

# WDSC First Kiss



# Abstract

Don't let your first experience with WDSC(aka Rdi and now RDPi) be your last kiss goodbye. Learn the quickest path to successful use of WDSC for RPG programmers. In this session we will cover initial startup, creating/editing/compiling RPG programs, how to "customize" your environment, and much more! Learn from somebody who has been using it for the past 6 years!

## Why I use WDSC

- View up to **80 lines of code at a time** (vs. SEU's 19)!
- "**UnDo**" functionality via Ctrl + Z (Like Visa says... "priceless")
- Embedded "compile error text" by double clicking on compile errors
- Ease of **editing files in the IFS** (i.e. XML, HTML, TXT, CONF, etc)
- **Search across entire libraries** worth of source physical file members (vs. PDM's single physical file approach)
- **Colored code** so you can scan source more quickly
- Debugging via SEP (Service Entry Point)
- Pressing F1 in source will open the RPG reference manual! No need to get out the paper manual or go to IBM's web site!
- Ability to save a debug configuration (i.e. calling a program with certain parms, not having to repeatedly specify UPDPROD(\*YES)) giving you the ability to debug with a single click of a button.
- **Content Assist**
- Ability to have two editors open on the same source member IN EDIT MODE!
- Very active community with MANY IBM WDSC developers "hanging out" on midrange.com (WDSC-L list)

# Machine Recommendations

- P4 1.8GHz or higher
  - If using a laptop make sure **NOT** to get a mobile processor as those are geared towards conserving battery power vs. giving you horsepower.
- AT LEAST 1.5GB of memory. IBM requires less but you must remember that this is a memory intensive application. You are buying productivity and memory is cheap.
- AT LEAST a 7200RPM Hard Drive. WDSC is also disk I/O intensive and you will see considerable performance degradation if you have a 4200RPM Hard Drive (4200 and 5400 are very common in laptops).
- AT LEAST a 80GB HD. Why so big? Think about the large updates you will be making to WDSC (in excess of 1.5GB sometimes) and when a new version of WDSC comes out you may want to run them side by side until the latest version feels stable enough for you. The download for WDSC 7.0 was over 7GB!
- Highly recommend 19"+ monitor for ease of using the workspace views and perspectives. I use a 22" monitor just for development and then have my laptop open for things like email and IM.

And lastly here are IBM's recommendations:

<http://www-306.ibm.com/software/awdtools/wdt400/sysreq/index.html>

# Where Do I Get It?

**#1 Method:** With each new OS/400 upgrade where you have paid for the compilers (i.e. 5722-WDS) you should get a set of WDSC CD's. Ask your System i5 admin for them.

**#2 Method:** If you have license to WDSC you can use the ESS (Entitled Software Support) web site at [www.ibm.com/eserver/ess](http://www.ibm.com/eserver/ess) to download WDSC 7.0. Note this will require you download about 7GB of ISO CD images. Microsoft has a cool utility named VCDControlTool.exe that you can use to install these ISO CD images without first burning them to physical media. Do a google search for this tool to obtain if for free from Microsoft.

**#3 Method:** How to get your hands on it if all other avenues fail: <http://www-306.ibm.com/software/awdtools/wds400/about/howToOrder.html> This will most likely entail getting your System i5 BP engaged and they will get it into your hands, but they will need a starting point and the above URL is a good place for you to let them know exactly what you mean.

# Installation

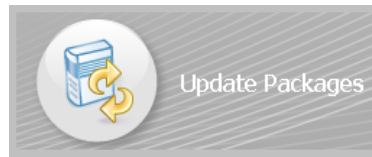
Installation of WDSC 7.0 is much less eventful than previous versions (a good thing).

Simply put in the first CD and sit back and wait to be prompted for the next one.

Take all the defaults as you are going through the install unless you plan on doing more extensive Java programming that requires previous versions of Websphere Application Server.

On a machine with the recommended configuration plan on spending 2 to 3 hours installing WDSC. Note that you can be working on other things while this is happening as most of the time is copying content from CD. Also note that if you copy the CD to an ISO image on your hard drive that I was able to do an install in about 1hr. This is a good approach if you want to install on multiple machines.

Last thing you should do is download the latest updates. If you are on a slow connection this could take hours simply because the first download for WDSC 7.0 is 1.5GB. I have a 6MB down DSL connection and was able to download and fully install the update in about 45 minutes. Applying updates is done with the IBM Installation Manager found here: [Start->Programs->IBM Installation Manager->IBM Installation Manager](#). Once in there select the Update Packages icon.



# Starting WDSC

Starting WDSC is just like any other application, though I would recommend creating a shortcut on your desktop so you don't have to go through the following each time: **Start->Programs->IBM Software Development Platform->WebSphere Development Studio Client for iSeries->WebSphere Development Studio Client for iSeries**

Part of the initial startup process is to select what is called a workspace. The workspace is where all of your preferences and cached source will be stored as you are working on them. I have put them in a variety of places in the past including My Documents but found that sometimes Windows didn't like some of the long path names generated by WDSC, so now I stick them in C:\WDSC7 right off the root of my HD – I would recommend you do the same.

It is common for WDSC to take a minute or more to start on lesser machines.

The welcome screen will be displayed once WDSC is fully loaded.

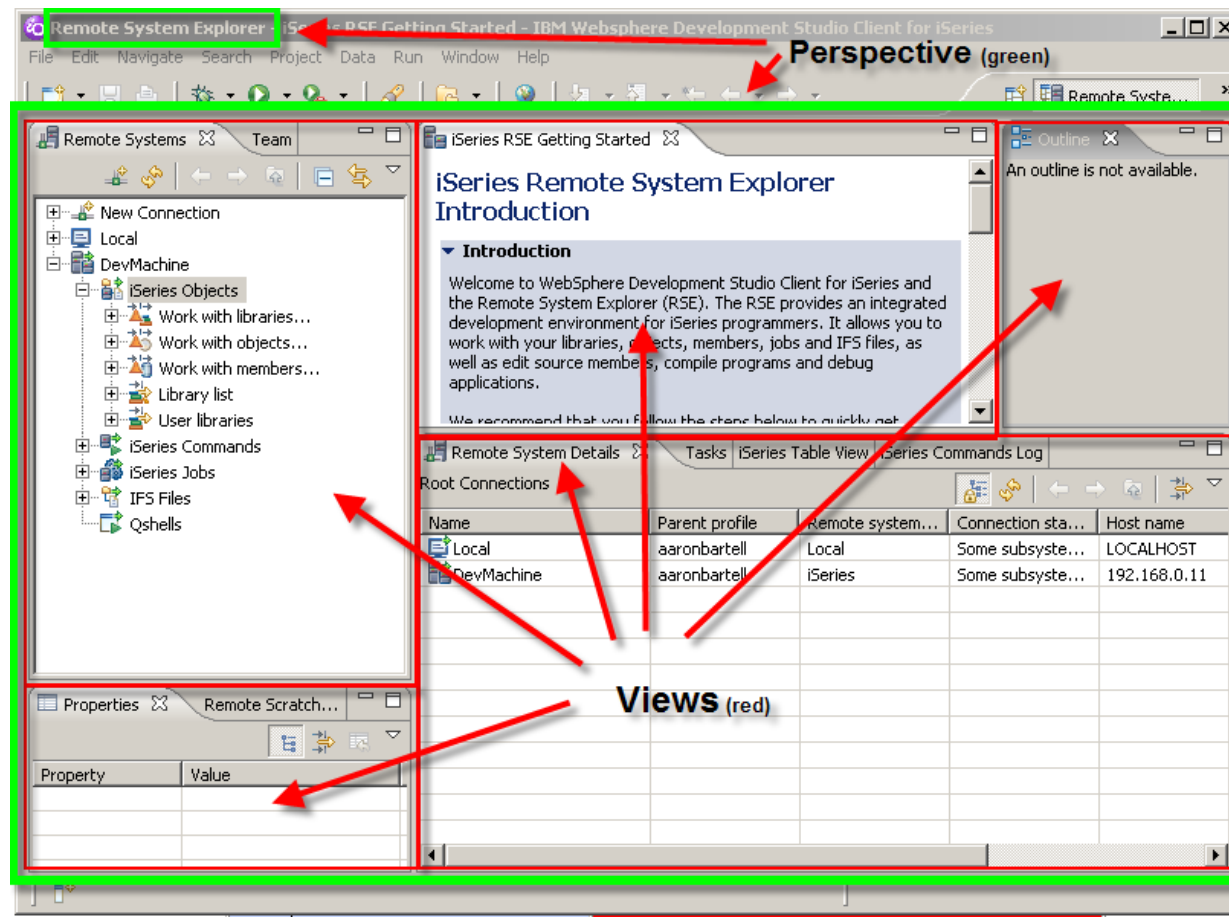


# Perspectives and Views

The WDSC window is composed of what are called Perspectives and Views. A Perspective is a collection of Views. When WDSC was opened for the first time you saw the Welcome View maximized in the Remote System Explorer Perspective.

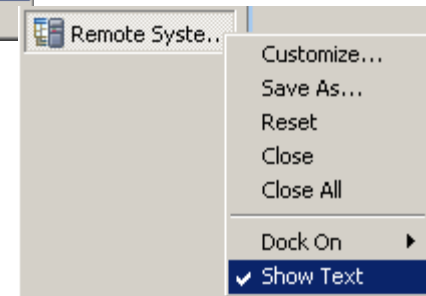
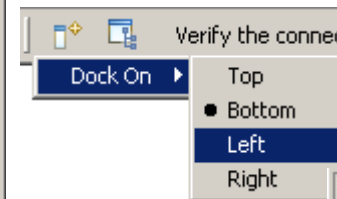
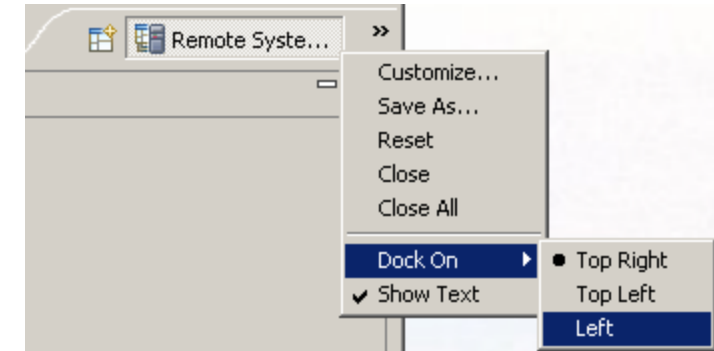
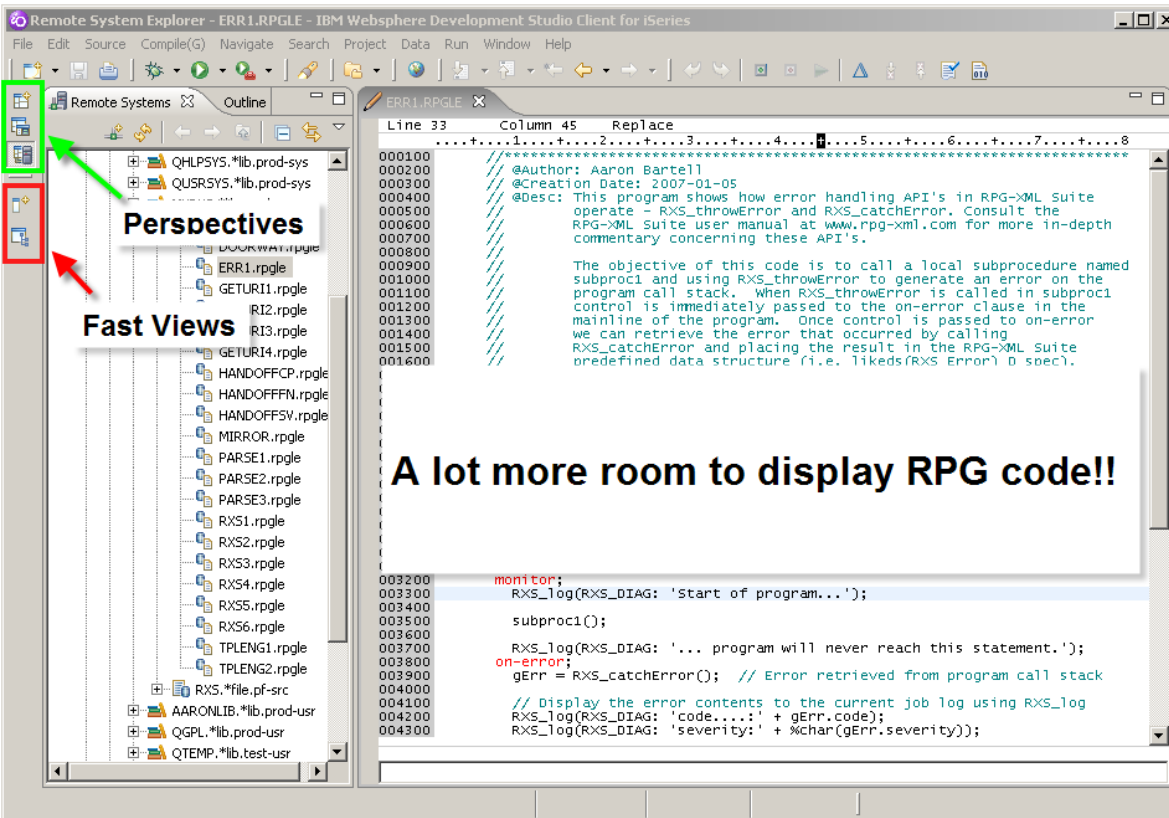
A Perspective simply helps organize a default set of Views. For instance, you can add a new View to the Remote Systems Explorer Perspective simply by selecting Window->Show View

If you screw up a perspective beyond repair (maybe closed something you didn't mean to and cant find it again) then simply select Window->Reset Perspective and you will be back to where you started.



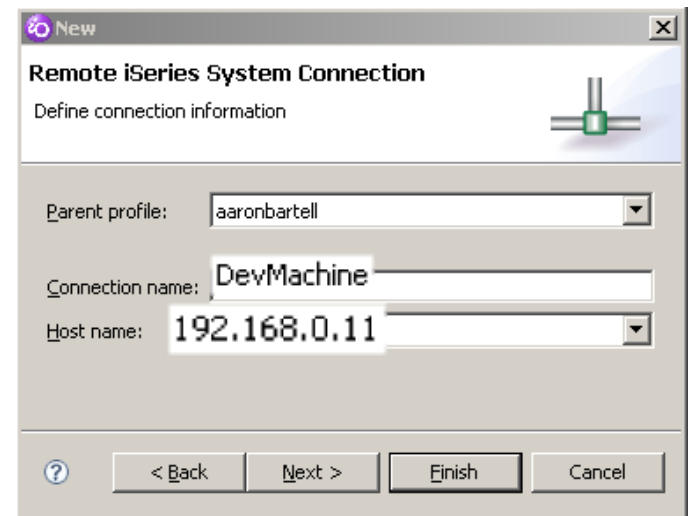
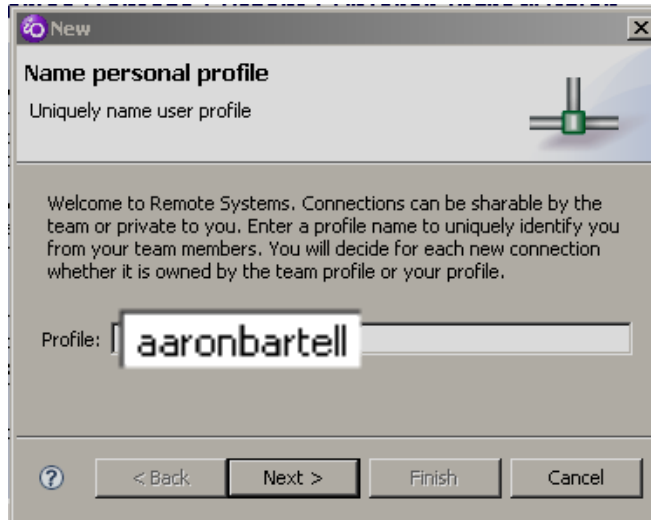
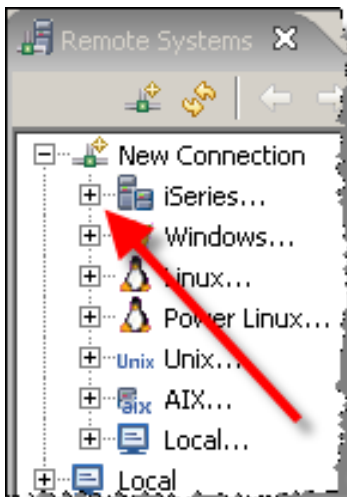
# Cleaning up your Views

The Remote System Explorer view is WAY too cluttered for my own personal use. I find it is best to close many of the lesser used views, combine others into the same space, and switch others to Fast View. Fast View temporarily hides a View but doesn't close it. A View can be accessed from the Fast Views area by clicking on it. I also like to move the Perspective and Fast View sections to be on the left instead of at the top and bottom. Note that WDSC will remember all of the relocating of views the next time you startup the product.



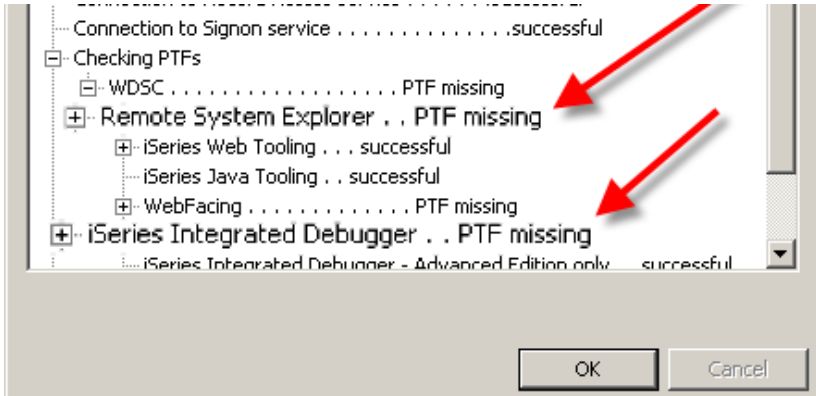
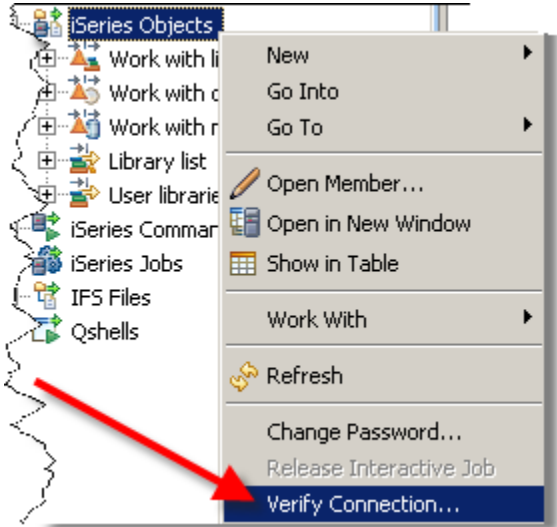
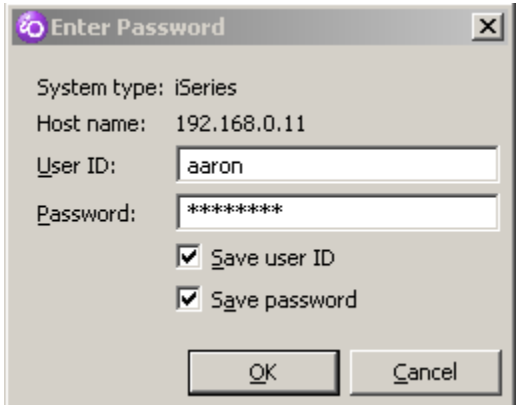
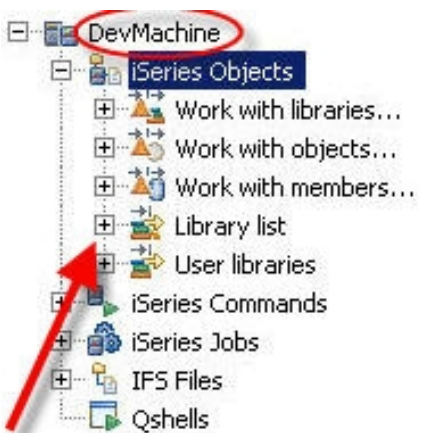
# System i5 Connection

After WDSC has fully loaded you can close the Welcome view and expand the New Connection and iSeries sections. When prompted for a profile simply enter your first and last name. The last dialog will ask for a “friendly” connection name along with the actual host or IP address.



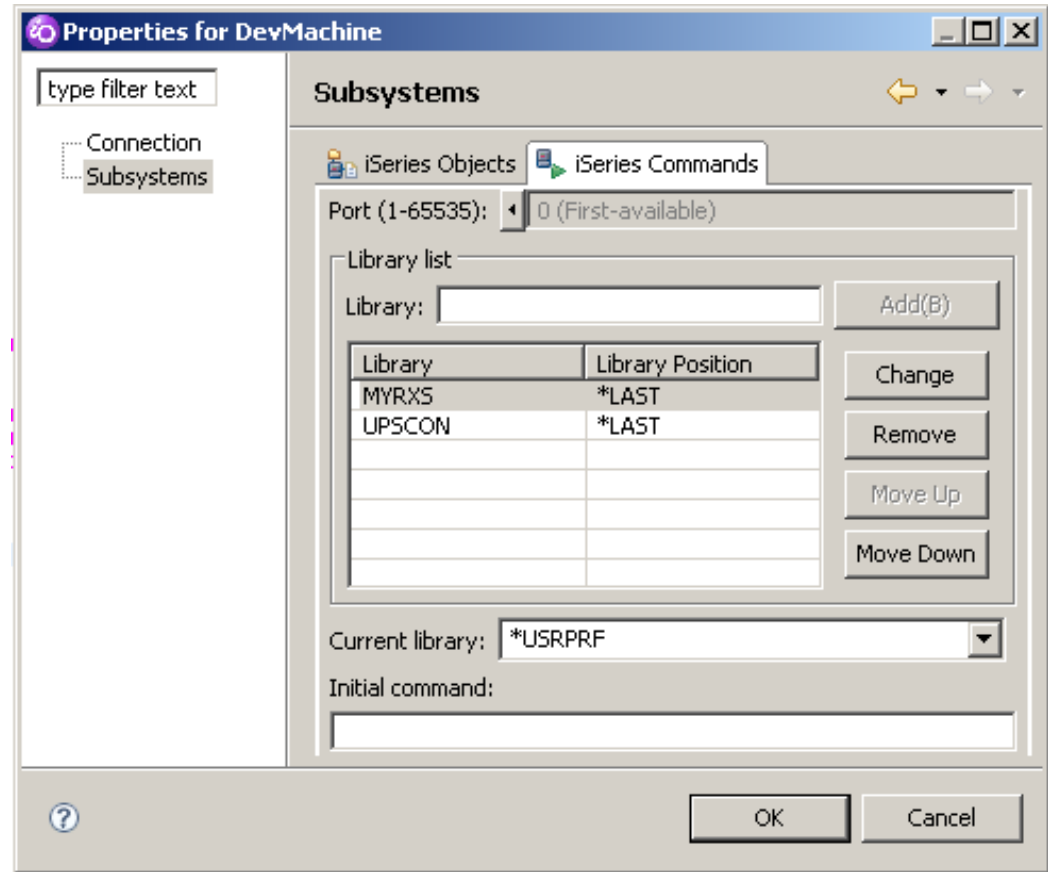
# System i5 Connection

Now that you have created a connection you can test it by expanding the Library List section. This will prompt you with the Enter Password dialog. Enter the same information as your 5250 login. Once logged in right click on iSeries Objects and select Verify Connection. This will check to ensure you have all the latest server side PTF's installed. If any are missing for Remote System Explorer or iSeries Integrated Debugger I would have them applied.



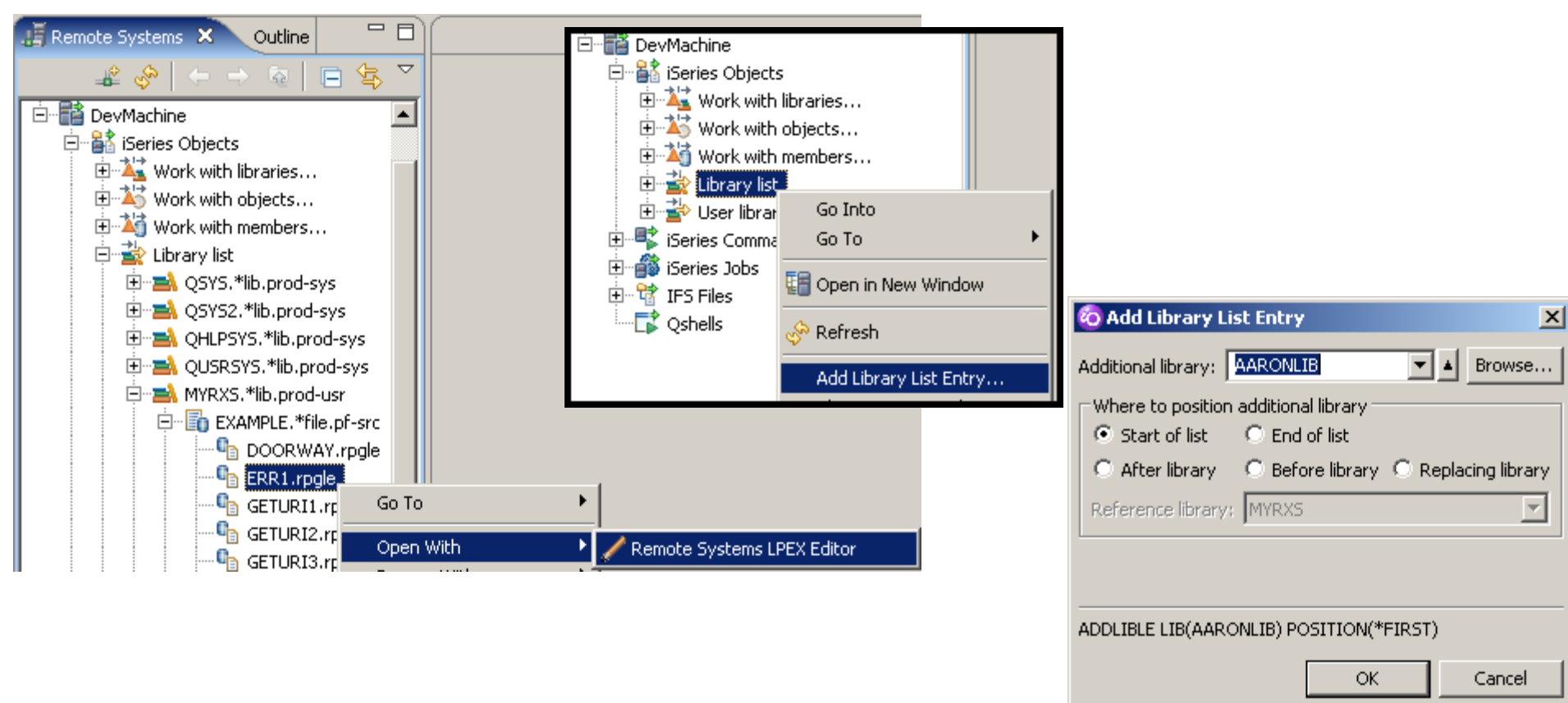
# Default Libraries

Developers often need a set of libraries available to them during compile and those aren't always included in our profiles job description and thus not in our WDSC library list upon connecting. WDSC allows you to define additional libraries to add when you initially connect to a machine by right clicking on the machine and selecting Properties->iSeries Commands tab.



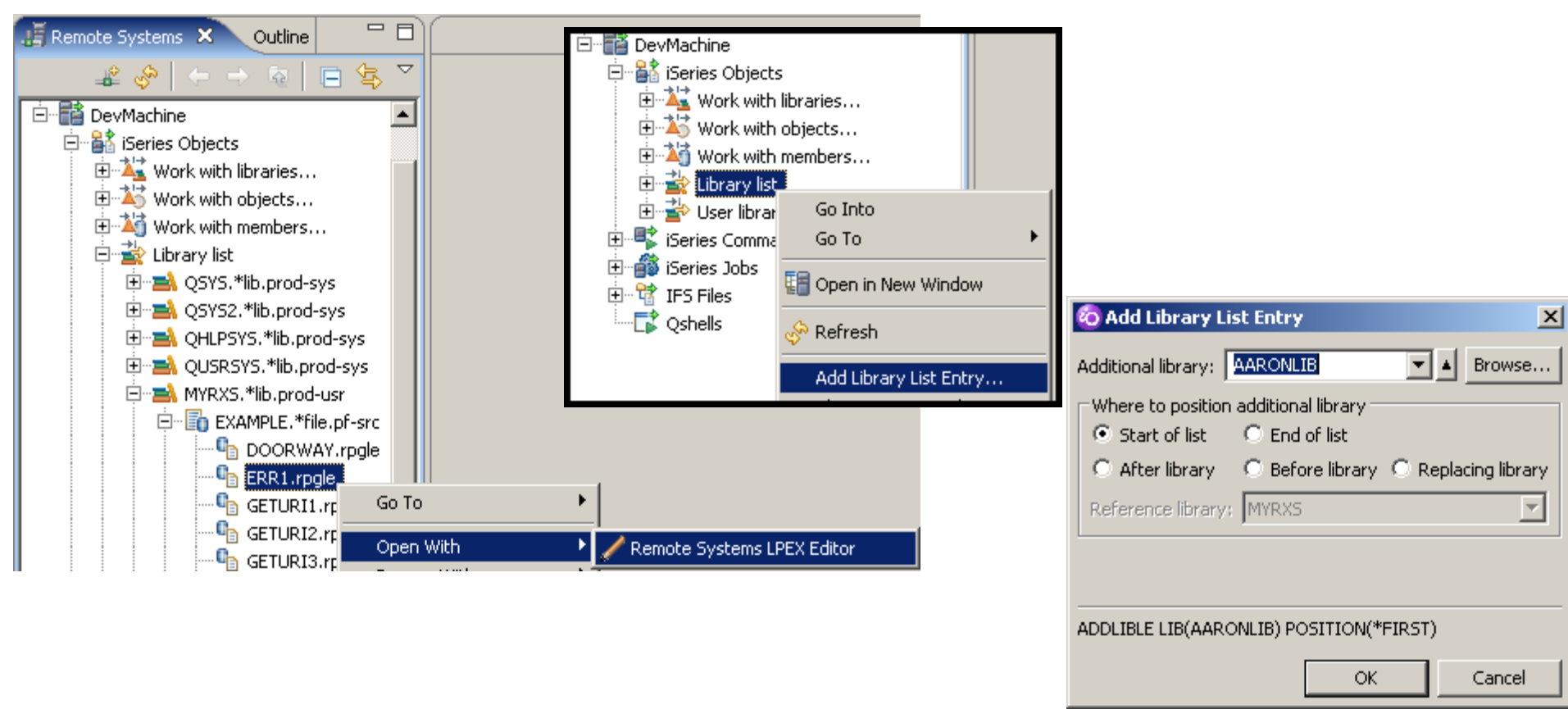
## Opening Source Member

Once a connection has been created you can start using WDSC to edit your RPG, DDS, CL, etc, code. Navigating to your code is like navigating in Windows Explorer – simply start at the Library List section and expand your way to the library, source physical file and member you would like to open. If your source library is not in the list then right click on the Library List icon and select Add Library List Entry.



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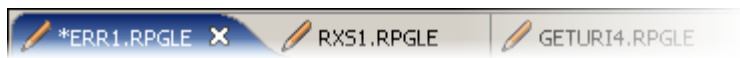
# Editing and Saving

The LPEX (**L**ive **P**arsing **E**xtensible Editor) editor is used to modify and view source code within WDSC. To make program changes simply start typing as you would in any Windows based text editor. Note that the LPEX editor is unique in that it brings SEU into the Windows world and many times gives you the best of both. For instance you still have the sequence number area to the left of the source and you can use traditional Windows features like Ctrl+Z to undo a recent change (amazingly cool!). Opening a source member for edit in WDSC will lock the member just like editing using SEU will lock the member.

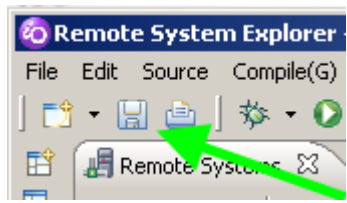
A source member has been modified if an asterisk is displayed to the left of it's name.



Open as many source members as you like and easily switch between them with the mouse or use Ctrl+E to bring up a list and use the arrow keys to select one.



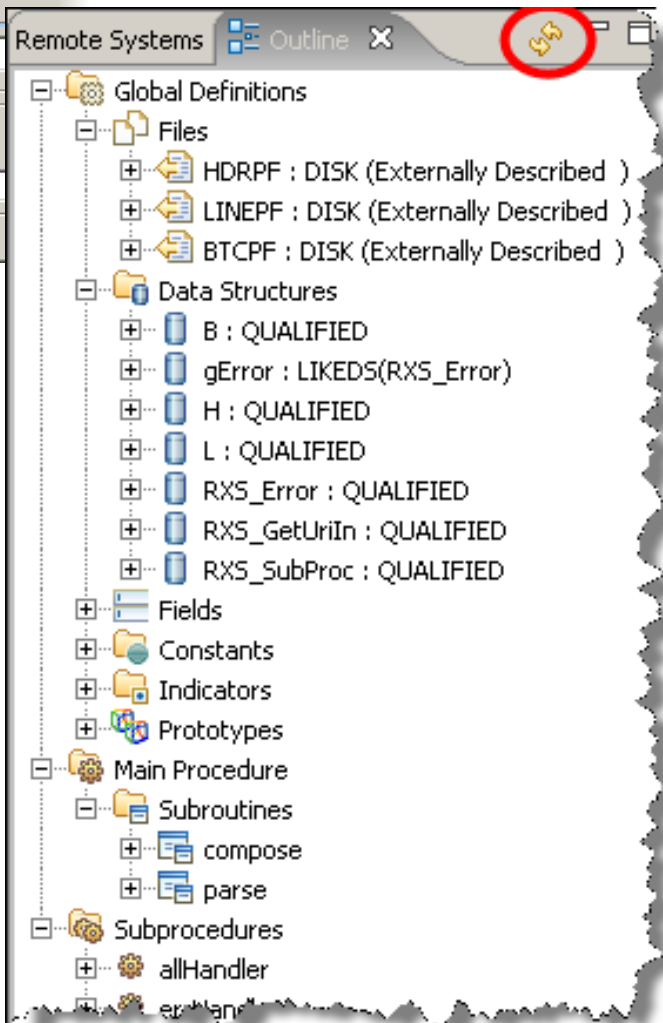
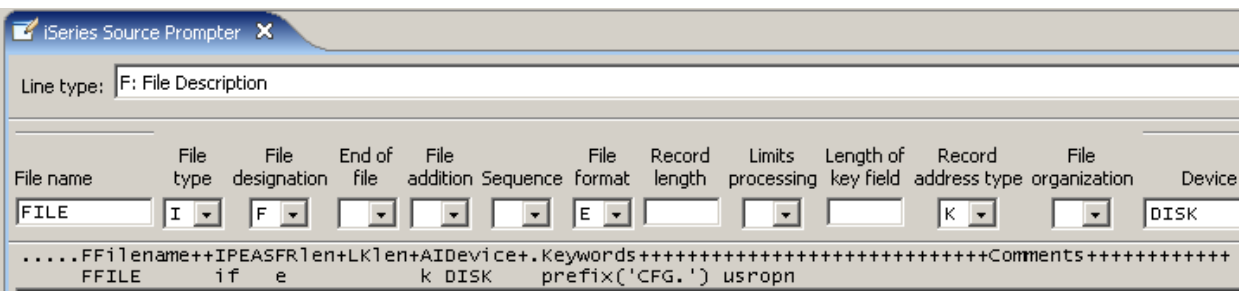
Save a source member by selecting the Save icon or using Ctrl+S.



Attend my WDSC Tidbits of Goodies session and learn how to view over 80 lines of code at a time!!

## Editing and Saving Contd...

You can hit F4 on any source line and be prompted with structured input fields (for the weak ;-)

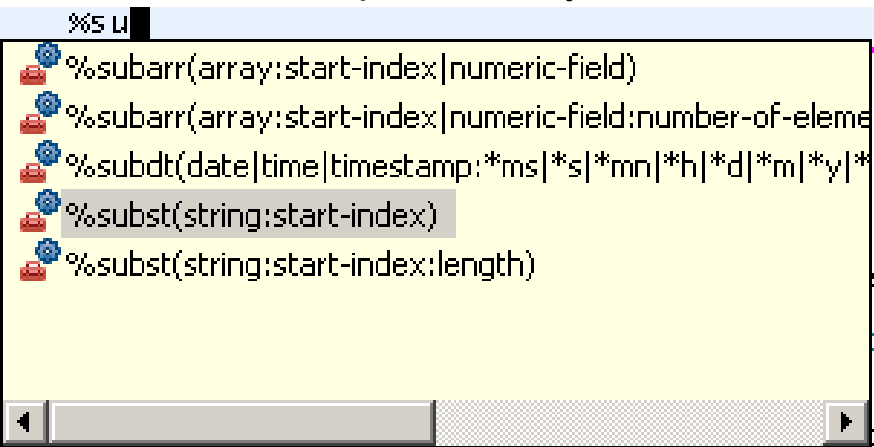


Use the Outline view to see all of the different definitions in your program. By default this is NOT occupied with data. To occupy it you need to select the refresh button. This view is NOT updated as you add new variables into your program so you will have to select the refresh button whenever you want the most recent definitions to display in the Outline view.

With the Outline view occupied you can now use Ctrl+Space (Content Assist) while in the code to get a list of definitions to easily select from. This can save a lot of time and keying mistakes!

# Editing and Saving Contd...

The Content Assist WDSC feature allows you to get a context sensitive list of available definitions to pick from to save you typing time and eradicate spelling errors. This works on both program definitions as well as RPG compiler BIF's. Note that you will need to select the refresh button on the Outline view to get program definitions (i.e. variables, files, etc). After you select a BIF or sub procedure it will continue to prompt you for parameters and high-light in bold the current parameter you are on.



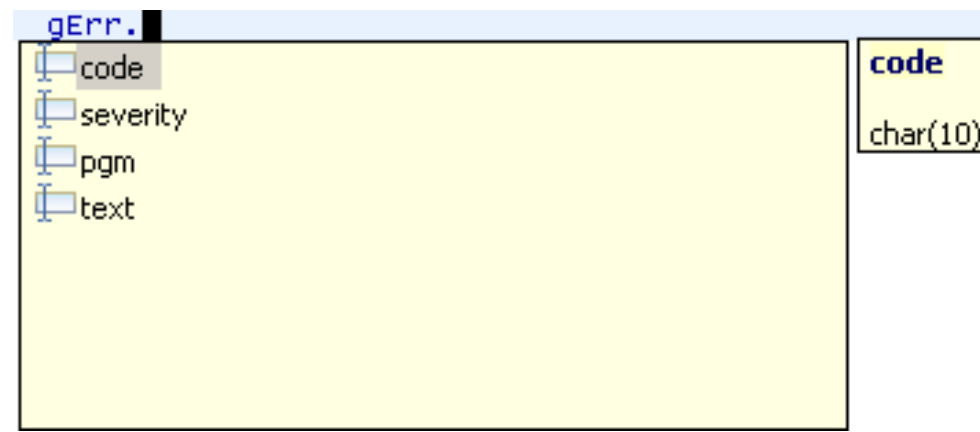
**%SUBST(string:start-index)**

%SUBST (Get Substring) returns a portion of argument string. It may also be used as the result of an assignment with the EVAL operation code.

After you select a BIF or sub procedure it will continue to prompt you for parameters and high-light in bold the current parameter you are on.

**%SUBST**  
 (  
 string  
**start-index**  
 length  
 )

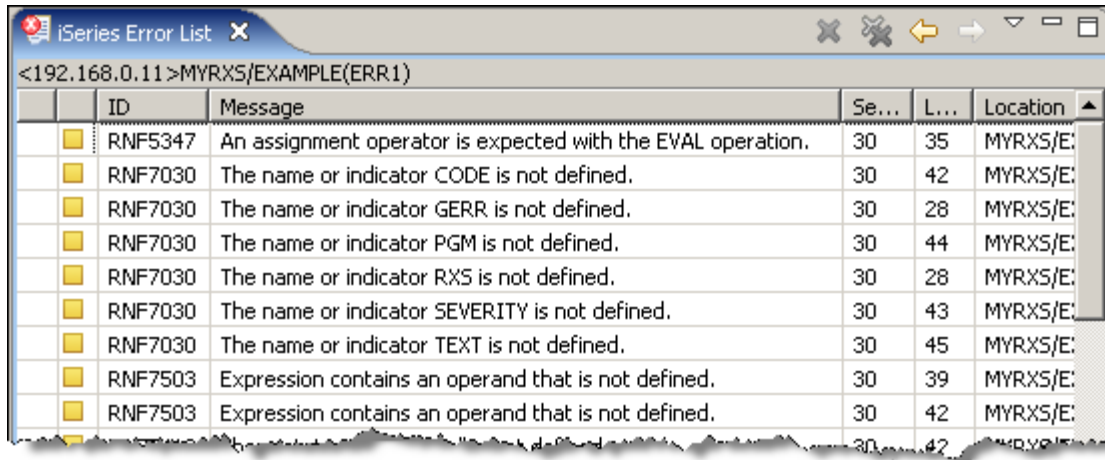
%subst(myStr: )



# Compiling

Before compiling you can try using the Verify feature which will confirm that the source doesn't contain syntactic or semantic errors. To verify your RPG code select menu Source->Verify. Doing this can save precious i5OS CPU cycles from being used to compile programs and it is almost instantaneous from the programmers end – very nice!

When you compile or verify your code the iSeries Error List will be displayed (I usually put this into Fast View to save window space). Simply click on one of the errors and it will immediately take you to that line of code in the program with the error displayed directly beneath it! To clear the pink errors from your source member select Ctrl+F5.




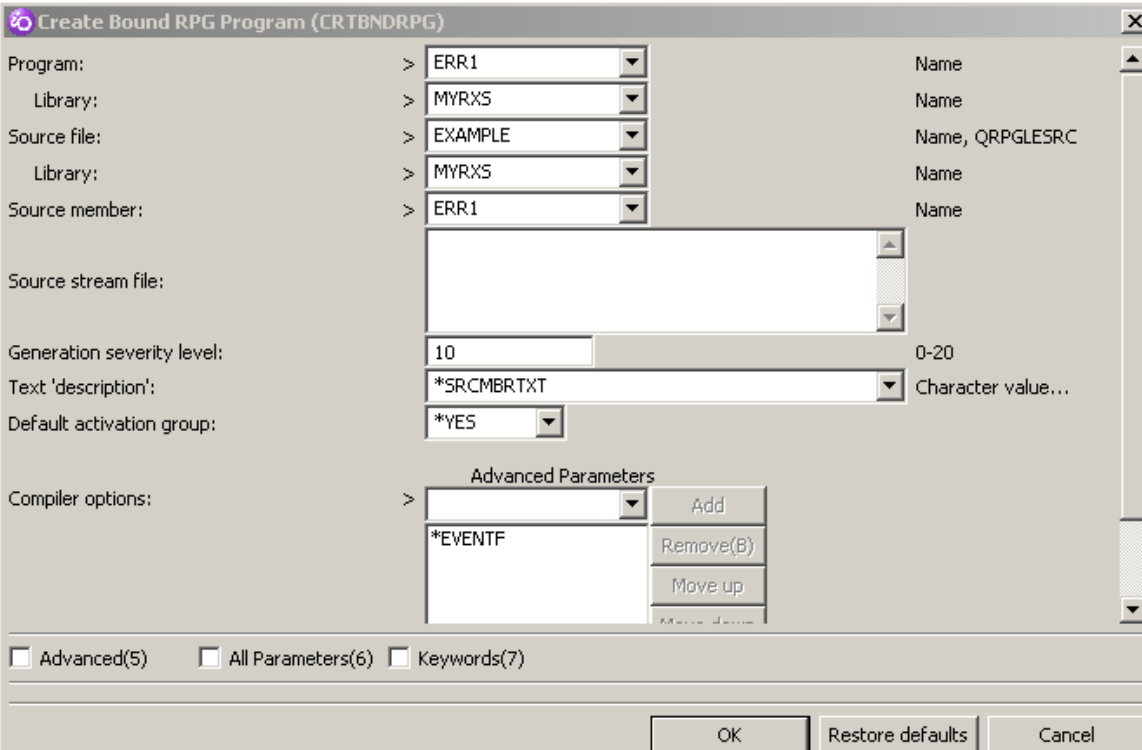
The screenshot shows the 'iSeries Error List' window for the program '<192.168.0.11>MYRXS/EXAMPLE(ERR1)'. The window contains a table with the following columns: ID, Message, Se..., L..., and Location. The errors listed are:

ID	Message	Se...	L...	Location
RNF5347	An assignment operator is expected with the EVAL operation.	30	35	MYRXS/E:
RNF7030	The name or indicator CODE is not defined.	30	42	MYRXS/E:
RNF7030	The name or indicator GERR is not defined.	30	28	MYRXS/E:
RNF7030	The name or indicator PGM is not defined.	30	44	MYRXS/E:
RNF7030	The name or indicator RXS is not defined.	30	28	MYRXS/E:
RNF7030	The name or indicator SEVERITY is not defined.	30	43	MYRXS/E:
RNF7030	The name or indicator TEXT is not defined.	30	45	MYRXS/E:
RNF7503	Expression contains an operand that is not defined.	30	39	MYRXS/E:
RNF7503	Expression contains an operand that is not defined.	30	42	MYRXS/E:

```
/free  
  monitor;  
    RXS_log(RXS_DIAG: 'start of program...');  
RNF0267: Character literal has missing trailing apostrophe; trailing apostrophe assumed.
```

## Compiling continued...

To compile a program simply right click on the member in RSE (Remote System Explorer) and select Compile->CRTBNDRPG or if the member is open and is the active editor you can select Compile(G)->Compile->CRTBNDRPG from the main WDSC menu bar. Once you have done a compile using CRTBNDRPG there is a short cut button that looks like a piece of paper with '010' superimposed on it.  If you need to modify the compile parameters simply chose Compile->Compile (Prompt)->CRTBNDRPG and you will see a window like below.



**Create Bound RPG Program (CRTBNDRPG)**

Program: > ERR1 Name  
Library: > MYRX5 Name  
Source file: > EXAMPLE Name, QRPGLSRC  
Library: > MYRX5 Name  
Source member: > ERR1 Name

Source stream file:

Generation severity level: 10 0-20  
Text 'description': \*SRCMBRTXT Character value...  
Default activation group: \*YES

Compiler options:

Advanced Parameters

> [ ] Add  
\*EVENTF Remove(B)  
Move up  
Move down

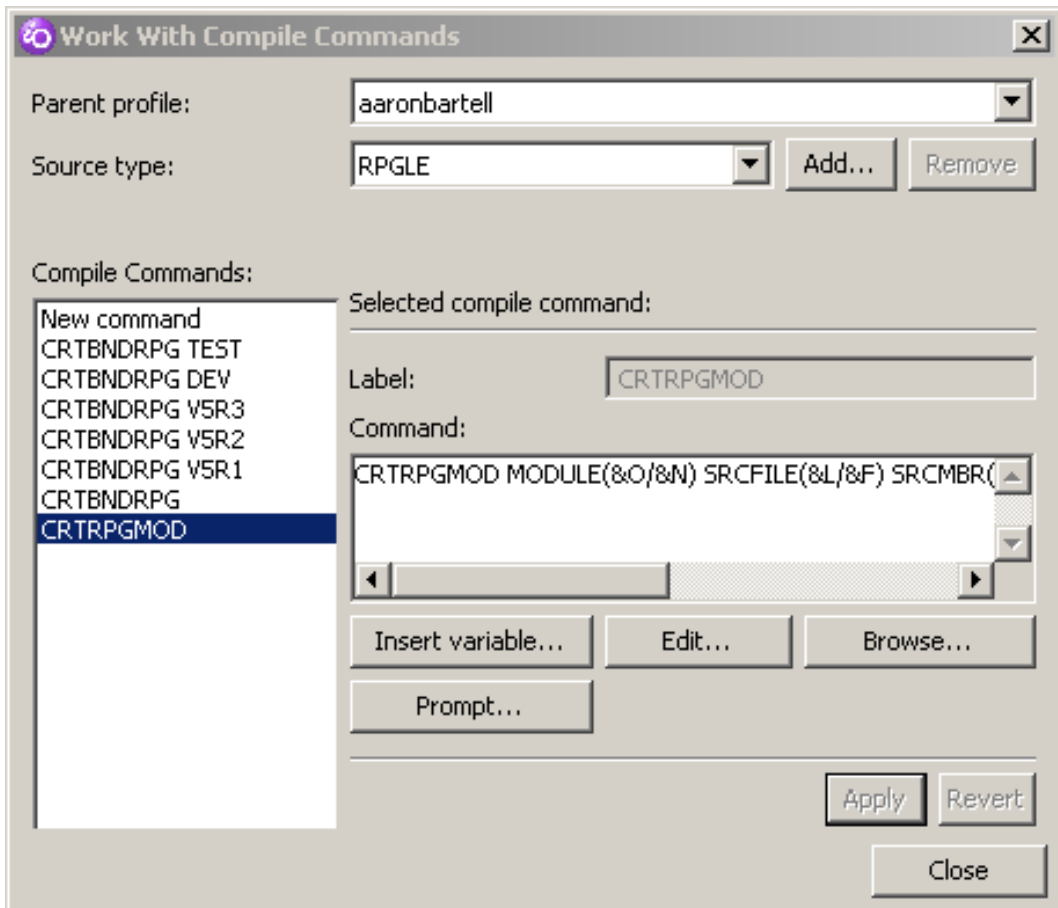
Advanced(5)  All Parameters(6)  Keywords(7)

OK Restore defaults Cancel

While prompting the compile command you can hit F1 in any of the fields and it will bring up the IBM reference manual located on your machine.

# Compiling continued...

If you find yourself repeating a certain compile command prompt repeatedly you can simply save it to a named compile command instead of prompting each time. Go to Compile(G)->Compile->Work With Compile Commands to see the list of current commands.

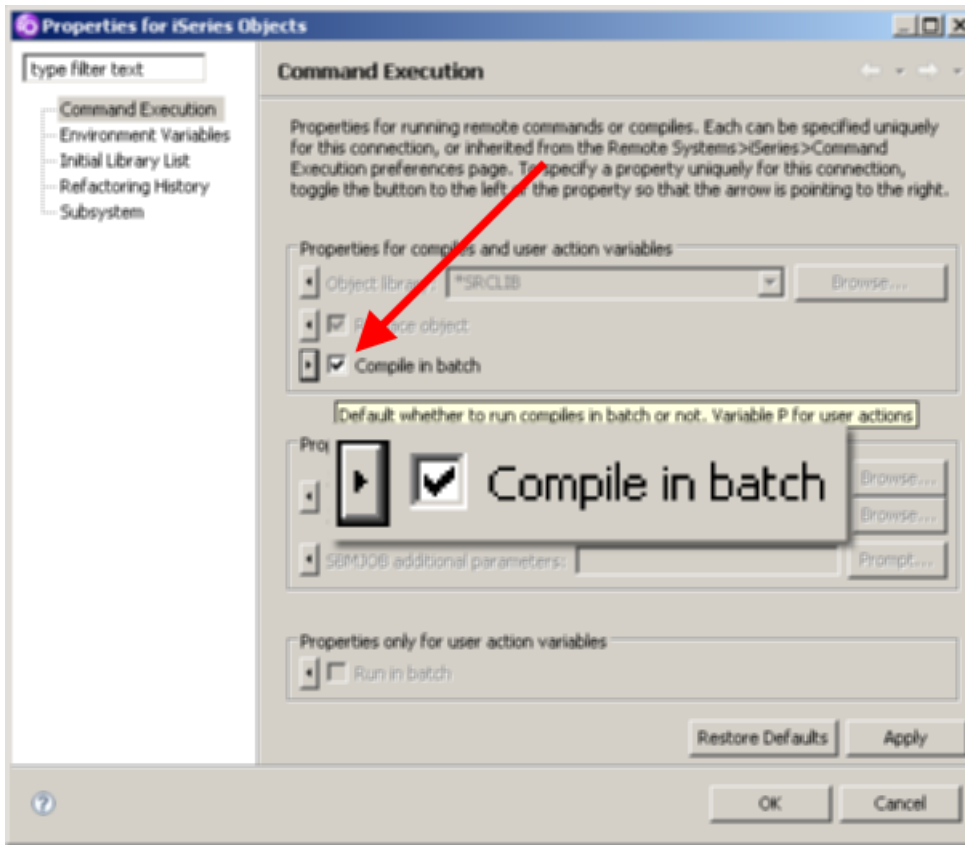


I like to use this to predefine certain libraries to compile into or compile to a specific release (i.e. V5R1 vs. V5R3)

If there is a similar command defined you can right click to copy and paste. You can edit the raw command in the Compile text box or prompt for the values.

## Compiling continued...

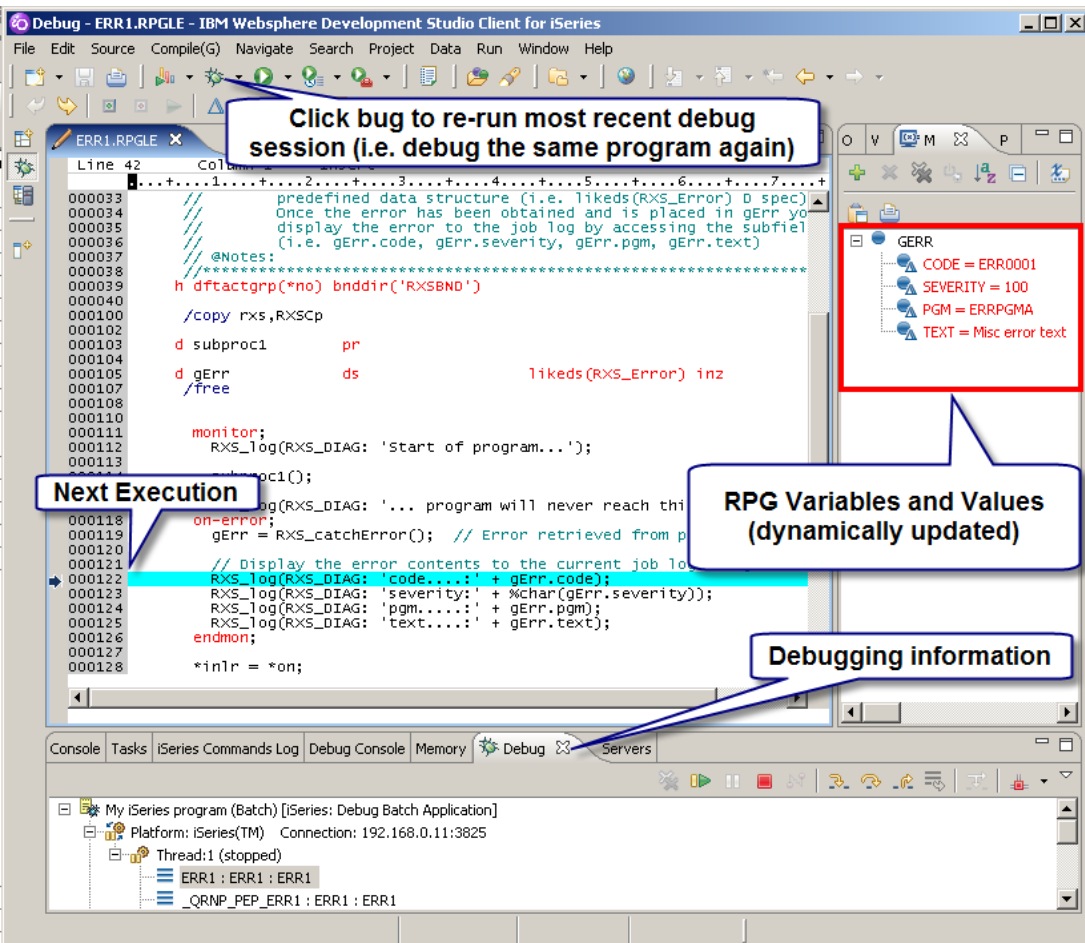
Troubleshooting: I inevitably have trouble compiling via batch from every WDSC release I have used and 7.0 is no exception. Sometimes when I submit a compile I can see it going through the initial compiling stage, but then it never comes back with the iSeries Error list. You can address this by **un-checking** the *Compile in batch* option available by right clicking on iSeries Objects in RSE and selecting Properties.



Note that this means your environment will be locked while the compile executes, but it is only a couple of seconds usually (or however long the compile actually takes).

# Debugging

Debugging in WDSC has gotten reliably better with each release. The best part about it is that you don't have to first go in and set a break point. Simply right click on a \*PGM object in Remote Systems view and select Debug As(F)->Batch.



Note that it is best to reorganize the different views within the Debug perspective to optimize source and variable viewing.

The variables display in the Monitor view vs. the Variables view as one might expect. To 'monitor' a variable simply high-light it and select Monitor Expression.

Is WDSC hanging when you try to debug? Make sure there aren't any MSGW jobs from previous debugs that need to be responded to before you can continue.

# Debugging

If you want to review past debugging configurations/sessions simply select the down arrow button next to the bug icon and then select Debug... . This will bring up a dialog allowing you to save this configuration with a specific name and modify settings like UPDPROD(\*YES).

The How To Start tab has a text area with the following:

```
SBMJOB CMD (CALL PGM (MYRXS/ERR1) ) ↑
```

From here you can add PARM values to the call which will save time on repetitive debugging.

**You can give this a permanent name if you like. I use the program name.**

Name: My iSeries program (Batch)

Connection: DevMachine

Library	Program	Type	
<input checked="" type="checkbox"/>	MYRXS	ERR1	*PGM

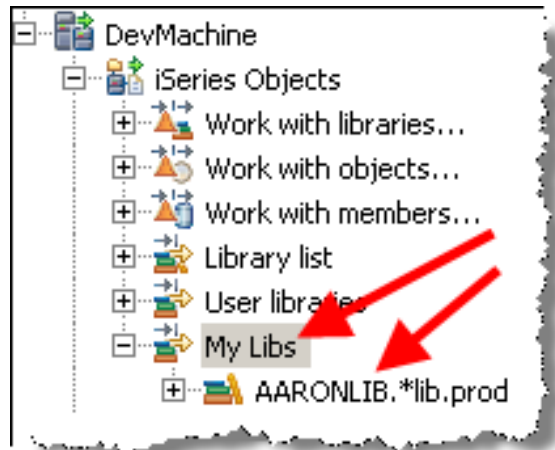
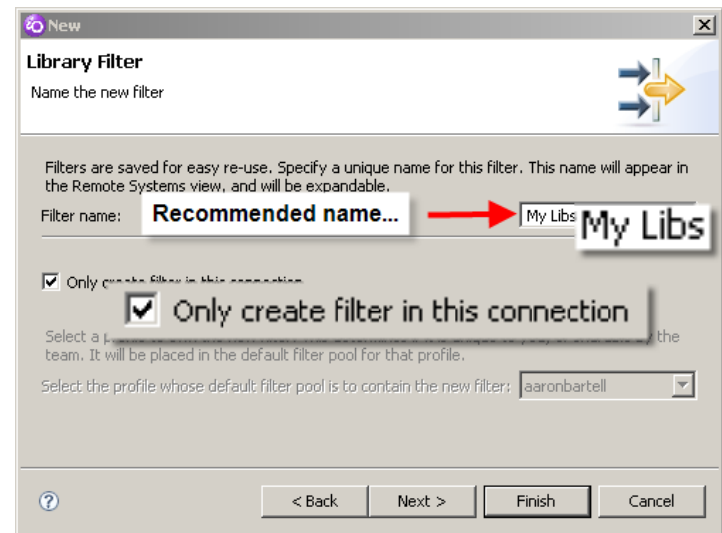
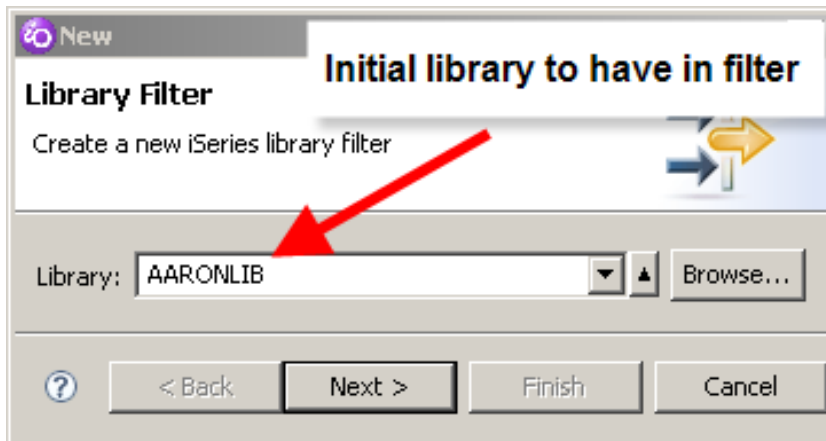
Step into  
 Terminate debug session on program completion  
 Update production files

Apply Revert

Debug Close

## Library Filter

One of the first things I like to create for a WDSC connection is a Library Filter. This allows me to create a grouping of libraries I access on a frequent basis. To create a Library Filter right click on iSeries Objects and select New->Library Filter

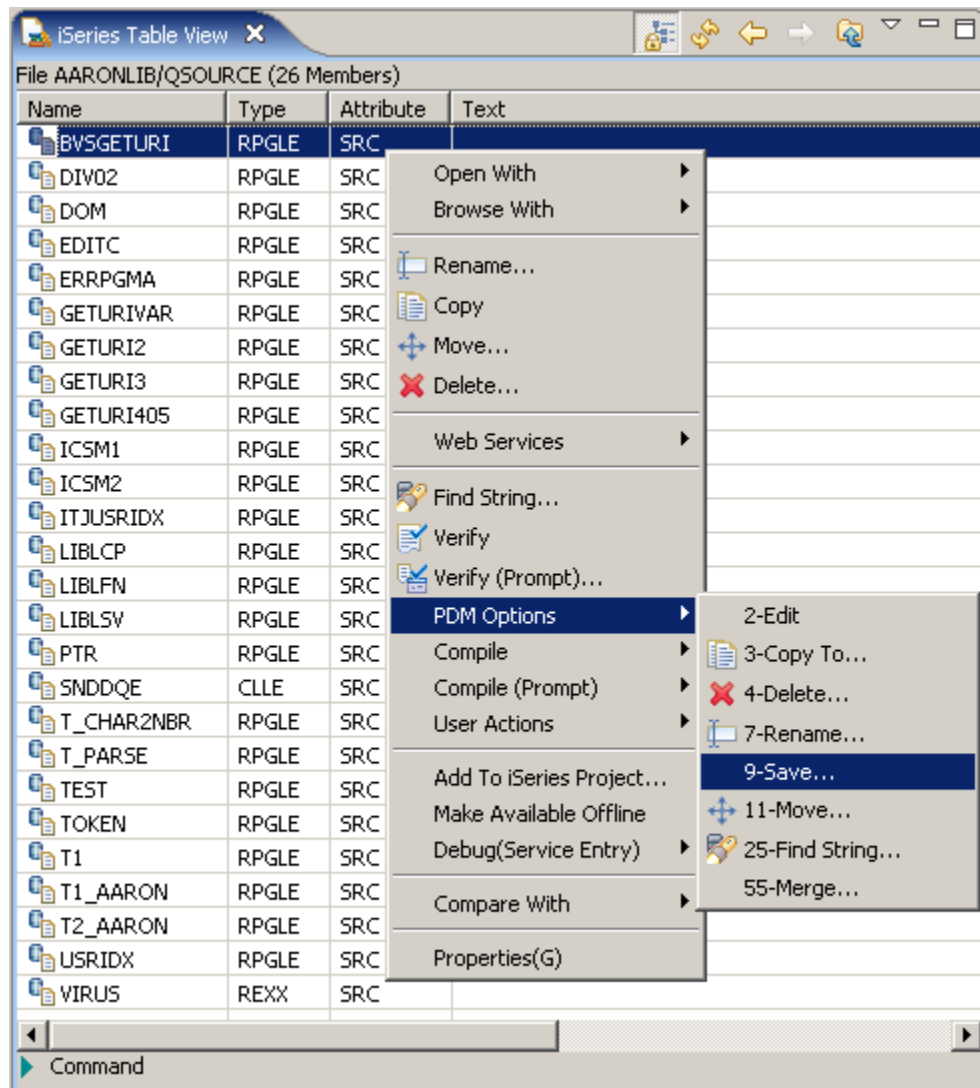


# iSeries Table View

You can use the iSeries Table View to display a list of items in a more traditional/PDM way. For example you can display a list of members or objects in a table structure vs. using the Remote Systems view.

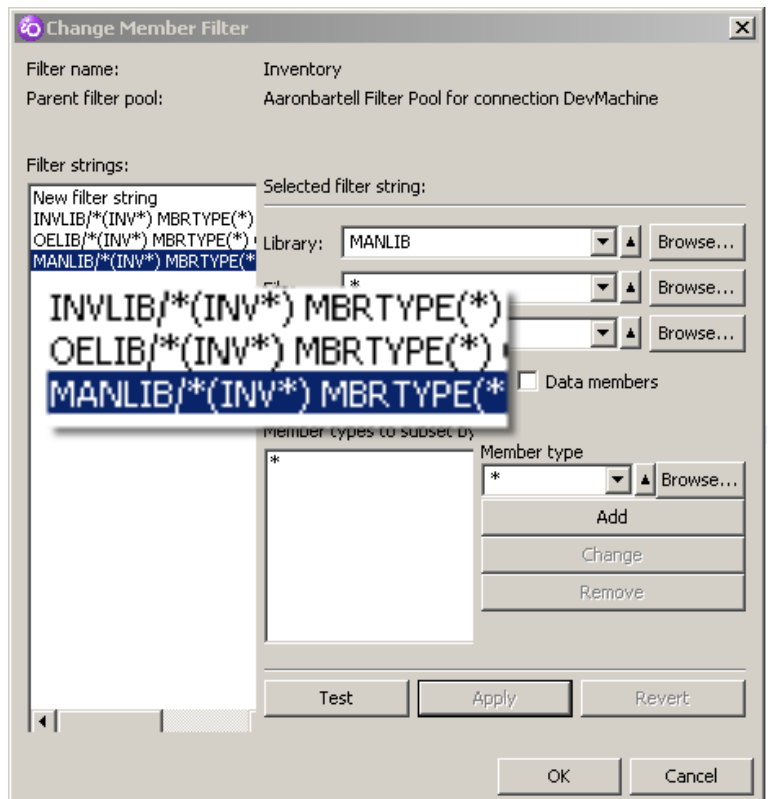
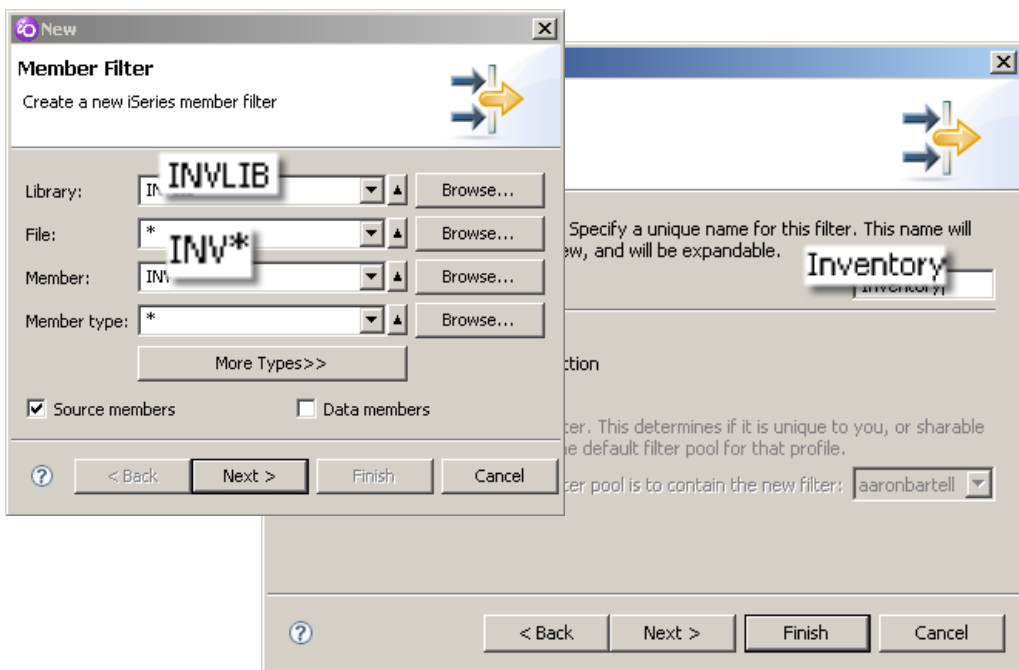
To enact this view simply right click on just about any expandable section within the Remote Systems view and select Show In Table. Navigate through the view by double clicking on list items to view the contents (i.e. double click on a library to see it's objects including source physical files).

This view also gives you the PDM Options right click menu option.



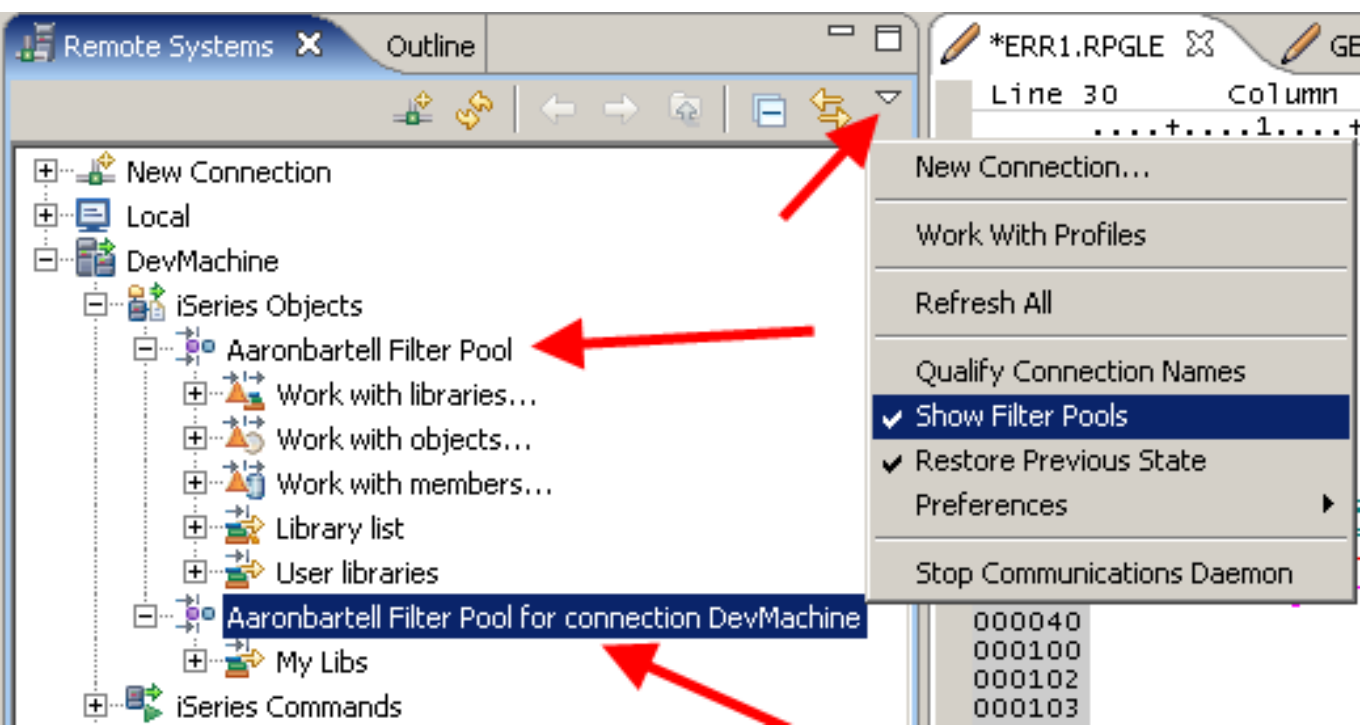
## Member Filter

Another valuable way to view source members is with the Member Filter. The cool thing about this feature is that you can group together many different source members from different source files into one filter by way of wild cards. First create the Member Filter by right clicking on iSeries Objects and select New->Member Filter; then specify the initial criteria in the screens that follow. After it is created you can right click and change it to add additional criteria. Expanding the Member Filter section will display all of the source members that match the criteria.



# Filter Pools

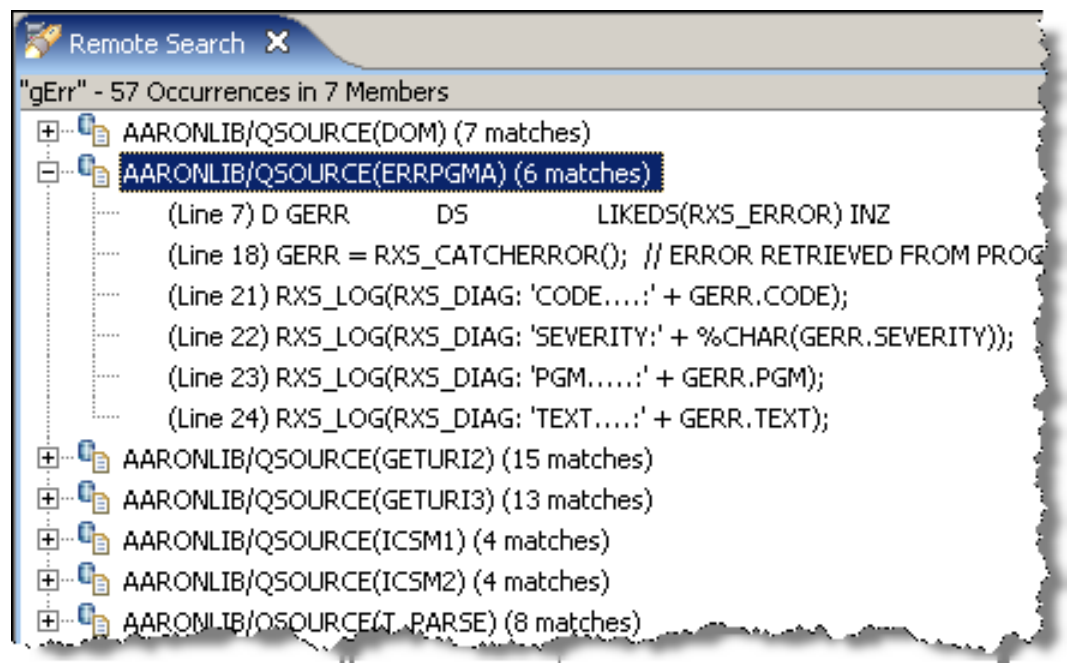
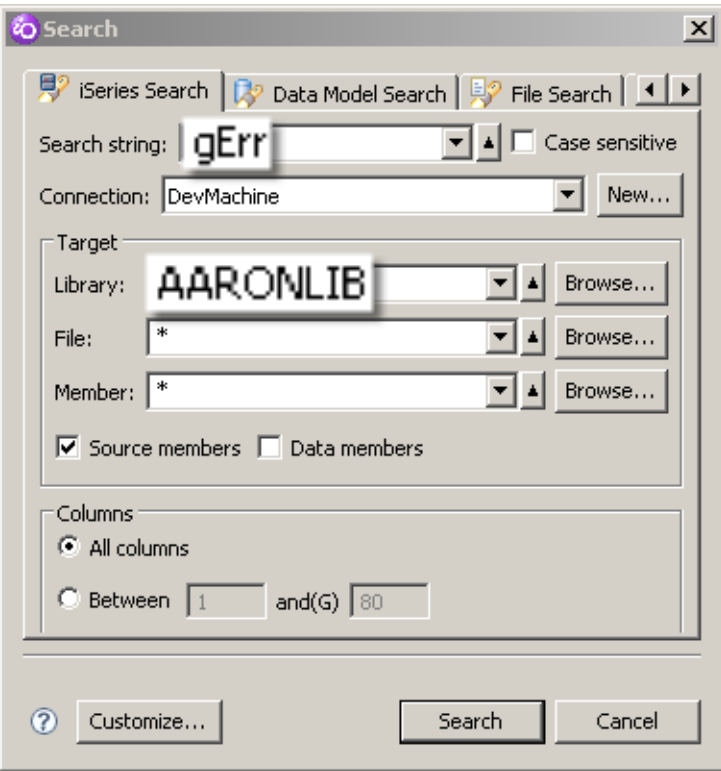
Filter Pools allow you to partition filters into named groups for easier management. I have found them most useful in separating filters from one machine to the next as each machine often times has different libraries. With that said I keep a default filter pool (i.e. Aaronbartell Filter Pool) that is on every machine connection because there are things like the Library List section that are useful for all machines. When option Show Filter Pools is selected you can add and delete filters from specific pools or groupings.



After you are done working with the filter pools simply de-select the check mark so they are not complicating navigation in RSE.

## iSeries Search

With WSDC you can easily search across multiple source physical files in the same library by using Search->iSeries from the top menu or by right clicking on a library/source physical file and selecting Find String. From the resulting Remote Search view you get a sample of each line where the search string was found and can access it by simply double clicking on that line which will open up the source member and place your cursor on that exact location – very nice!



# Useful Links

<http://wiki.midrange.com/index.php/WDSC>

<http://wiki.midrange.com/index.php/RDi>

<ftp://ftp.software.ibm.com/as400/products/ad/wdt400/v601/presentations/iSeriesQuickTour/quickTour.html>

<http://modernrpgiv.com/ModernProgramming/WDSCiTutorials/tabid/66/Default.aspx>

<http://iseriestv.com/Training/WDSC/index.html>

<http://www.as400pro.com/servlet/sql.tipListInq?cat=WDSC>

[http://faq.midrange.com/index.pl?\\_recurse=1&file=289](http://faq.midrange.com/index.pl?_recurse=1&file=289)

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# Questions?



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