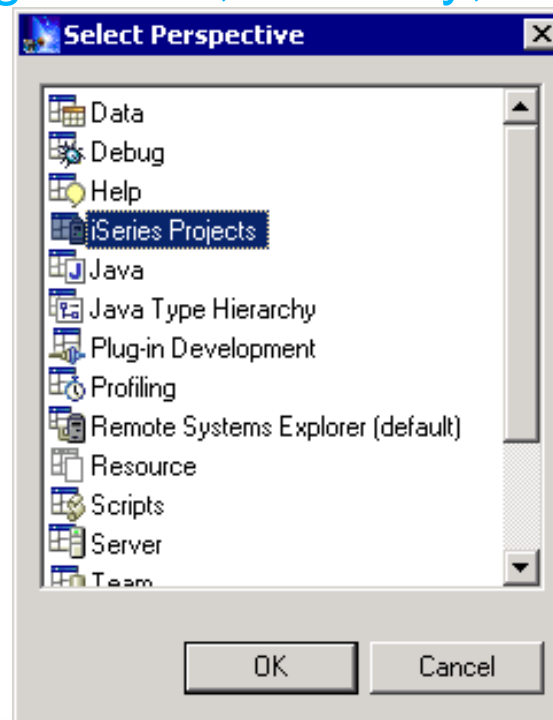
iSeries Projects

► iSeries Project Wizard
  - **For creating iSeries projects**
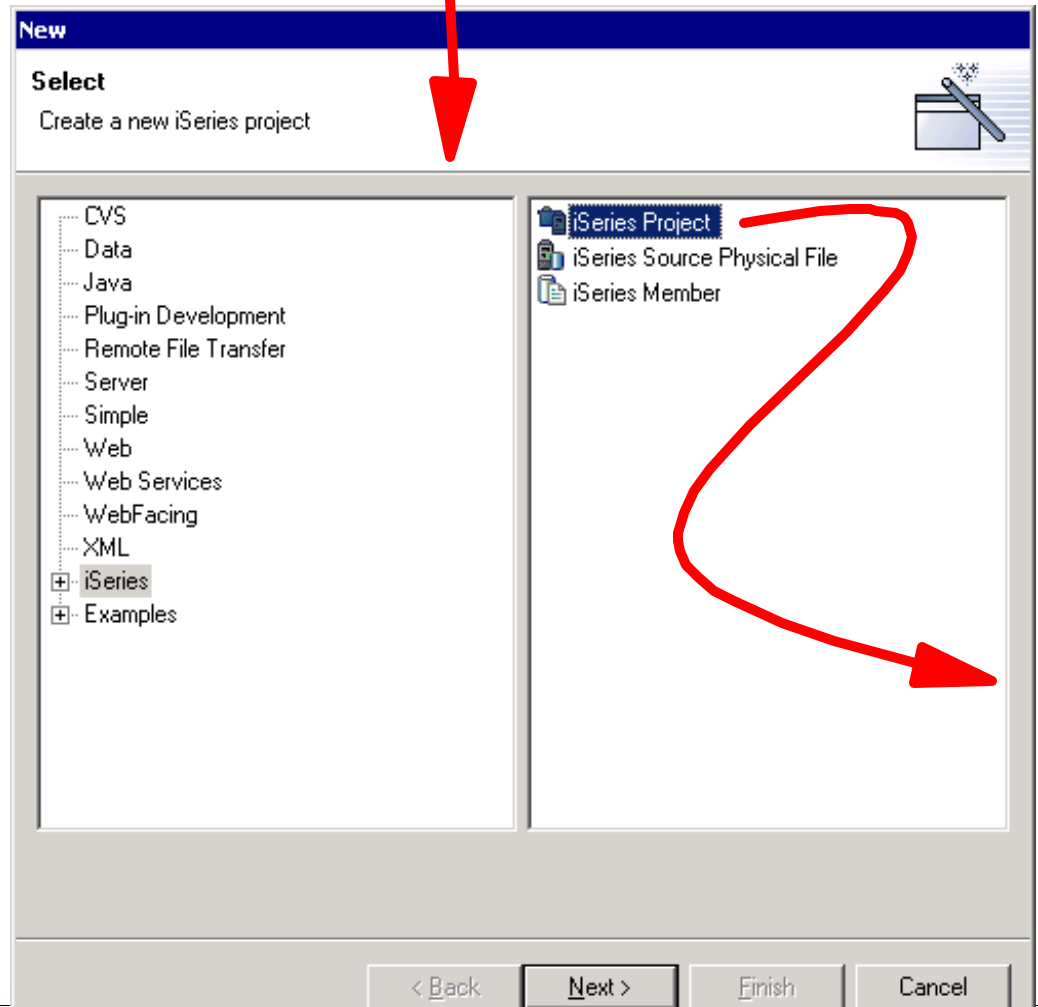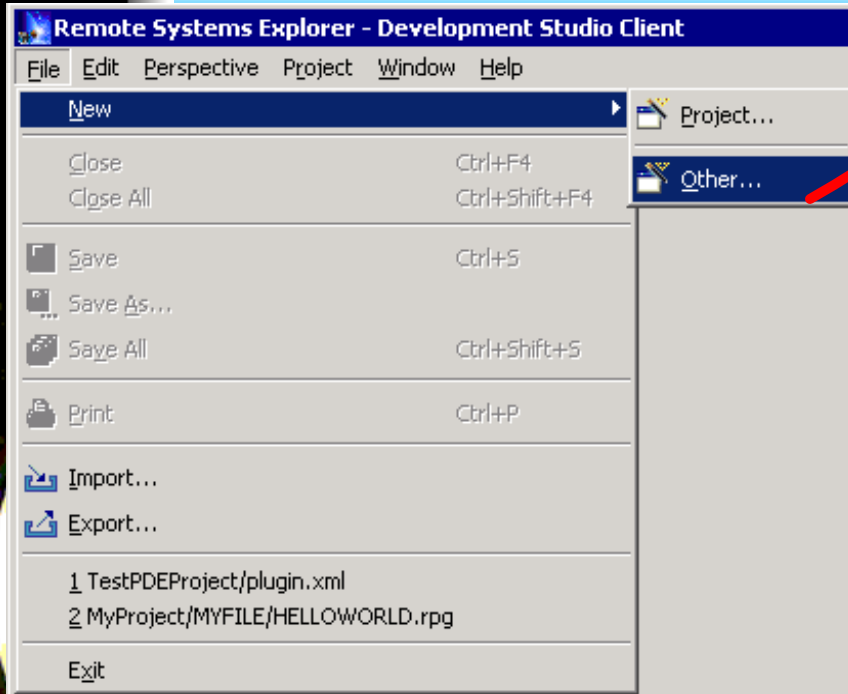
► What is an iSeries project?

  ► **Typical Eclipse project**
    ✔ Contains folders and files, can be shared by a team
    ✔ Can have its own tools and perspectives

  ► **But also**
    ✔ Holds copies of some source members from an iSeries library
    ✔ Those copies are "pushed" up occassionally and the project re-built

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iSeries Projects

Remote Systems Explorer - Development Studio Client

File   Edit   Perspective   Project   Window   Help

New	▶	📄 Project...
Close	Ctrl+F4	📁 Other...
Close All	Ctrl+Shift+F4	
💾 Save	Ctrl+S	
💾 Save As...		
💾 Save All	Ctrl+Shift+S	
🖨 Print	Ctrl+P	
📥 Import...		
📤 Export...		
1 TestPDEProject/plugin.xml		
2 MyProject/MYFILE/HELLOWORLD.rpg		
Exit		

New

Select
Create a new iSeries project

- CVS
- Data
- Java
- Plug-in Development
- Remote File Transfer
- Server
- Simple
- Web
- Web Services
- WebFacing
- XML
- ⊞ iSeries
- ⊞ Examples

- 📑 iSeries Project
- 📑 iSeries Source Physical File
- 📄 iSeries Member

< Back   Next >   Finish   Cancel

Use **File->New** to launch iSeries Project Wizard

iSeries Projects

New

iSeries Project
Create a new iSeries project that maps to an iSeries library.

Project name: My Project

☑ Use default location

Location: E:\WDSC\WSSD\workspace\My Project   Browse...

Specify the name and location of the iSeries project being created. An iSeries project allows for local development, while performing builds on a remote iSeries host machine.

Give your project a name

< Back   Next >   Finish   Cancel

New

iSeries Project Properties
Specify the iSeries project properties.

Choose connection from RSE list

Connection: My iSeries   New...

Associated library: MYLIB   Browse...

Specify the connection and library name that you wish to associate with this iSeries project. The connection allows for remote access to the iSeries host machine. Code changes made locally are pushed to the specified remote library. That library is also used for performing builds on the remote host.

Identify Associated Library: this is the target library for pushes and builds

k   Next >   Finish   Cancel

New

Build Properties
Specify the build command.

Build command: CALL MYLIB/MYBLDPGM

Enter the build command to be issued on the remote host that will build this iSeries project.

Identify command to call for Build action

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Eclipse

iSeries Projects

Toronto

► Dedicated Perspective for iSeries Projects

Create iSeries Project

Create Source File

Create Source Mbr

Select Perspective

- Data
- Debug
- Help
- iSeries Projects
- Java
- Java Type Hierarchy
- Plug-in Development
- Profiling
- Remote Systems Explorer (default)
- Resource
- Scripts
- Server
- Team

OK   Cancel

iSeries Projects – Development Studio Client

File   Edit   Perspective   Project   Window   Help

iSeries Navigator

- My Project

Reserved for Editor
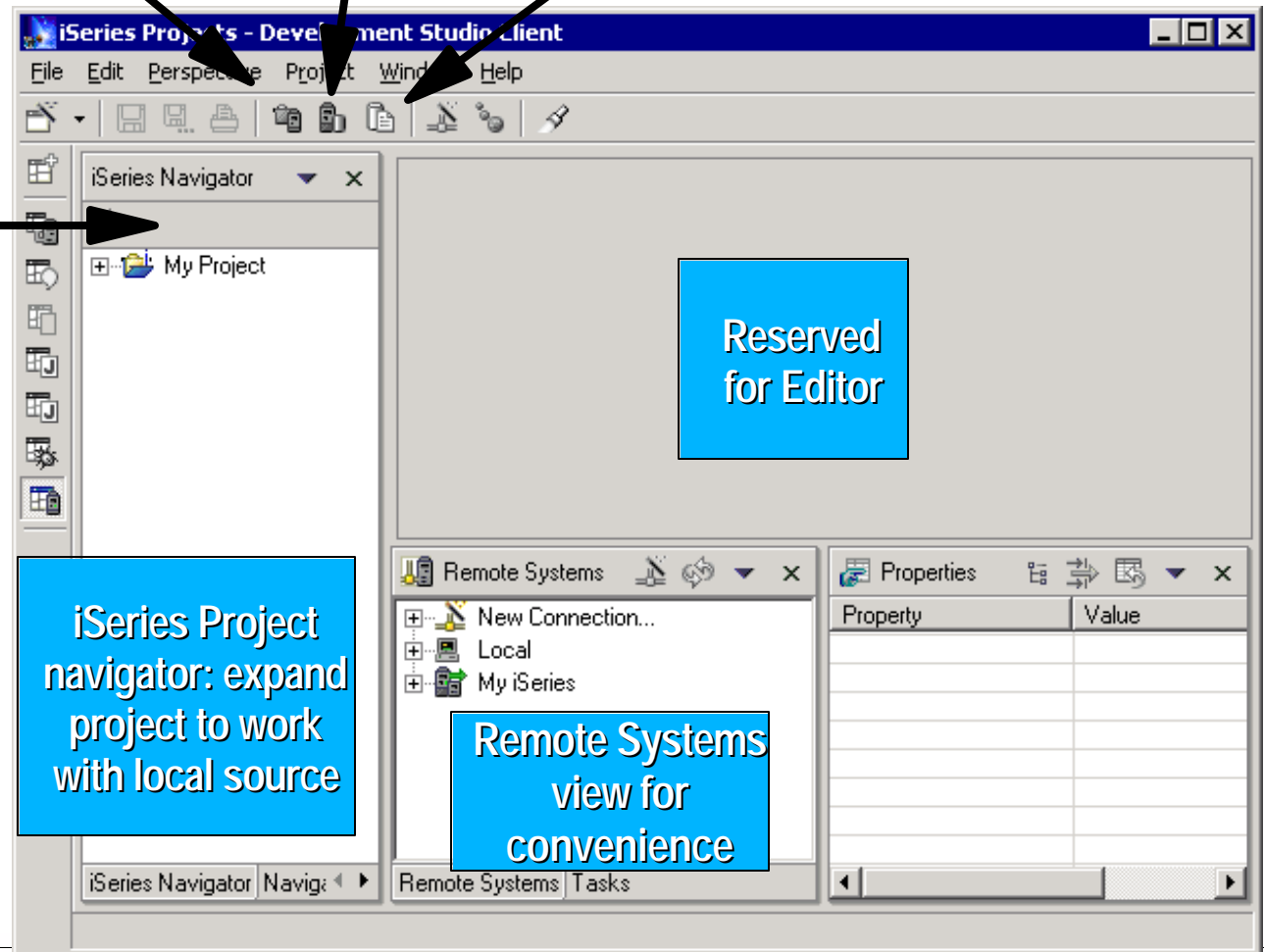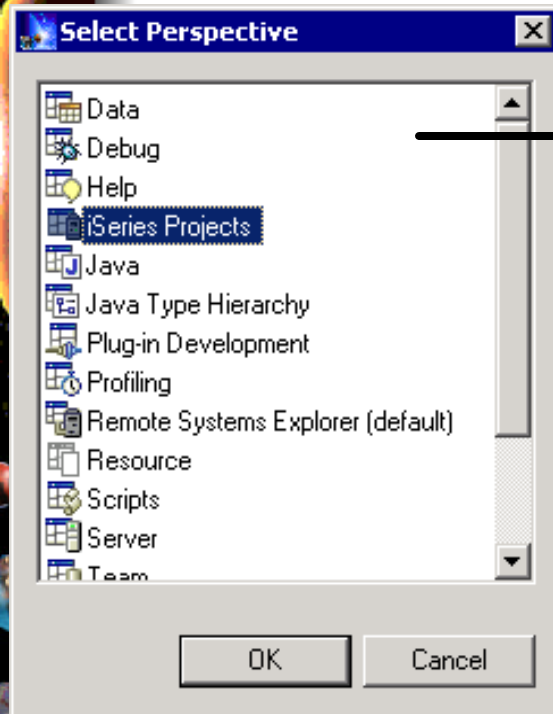
iSeries Project navigator: expand project to work with local source

Remote Systems

- New Connection...
- Local
- My iSeries

Remote Systems view for convenience

Properties

Property   Value

iSeries Navigator | Navig   Remote Systems | Tasks

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iSeries Projects

► iSeries File Wizard

- ● **For creating files in your iSeries project**

New File Wizard

New

iSeries Source Physical File
Create a new iSeries source physical file.

Enter or select the folder:

My Project

- ⊞ 🗁 My Project
- ⊞ 🗁 MyWebProject
- ⊞ 🗁 PhilDemo
- ⊞ 🗁 PhilJavaDemo
- ⊞ 🗁 RemoteSystemsConnections
- ⊞ 🗁 RemoteSystemsTempFiles

Select Project

Folder name: QRPGLESRC

Select an iSeries project and enter the name of the new source physical file being created. The source physical file will map to a folder in the selected iSeries project.

< Back   Next >

New

iSeries Source Physical File Parameters
Specify additional parameters.

CCSID: *JOB

Record length: 92

These attributes are used when the *FILE is created in the associated library of the iSeries project.

Specify attributes that are used when file is finally created in associated library

Finish   Cancel

Source File = a folder in your project
- ► Until you "Push" your changes.
- ► Then a CRTSRCPF is done

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iSeries Projects

Toronto

► iSeries Member Wizard

- **For creating mbrs in your iSeries project**

New Mbr Wizard

New

iSeries Member
Create a new iSeries member.

Enter or select the folder:

My Project/QRPGLESRC

- DefaultEAR
- My Project
  - NEWFILE
  - QDDSSRC
  - QRPGLESRC
- MyWebProject

Select the parent folder.

Member name: MYPROGRAM.RPGLE

Name the member: name.type

Select an iSeries source physical file, and enter the name of the new member file being created. The member will map to a file in the selected iSeries source physical file.

Member = a file in your folder
► Until you "Push" your changes.
► Then an ADDPFM is done

Finish   Cancel

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Eclipse

iSeries Projects

► **What about existing members?**

- **Use <u>Add to Project</u> action to copy them**
  - ► Right click on project, select "Show Remote Objects"
  - ► Drill down to source file, right click, select "Add to Project"
  - ► Drill down to members, right click, select "Add to Project"
- **Files added become folders locally**
- **Members added are copied to that folder**
- **Developer works on local copy**
  - ► Edits file
  - ► Pushes changes using "Push" action
  - ► Does a build using "Build" action
  - ► Shares with team using "Synchronize" action
- **Full power of Eclipse at disposal**
  - ► Team support
  - ► Marker/bookmark support
  - ► Editor registraction support ...

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Project "Bleedthrough"

iSeries Project Perspective

iSeries Projects

iSeries Project navigator:
- ► local files and members
  - Use **Push** popup menu action to copy from project to library
  - Use **Build** to build project
  - Use **Team->Sync** to copy to/from team repository
- ► remote objects, files and mbrs
  - Use **Add to Project** to copy from library to project

(Remote) =>
- ► only exists in associated library

(Local/Remote) =>
- ► exists locally and in associated lib

(Local/Remote) =>
- ► conflict between local and remote

otherwise =>
- ► only exists locally

iSeries Projects

Menu items:
- New ▶
- Open Perspective ▶
- Import...
- Show Remote Objects
- Copy
- Move
- Rename
- Delete
- Close Project
- Refresh
- Push Selected
- Push Changes
- Submit Build
- Team ▶
- Compare With ▶
- Replace With ▶
- Properties

iSe... Studio Client — File ... dow Help

```
NEWMBR    CALLPGM.rpgle X
Row 1        Column 1      Replace
.....FFilename++IPEASFRlen+LKlen+AIDevice+.Keywords++++++++++++++++++++
000100    FCUSTOML3  IF   E        K Disk
000200    DCustnoi       s                    like(CUSTNO)
000300    D*
000400    D CSTRUC      E DS                   extname(customl3:custom01)
000500    D return       s           20
000600    D*-------------------------------------------------
000700    C                EVAL     custnii='0010100'
000800    c                CALL     'GETDATA'
000801    c
000900    c                parm              custnoi
001000    c                parm              cstruc
001100    c                parm              return
001200    c                eval     *INLR = *ON
```

Lpex editor for local members or choose favorite editor

emote)
cal/Remote)
ocal/Remote)
Remote)
oca/Remote)
f (Local/Remote)
ocal/Remote)
Local/Remote)
Local/Remote)
Local/Remote)
dta (Remote)

DATADICTS.file.pf.data (Remote)
QRPGSRC.*file.pf-src (Remote)
TESTTYPES.*file.pf-dta (Remote)
TESTTYPES2.*file.pf-dta (Remote)
TESTTYPES3.*file.pf-dta (Remote)
TESTTYPES4.*file.pf-dta (Remote)
TESTTYPES5.*file.pf-dta (Remote)
TESTTYPES6.*file.pf-dta (Remote)
TESTTYPES7.*file.pf-dta (Remote)
CALLPGM.*module.rpgle (Remote)
CUSTOML3O.*file.lf (Remote)
GETDATA.*pgm.rpgle (Remote)

iSeries Navigator | Navigator | Bookmarks

Local Member: /My Project/QRPGLESRC/CALLPGM.rpgle

Remote Systems
- New Connection...
- Local
- my iseries connection
  - iSeries Objects
    - Your libraries...
    - Your objects...

Remote Systems Explorer to work with objects in remote library

Properties

Property	Value
editable	true
last modified	5/5/02 12:27 PM
name	CALLPGM.rpgle
path	/My Project/QRPGLESRC/CALLPGM.rp...
size	1222

Property Sheet to show properties of selected local or remote object

► Using projects

Prod Lib

Test Lib

library list   library list   library list

Dev1 Lib   Dev2 Lib   Dev3 Lib

Team
Repository

push
build   push
build   push
build

Dev1 IDE   Dev2 IDE   Dev3 IDE

team
sync   team
sync   team
sync
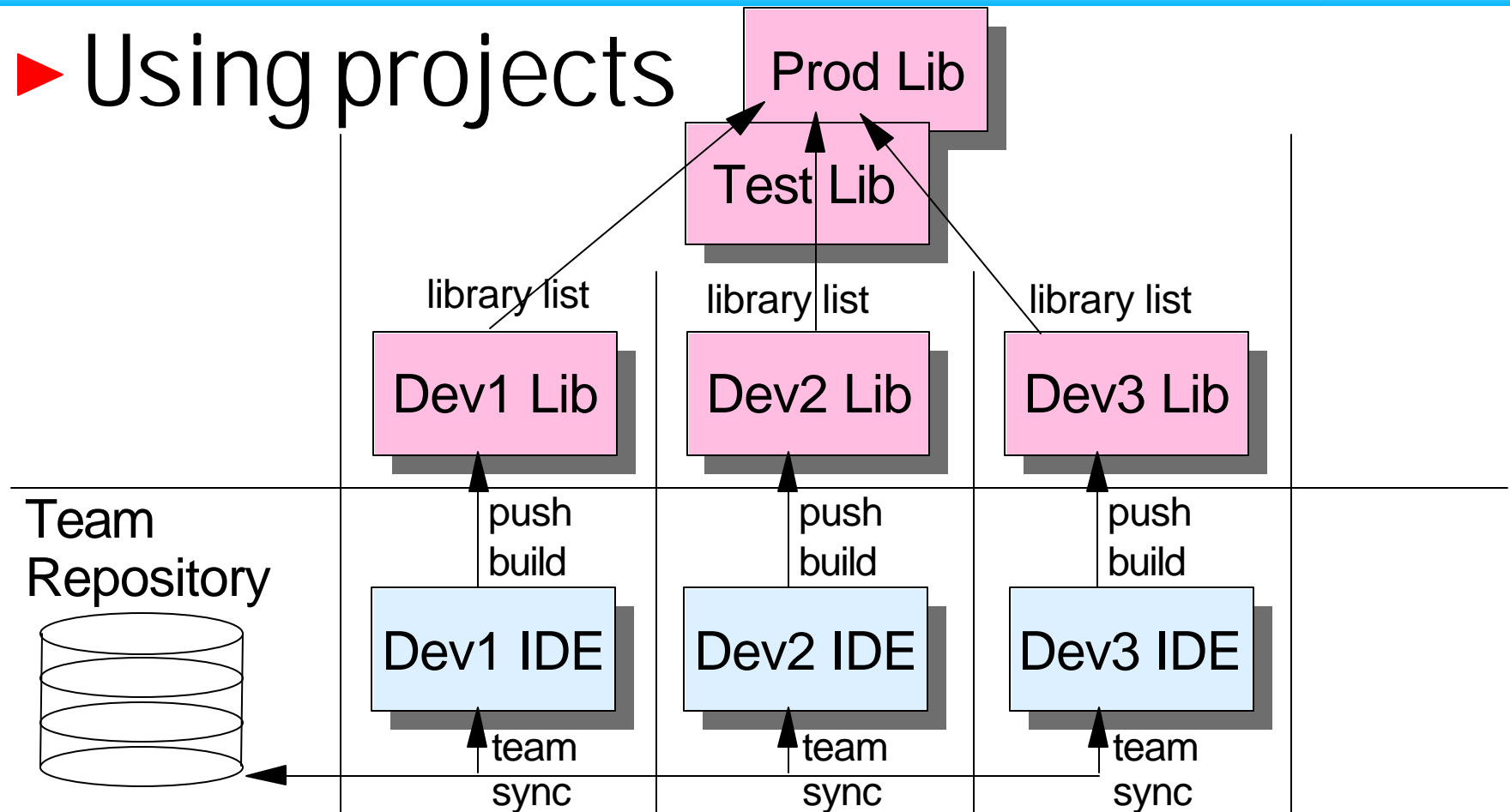
- **Projects typically hold small delta**
  - ►Eg: Files necessary to implement new feature
- **Each developer can have unique ass'd lib**
  - ►Eg: For private builds
  - ►Use team synch to pick up colleague's work so far

iSeries Projects

► Stay tuned...

- **iSeries Projects are new, and their functionality is still immature**
  - ► They are offered initially to gather feedback so they can subsequently be optimized to best match your development patterns

- **The support for iSeries project will iterate quickly in coming releases**
  - ► Including much better integration support for iSeries change management vendors such as Aldon, MKS and SoftLanding.

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More Information?

► Information Sources

- **www.ibm.com/software/ad/wds400**
  - ► Portal for WDSc
- **www.eclipse.org**
  - ► Eclipse and information about eclipse
- **www.ignite400.org**
  - ► Introduction to eclipse article
- **eServer iSeries magazine, July issue**
  - ► 3 articles on WDSc
- **www.ibm.com/websphere/developer**
  - ► WebSphere Developer Domain
  - ► Many articles and tutorials on technology and tools, including eclipse and WSWB and WebSphere Studio configurations

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