Source Code Management using IBM Rational Team Concert

Work Items, Software Configuration Management, and Team Collaboration Platform for COBOL, Java, PL/I, C/C++, and Assembler Development

Student Exercises

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Overview

This lab is for use with Rational Developer for z (RDz) integrated with Rational Team Concert (RTC). RDz is an integrated development environment (IDE) that consists of a workbench and a common set of tools to help you develop and maintain Assembler, COBOL, C/C++, and PL/I. RTC provides project tracking, planning, build, collaboration and source code management. RDz and RTC can be installed separately or together in an integrated environment where both RDz and RTC share the same eclipse client. The lab will demonstrate how to use RTC to track progress using Work Items and Iteration Plans. It will show how to manage source code with the Jazz Source Code repository.

Module 1 Source Code Management (SCM) using Eclipse

1.1. Source Code Management with RTC

Some background on source control management in RTC and an explanation of some commonly used terms.

Some Jazz Terms Defined:

Project Area

The project area is the system's representation of a software project. The project area provides definition for the project deliverables, team structure, process, and schedule.

Team Area

The structure of the project teams is defined by one or more team areas. A team area serves these functions:

1. *Defines the users (team members) on the team and specify their roles.*
2. *Defines the development line in which the team is participating.*
3. *Customizes the project process for the team.*

Streams and Components

A stream is a repository object that includes one or more components. A component is a collection of related artifacts, such as an Application, an Eclipse plug-In, or a group of documents that comprise Web site content.

Change Set

A change set is a repository object that collects a related group of changes so that they can be applied to a flow target (workspace or stream) in a single operation.

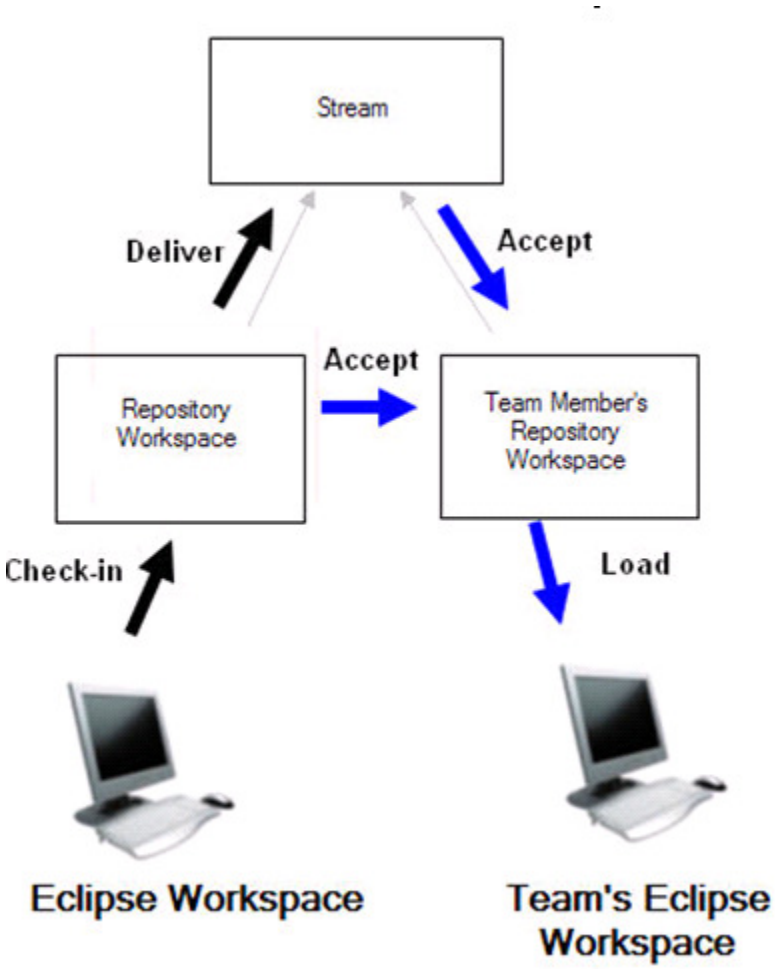
The change set is the fundamental unit of change in Jazz source control. The contents of any workspace, component, or stream can be expressed as a collection of change sets, beginning with the one created when the initial set of projects was checked in. A change set can include changes to the contents of individual files and changes to a component namespace (such as delete, rename, and move operations).

The source control component handles the storing, retrieving and sharing of source code and other artifacts in your project. It is important to understand the terminology and relationships involved in any model so we will give some background information on managing source code with RTC including terminology.

In Rational Team Concert, we want users to benefit from SCM's ability to track and version your changes, whether or not you are ready to share those changes with your team. Accordingly, as a user you have your own private **repository workspace** which stores the changes you've made, regardless of when you decide to make them available to your team. Sometimes it will be only a

couple of hours before you decide to share your changes; sometimes it will be longer. You decide when to make the changes available to your team. When you **load** your repository workspace, the files and folders in it are transferred to your Eclipse workspace on your computer. To push a change from your Eclipse workspace to the repository workspace you **check-in** the change.

A **stream** is used to store the team's work. When you want to make your changes available to your team, you **deliver** them from a repository workspace to a stream. When you wish to incorporate other team members' changes, you **accept** them from the stream (Note that you can also accept changes directly from another repository workspace, allowing for fine-grained sharing of changes between team members). For example, two team members might collaborate on a small bug fix; or, if someone starts a change and has to go on vacation, another team member could continue the work and then deliver it later. All changes you make in your repository workspace are tracked within change sets. Each change set is composed of a collection of explicit, primitive changes to one or more files or folders. The following picture shows the source control process.

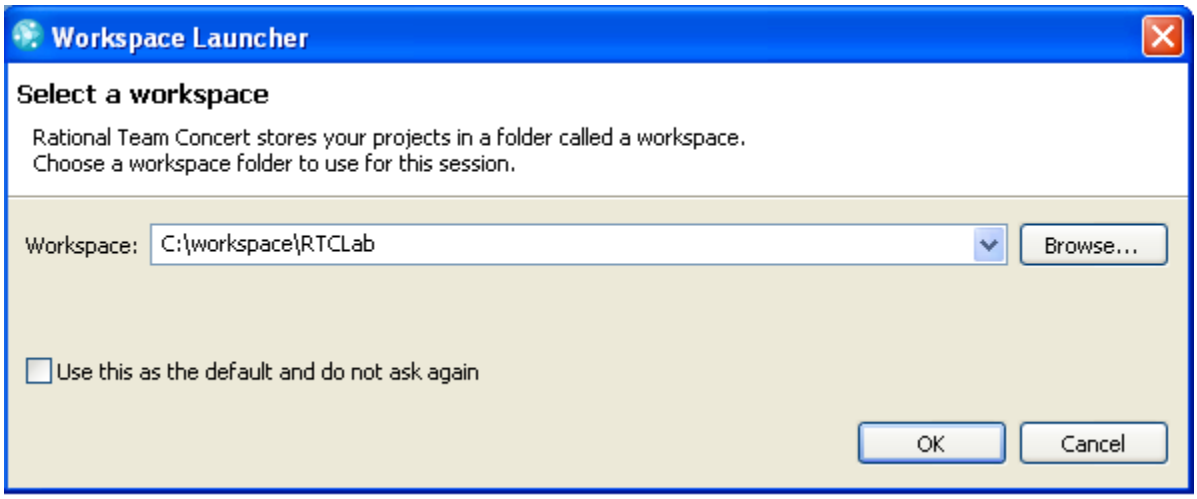


The scenario presented in this first lab is that you are a new member in the team so you will need to connect to the teams RTC repository, get a list of the work assigned to you. Create a child task associated with work you are going to do and make the necessary code changes. Then run a build to compile your changes, and check the output. Finally complete the work item.

1.2. Connecting to an RTC repository

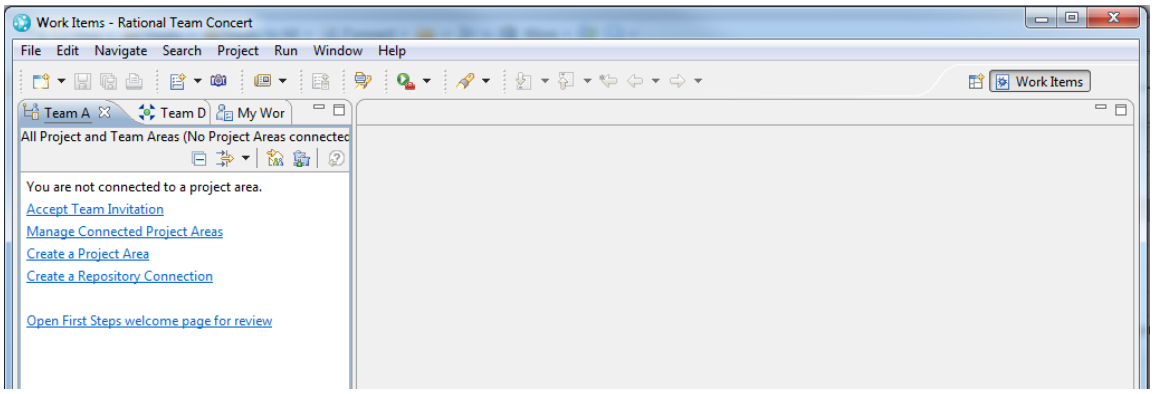
a) You should find the icon for Rational Team Concert on your desktop (IBM Rational Team Concert), double click to start the client. (The client has the Rational Developer for z client also installed for use during this lab).

You will be prompted with the Workspace Launcher where you can select your Eclipse workspace. This is a directory where all your settings are managed and where all your source code is stored. The workspace, **RTClab**, should be listed by default but if it is not just click the downward pointing arrow in the box and select **C:\workspace\RTCLab.** Click **OK.** Use the **RTClab** workspace for this lab, as it is preconfigured for you.

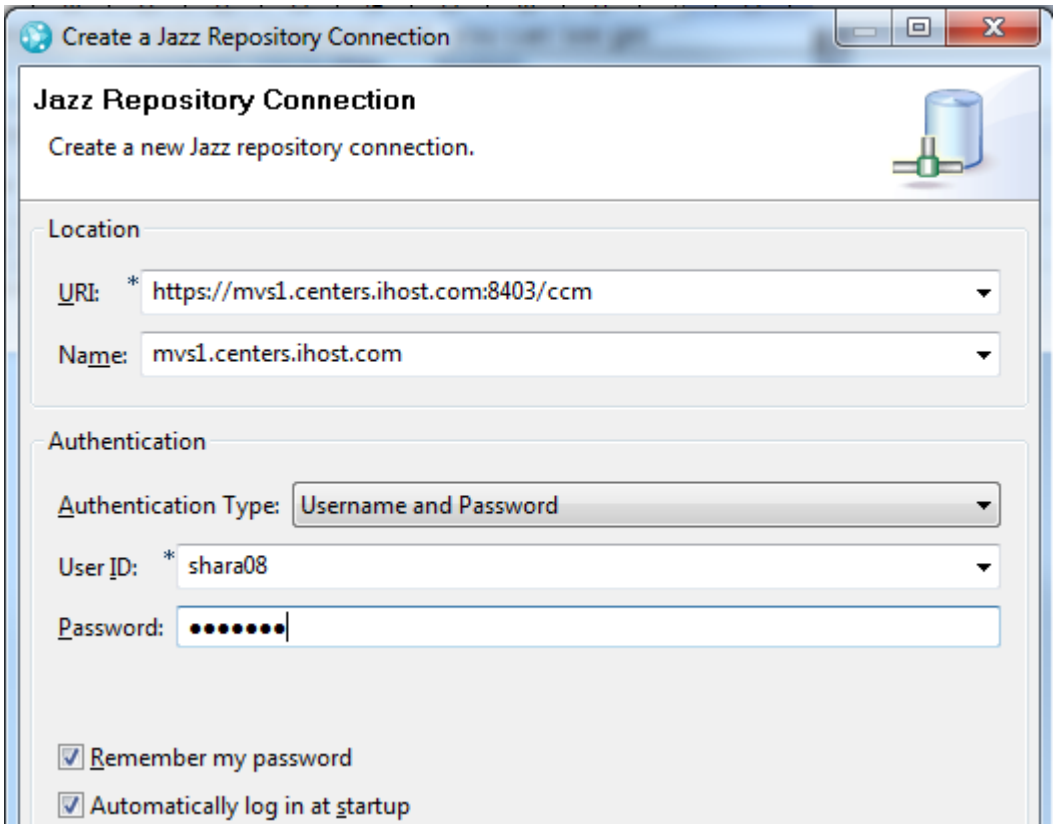


Note : If you have already gone past the workspace launcher selection box, you can still get to the required workspace by switching workspaces. Go to **File → Switch Workspace** and then either choose the workspace name or choose **Other** and type the workspace name in the field, or use the downward pointing arrow, or Browse to the workspace.

a) First we need to log into RTC. This may be the first time you have logged in, so for the first time we may need to create a repository connection. This is to tell our Eclipse client which server repository we are talking to. The screen should look like this:

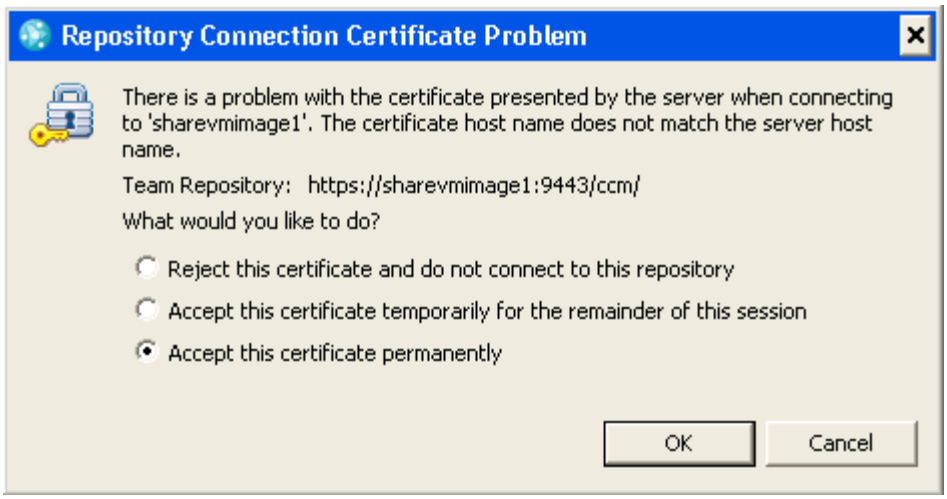


b) Click on the **Create Repository Connection** and enter the following information as shown the next screen:

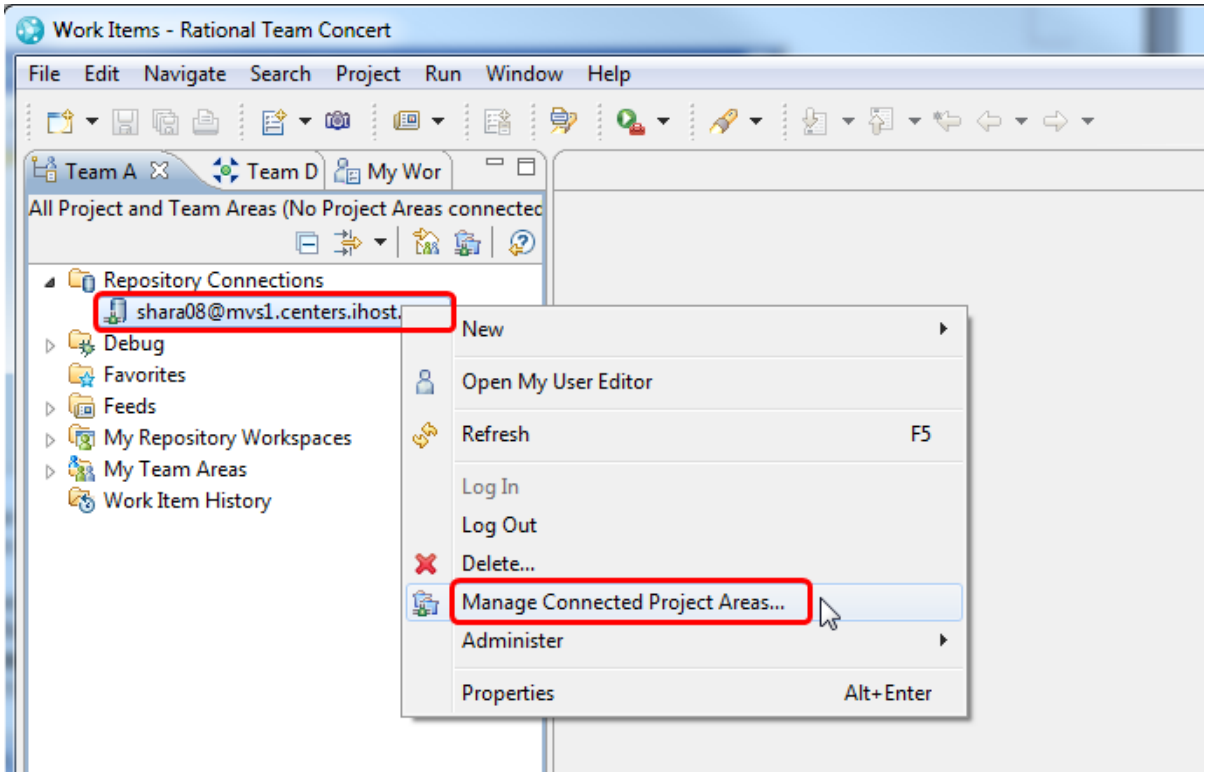


Instead of using **shara08** as your userid, use the userid that has been provided for you, for example **shara01**, **shara02**, **shara03**, etc. The password you should enter is **firstpw**. Click **Finish** to continue.

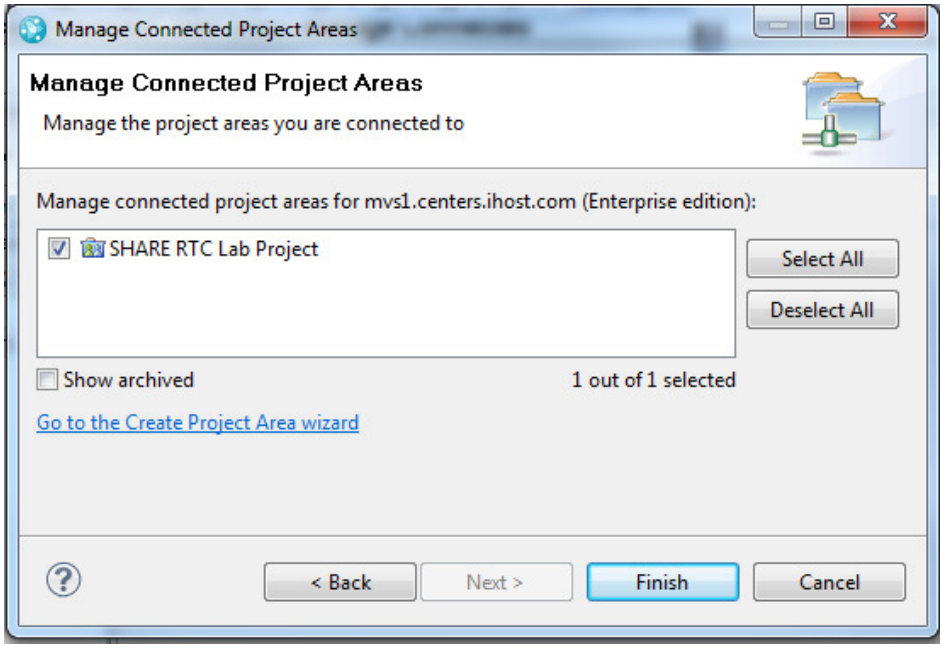
c) If you get any certificate problems when connecting, just accept the certificate permanently:



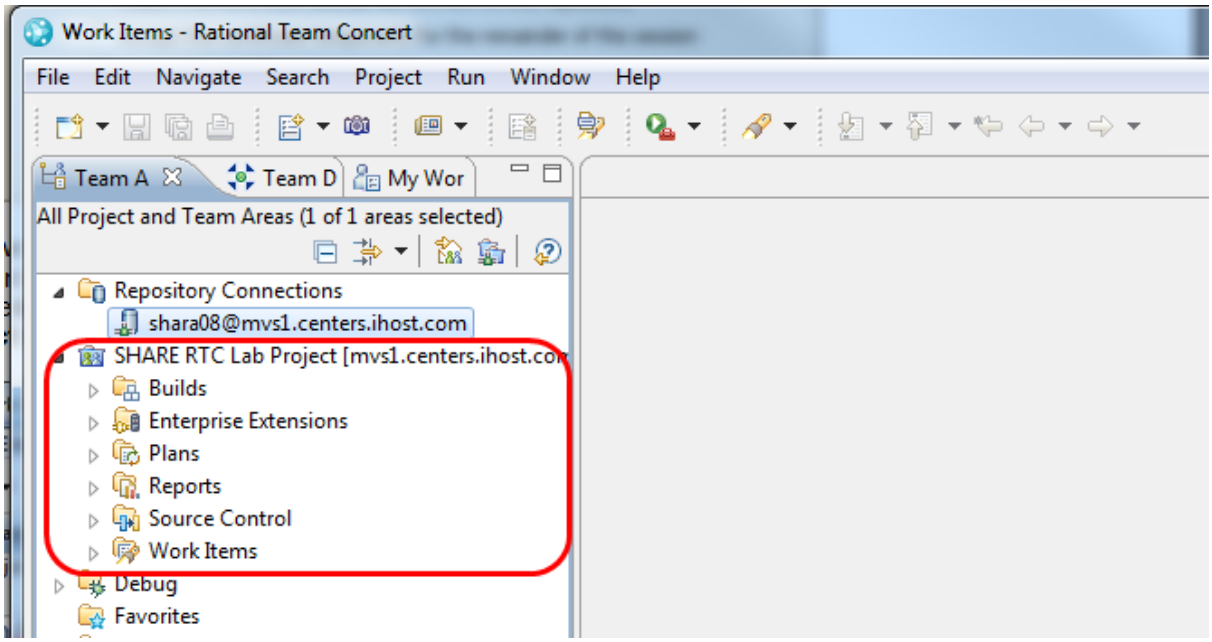
d) We now need to connect to the project are that our team is using. There can be multiple project areas in the same repository for different teams. Right click on the repository connection that you just created, that should have a green connection decorator, then select **Manage Connected Project Areas…**



e) On the resulting screen, select the check box next to the **SHARE RTC Lab Project** and click the Finish button:

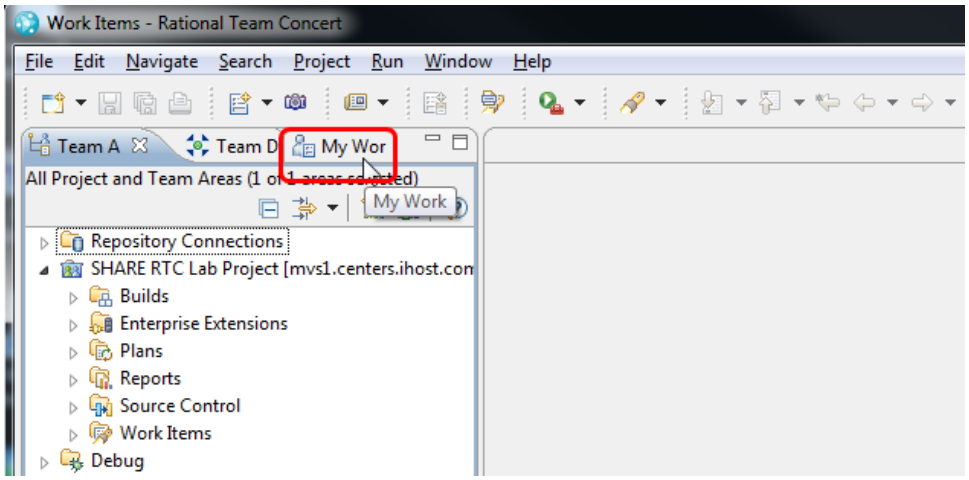


f) The **SHARE RTC Lab Project** node should now have appeared in the tree view, such that if you click the arrow next to it, the RTC project nodes will be displayed. We will explore some of these throughout the course of the labs.

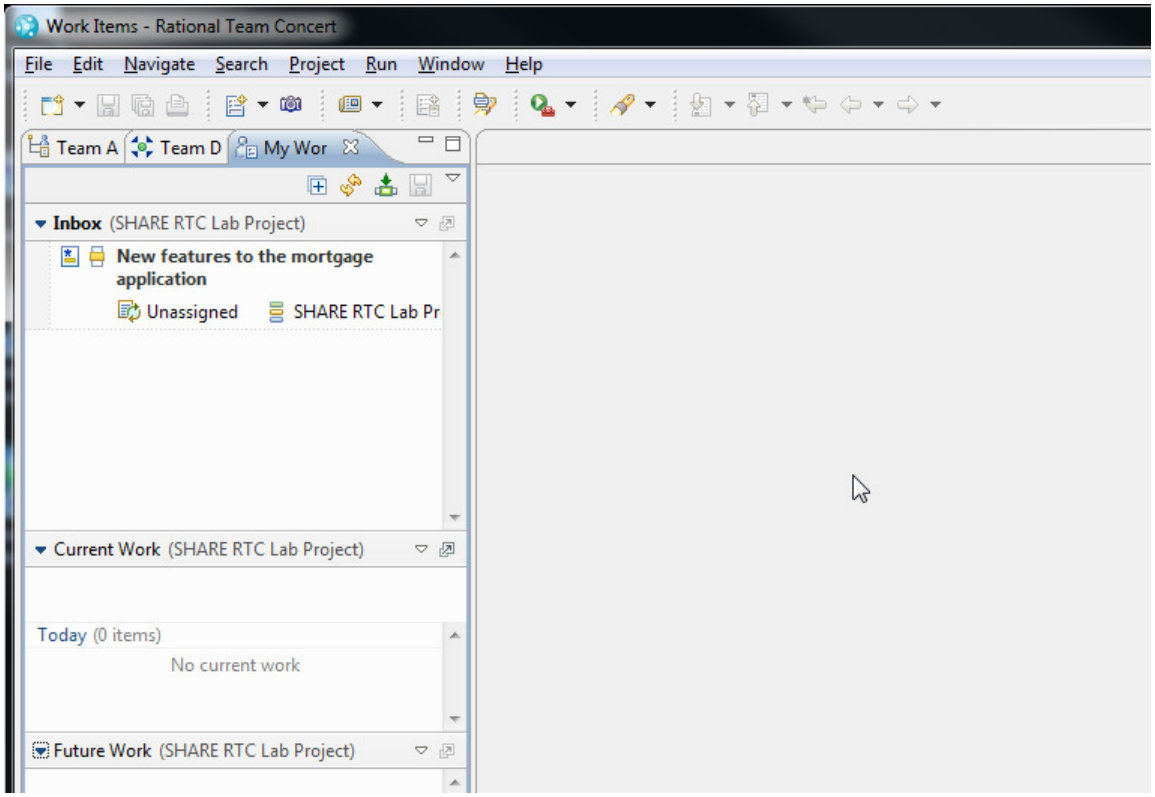


1.3. Working with work items

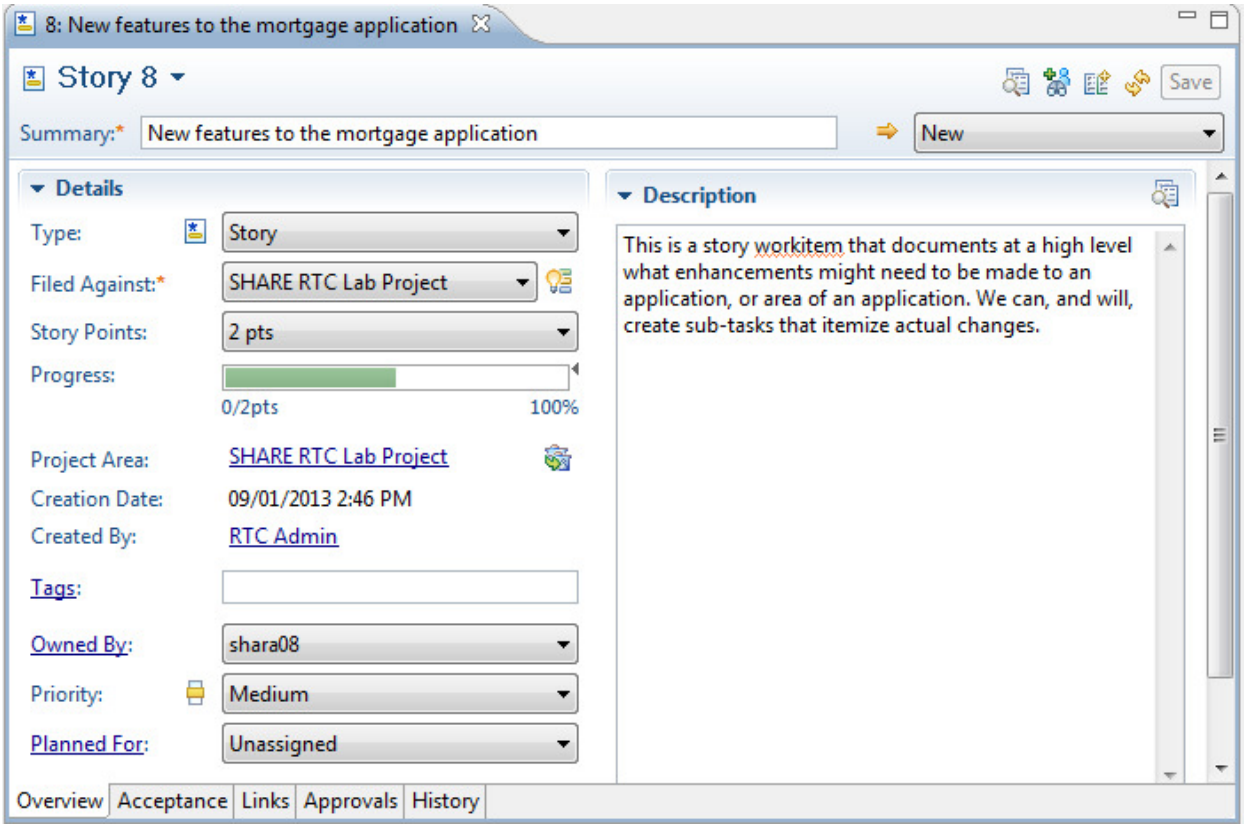
a) You are currently in the **Team Artifacts** view. So to get started on some work click the **My Work** view tab. This will display workitems that have been assigned to you.



In your inbox you will see a work item that has been assigned to you: “New features to the mortgage application”.



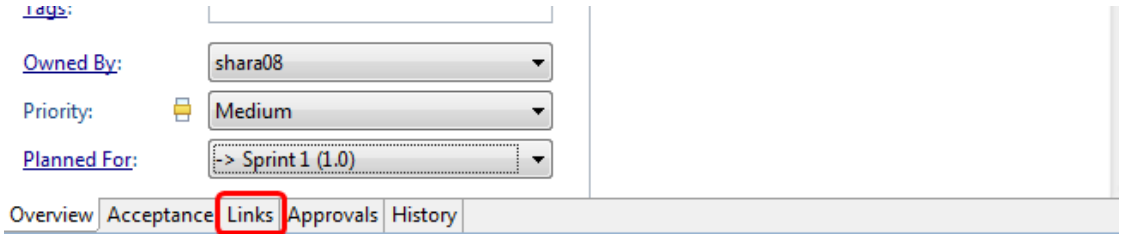
b) Let’s go ahead an open that work item by double clicking it, or by right clicking and selecting **Open**.



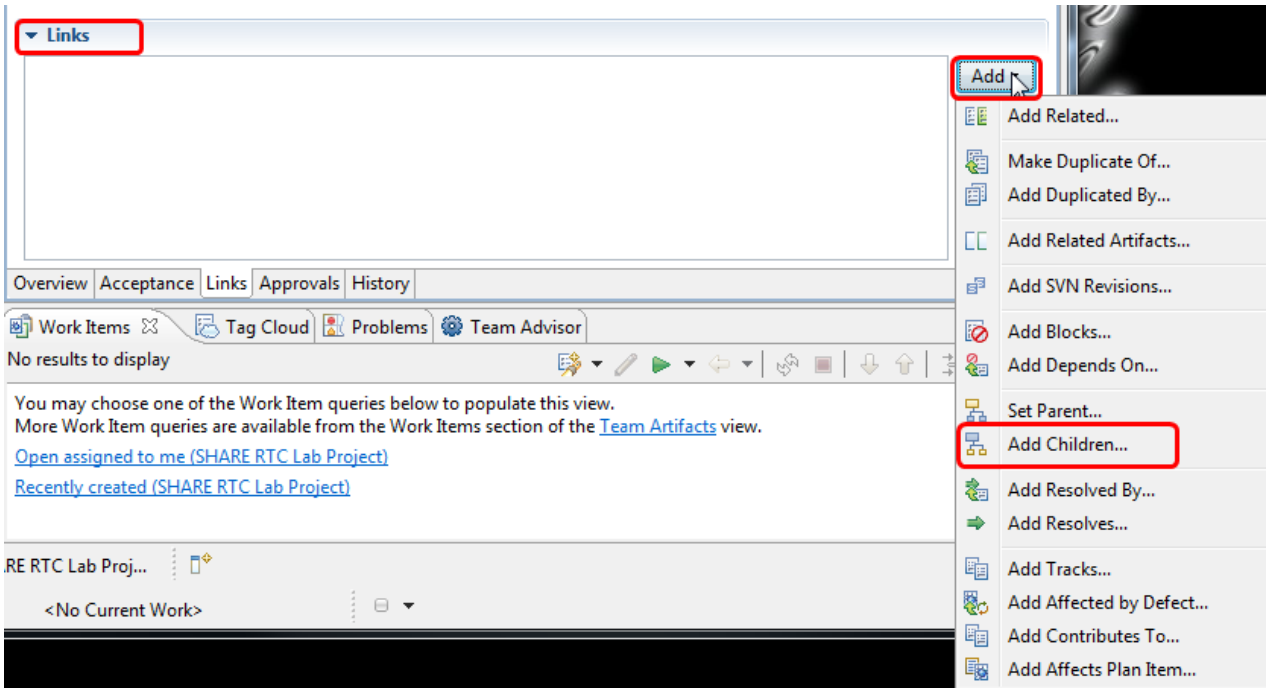
We can see this is a "Story" type of workitem, so this is a high level type work item that gives an overall view of a change. What we can do is create sub tasks as children under this Story. You can also allocate Story Points, which are a measure of the complexity of change. So we are going to go ahead and make a couple of changes to this work item, and also add a couple of task work items.

First of all click the drop down box next to **Planned For** and select Sprint 1, which is the current sprint as it is denoted with a **–>** next to the iteration. Next click on the work item **status** in the top right corner, currently set to **new**, and change it to **Start Working**. You now have to save your changes by clicking the Save button in the top right corner.

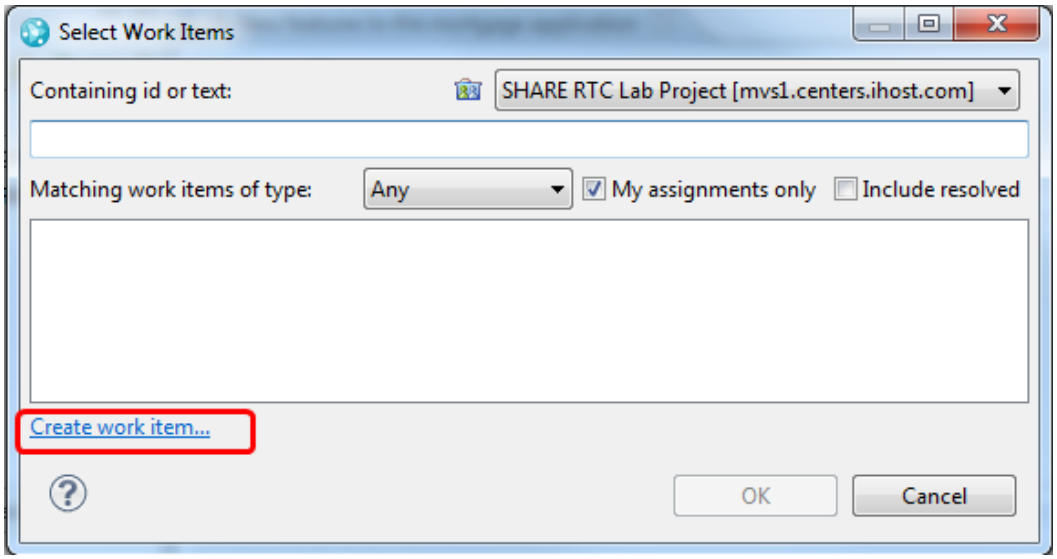
c) We are now going to create a couple of new work items to split our work into smaller more manageable pieces. As these are going to be children of the parent story we will create the work items from within the Story work item. Click on the links tab at the bottom of the Story work item.



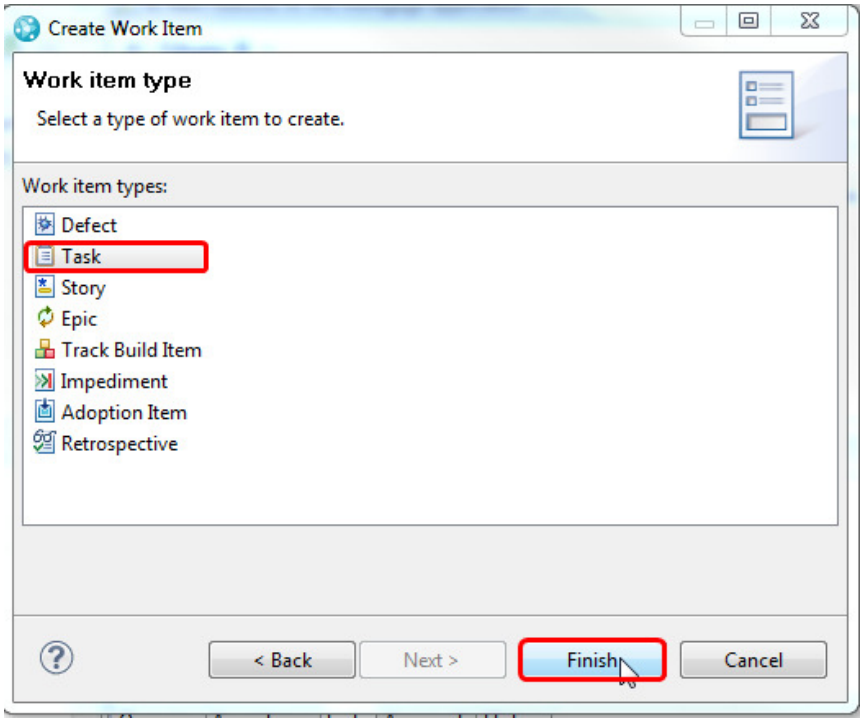
In the **links** section of the displayed screen, click the **Add** button, and then click the **Add Children…** option in the context menu.



In the **Select Work Items** screen that is displayed we can search for already existing work items if required. In our scenario we are going to create the work items. So click on the **Create work item…** hyperlink at the bottom left of the screen.



The **Create Work Item** wizard will start asking what type of work item to create. In this case let's create a Task work item by double clicking Task, or by selecting Task and clicking Finish.



A new work item window will be display ready for us to enter some information, so go ahead and add the following:

Summary Enter “Make changes to the EPSMLIST program”

Description Enter a description if you wish

Filed Against In the drop down select **Share RTC Lab Project**

Owned By In the drop down select your userid, for example shara08

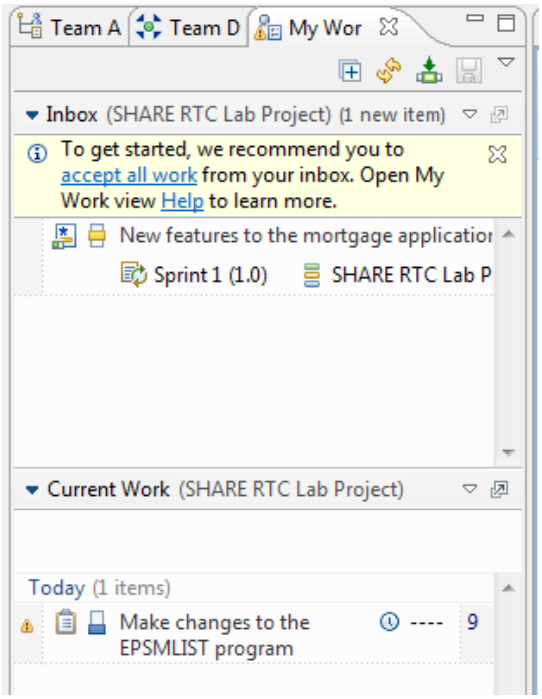
Priority In the drop down set the priority to what ever you like

Planned For In the drop down select the current iteration, **Sprint 1**.

Click on Save and the work item will be created. If you click on the links tab you will see that this new work item has a parent of the Story work item. Similarly if you look at the links tab of the Story work item you will see that it now has a child relationship to this new work item. This is how work items in RTC are related to each other.

Finally, in the new work item you just created click on the work item **status** in the top right corner, currently set to **new**, and change it to **Start Working**. You now have to save your changes by clicking the Save button in the top right corner.

d) You will see that while you were doing all this, the **My Work** view was changing to reflect the addition of the new work item. If this view says to **accept all work**:

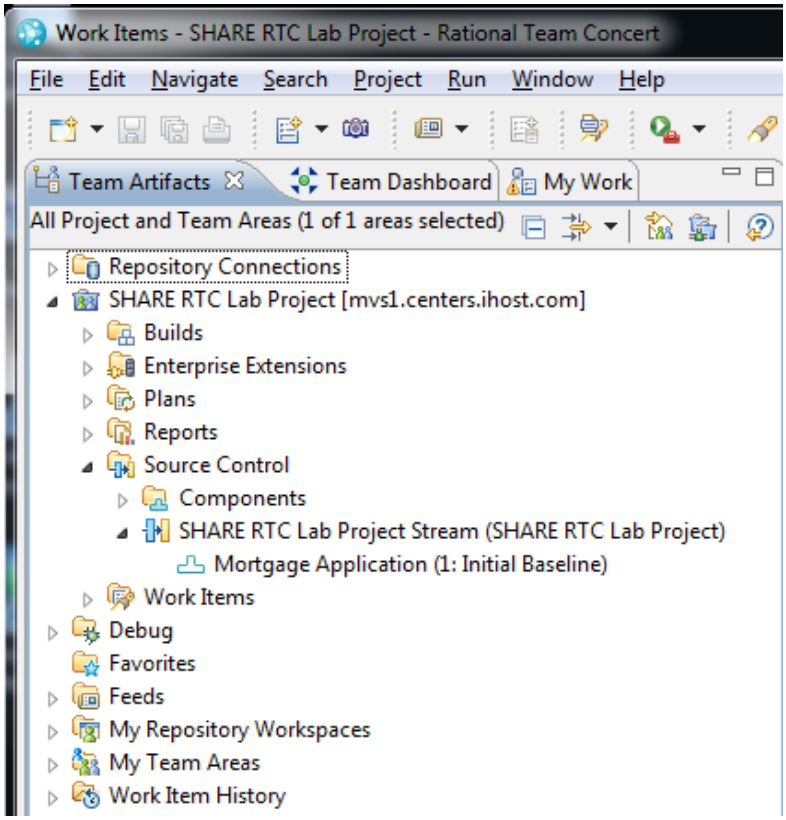


Then click on the hyperlink and both work items will now appear in your current Work list.

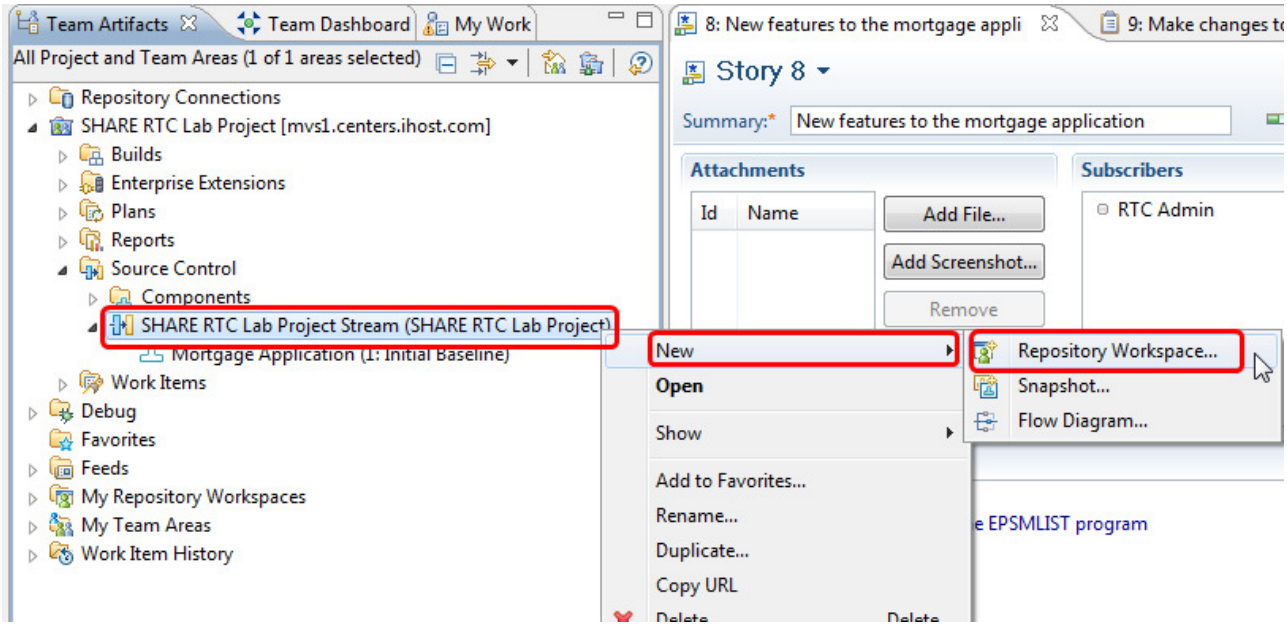
1.4. Getting a local copy of the source code to work with

Now that we have a work item created we can start making our code changes. Currently the code is stored in the repository in a stream. In order to work on the code we need to create our own area in the repository to store our changes and in addition take a local copy in our Eclipse workspace to actually do the changes. The next part of the lab will direct you through that.

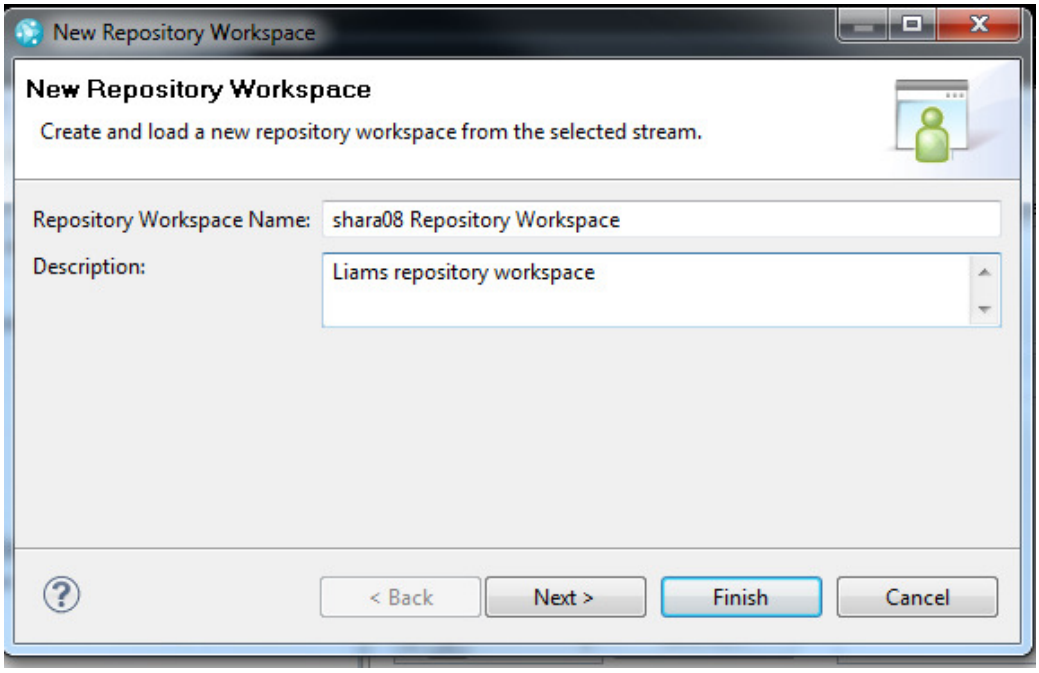
a) First, we are going to create a local **repository workspace,** to work with files in the repository. To do this, first locate your team stream for the project area **RTC Lab Project**. From the **Team Artifacts View**, expand **SHARE RTC Lab Project** project area and then expand the **Source Control** node. You should see a team stream named **SHARE RTC Lab Project Stream**.



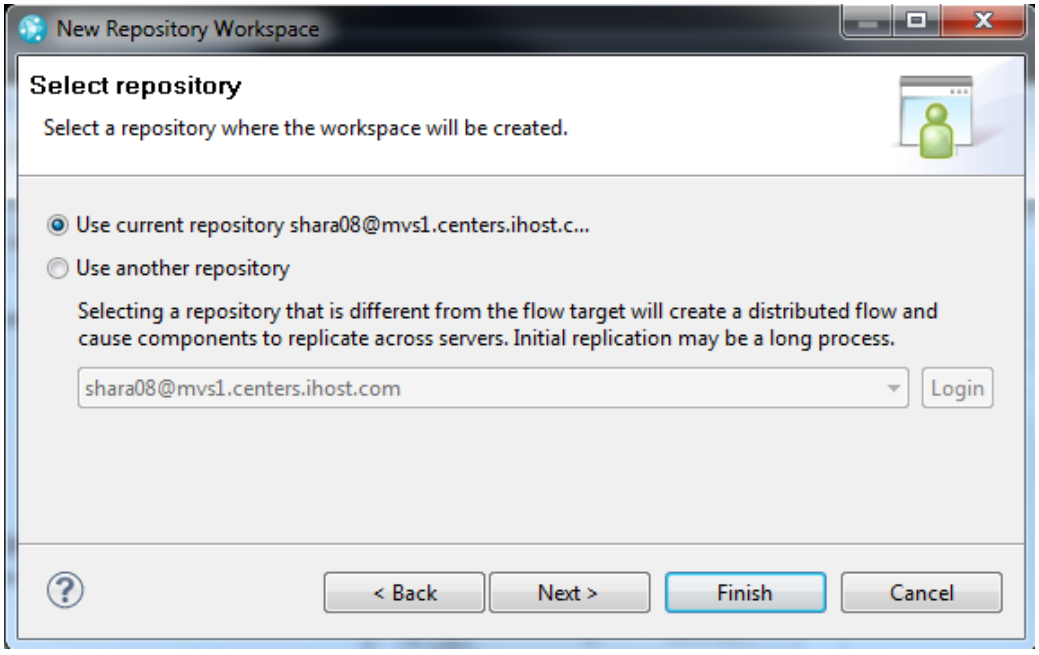
b) Right-click on the **SHARE RTC Lab Project Stream** and select **New** → **Repository Workspace**.



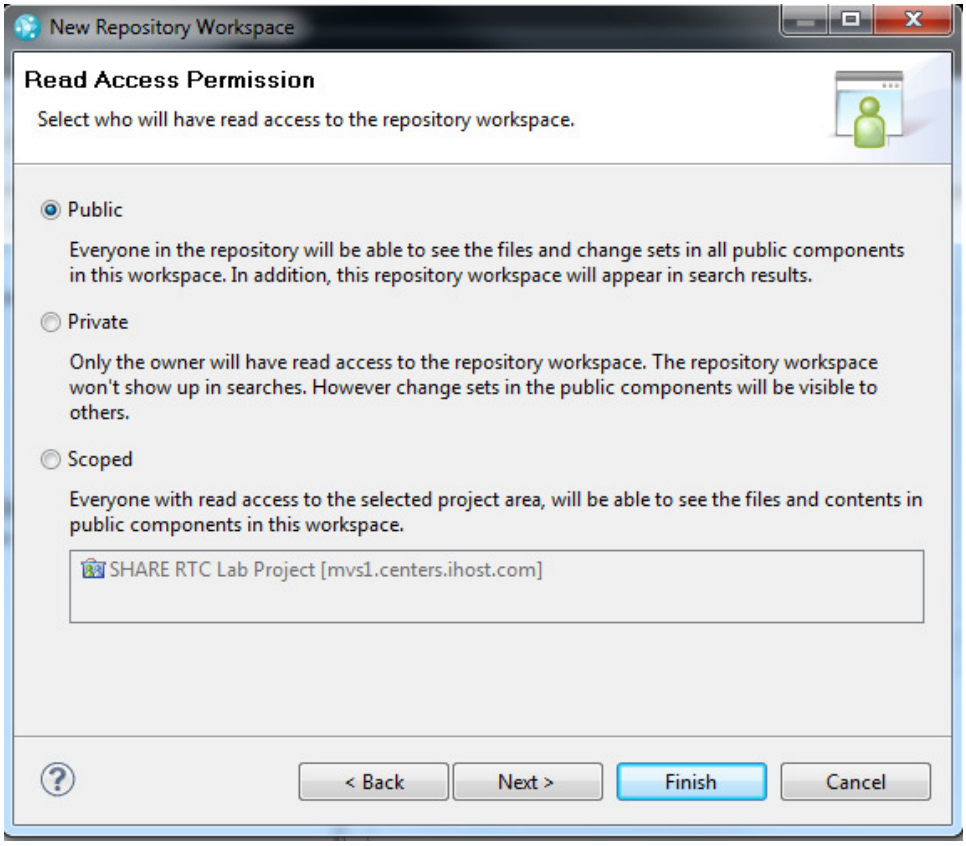
c) Give the **repository workspace** a name such as **shara## Repository Workspace** where **##** is your user number, such as **shara01** and click **Next**.



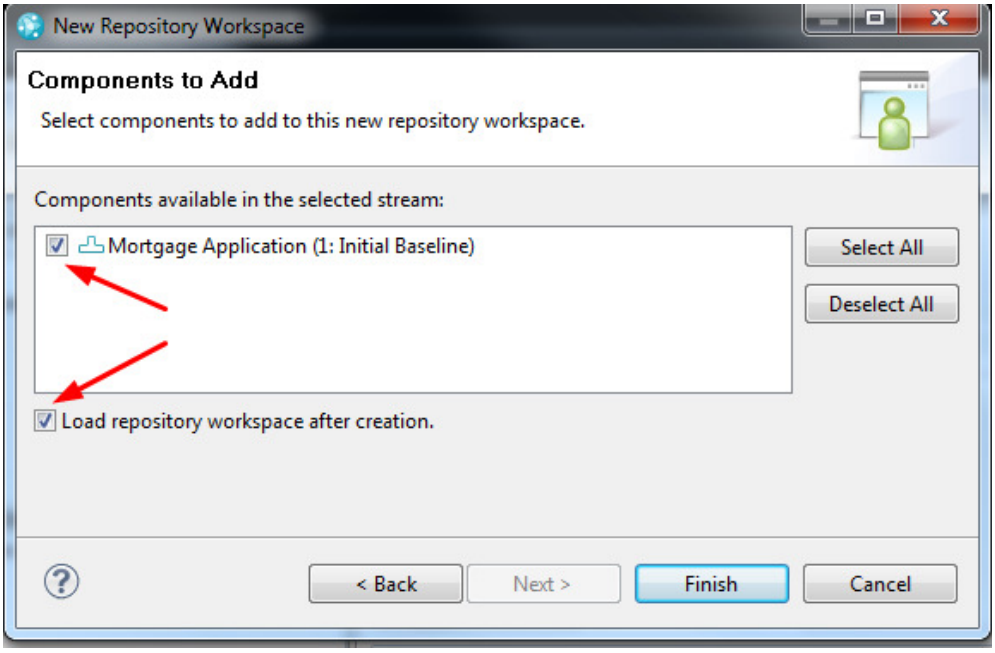
d) Select the current repository for the workspace



e) Next select the read access permissions, for this lab, make the workspace **public**, then click next..



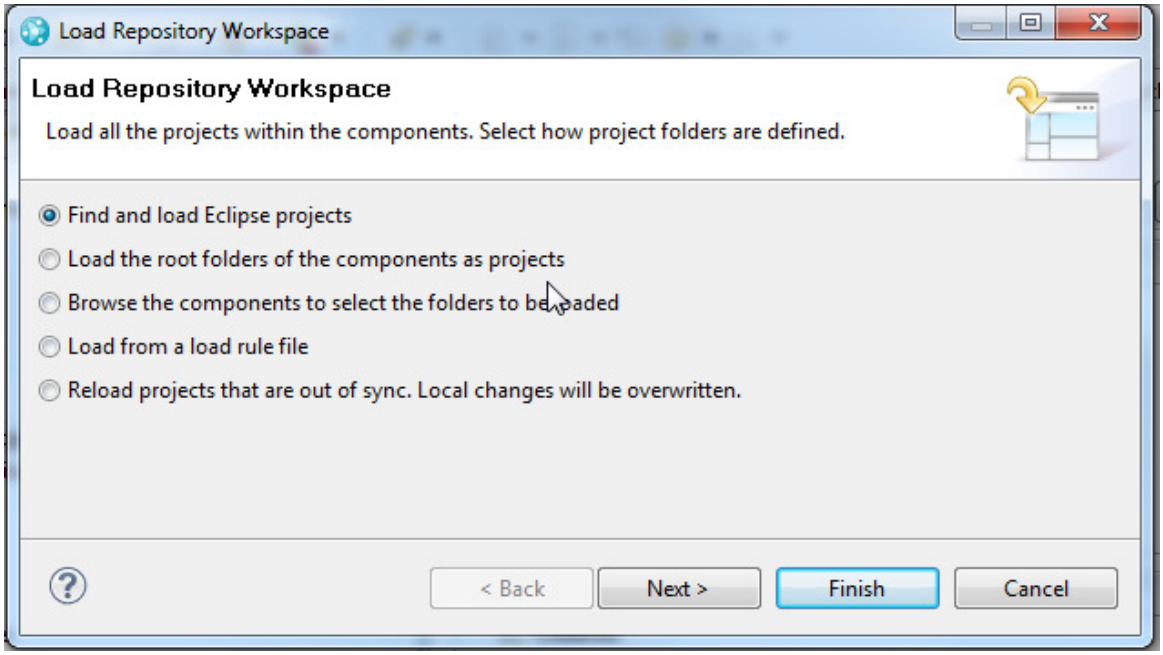
f) Make sure all components are selected and load the repository workspace after creation is checked, click **Finish**.



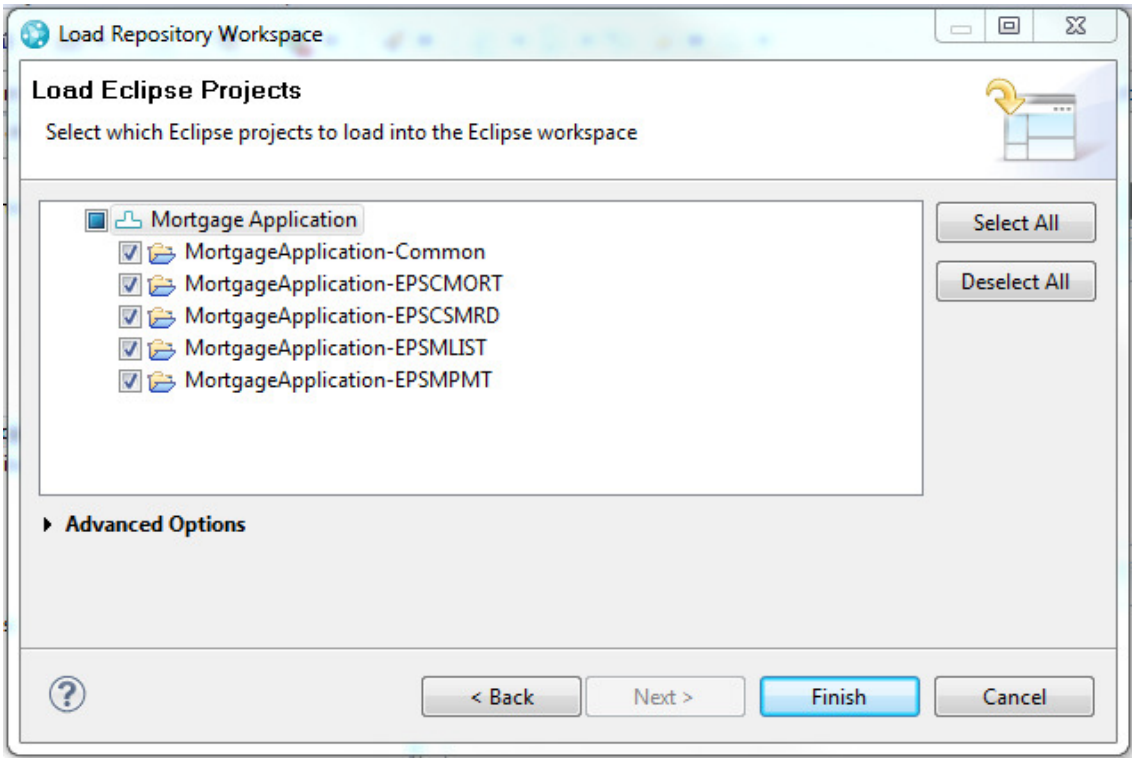
Some Jazz terms reviewed

*You use a personal **Repository Workspace** to work on project files under **Source Control**. You **Load** the repository workspace to copy the files and folders into your local workspace (Eclipse) on your computer. Jazz tracks all changes made to source-controlled files with **Change-Sets**. Each change-set itemizes the changes to one or more individual files or folders, carries a comment, and references the relevant work item motivating the changes. You **Check-in** your change-sets to upload copies of the modified files from your local workspace to the **repository workspace.***

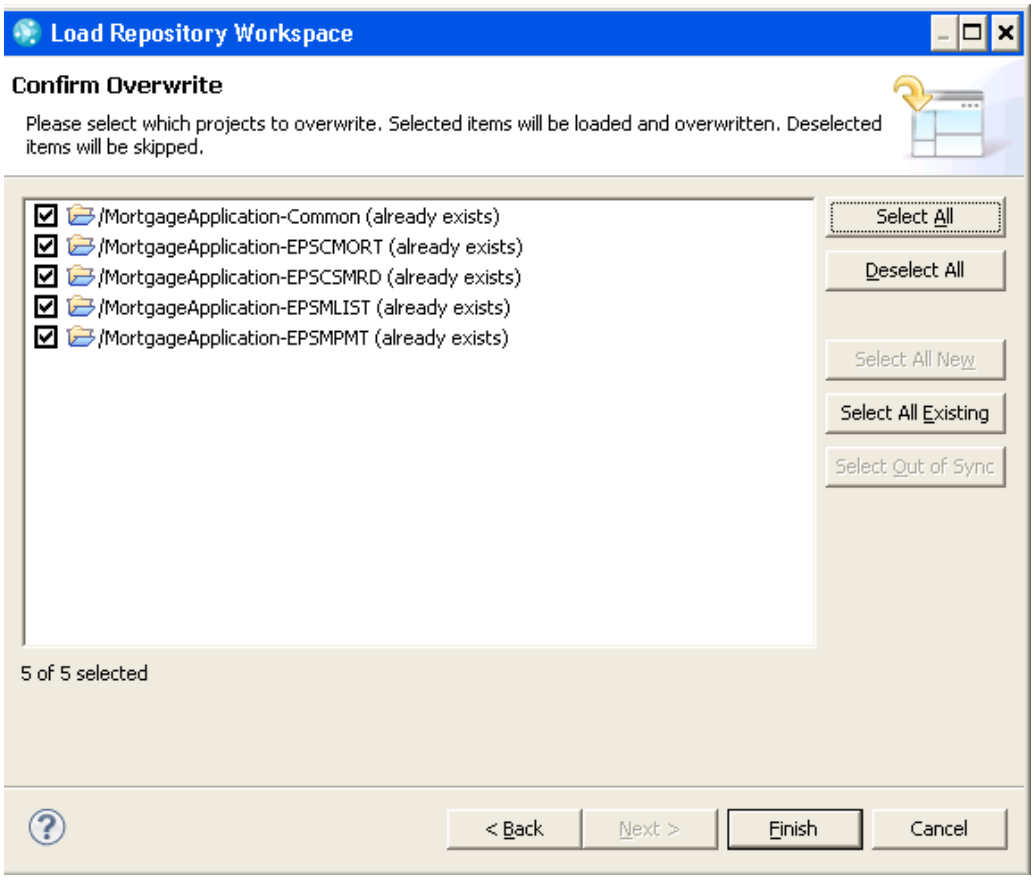
g) You should now get a prompt for loading projects into your repository workspace. Make sure **Find and Load Eclipse Projects** is selected, and then click **Next**.



h) You will get a Load Eclipse Projects panel where you can select individual projects to load. Let go ahead and take the default, which is to load all projects. Click **Finish**.



i) If you get a request to overwrite then select all the projects and press **Finish**.



j) A loaded repository workspace will appear in the Pending Changes View. Loaded repository workspaces are special in that whenever you change a loaded file or folder in your Eclipse workspace, the changes are tracked and shown in the Pending Changes view. Here, you can manage your changes and perform common tasks such as

- Check-in changes to your repository workspace.
- Organize changes into change sets.
- Undo changes you've made.
- Associate change sets with work items.

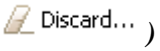
If this view is not visible, go to **Window → Show View → Other → Jazz Source Control → Pending Changes**.

Note: Loaded means that the code in the repository has been copied down to your PC into a folder so that you can work on it. A loaded component is identified by the  decorator. If you have a component in your Repository workspace that is not loaded then it is not filled out in blue, thus:  .

Other change-set operations:

Suspending a change set ( ***)***

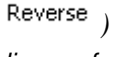
*There might be times when you need to begin working on a new change set for a given set of items before you are finished with one that is in progress in your workspace. When in this situation, you can **suspend** the current change set, which removes it from your workspace but preserves it in the repository. The files in a suspended change set revert to the state they were in before the change set started, and the change set itself is moved to a special Suspended folder so that you can **resume** the work when you are ready.*

Discarding a change set ( ***)***

There are two basic scenarios for discarding a change set:

Appendix A. If you have accepted an incoming change set but decide later that you don't want it in your workspace, you can discard it to undo the accept and return the change set to the component's Incoming folder.

Appendix B. You can also discard a change set that you created but have not yet delivered. Discarded change sets of this type remain in the repository but are not placed in any special folder. To make it easier to retrieve a discarded change set that does not exist in any other stream or workspace, you can associate it with a work item before you discard it and then accept it from the work item later.

Reversing a change set ( ***)***

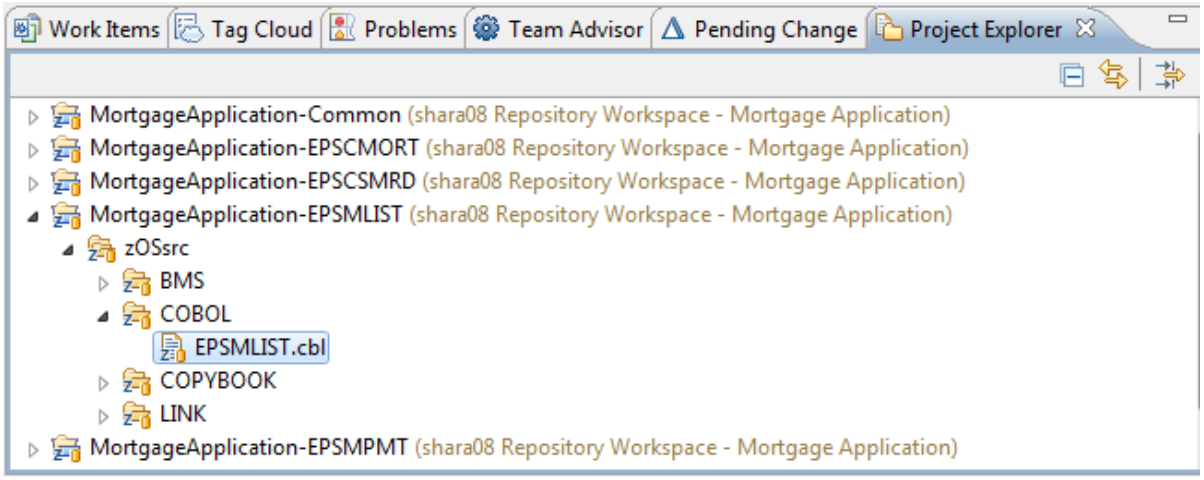
If you want to undo the delivery of a change set, you can create a new change set that reverses all the changes in it and then deliver the reversed change set.

1.5. Making the code changes

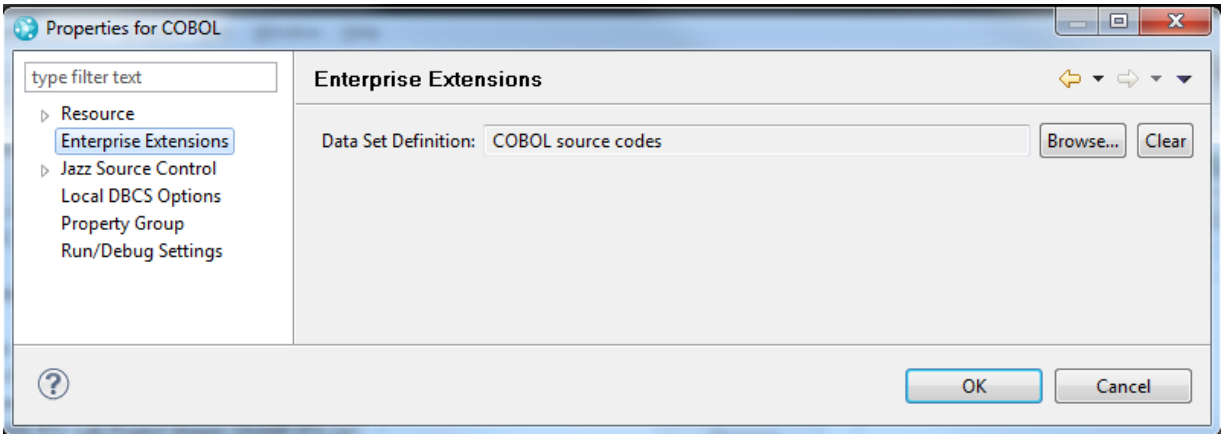
In this section we are going to walk through modifying a COBOL part. We have already loaded a local copy into some folders on our PC. We will use Eclipse to make some changes to these files. These folders have a certain “nature” and for z/OS artifacts in RTC these are called zComponent projects.

a) So let’s drill into the **zComponent** Projects. A zComponent project is a special type of Eclipse project that has a z/OS nature. This means that there will be special processing involved for this type of project, such as translation to EBCDIC when files are sent to z/OS for compiling.

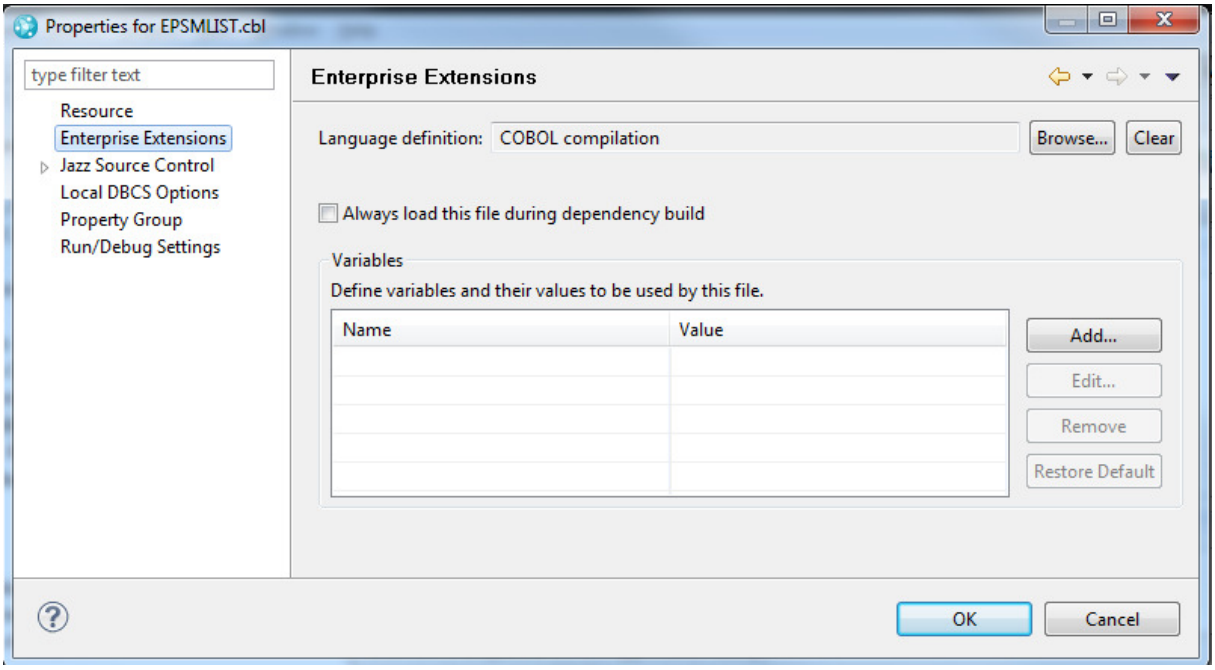
To make changes to the files in these folders we need to be able to see the zComponent folders. For this we can use the **Navigator** View or the **Project Explorer** view. Add the Project explorer view to your workspace by selecting **Window → Show View → Other…**, in the filter box start typing **Project Explorer** until you see the node appear, then select it and click **OK**. In the Project Explorer open the **MortgageApplication-EPSMLIST** project by expanding the node. Open the **zOSsrc** folder and then the **COBOL** folder and look at the files.



Open the properties for the **COBOL** folder by right clicking on the COBOL folder and selecting properties. If you click on the ***Enterprise Extensions*** you will notice the specification of the associated data set definition. A data set definition is a system definition that defines how a z/OS data set will be allocated, when required, on the mainframe. For example, during build when files are sent to z/OS to be built. Click **OK** or **Cancel** to close the properties window.



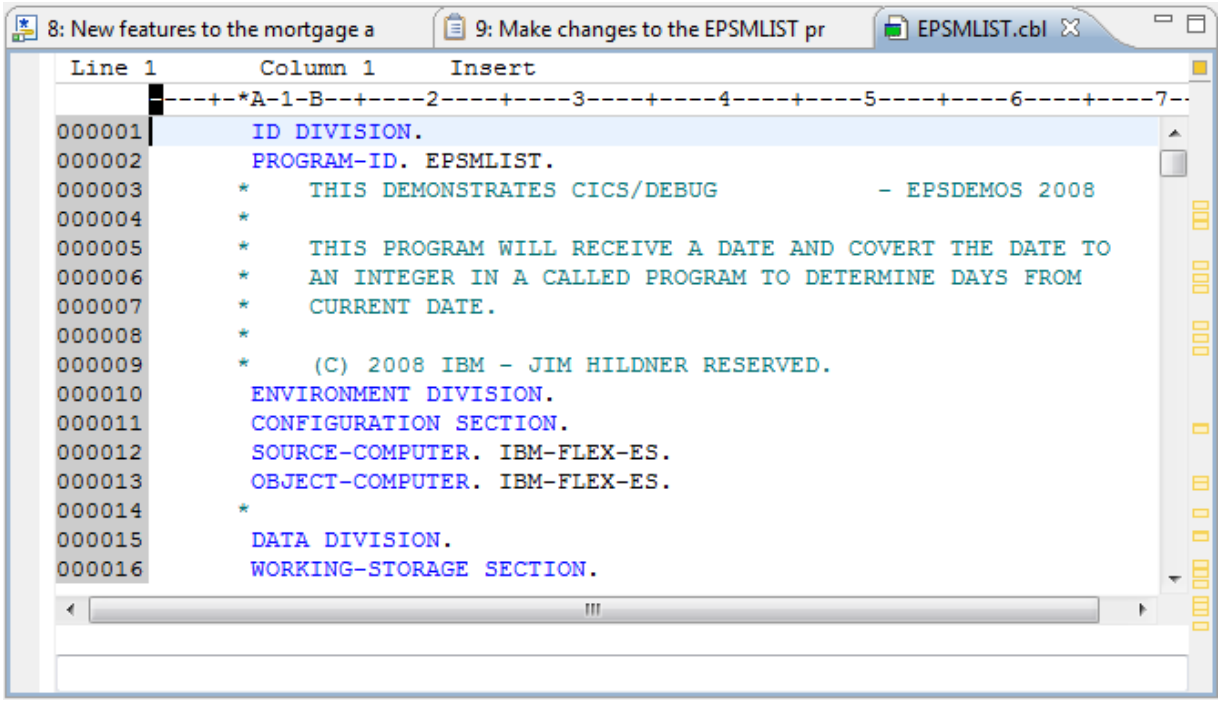
Similarly right click on the EPSMLIST file and select properties, again if you click on the ***Enterprise Extensions*** you will see the language definition associated with the file. A language definition is a system definition that tells RTC how to build a program, in a similar that JCL describes how to build/compile a program. Click **OK** or **Cancel** to close the properties window.



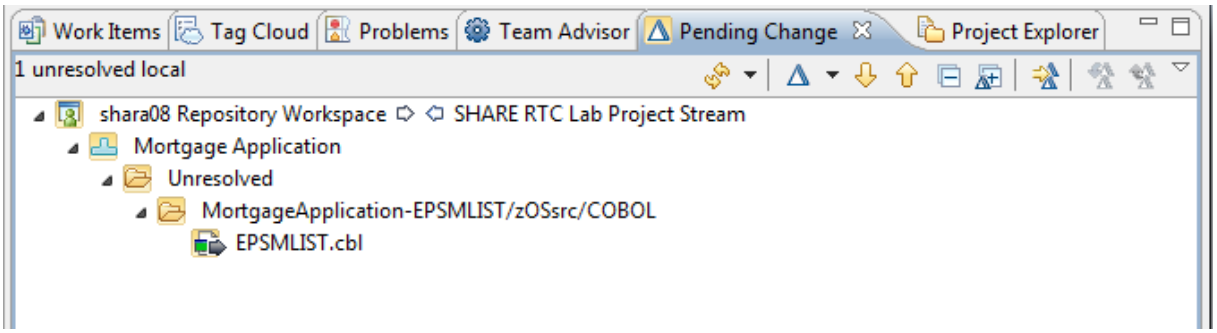
b) Now that we have an basic understanding of the definition for the zComponent project, let's make a source code change.

c) Double click on the EPSMLIST COBOL file with the .cbl extension. You will see it has been opened in the RDz editor. In RDz you can change the way the editor looks to suit your preference. Go to **Window → Preferences → LPEX Editor** then select the editor of your choice, with the obvious choice being ISPF!

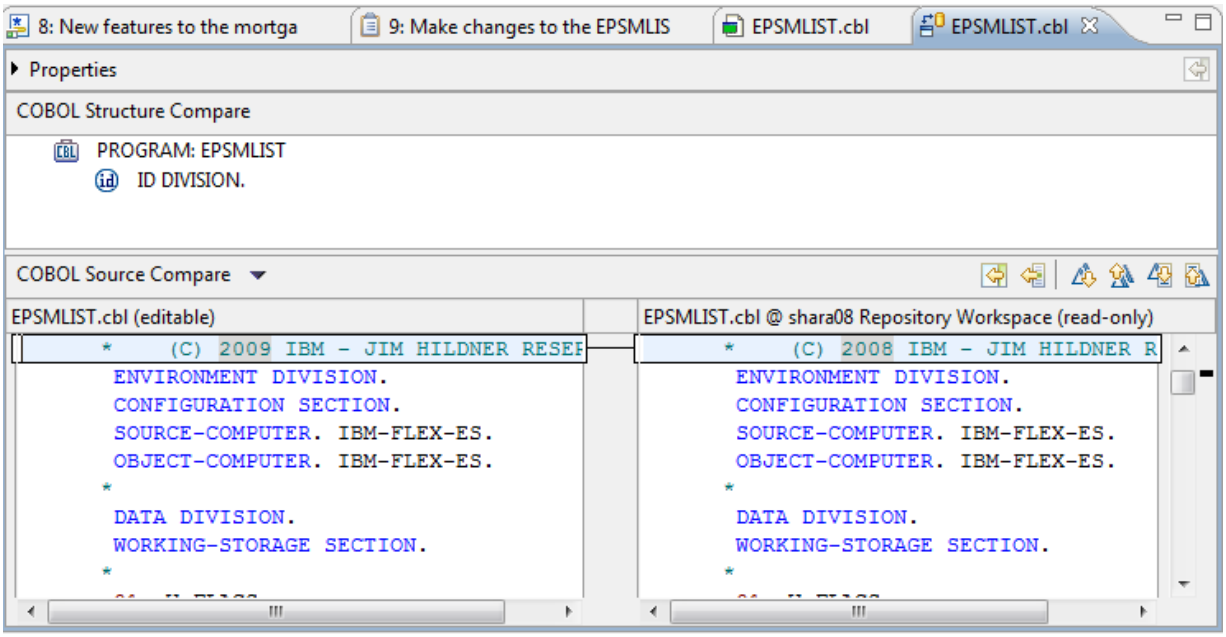
d) Make some change in the comments, and save. To save a file, either right click inside the file and select Save, Just close the file and confirm you wish to save it when asked, select **file → Save** from the main menu bar, or click the icon of the floppy disk on the toolbar.



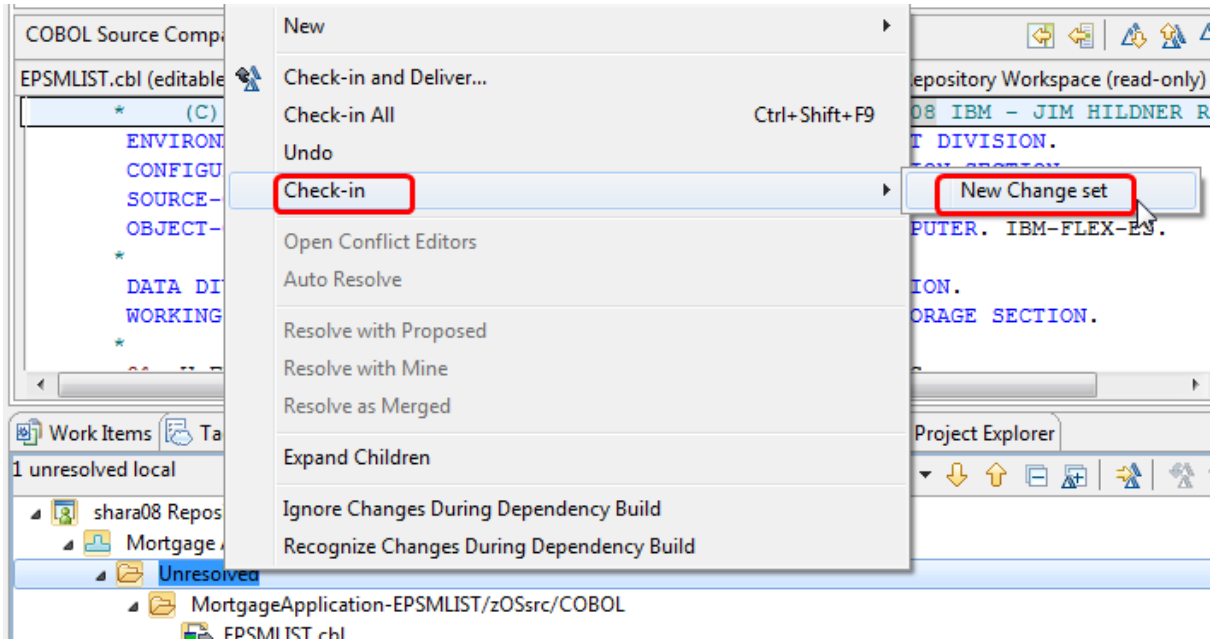
e) Look at the pending changes view, it should be displayed below the source code. If not, open the view with **Window → Show View → Pending Changes.** You will now see that the Mortgage Application has a set of unresolved changes.



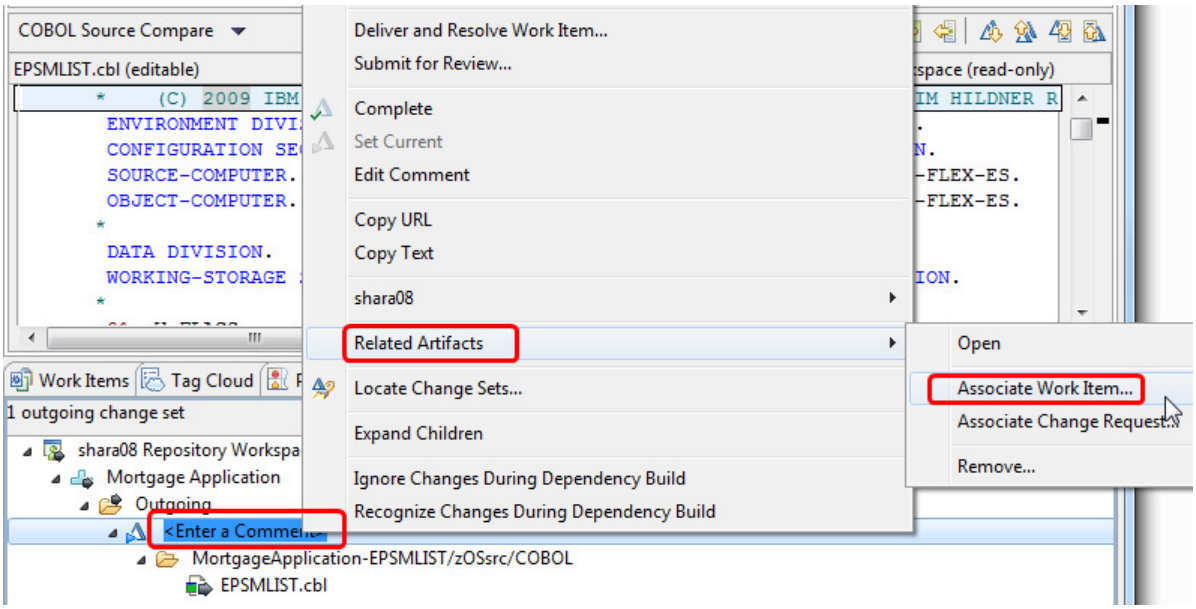
If you expand to see the file that changed, and double click on the file, the Text compare window will be displayed so that you can see what was added.



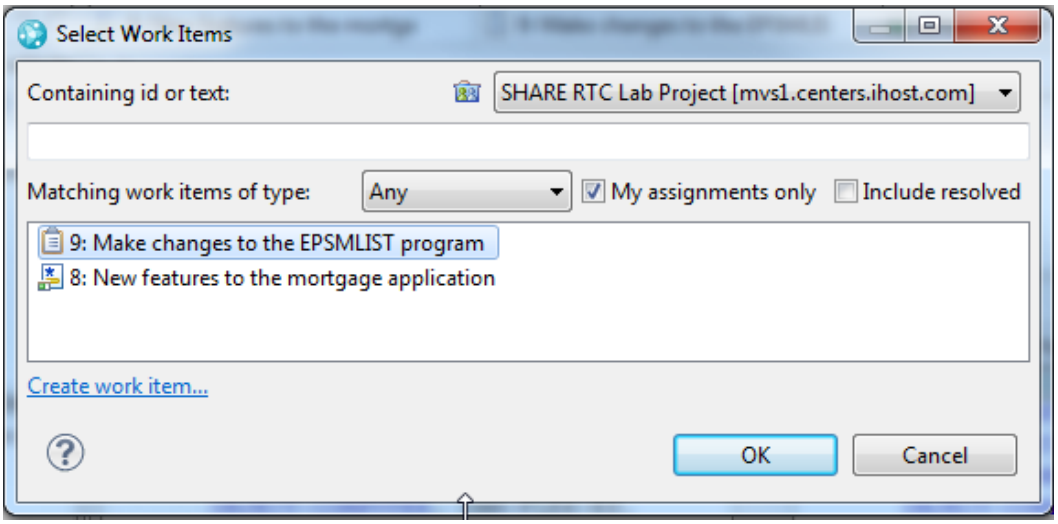
f) Go back to the Pending Changes View and right click on the **Unresolved** line, you will get the option to **Check-in** or **Check-in and Deliver…** The later allows you to save the changes to your repository workspace, as well as to deliver them to the stream. Go ahead and select **Check-in → New Change set** at this time. This will copy the change into your own repository workspace, but not deliver it to the stream, so your team mates won't be affected by your change.



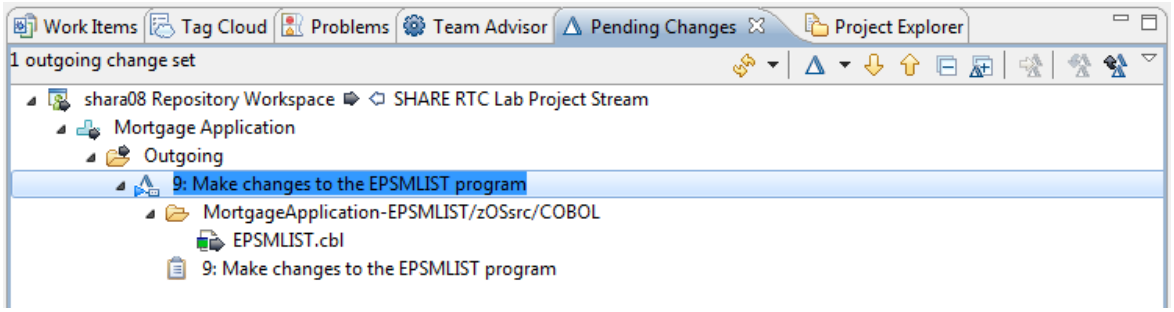
g) Now we want to associate our work item with the change. You will notice that the Unresolved tree node has now gone and has been replaced by a line that says **<Enter a Comment>**. If you right click on this line, Then select **Related Artifacts → Associate Work Item** you will be able to add your work item to this changeset.



h) Select the work item you created earlier.



The Pending Changes View will reflect that the work item is associated to the change set



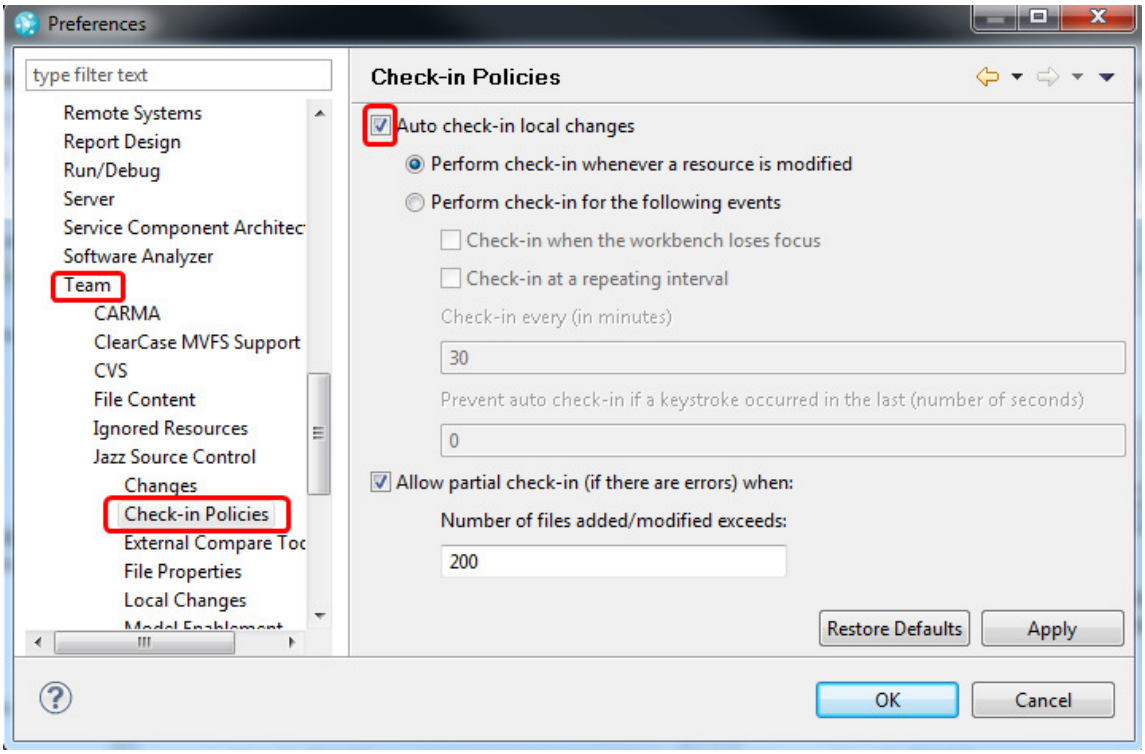
1.6. Optional: Enabling Automatic Check-Ins

Once a change is made to a versioned file (a file already being tracked by the Jazz Source Code repository), its corresponding change-set must be checked in to commit the change to your repository workspace. By default, check-ins must be initiated by the user. However, Rational Team Concert provides the option for making check-ins occur automatically.

a) Select **Window → Preferences** to open the Preferences settings.

b) Expand **Team → Jazz Source Control** and select **Check-in Policies**

c) Check **Auto check-in local changes** and press OK.



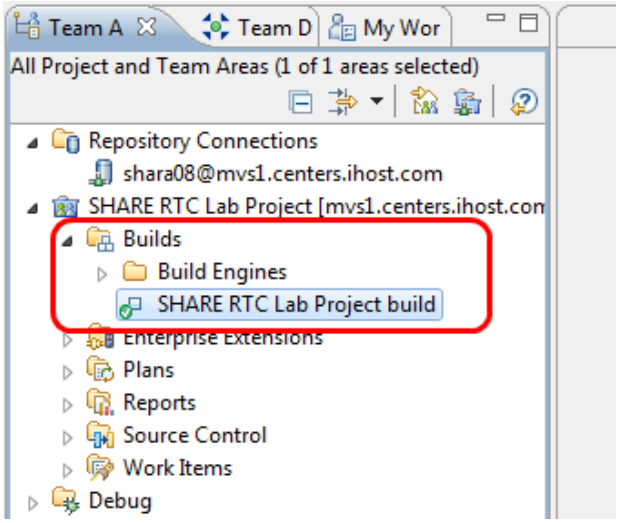
1.7. Building the code

Now that you have changed the code you will need to build it and test it. So far everything you have done has been in the Eclipse environment. This is no different for the build. However, in order for the compiles to work, the code needs to be sent to a z/OS system to be built. So regular source data sets will be populated with the code, a compile will run, and regular OBJ an LOAD data sets will contain the built files.

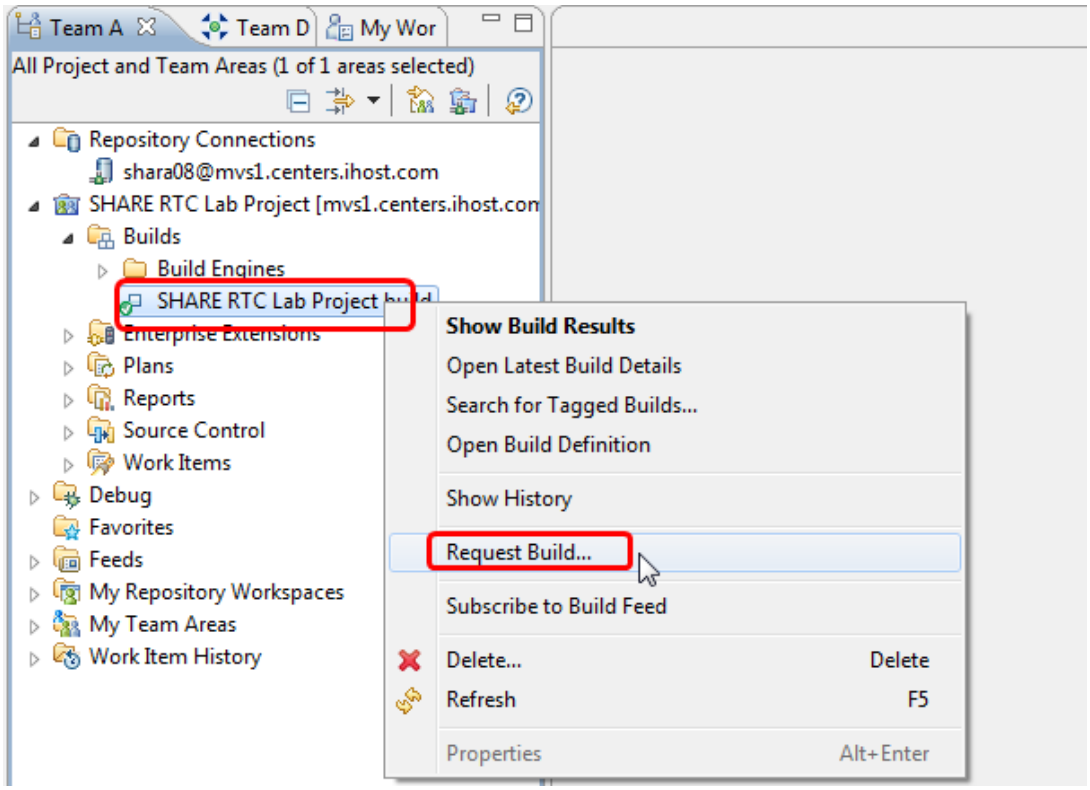
You can then use those built outputs to test your changes. (Don't worry, we won't be doing any testing in this lab).

The build definitions are normally set up by an administrator, but you can still build to your own data sets by using what is called a personal build. This is how we will invoke the build in this lab.

a) In the Team Artifacts view you will see a **Builds** node in the project tree. Open that and you will see a build listed called **SHARE RTC Lab Project Build**.



b) Right click on the build and select Request Build …

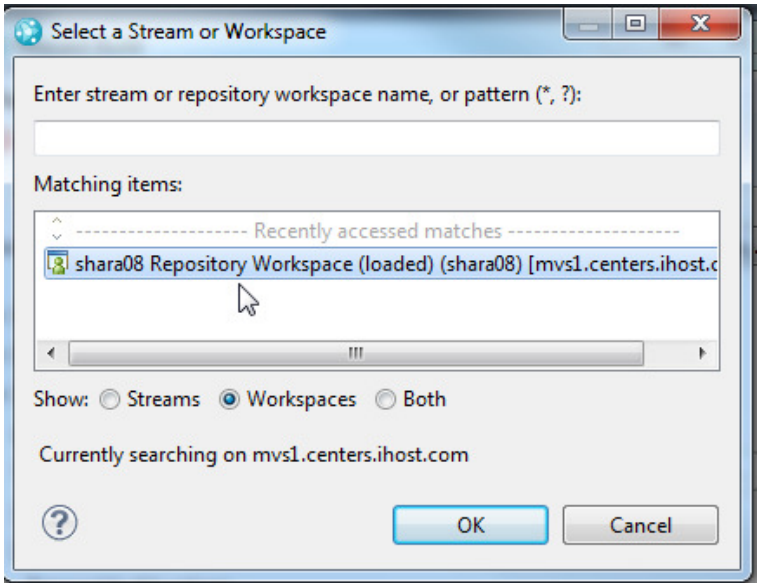


c) The Request Build wizard will open where you can make some changes. Remember we have only checked the changes into our repository workspace. They have not been delivered to the stream as yet. The **SHARE RTC Lab Project Build** as it stands will build from a build workspace that is connected to the stream. So we need to tell it to build our code specifically.

d) In the Request Build dialog open the **Dependency Build Options** section by clicking it. You will see a number of radio buttons, check boxes and entry fields. Make the Following changes:

   i. Select the **Personal Build** option, so that it is ticked.

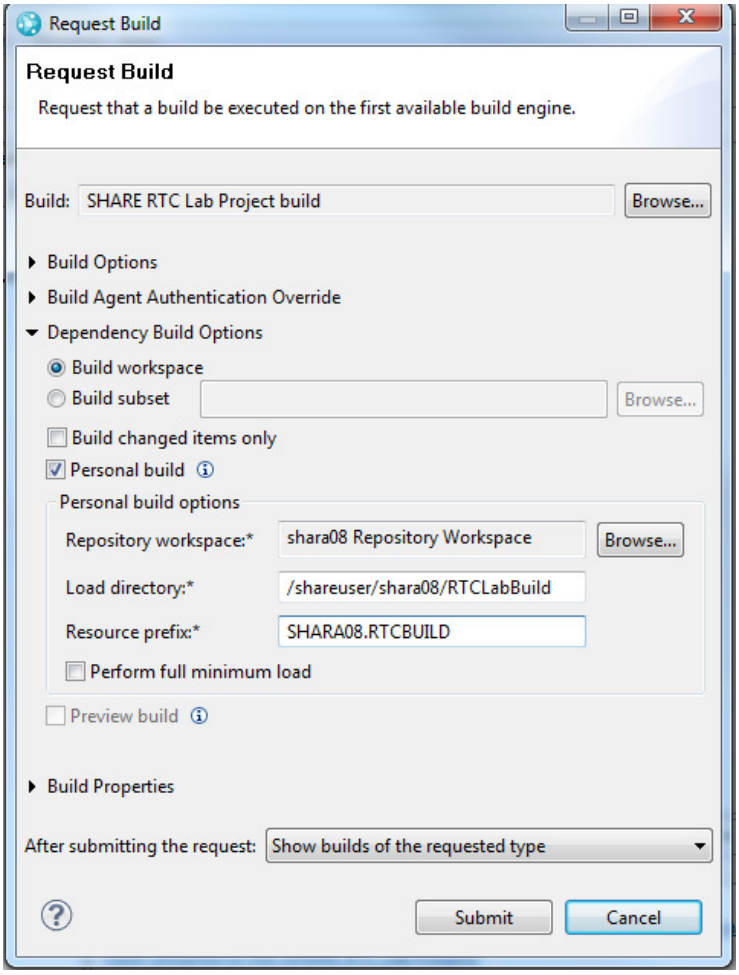
   ii. Click the **Browse** button next to **Repository Workspace** and search for your own repository workspace. It should be in the list, but if it is not you may need to enter the name (or part of it) of the workspace you created earlier in this lab.



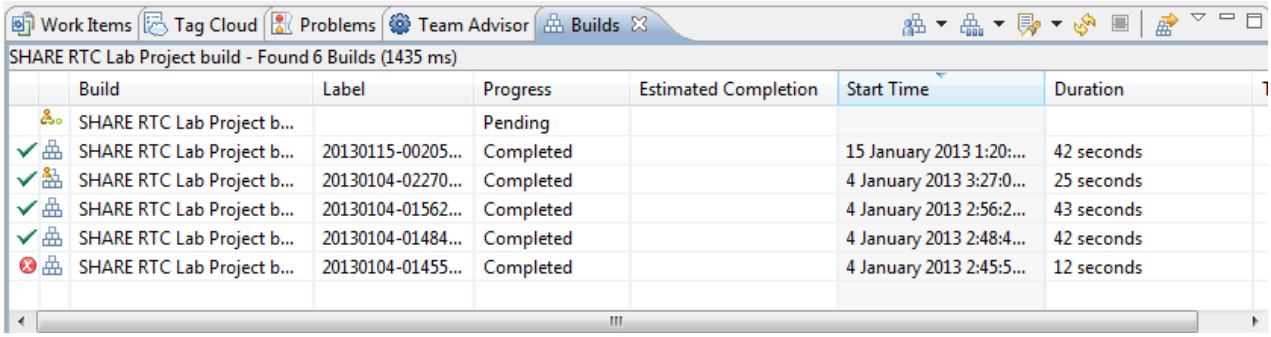
   iii. In the Load directory you need to enter a USS directory that will be used during the build. Enter /**sharelab**/**shara##**/**RTCLabBuild** where ## is the number of your userid.

   iv. In the **Resource prefix** enter a high level qualifier of the location where the data sets will be loaded and built to. Enter **SHARA##.RTCBUILD**, where ## is the number of your userid.

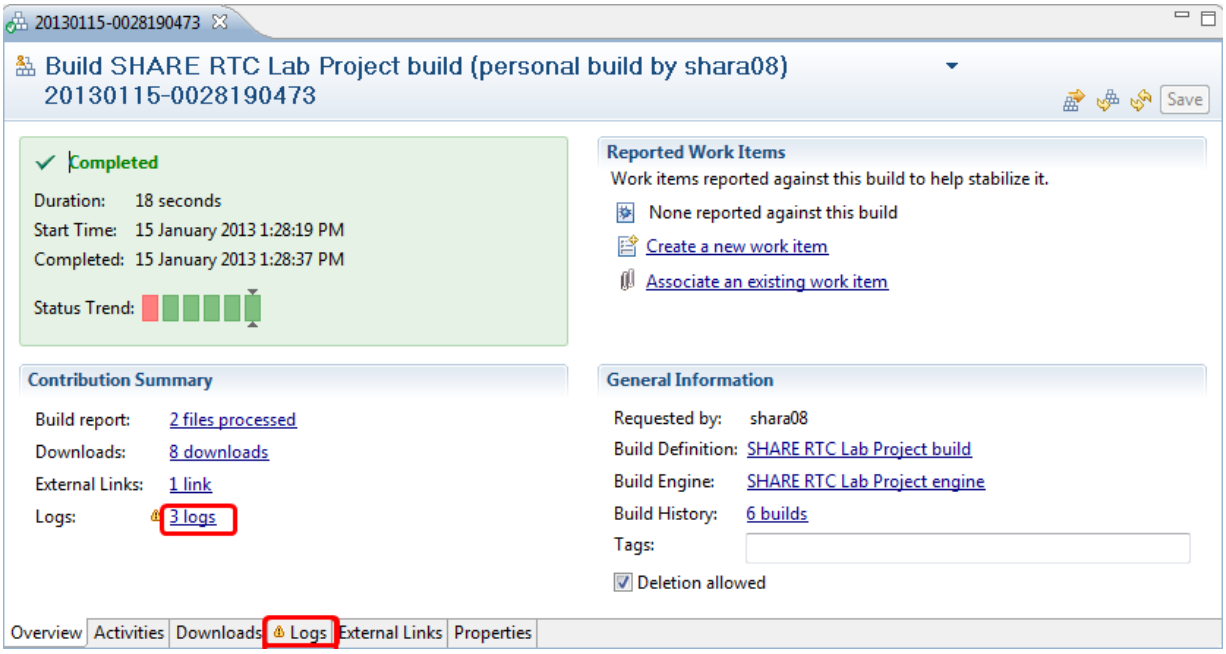
e) Your Request build panel should look something like this:



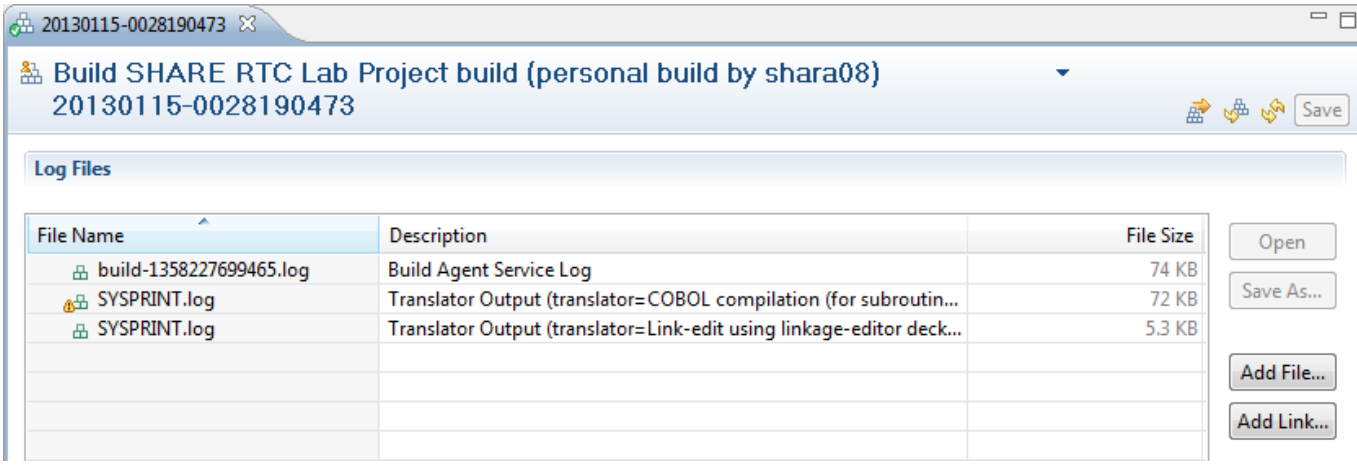
f) Click Submit to start the build. Once started the Builds tab will be displayed to show the progress of the build:



g) Once the build finishes, when the progress goes to completed, you can check the results. Double click on build result and the build result will open in the editor window:



h) You can see from the result that there are a number of logs. These are the outputs from the compiles/links. Either click the Logs tab, or the Logs hyperlink and you will be presented with the log list screen:



i) You can see the output from the COBOL compile, and from the link-edit. If you want, double click the COBOL compile output to look at the compile output. Of course these outputs can be suppressed if required such that they are only produced if a compile error occurs.

At this point, after testing your code, you might deliver your code to the stream so that it can be integrated and shared with the rest of you team mates. For this lab however we will stop prior to delivering, so as not to confuse other lab participants with your code changes.

Conclusion

This concludes Module 1. You now should have a basic understanding of source code management using the Eclipse Client, along with the integration with the work items, and build.

Module 2 Source code management with the ISPF Client

RTC has a number of different clients, so you can work in the environment that best suits your needs. For source control the Eclipse Client has the richest function. You can however work in a Web client, a Visual Studio client or, if you are used to a z/OS development environment, an ISPF Client.

Many z/OS shops wanted to continue using the tools they were used to to work on mainframe programs, in particular ISPF edit. So RTC provided an ISPF Client that allowed the SCM operations of RTC to be performed through ISPF. Other operations around work items, plans and admin would still be handled either from the Web UI or the Eclipse GUI.

In this module, you will see how to start the RTC ISPF Client and use it to edit, check-in, deliver and build z/OS programs.

Lab Scenario

You will create a defect work item through the RTC Web Client and assign it to yourself. You will then use that work item to make a change to a COBOL program, compile the code, test it and then deliver it the stream for you colleagues to pick up.

2.1. Logging into the SHARE LPAR

First of all you will need to logon to the SHARE LPAR. You are probably in a VMWare image from the previous module. This image does not have PCOMM installed so you will need to minimize the image to return to the normal desktop. Once you have minimized the image, to login, follow these steps:

- Double click on the “mainframe” or “TSO” icon on your desktop. 

- At the application prompt, type **TSO** and press Enter.
- At the prompt, enter your userid (**SHARAxx** – you will be allocated a number).
- On the TSO/E Logon Panel, enter your password which is **FIRSTPW**.
- You should be presented with the SHARE ISPF Primary Option menu

2.2. Starting and logging into the ISPF Client

The ISPF Daemon is a started task that runs to handle all requests to the various RTC servers. The Daemon should already be running. If you are interested in looking at the daemon, go to SDSF with a prefix of **ISPFDMN**, and you will see the started task. Have a look through the job if you wish.

a) To start the ISPF Client enter **RTC** on the command line in the ISPF Primary options menu and press Enter, you will see the RTC primary screen :

```
  Menu  Help
 ------------------------------------------------------------------------------
                  Rational Team Concert Primary Option Menu
Option ===> _

0 Settings    Terminal and user parameters          *** Not connected ***
1 Connections Work with connections to source       User ID . . :
2 Workspaces  Work with repository workspaces       Server. . . :
3 Edit        Work with source data                 Project . . :
4 Build       Work with build options                Release . . :
X Exit        Exit client
```

b) First thing we will check are your settings. This will tell the RTC Client on which port the daemon is running and additionally what the daemon registry directory is. These have to match what is set in the daemon you are pointing to. For this LPAR the daemon port is **8421** and daemon registry is **/shareuser/lxd1/jazz40/ccm.**

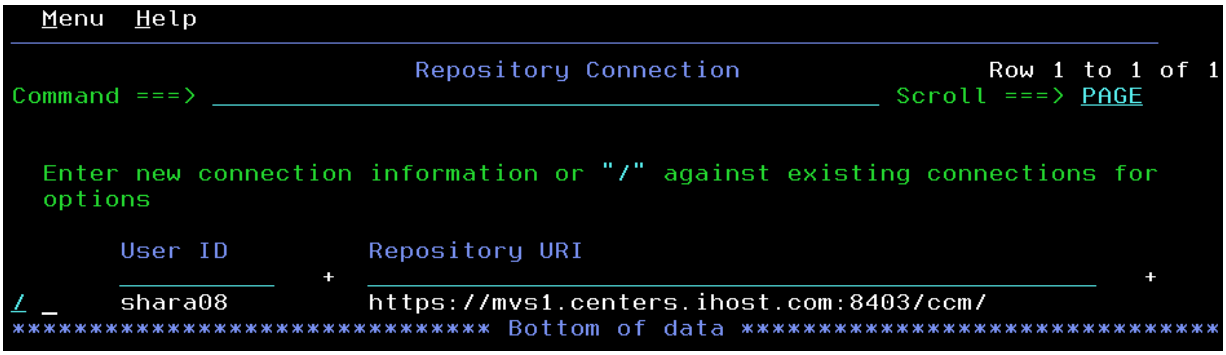
```
  Menu  Help
 ---------------------------------------------------------------------------
                              Preferences                      Row 1 to 7 of 7
Command ===> _

Share files in binary mode         _
Client Code Page                   IBM-1047
Client Time Zone
Client Trace Log Maxsize           100000
Client Trace Log Number            3
Daemon Port                        8421
Daemon Registry Directory          /shareuser/lxd1/jazz40/ccm
Daemon Timeout                     1200
******************************* Bottom of data ********************************
```

c) Press Enter to go back to the primary menu. We are now going to connect to our RTC Repository through the daemon. Select option **1 – Connections** and press **Enter**; you will be presented with an empty repository connection screen. First step is to add your userid and repository address into the fields provided. For the user ID enter shara##, where ## is the userid number assigned to you. For the repository address enter the address **https://mvs1.centers.ihost.com:8403/ccm/**

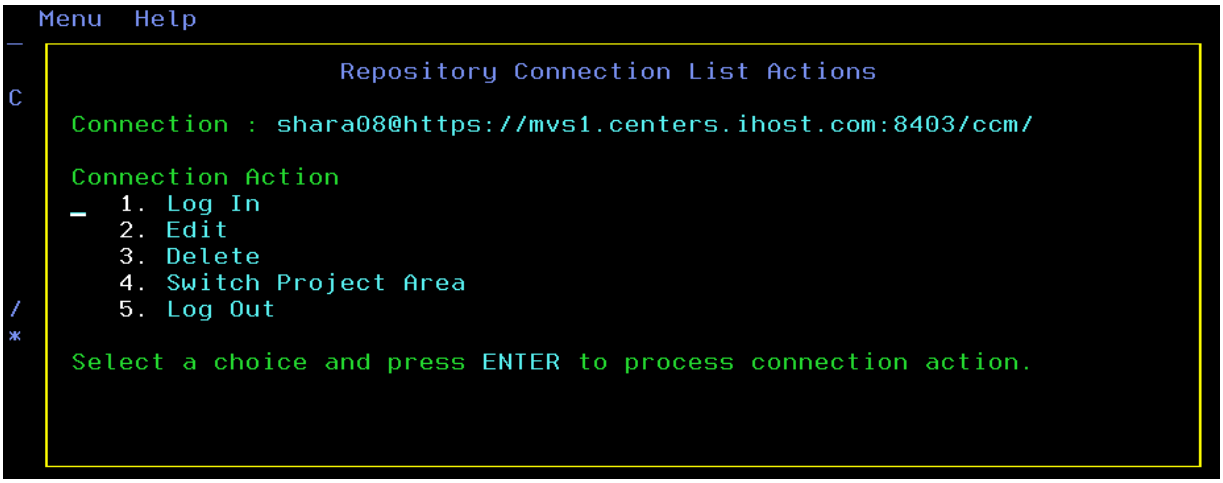
d) .

```
  Menu  Help
 ------------------------------------------------------------------------------
                         Repository Connection
Command ===>                                            Scroll ===> PAGE

  Enter new connection information or "/" against existing connections for
  options

       User ID         Repository URI
       shara08     +   https://mvs1.centers.ihost.com:8403/ccm/          +
********************************* Bottom of data ****************************
```

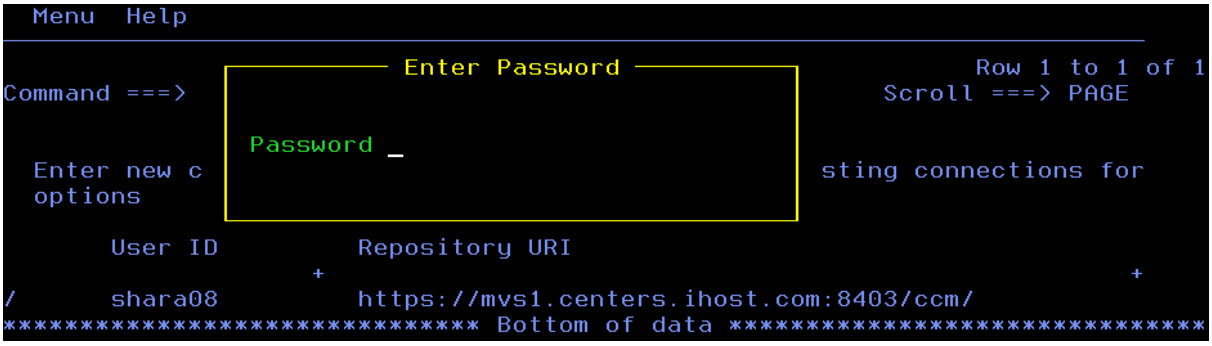
e) Press enter and the connection will be added to the list. If you have multiple servers you can connect to you can add them all to the list to use for connection. Now you can enter an **L** next to the connection to login, or alternatively enter a "/" to see all available options:



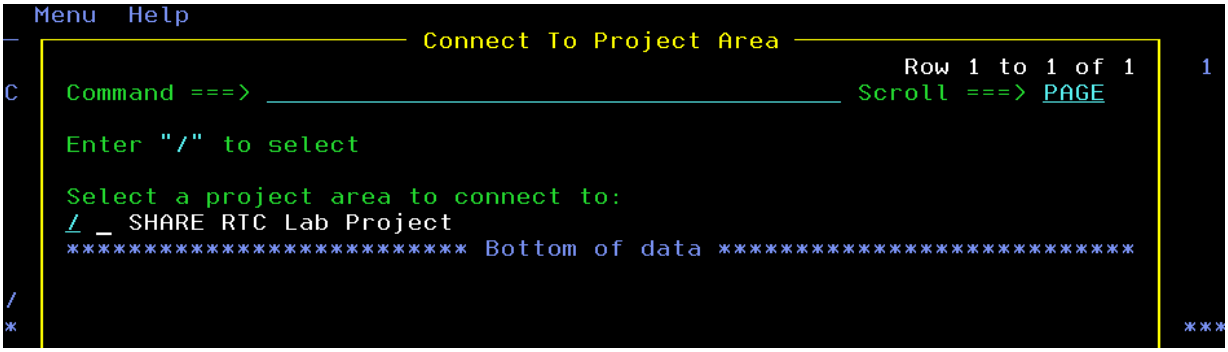
You will be presented with a list of options, so just select **1** to login:



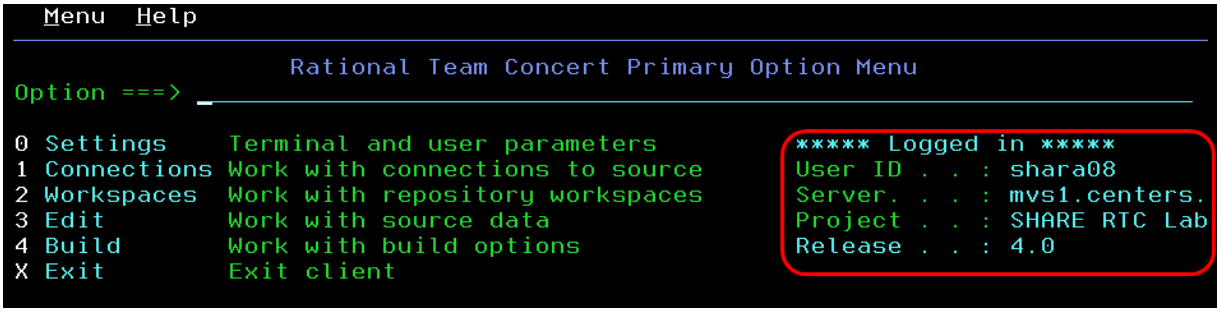
f) You will be presented now with a password screen where you can enter your jazz repository password, which will be **firstpw**. The password is a protected field so you will not see it as your type.



g) If you have never logged in before you will be presented with a screen to select a project area. Your RTC repository may have multiple project areas you can select from. The connection panel is also the place you can switch between project areas. For this lab there is a single project area, so select it with a "/":



h) You should now be logged in and presented with the primary options panel to inform you of that:



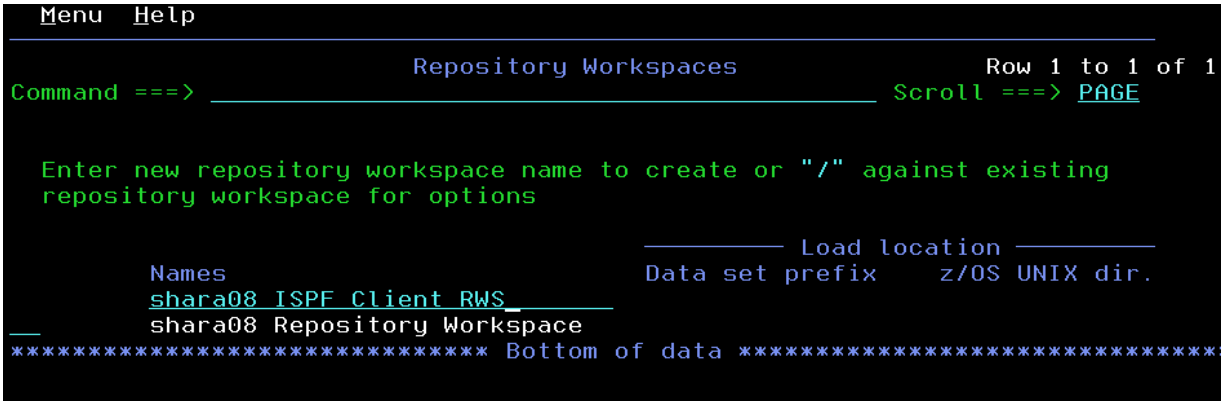
Note: Many of the fields in RTC are what are known as scrollable fields in ISPF. So for fields where the information is too long for the available width you can still get the rest of the information. Position the cursor somewhere in a field, for example under the actual project name “SHARE RTC Lab”, and then press **PF4**. A panel is displayed with the information. Some scrollable fields are updatable, so you can press **PF4** to enter additional data. Alternatively, with the cursor in a scrollable field just press **PF10**/**PF11** to scroll the available data left and right.

2.3. Working with your repository workspaces

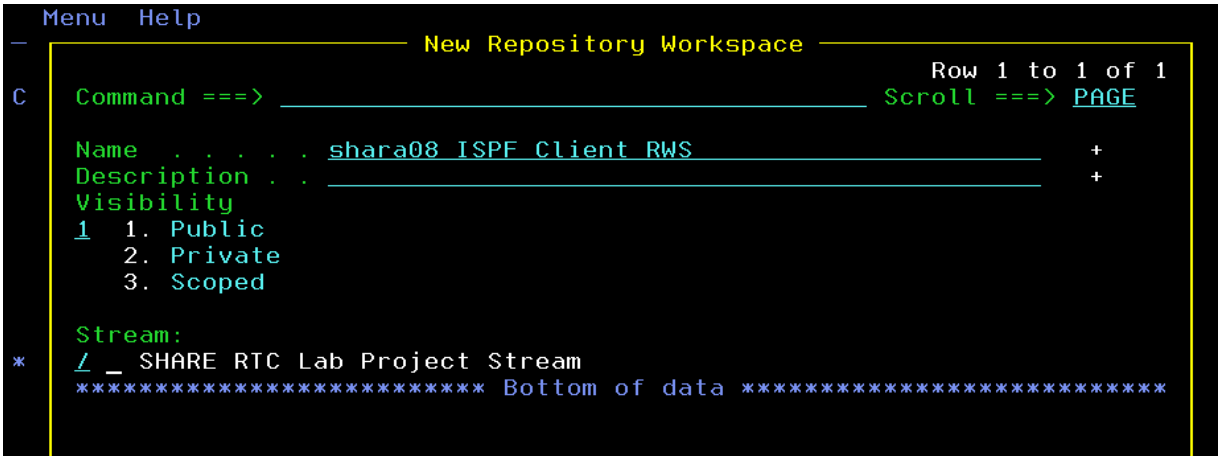
The first thing we need to do is load some PDSs with source code data from the RTC repository. On z/OS the source needs to be in normal PDSs so that ISPF can edit the code and compilers can compile it. The actions of the Eclipse GUI such as LOAD and SHARE have been propagated to the ISPF Client, so regardless of which interface you use the processes are basically the same. So let’s get started…

a) From the primary option menu select **option 2**, to work with your repository workspaces. You will see in the list provided the repository workspace that you created in the previous lab. It is not a good idea to use the same repository workspace in different clients, as the contents get out of sync. RTC will get confused as it tries to manage local changes with the repository workspace. So let’s create a new repository workspace for the ISPF Client scenario. Enter a repository workspace name, whatever you like, for example **shara08 ISPF Client RWS**

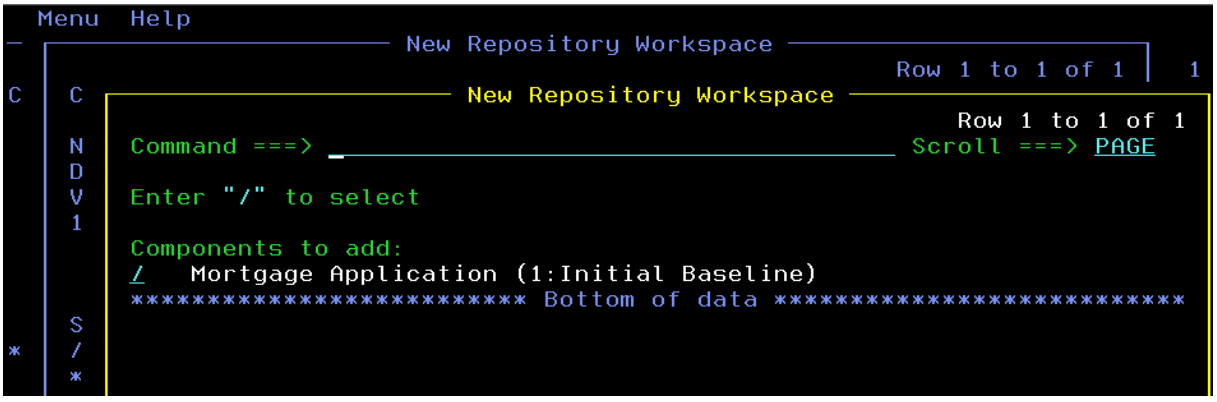
b) , in the Name field provided and press enter:



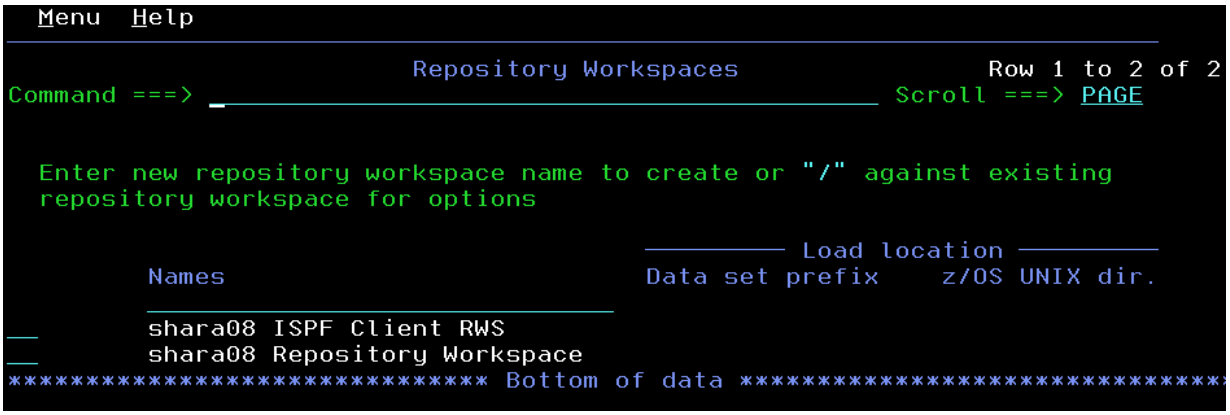
c) Enter the workspace visibility and select a stream to flow with using a “/”, there should only be one in the list, then press enter:



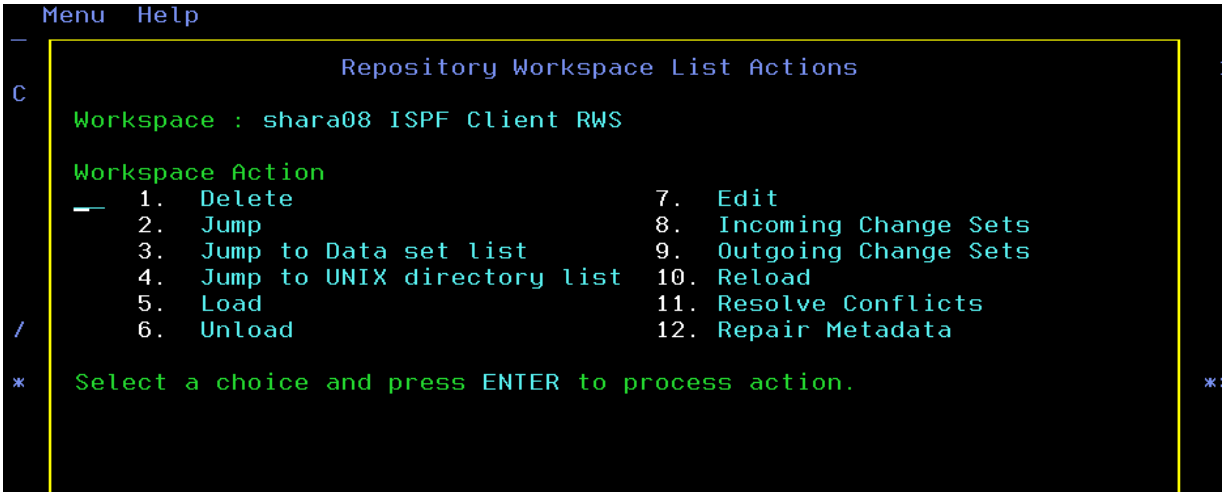
d) Select the component you want to include, again in this lab there should be only one, and press enter:



e) You will now be presented with a list containing your repository workspace, where you will now be able to perform your next actions:

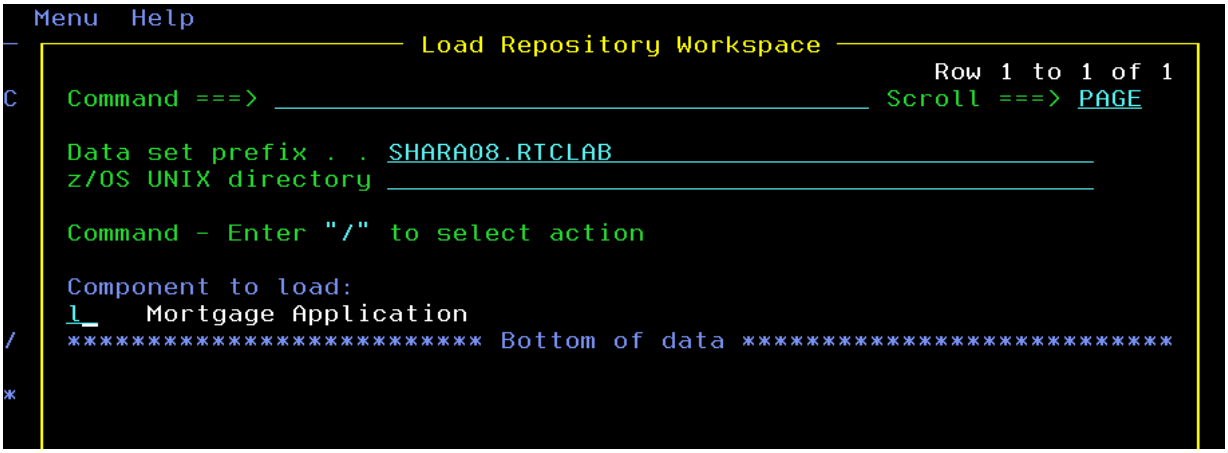


f) If you enter a "/" next to the repository workspace you will see a list of actions that can be performed.

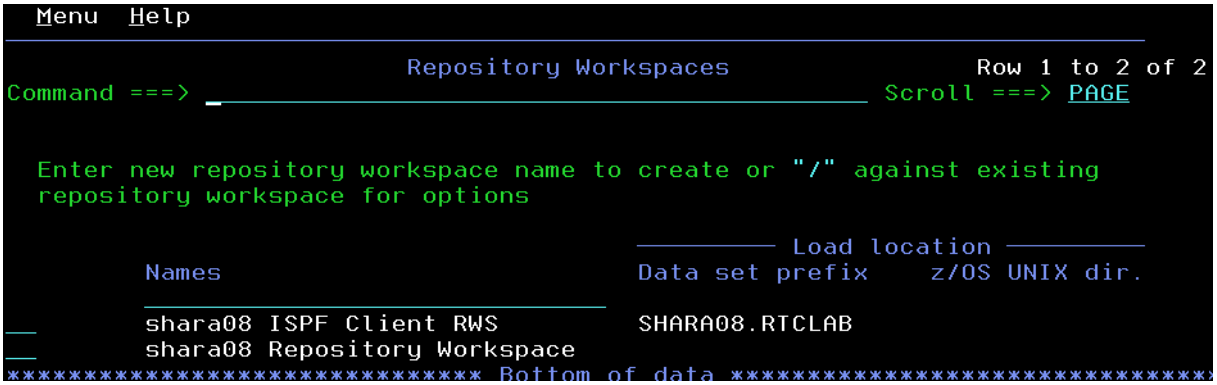


The main ones will be Load, Jump, Incoming Change Sets and Outgoing Change Sets. So we will concentrate on these for now.

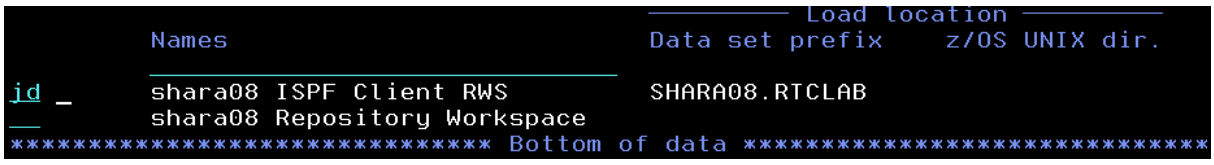
g) The first thing we need to do is load a set of PDSs with the source code held in the repository so that we can begin working on it. Either from the list shown above select option **5** to perform a Load, or if you are still on the repository workspace list screen, enter an **L** to load. You will be presented with a screen where you have to enter your **data set prefix**. This is a high level qualifier, and most likely a middle level qualifier to identify where RTC is going to load the source data. Your high level qualifier for this lab will need to be you SHARE LPAR userid, **SHARA##**, that was assigned to you. For the middle level qualifier use something like **RTCLAB**. In the example shown the HLQ is **SHARA08**. You can ignore the z/OS UNIX directory location for this Lab.



Enter an **L** next to the component to load and press **Enter**. You will be presented with a confirmation screen where you can just press **Enter** again. The load may take some time as it transfers all of the source code data from the RTC repository to the PDS data sets it will create for you. RTC uses the data set definitions to know what attributes to allocate a data set with. Once the load has finished you will be presented with the repository workspace screen, except the load location will now be filled in:



h) From here we can now easily jump to a data set list with our loaded data sets so we can begin making code changes. Enter a **JD** next to the repository workspace, and you will be taken to the data set list (similar to ISPF option 3.4) except for the data set pattern specified in the load location.

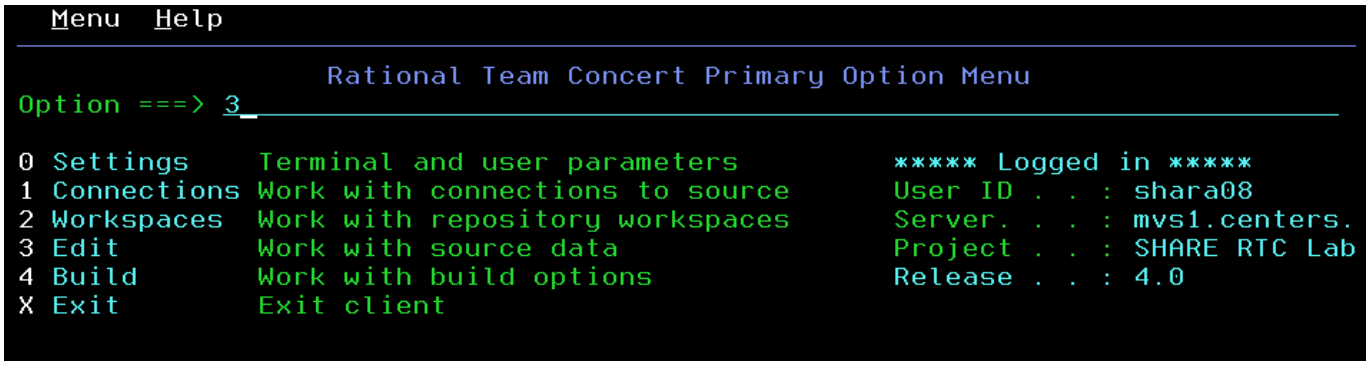


The next section will talk you though making program changes and checking programs in.

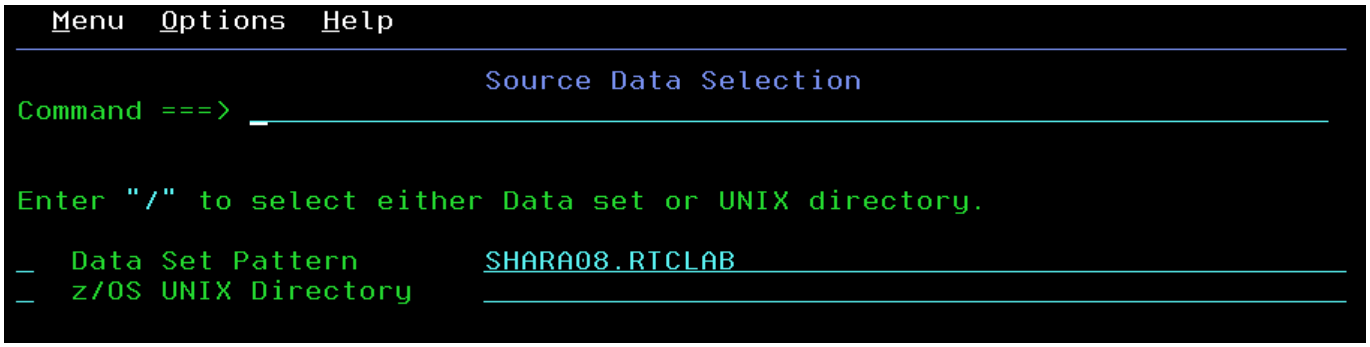
2.4. Making changes to programs

There are two ways to start editing members. The first is to use the Jump option from the repository workspace panel, to jump directly to the source code data panels, which we used in the previous section. You can use the **J** command to jump to the main option 3 panel, or the **JD** to jump directly to the data set list, or the **JU** to jump directly to the z/OS Unix directory list.

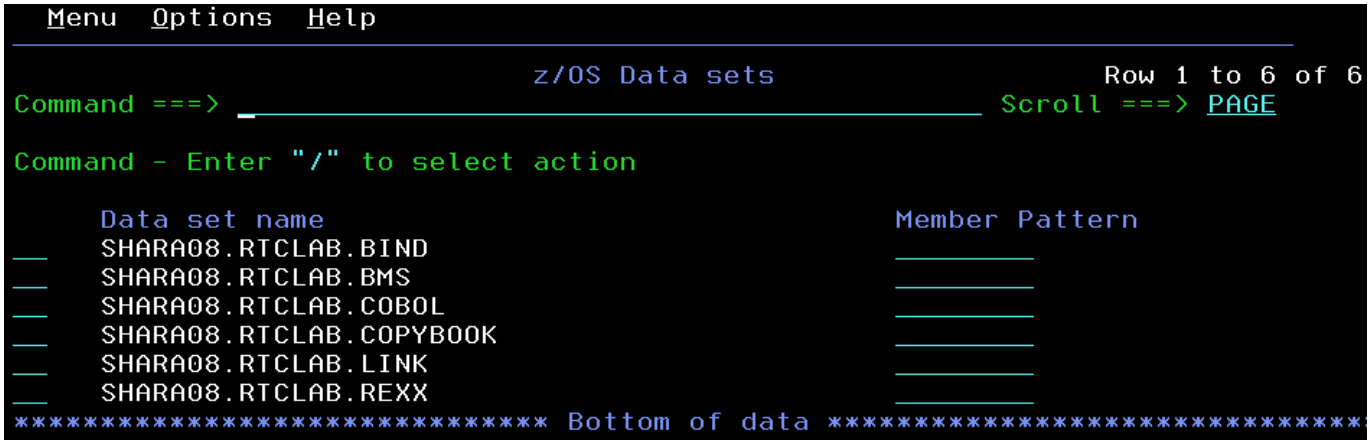
Alternatively, and this is for information only as we already used the **JD** command, you can start with option **3** on the RTC primary menu:



In this case you will be given a panel where you can enter your data set pattern, which works the same as ISPF option 3.4 or ISPF option 3.17 for z/OS UNIX directories. In this case enter your data set pattern, which will be SHARAxx.RTCLAB, or whatever you used when you did your load.



Entering a “/” next to the Data Set Pattern and pressing enter will show data sets that match this pattern, which is the same panel you would be presented with if you had used the Jump option from the repository workspace panel:



So we now have a list of data sets we can start working with to make some code changes. So let’s get started on that…

a) Enter an **E** next to the **SHARAxx.RTCLAB.COBOL** data set. Press enter and you will be presented with the member list for this dataset.

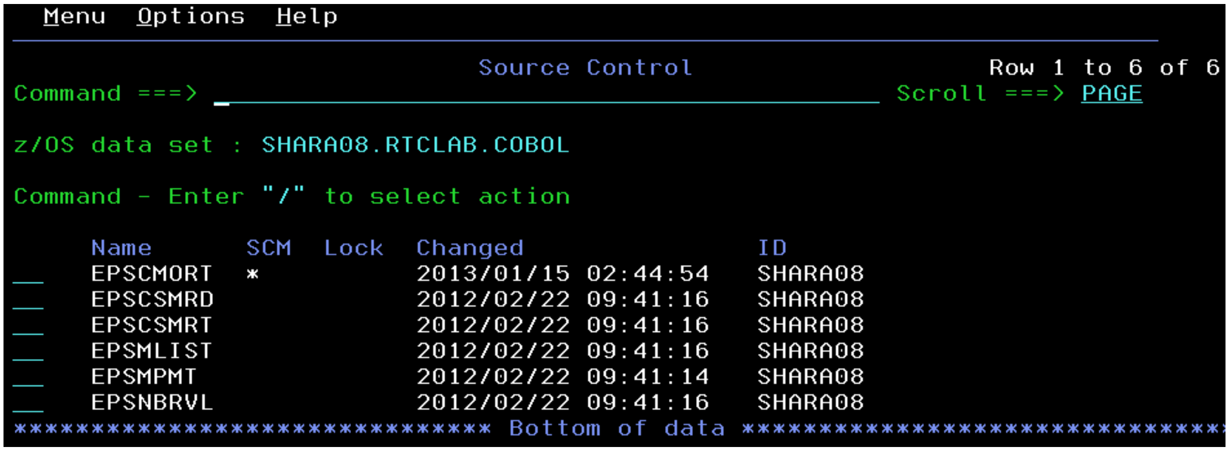
```
 Menu  Options  Help
--------------------------------------------------------------------------------
                              Source Control                    Row 1 to 6 of 6
Command ===> _____________________________________________ Scroll ===> PAGE

z/OS data set : SHARA08.RTCLAB.COBOL

Command - Enter "/" to select action

     Name      SCM  Lock  Changed              ID
__   EPSCMORT            2012/02/22 09:41:16   SHARA08
__   EPSCSMRD            2012/02/22 09:41:16   SHARA08
__   EPSCSMRT            2012/02/22 09:41:16   SHARA08
__   EPSMLIST            2012/02/22 09:41:16   SHARA08
__   EPSMPMT             2012/02/22 09:41:14   SHARA08
__   EPSNBRVL            2012/02/22 09:41:16   SHARA08
****************************** Bottom of data ********************************
```

b) Enter an **E** next to the **EPSCMORT** member and press enter. You may be presented with the Edit Entry Panel where you can enter other Edit parameters, such as macros, etc. Just press **Enter** if you are. You are now in the normal ISPF editor for this member. We are going to make a simple change. Just add an extra comment line with a comment of your choice, using the previous comment lines as an example:

```
 File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       SHARA08.RTCLAB.COBOL(EPSCMORT) - 01.02          Columns 00001 00072
Command ===> _____________________________________________ Scroll ===> PAGE
****** ***************************** Top of Data ********************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001        ID DIVISION.
000002        PROGRAM-ID. EPSCMORT.
000003       *    THIS DEMONSTRATES CICS/DEBUG           - EPSDEMOS 2008
000004       *
000005       *    THIS PROGRAM WILL RECEIVE A DATE AND COVERT THE DATE TO
000006       *    AN INTEGER IN A CALLED PROGRAM TO DETERMINE DAYS FROM
000007       *    CURRENT DATE.
000008       *
000009       *    Comment for SHARE_
000010       *    (C) 2008 IBM - JIM HILDNER RESERVED.
000011        ENVIRONMENT DIVISION.
000012        CONFIGURATION SECTION.
000013        SOURCE-COMPUTER. IBM-FLEX-ES.
000014        OBJECT-COMPUTER. IBM-FLEX-ES.
000015       *
000016        DATA DIVISION.
000017        WORKING-STORAGE SECTION.
000018       *
```

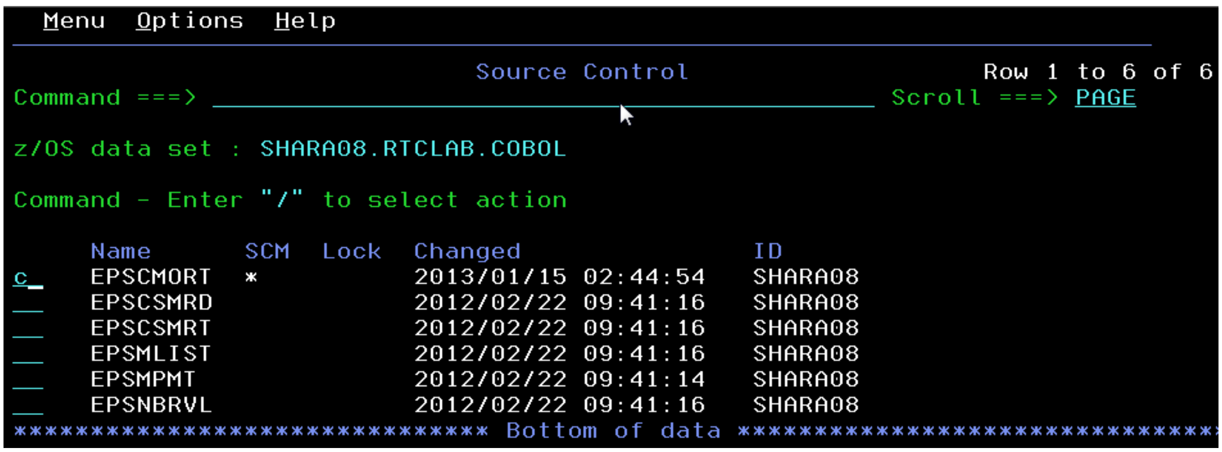
Note: In COBOL an asterix in column 7 denotes a comment line.

c) Press **PF3** to save and exit the member, and you will see that the member list display has been updated to show that you have edited the member. The * in the SCM column shows that you have an unchecked in change.



```
  Menu  Options  Help
                                Source Control                     Row 1 to 6 of 6
Command ===> _                                                    Scroll ===> PAGE

z/OS data set : SHARA08.RTCLAB.COBOL

Command - Enter "/" to select action

     Name      SCM  Lock  Changed                ID
___  EPSCMORT  *          2013/01/15 02:44:54    SHARA08
___  EPSCSMRD             2012/02/22 09:41:16    SHARA08
___  EPSCSMRT             2012/02/22 09:41:16    SHARA08
___  EPSMLIST             2012/02/22 09:41:16    SHARA08
___  EPSMPMT              2012/02/22 09:41:14    SHARA08
___  EPSNBRVL             2012/02/22 09:41:16    SHARA08
******************************* Bottom of data ********************************
```

d) In order to check the member in, you are going to need to associate it with a work item. Next to the member you changed, enter a **C** to check the change in, and press enter:

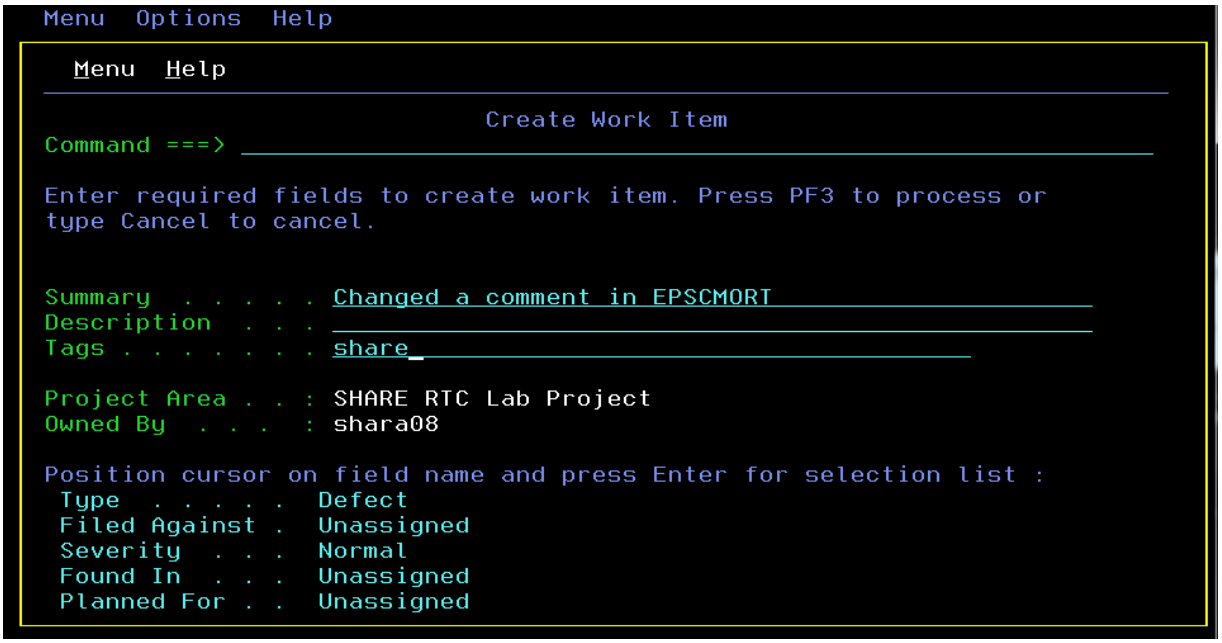


```
  Menu  Options  Help
                                Source Control                     Row 1 to 6 of 6
Command ===>                                                      Scroll ===> PAGE

z/OS data set : SHARA08.RTCLAB.COBOL

Command - Enter "/" to select action

     Name      SCM  Lock  Changed                ID
c_   EPSCMORT  *          2013/01/15 02:44:54    SHARA08
___  EPSCSMRD             2012/02/22 09:41:16    SHARA08
___  EPSCSMRT             2012/02/22 09:41:16    SHARA08
___  EPSMLIST             2012/02/22 09:41:16    SHARA08
___  EPSMPMT              2012/02/22 09:41:14    SHARA08
___  EPSNBRVL             2012/02/22 09:41:16    SHARA08
******************************* Bottom of data ********************************
```

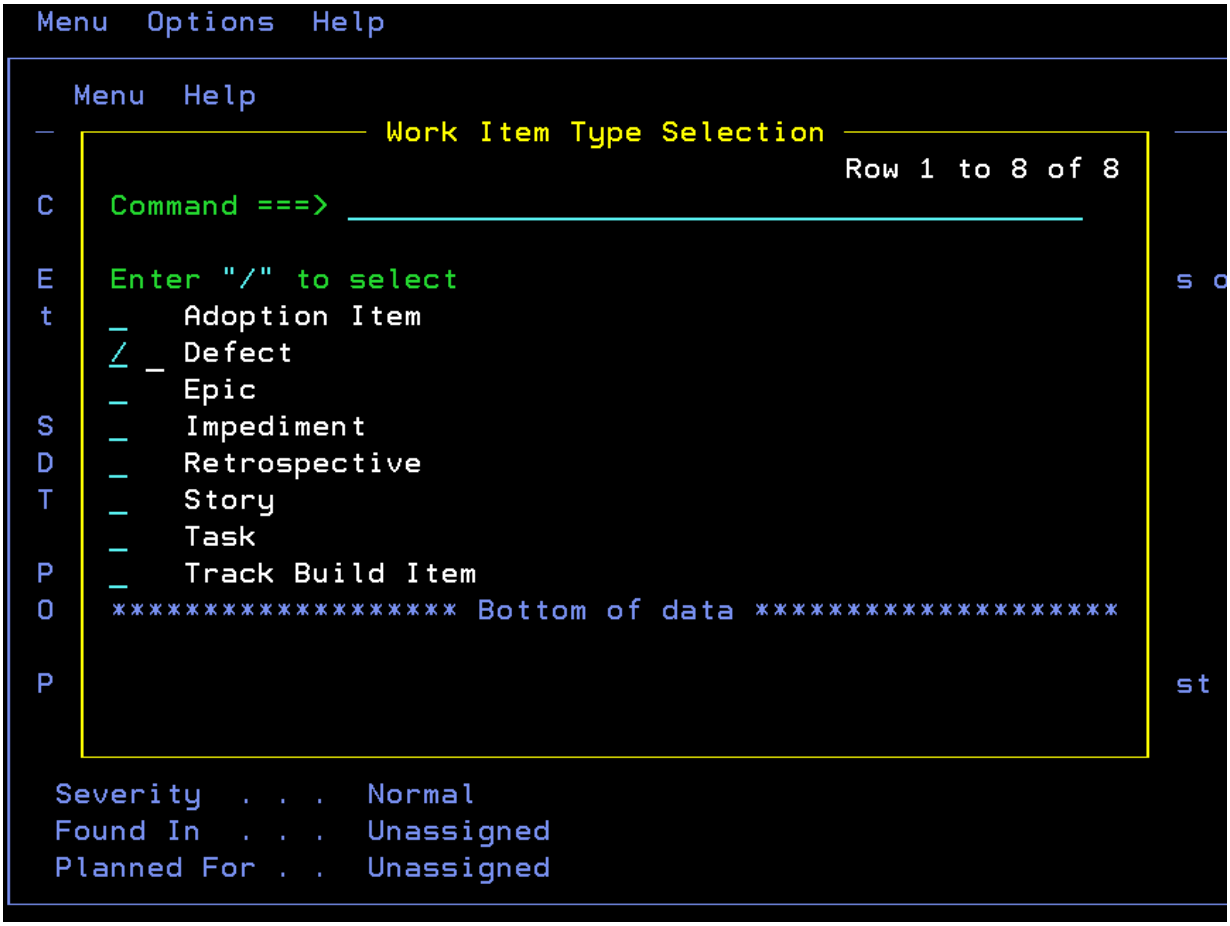
e) You will be presented with a panel where you can now associate your changeset with an existing work item and add an optional comment or create a new work item. If you wish to enter it with an existing work item (less typing ☺) enter a * in the work item field and if you wish, a comment in the comment line. Or if you know a work item number you can, rather than entering an * to get a list, just enter the work item number directly.

However for this lab we will create a new work item. Enter a "/" in next to the Create work item field on the screen.

f) Once you press enter you will be presented with the **Create Work Item** screen. Enter a summary and description if you wish. These fields are scrollable, so pressing **PF4** while the cursor is in the field will enable you to enter extra data.



g) To set the ***Type***, ***Filed Against***, ***Severity***, ***Found in*** and ***Planned for*** values position your cursor on those fields (either the name or the value) and press enter. You will be presented with a selection panel that presents you with valid values retrieved from the server. You can select the value you wish with a "/".



h) Once you have entered all the required fields, for this lab **Type**, **Filed Against** and **Planned for**, on the Create Work Item screen press **PF3** to create the work item.

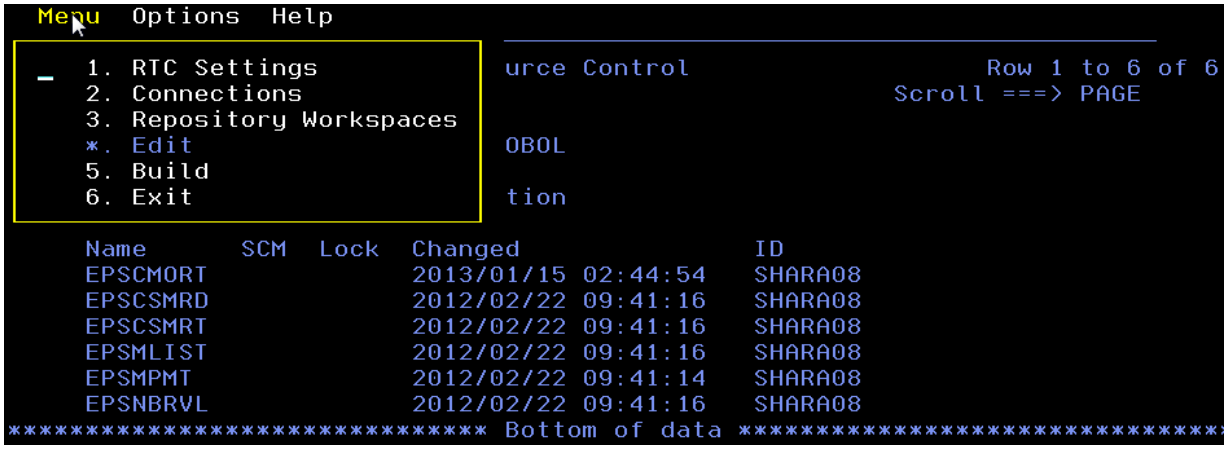
i) You will be returned to the **New Change Set** screen where, now that you have a work item number assigned you can press enter again to associate the work item to the change.

j) You will see that now you have pressed enter, the * in the SCM column has disappeared, showing that you have checked the code in. The next stage we need to perform is to build the program to make sure our change compiles.

2.5. Performing Builds

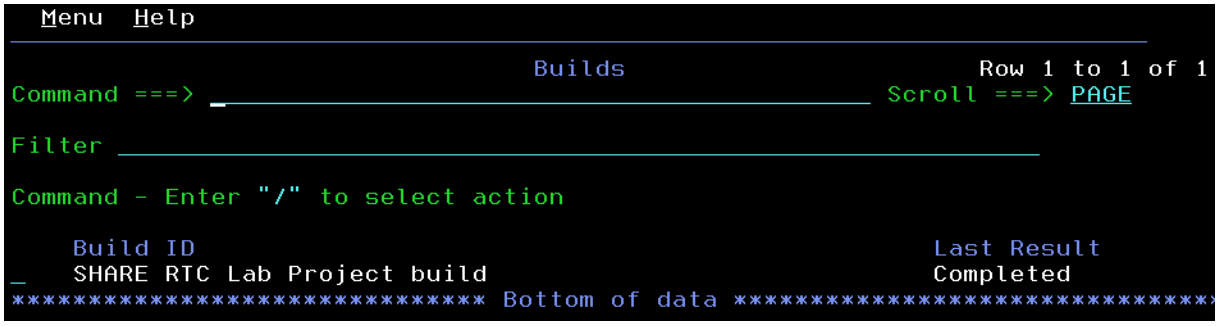
Before you can deliver your changes and make them available to the rest of the team you might want to compile and test your program. So let's explore the build options available from the ISPF Client.

a) To get to the build options we could **PF3** out until we went back to the RTC Primary option menu. But instead we are going to use the Action Bar choices on the RTC menus. Position your cursor on the Menu bar and press enter and the action bar menu should be displayed.



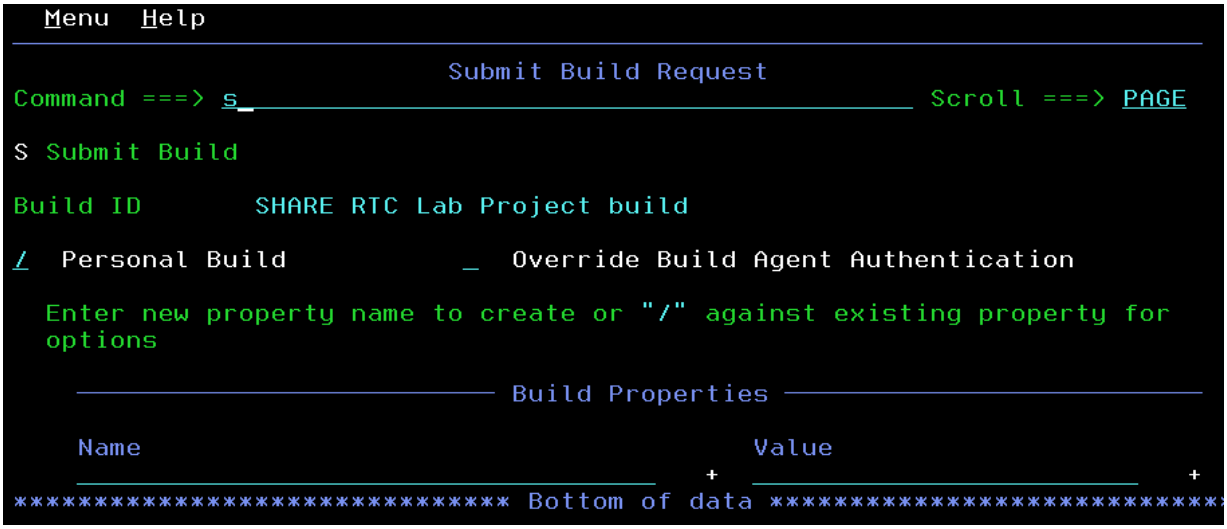
From here we are going to select option **5** for Build and press enter.

b) The Builds panel should be displayed with a list of the different build definitions. You may need to enter an * in the filter and then press enter. There should only be one build definition for this Lab and it should show that last status of the build. In the example below, it shows it is completed.

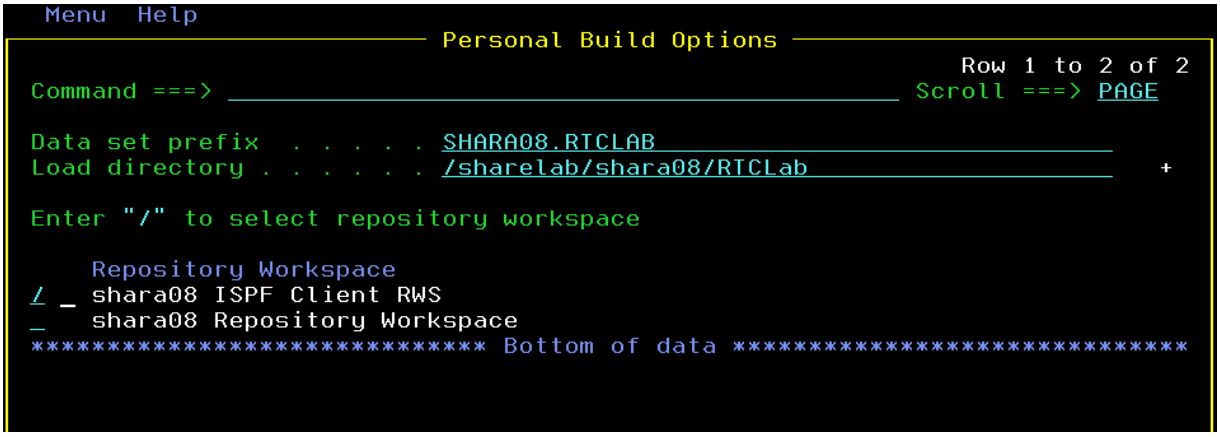


c) To view previous builds enter a **V**, or if you want to request a new build enter an **R**, or enter a "/" to see available options. For this lab we will enter an **R** to request a build. If you want, enter a **V** to view any previous builds. This will show us, much like the Eclipse GUI, a list of all the previous builds and their current status. If you chose to view the builds **PF3** back to the above screen to enter an **R** to request a build.

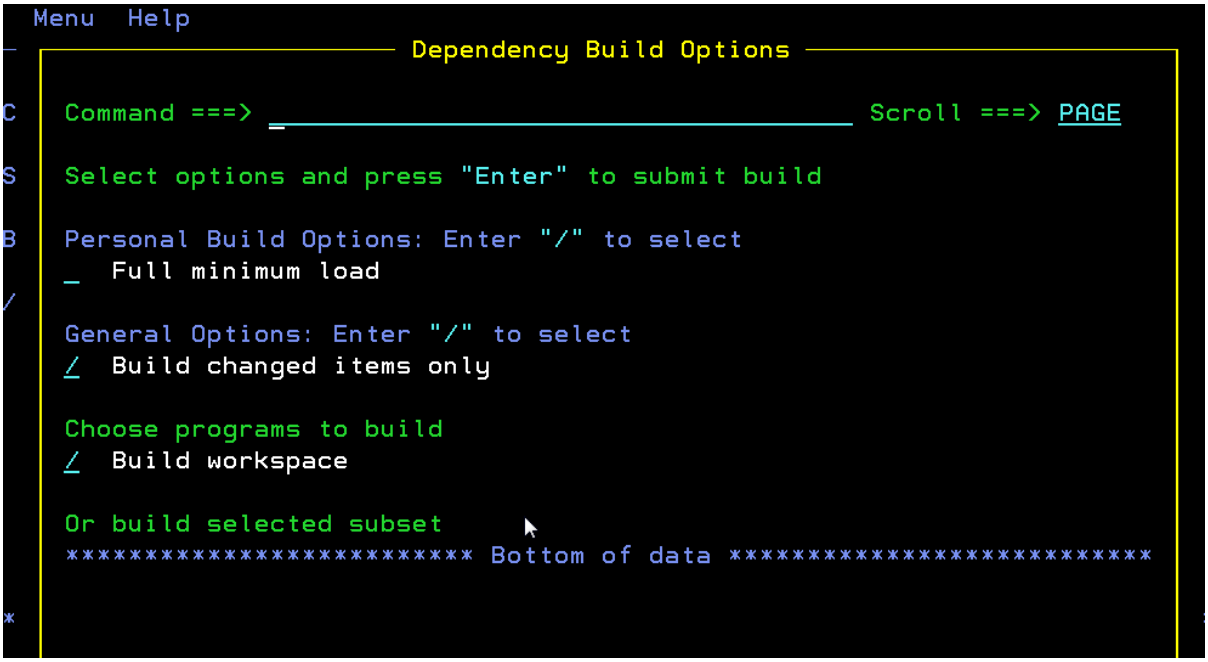
d) We now want to start a personal build to build the code changes we have made in our own personal repository workspace. So next to any one of the existing builds enter an **R** to request a build. This will display the **Submit Build Request** panel, which shows the build properties we will be using. However we want to submit a personal build so that it uses our own repository workspace and build data sets. So select the Personal Build option with a "/" and enter an **S** on the command line to submit the build.



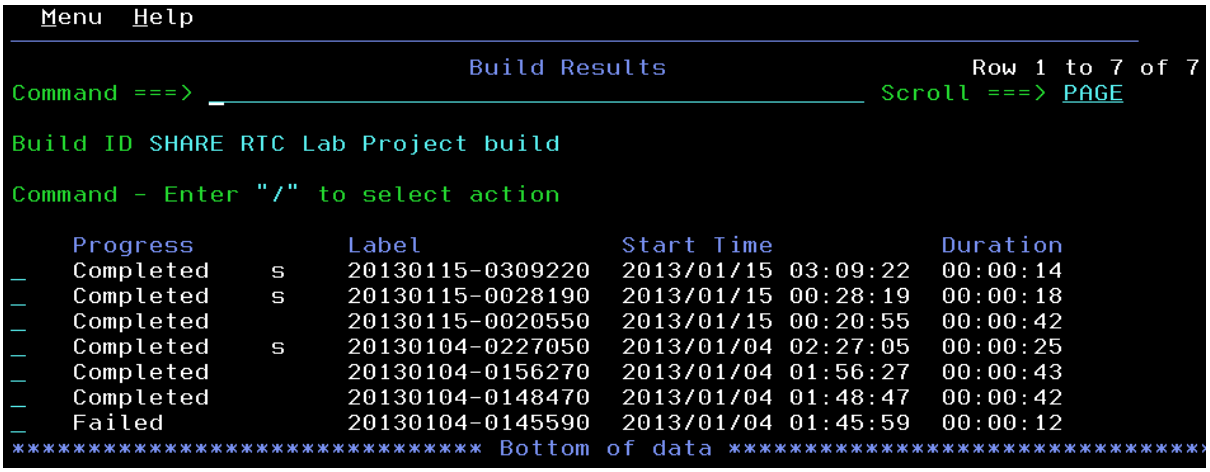
e) On the personal build options screen you need to select the repository workspace to use with a “/”. You also need to enter your data set prefix and load directory. For the data set prefix you can use the same settings as you did for the load, so **SHARAxx.RTCLAB**. For the load directory we need to specify a work location that RTC will use for the build xml files. Use /**sharelab**/**shara##**/**RTCLab**where **shara##** is your SHARE LPAR userid.



Press Enter and you will be presented with the Dependency Build options screen. In this case make sure Build changed items only is set with a “/”.

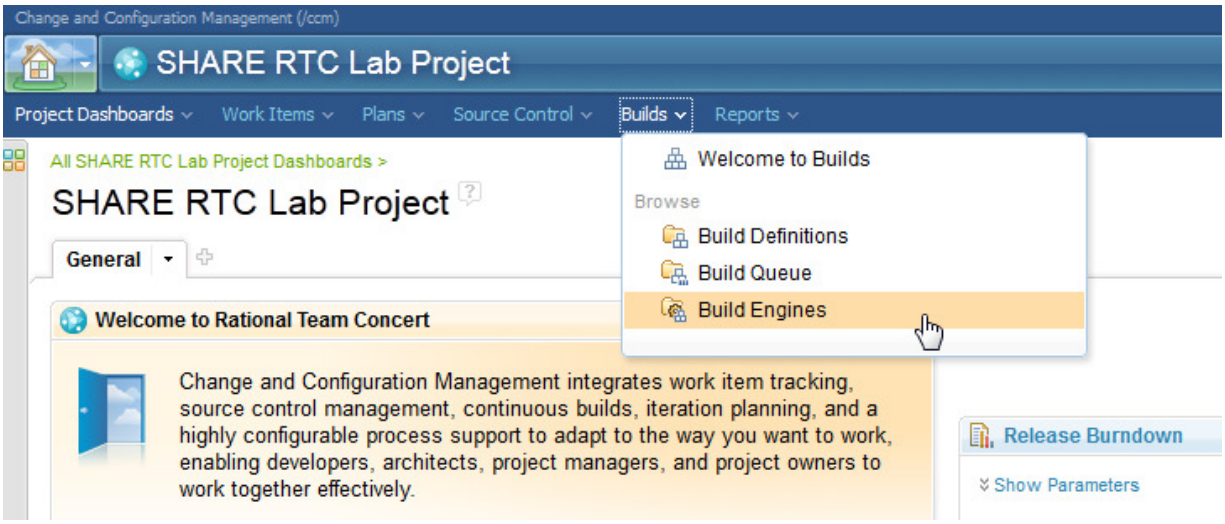


Press Enter and you will be returned to the Build results screen, where you will see the build is **pending**. If you press Enter you will see the status change to **In Progress**. The build may take some time, but should only build your 1 changed program.

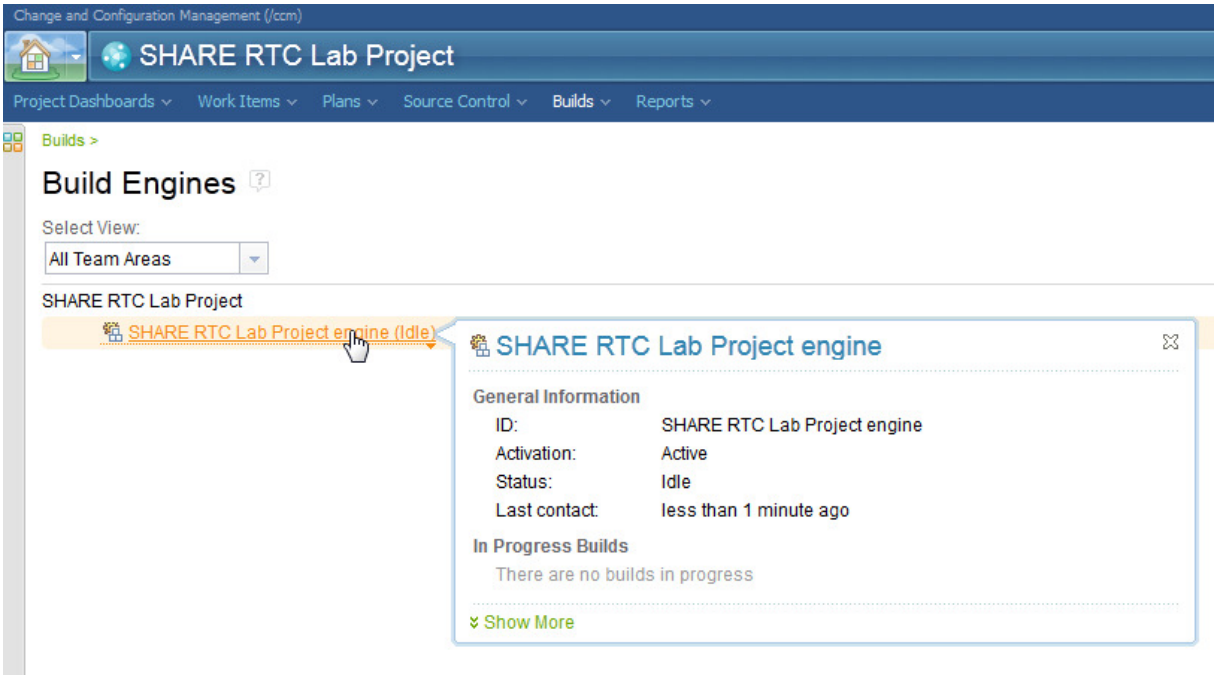


f) Once completed we should check the output from the build. Unfortunately the server installed for this lab is a 4.0 server. In RTC 4.0.1 it is possible to view the build results through the ISPF Client to check the output. However, for this lab we will check the output through the web client to get a taste of another client interface.

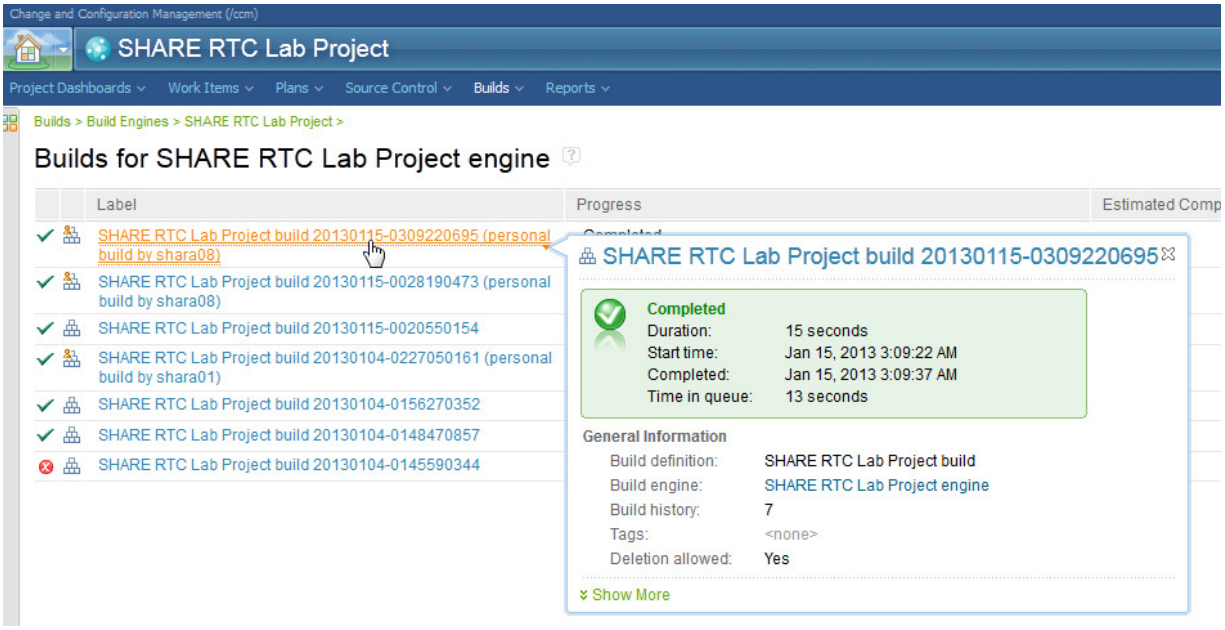
g) We could check the build results through the Eclipse GUI, but as we showed this in the previous lab we will check the build output via the Web UI. In a web browser use the URL **https://mvs1.centers.ihost.com:8403/ccm/web/projects/SHARE RTC Lab Project**. You may need to login again using your **shara##** userid and password **firstpw**. On the main dashboard screen you will see the builds tab along the menu bar. Select that and then select the Build Engines option.



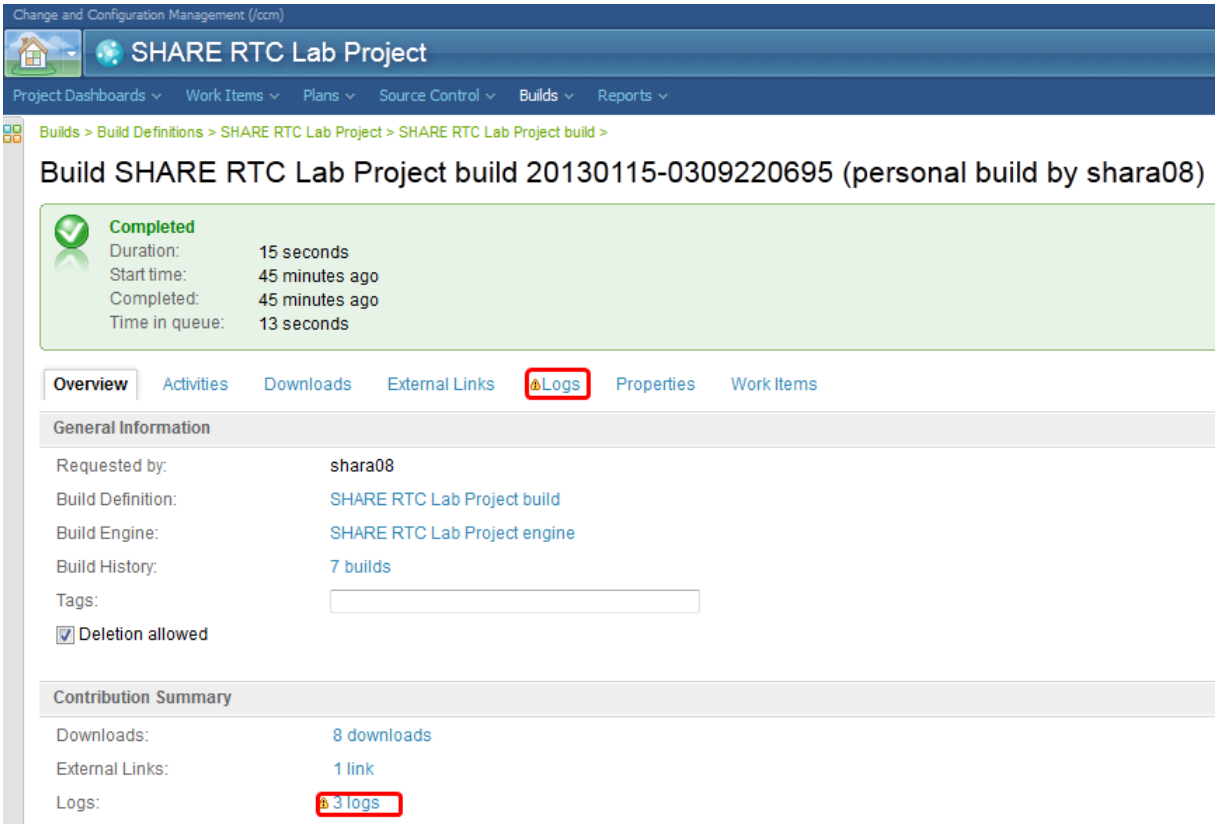
h) On the next screen, click on the link for the **SHARE RTC Lab Project engine**.



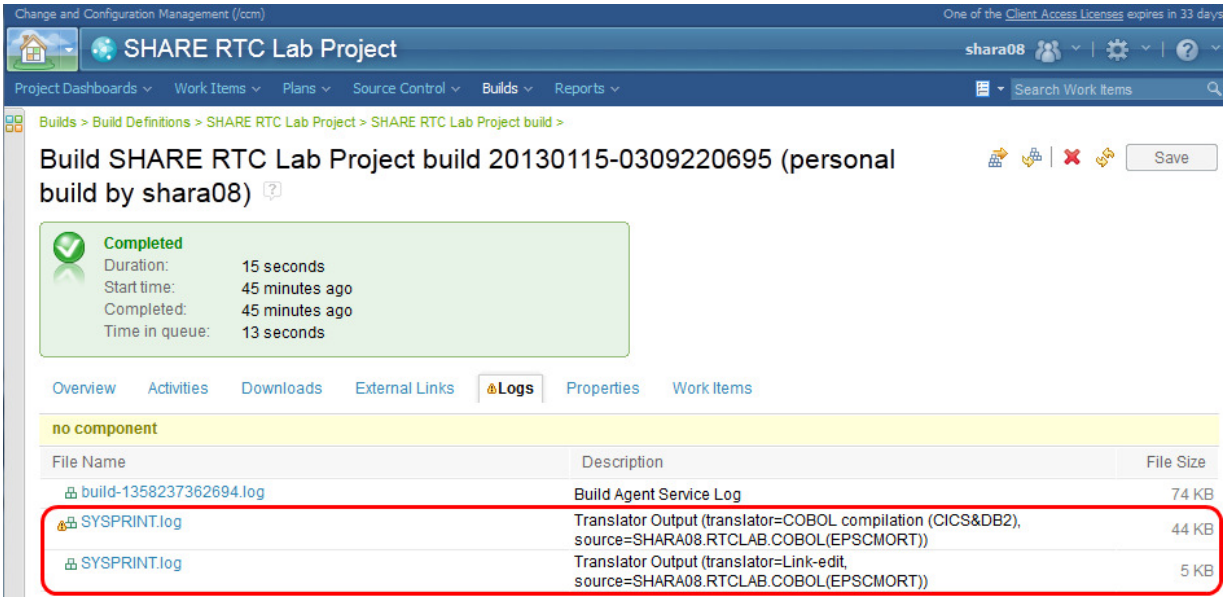
i) You will then be presented with a list of build results, similar to that shown in the ISPF Client. You should see that the last one is the personal build that you submitted from your ISPF session. If you hover your mouse over the link you will get a popup giving you some details about the build.



j) You can then select the link to take you into the build results



From here you can click on the tabs to show you various things. The one we are interested in is the Logs tab. Once you click that you will see all the compiler outputs. We are interested in the SYSPRINT output from the compile of EPSCMORT, that we changed previously.

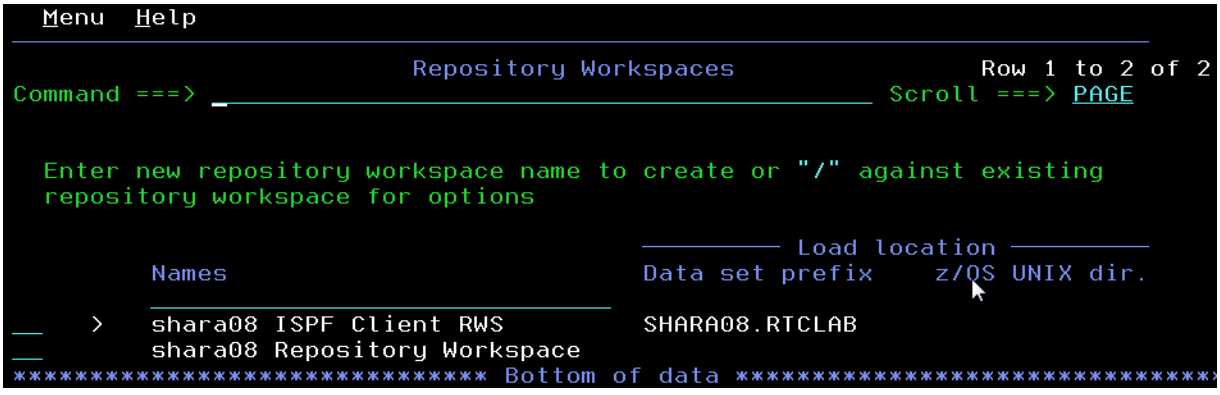


Click on the link for the COBOL compile and the system should download the file. You should now be able to view the file with a text editor such as Notepad.

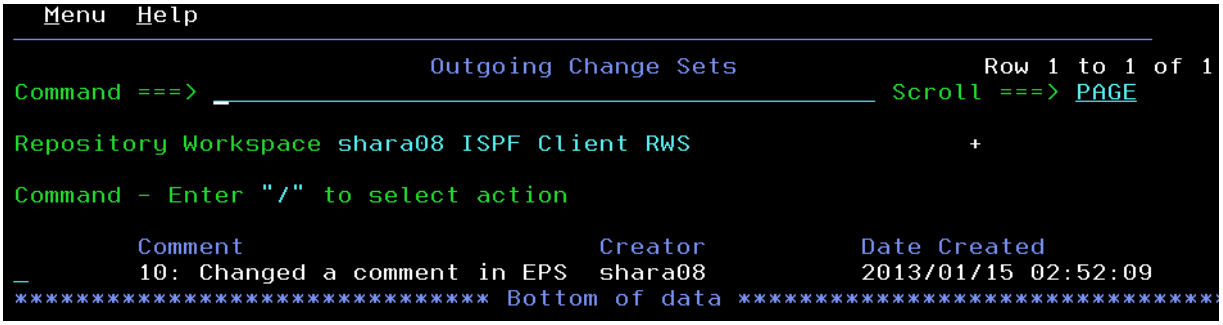
2.6. Delivering your changes to the stream

Now that you have successfully made a change to your programs, you are ready to deliver those changes to the projects stream so that you can share them with the rest of your team. This is a simple process.

a) Either from the RTC main menu, select option **2 – Workspaces** or select the Menu action bar choice, press enter and **3 – Repository Workspaces**. The repository workspaces panel will be displayed, and you will notice in the prefix area a **>** symbol. This shows we have outgoing changes that we can deliver. If the was a **<** symbol, then this would signify we had incoming changes to accept.



b) You can use the “/” to bring up a list of available options, or in this case just enter an **O** to bring up the outgoing changes panel.



c) You will see the changeset, and the work item you attached to it listed. If you wish to see what files are being delivered you can enter a **V** to list the files.

From here you can then enter a "/" for available options such as browsing the local or remote files, or comparing your local file with what is on the server.

d) Press **PF3** to go back to the Outgoing Change Sets panel. Now enter a **D** to deliver the change to the stream. Once complete you will get a confirmation message.

e) Your changes have now been delivered to the project stream, so any team mates who have this component in their repository workspaces will now be able to accept your changes and merge them with their own.

Conclusion

This concludes Module 2. You now should be familiar with source code management using the RTC ISPF Client.

Lab Conclusion

This lab has demonstrated the basic functionality of Source Code Management with Rational Team Concert. Download your own copy from jazz.net and play all you want to learn more.

To use the sample code used in this lab go to:

https://jazz.net/wiki/bin/view/Main/DependencyBuildScenarioV4

or for the V3.0.1 version

https://jazz.net/wiki/bin/view/Main/DependencyBuildScenario

and for information on setting the build up go to :

https://jazz.net/wiki/bin/view/Main/DependencyBuildScenarioBuildEnvironmentSetup

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