# Enterprise Modernization Sandbox for IBM i Lab Exercise Workbook

## Rational Developer for i

## Lab 01 – Getting started

This lab shows you how to get connected to an IBM i server using Remote Systems Explorer (RSE) and how to use that connection to view and work with objects.

Version 8, October 2022

The most up to date version of this document can be found on Rational Developer for i - Hands-On Labs at http://ibm.biz/rdi_labs.
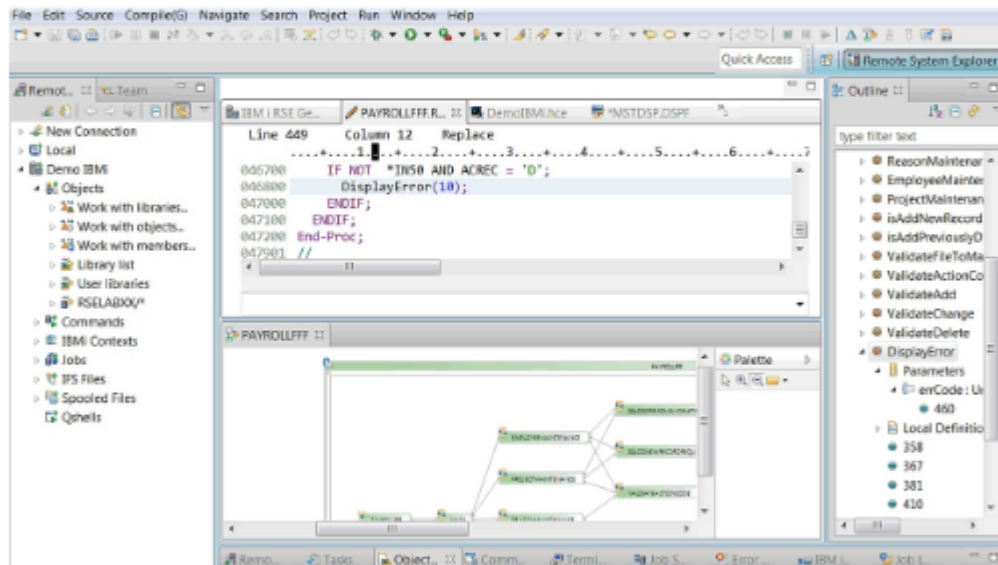
# RDi Lab User ID Assignment

## Please sign in with an IBMid to run the RDi labs

Login

### Overview

This lab is the first in a series of labs that introduce Rational Developer for i (RDi). The complete set of labs show how to edit, compile, debug and sample IBM i application. The labs also show how to use the RDi Application Diagram Viewer, Screen designer, and Report Designer.

The Labs 02 to 09 depend on the instructions in this Lab 01. You should work through this lab first to establish a connection to an IBM i server, then it is up to you whether you work on these labs in sequence or pick one of the labs that you are most interested in.

### Learning objectives

Download the Rational Developer for i trial, if you don't already have it installed.
Start the product and open the Remote Systems Explorer (RSE) perspective.
Use tools and views in this perspective to connect to an IBM® i system.
Work with native IBM i objects using the RSE.

### Skill level and prerequisites

Introductory.

You do not need to have completed any prior labs in the sandbox before attempting these exercises.

Knowledge of basic Microsoft Windows operations such as working with the desktop, mouse operations such as opening folders and drag-and-drop is assumed.  It will also be helpful if you understand DDS and ILE RPG.

## *Conventions used in this workbook*

**Bold font** is used to highlight user interface controls
`Mono-spaced font` is used for user input text and code blocks
*Italic font* is used for variable names and glossary terms

The following icons are also used to identify categories of information:

| Icon | Purpose | Explanation |
|---|---|---|
| ⚠ | Important! | This symbol calls attention to a particular step or command. For example, it might alert you to type a command carefully because it is case sensitive. |
| *i* | Information | This symbol indicates information that might not be necessary to complete a step, but is helpful or good to know. |
| 🚧 | Trouble-shooting | This symbol indicates that you can fix a specific problem by completing the associated troubleshooting information. |

## *Client System requirements*

The labs require <u>IBM Rational Developer for IBM i (RDi)</u> to be installed on your workstation. If you do not yet have this, you can download it for free from http://ibm.biz/rdi_trial. As of version 9.5, RDi includes a built-in emulator so you will not need any additional software. If you are using a previous version, then any 5250 emulator will work.  The IBM i Access Client Solutions contains a best of breed emulator that is freely available to those who have an IBM i that is V6R1 or later.

## *Host System requirements*

The easiest way to ensure you have everything you need, is to use the EM Sandbox demonstration IBM i server that is set up and ready to use with these lab exercises.

> **Tip**
> If this is **not** an instructor led class with PC's provided, you may need to install and setup the IBM software on your PC first.
>
> 120 day Trial of Rational Developer for i can be downloaded here:
> http://www.ibm.com/software/products/us/en/dev-ibm-i
> Page to request userid for IBM i demonstration system:
> http://ibm.biz/rdi_labs_getuserid

# 1  Obtaining a User ID for the IBM i demonstration server

This module takes you through the steps needed to allocate your dedicated User ID on the shared demonstration server for use while you are working on this and other labs in the EM Sandbox.

Once you have successfully allocated a User ID on the demonstration server, this will be dedicated to your use from the point of allocation until the next reset of the demonstration server occurs.  The reset occurs normally on a weekly frequency, at about midnight on Saturday, Eastern US time.  If you allocate a User ID on Monday, you will normally be able to retain use of that User ID for the entire working week.

If for some reason you cannot obtain a User ID using the process described below, please check the support forum here and request support from the developerWorks team:

http://ibm.biz/rdi_forum
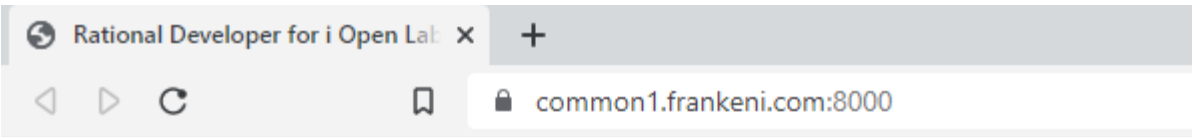
This forum may also be used for any other question, issue or suggestion about the way the EM Sandbox is used or accessed.

## 1.1  Open a browser session and navigate to the User ID allocation page

__1.    Launch a browser window.  Any browser is supported
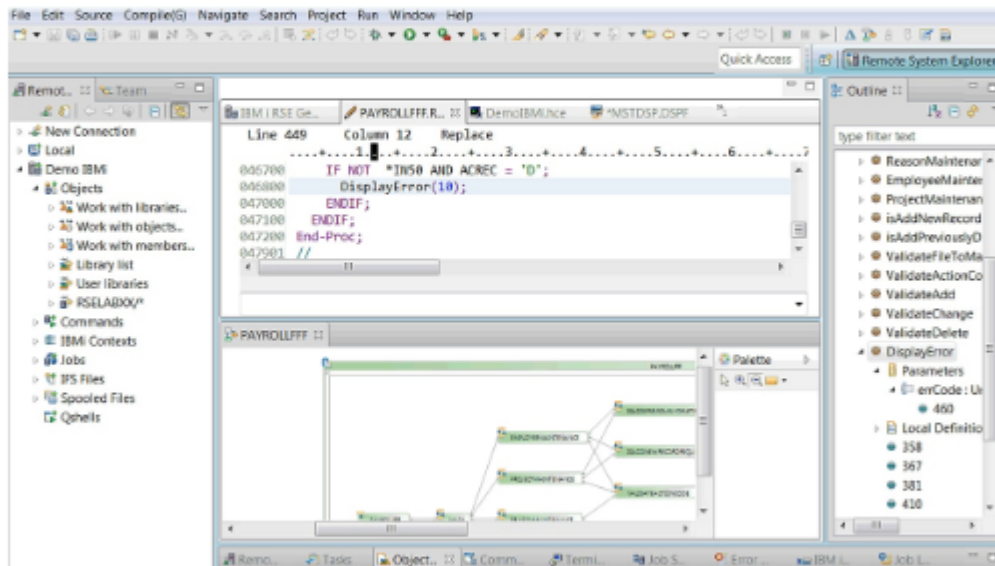__2.    Cut and paste, or type in, the following URL:

http://ibm.biz/rdi_labs_getuserid

**__3.** You will see a page like this:

## 1.2 Enter your details and request a User ID

### Please enter the following information to get a user id:

Name:     Edmund Reinhardt

Email:     edmund.reinhardt@ca.ibm.com

Company:     IBM

**Submit**

__1.     Signing with your IBMid or create a new one, which will pre-fill the Name and Email

### Team User ID Assigned

### Log in information for RSELAB:

__2.     Hit **Submit** to reserve a User id

__3.     While the request is being processed, you will see the following result page:

**UserID:** WLAB08

**Password:** W084565

### Your information:

**Name:** Edmund Reinhardt

**Company:** IBM

**Email:** edmund.reinhardt@ca.ibm.com

__4.     Record the Assigned User ID and corresponding password from the Result Status field:

User ID:          WLAB____
Password:         W_____

The User ID will always be of the form WLAB<NN> where NN is a two digit number (with a leading zero if below 10).  The Password will be of the form W<NN><xxxx> where NN is the same two digit number in the corresponding User ID, and "xxxx" is a random component.

__5.     This User ID is normally yours to use for the remaining duration of the week.  You will need to reference this multiple times during all of the lab exercises.  Keep a record of it handy.

# 2  Starting RDi and the Remote Systems Explorer

This module teaches you about the workbench, the workspace, a perspective and specifically the Remote Systems Explorer perspective.

## *2.1  Starting RDi*

First you must start RDi.  Follow these steps:

__1.    Click the **Start** button on the task bar of your desktop.
__2.    Select **All Programs > IBM Software Delivery Platform > IBM Rational Developer for i V9.x > IBM Rational Developer for i**
__3.    During initialization, a "splash screen" is displayed while RDi loads plugins and gets ready for use.  You may see different product names displayed if you have a different configuration of products installed.

__4.    By default, the first time you launch RDi, a welcome screen is displayed:
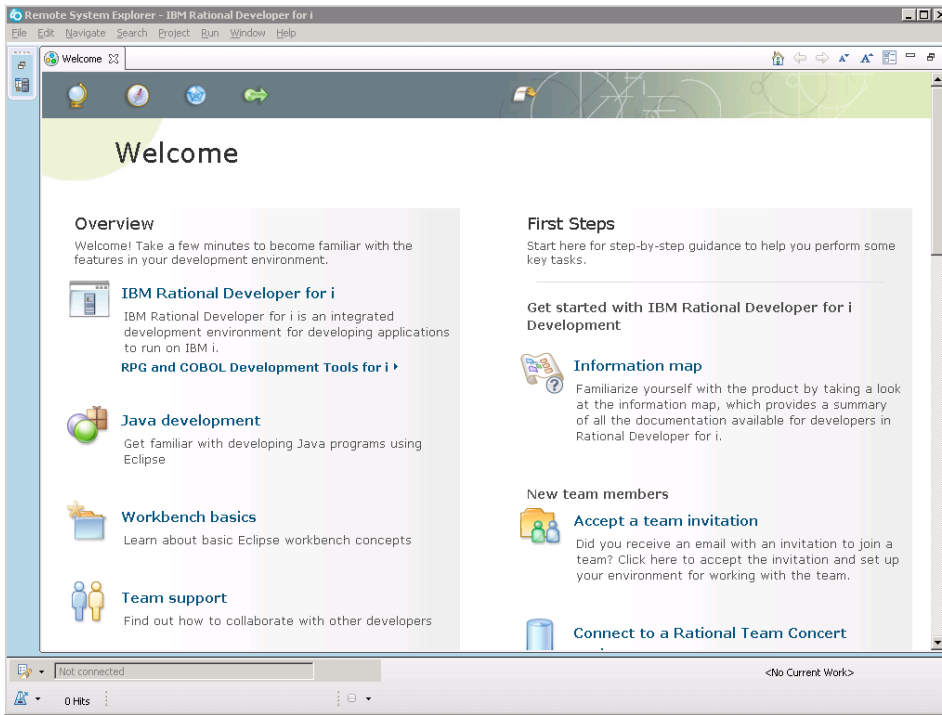


You may also briefly see some other activity related to initialization, for example a check of license status.

> **Tip**
> To open the Welcome page again, select **Help > Welcome.**

__5.    If the Welcome Overview is not displayed, select **Help > Welcome**
__6.    Click to expand the **RPG and COBOL Development Tools for i** section.

__7.    Select any of the entries and explore the topic.

## Overview

Welcome! Take a few minutes to become familiar with the features in your development environment.

### IBM Rational Developer for i

IBM Rational Developer for i is an integrated development environment for developing applications to run on IBM i.

RPG and COBOL Development Tools for i
    Remote System Explorer
    iProjects
    Application Diagram
    Screen Designer
    Report Designer
    Integrated i Debugger
    IBM i Web Services and Java Tools

__8.    When you are done, click the **X** next to the **Welcome** tab to close the **Welcome** page. Closing the Welcome page will take you to the Remote Systems Explorer perspective.

__9.    Click the maximize button to maximize the workbench if it is not already full screen.
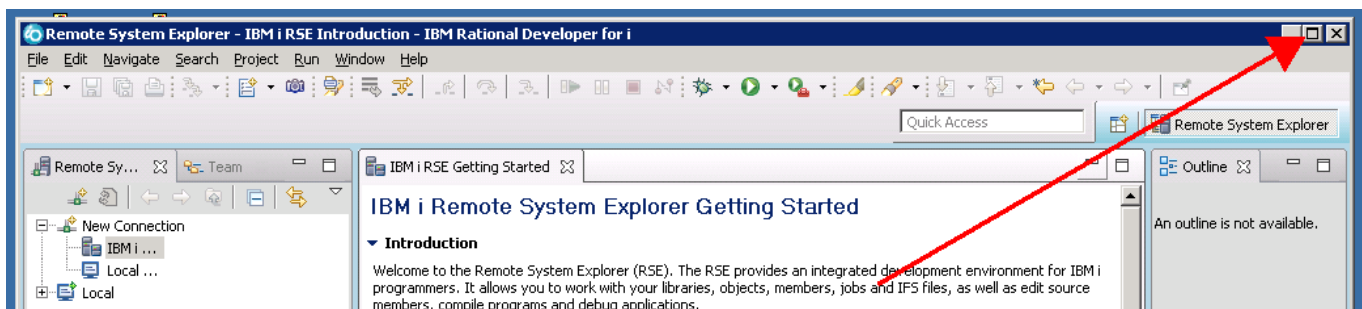
You have started the product and opened the workbench. The workbench refers to the desktop development environment. The workbench aims to achieve seamless tool integration and controlled openness by providing a common paradigm for the creation, management, and navigation of workbench resources. Each workbench window contains one or more views and an editor.

## 2.2  Working with the Remote Systems Explorer perspective

If you are not sure which perspective is open at the moment, you can check for the name of the perspective in the workbench title bar.
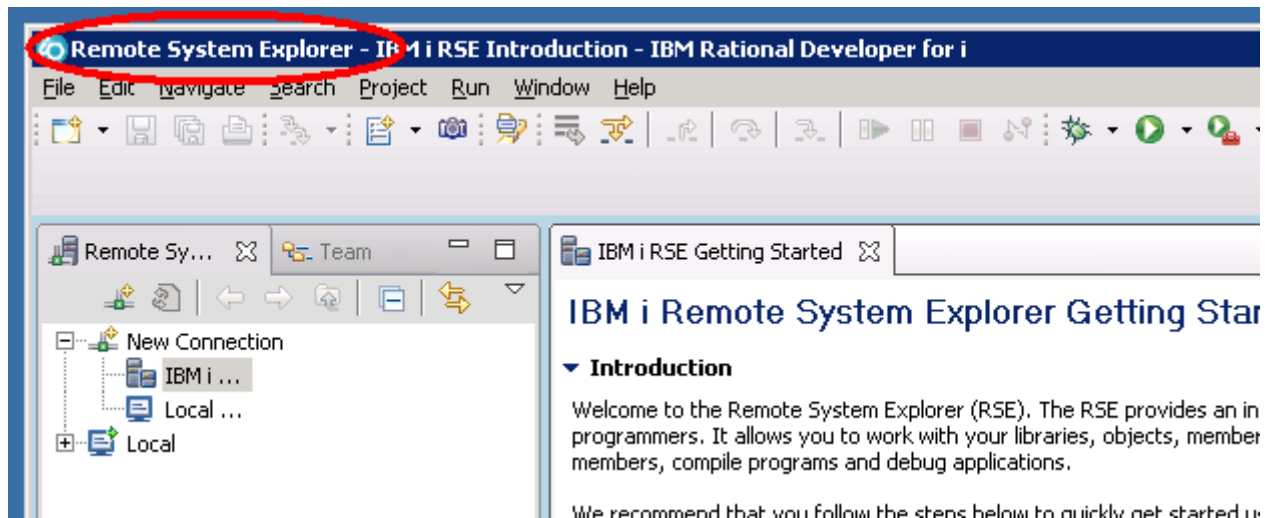


### 2.2.1  What is a perspective?

A perspective defines the initial set and layout of views in the workbench window.  Within the window, each perspective shares the same set of editors.  Each perspective provides a set of capabilities aimed at accomplishing a specific type of task or working with specific types of resources.  For example, the Java$^{TM}$ perspective combines views that you would commonly use while editing Java source files, while the Debug perspective contains views that you would use while debugging a program.  Perspectives contain views and editors and control what appears in certain menus and tool bars.

If you see a different perspective, not the **Remote Systems Explorer** open in the workbench, or no perspective, follow these steps:

__1.    Click **Window > Open Perspective > Remote Systems Explorer** from the workbench
        menu
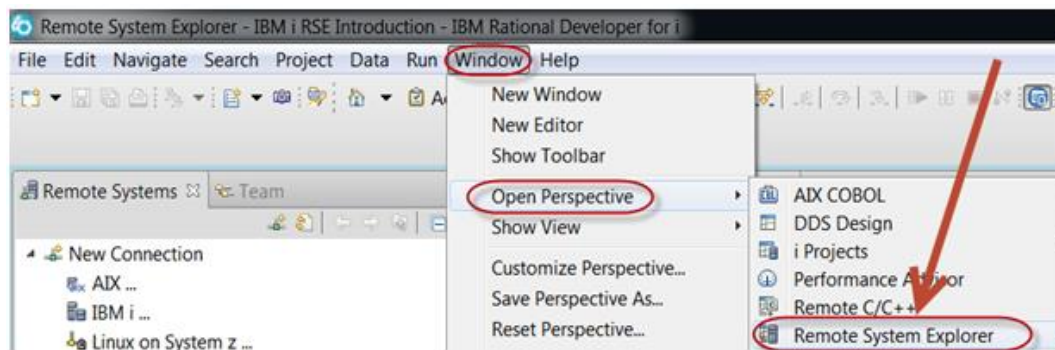


The Remote Systems Explorer perspective opens.

You work in the Remote Systems Explorer perspective in the workbench.  This perspective is for IBM i
developers.  You can display the connections that you have already configured, create a new connection,
connect to and disconnect from the connections that you have defined, work with IBM i files, commands,
jobs, and integrated file system files.

This perspective will be active when you start the product with a new workspace.  If you had used the
workspace before then, the workbench would come up with the perspective that you last opened.  You
will learn more about the Remote System Explorer perspective in the coming exercises as this is where
you launch the IBM i developer tools and use the views from the workbench.

In general, the term workspace refers to the local storage for the workbench on your workstation.  The
workspace holds local copies of files you are working on, the current state of the workbench as well as
preferences and configuration settings you have established for your workbench.

## *2.3  Configuring a connection to the IBM i server and connecting*

This module teaches you how to create a connection to an IBM i server, find a library in your library list,
select objects from a library and finally open a member in the Remote Systems LPEX Editor.  You also
learn about several views such as the Remote Systems view, IBM i Table view, and the Outline view.

### 2.3.1  Configuring a connection to an IBM i server

When you first open the Remote Systems Explorer, you are not connected to any system except your local
hard drive on your workstation.  To connect to a remote system, you need to define a connection.  When
you define a connection, you specify the name or IP address of the remote system and you give your
connection a unique name that acts as a label in your workspace so that you can easily connect and
disconnect.  When you connect to the remote system, the workbench prompts you for your user ID and
password on that host.

All connections, filters, and filter pools belong to a parent profile.  Filters are described in a later lesson.  Profiles are discussed when you create your first connection.  Remember you have already opened the Remote Systems Explorer perspective in the previous module.
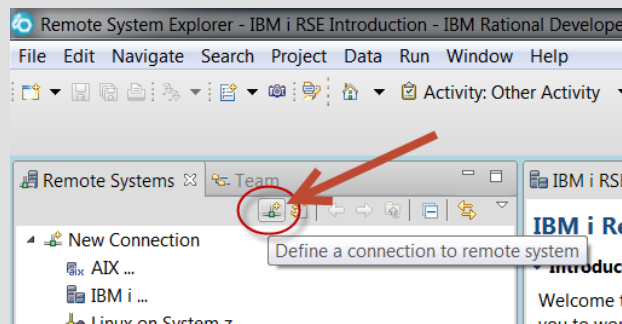
In the Remote Systems view:

__1.     Click to the left of **New Connection** to expand if it is not already expanded to show the various remote systems types you can connect to through the Remote Systems Explorer.
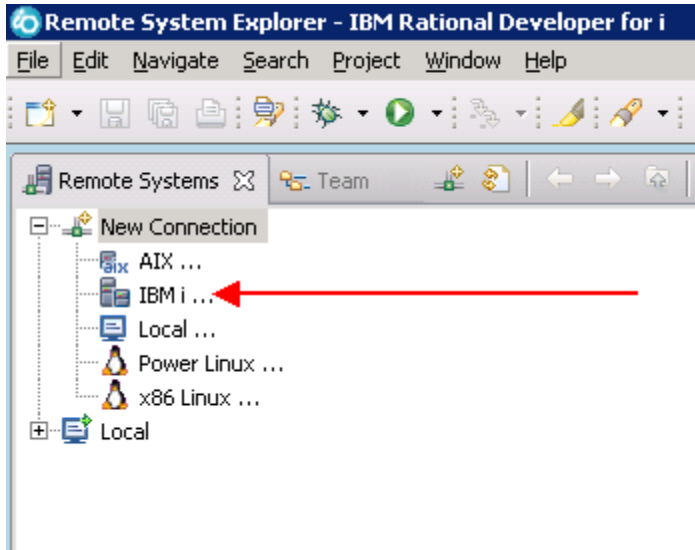


**Troubleshooting**
If you don't have a **New connection** node, use the **New connection** button to create the connection.



__2.     Double-click **IBM i** to configure a connection to a remote system.

The Remote IBM i System Connection page opens.
Here you specify the information for your connection.  The **Parent profile** defaults to the name of the workstation.  Your profile will be different from the one shown here.
The cursor on this page is positioned in the **Host name** field.

__3.     In the **Host name** field, type the IP address or the fully qualified hostname of your IBM i
        server.

![info icon] **Connection Host name information:**
**If you use the IBM i server on the internet, use:  as the Host name. If you use
your own IBM i server use that server name.**



The Connection name is automatically filled with the host name.  You can leave it as is, or you
might want to change it – for example "IBM i demonstration server".  This name displays in
your Remote Systems view and must be unique to the profile.

__4.     Leave the **Parent profile** default value. You don't need to change it.
__5.     Make sure the **Verify host name** check box is selected.

New Connection

**Remote IBM i System Connection**

Define connection information

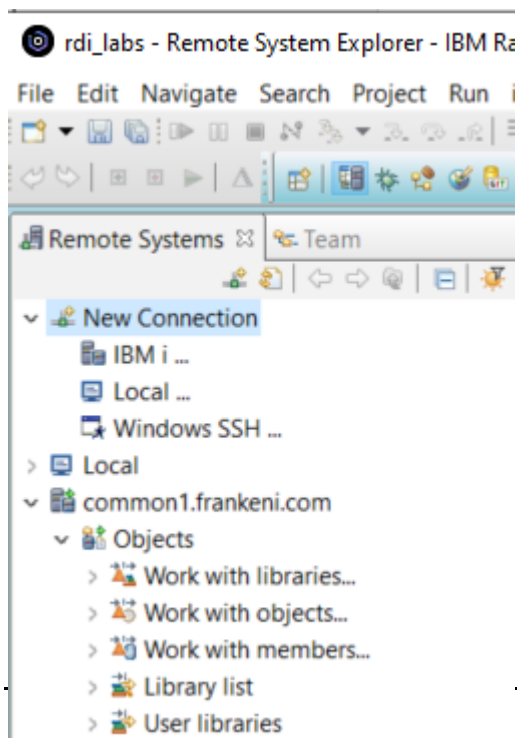| | |
|---|---|
| Parent profile: | edmundP50 |
| Host name: | common.frankeni.com |
| Connection name: | common.frankeni.com |
| Description: | |

☑ Verify host name

Configure proxy settings

< Back    Next >    Finish    Cancel
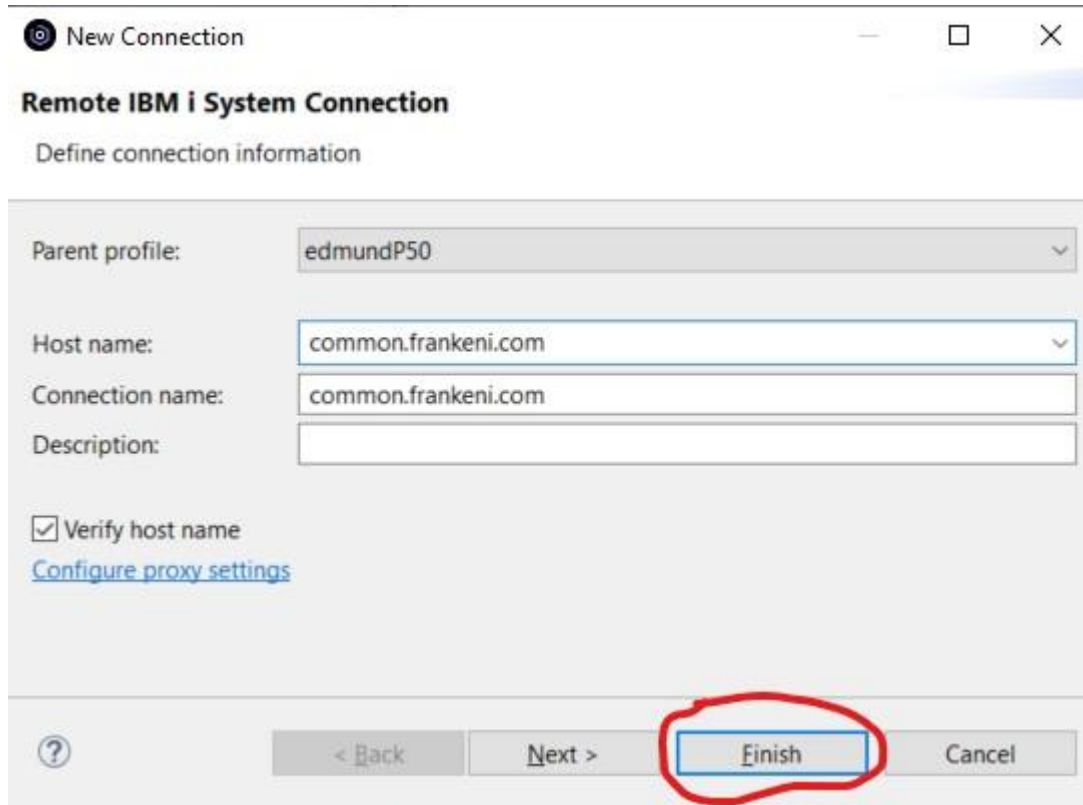
__6.    Click **Finish** to create the connection to the IBM i server.

rdi_labs - Remote System Explorer - IBM Ra

File  Edit  Navigate  Search  Project  Run

Remote Systems    Team

∨ New Connection
    IBM i ...
    Local ...
    Windows SSH ...
> Local
∨ common1.frankeni.com
    ∨ Objects
        > Work with libraries...
        > Work with objects...
        > Work with members...
        > Library list
        > User libraries

A connection node for the IBM i server appears in the Remote Systems view:

## 2.3.2  The RSE subsystems

After you configure a connection to an IBM i system, you can easily connect and expand your new connection to show the subsystems.  Subsystems are pre-defined filters grouping the various types of remote resources that can be explored in the remote system.  There are four subsystems.

- **Objects**
  A PDM-like group, allowing access to libraries, objects and members.
- **Commands**
  Contains predefined commands and allows you to create command sets each of which contain one or more often used commands.  When run, all commands in a command set are sent to the remote system and executed, and the results are displayed in the Commands log view.
- **Jobs**
  Allows you to see various jobs, subset by job attributes, and to perform a number of operations on those jobs.
- **IFS Files**
  Allows you to explore folders and files in the Integrated File System of the remote IBM i system.

## 2.3.3  Connecting to the IBM i server

Although you have a connection node for the server you specified in the previous step, RSE is not yet connected to the server.  RSE creates and manages connections when they are needed.  In this step you will cause a connection to be created by accessing some objects in the connection node.

__1.     Click to the left of your system name to expand the **common1.frankeni.com** connection.

In the Remote Systems view, your new connection is expanded to reveal your subsystems.  The **Objects** subsystem is the subsystem you will use most often!  It is very similar to PDM, in that it allows you to access objects in the QSYS file system, and perform actions on those objects.

__2.     Click to the left of **Objects** to expand that subsystem.



---
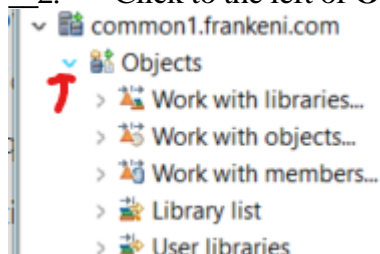
Notice the first three entries under the **Objects** subsystem are named after the PDM options, because they have similar capabilities.

__a. **Work with libraries** (similar to WRKLIBPDM)

__b. **Work with objects** (similar to WRKOBJPDM)

__c. **Work with members** (similar to WRKMBRPDM)

In addition there are entries for working with library lists and user libraries:

__d. **Library list** (to simulate PDM's WRKLIBPDM you can start with the pre-defined Library list filter, that when expanded lists all libraries in your library list.)

__e. **User libraries** (allows you to work with all user libraries you can access on that server.)

__3.    You also have more entries to work with under the connection itself and you can see from these entries that Remote Systems Explorer goes well beyond PDM!  It allows you to explore IBM i jobs and commands and the IFS file system.

Now let's work with a library in your library list and add the library that you'll be using in this tutorial:

__4.    Right-click **Objects** and click **Properties** on the pop-up menu. The **Properties for Objects** dialog displays.
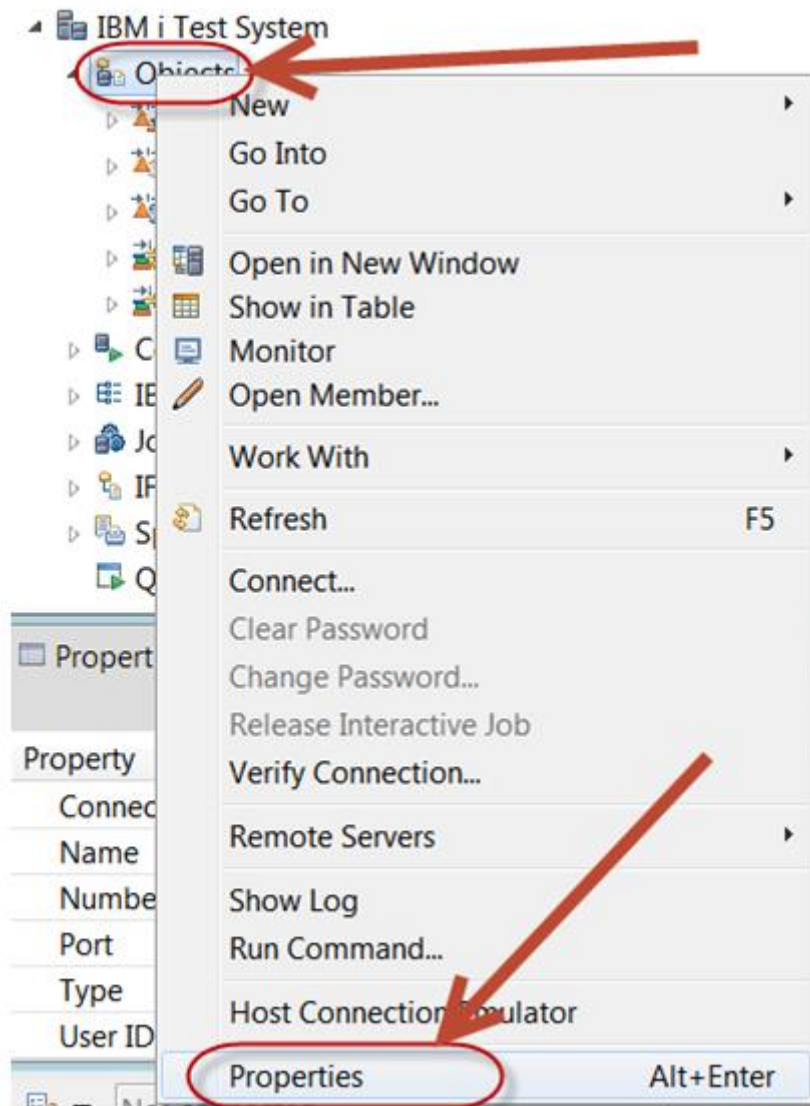


__5.    Select **Initial Library List** on the left pane.
__6.    In the **Library** field, type **RSELABxx** where **xx** is the number component of your User ID. (Do not use "xx" or "99").
__7.    Click **Add**.

__8.    Click **OK**.
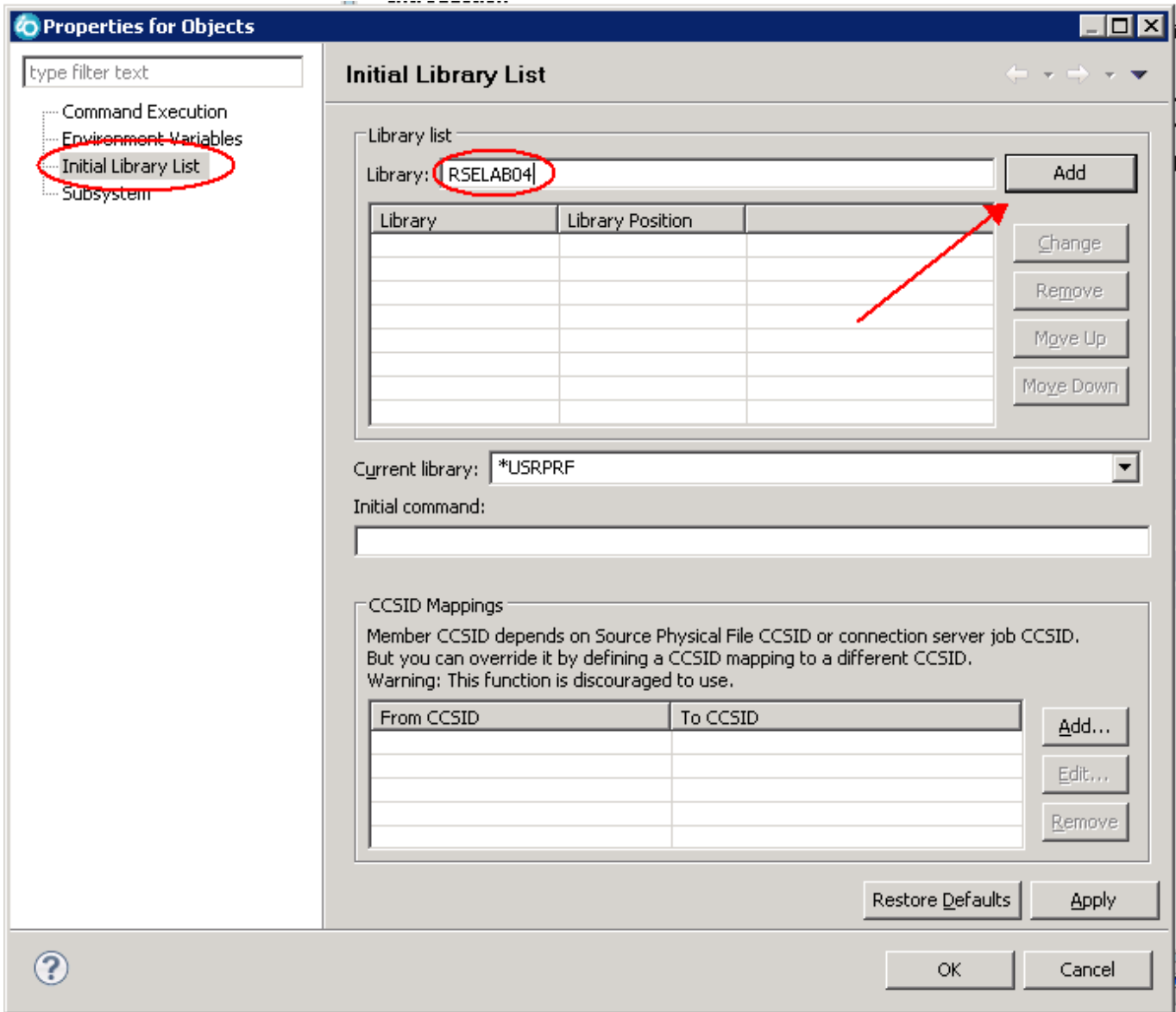


This will add the library RSELAB**xx** to your library list every time you open this connection. You can use the properties of any of the subsystems to set connection information such as adding a library to the library list.
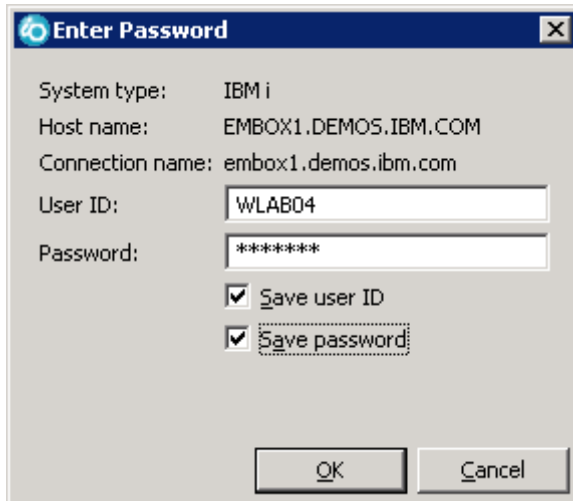
**Tip:**
You can also change your library list using the pop-up menu items **Add Library List Entry** or **Change Current Library** on the **Library list** folder in the Objects subsystem.
These changes are only valid for the current active connection, until you disconnect.

__9.     Expand the **Library list** folder.
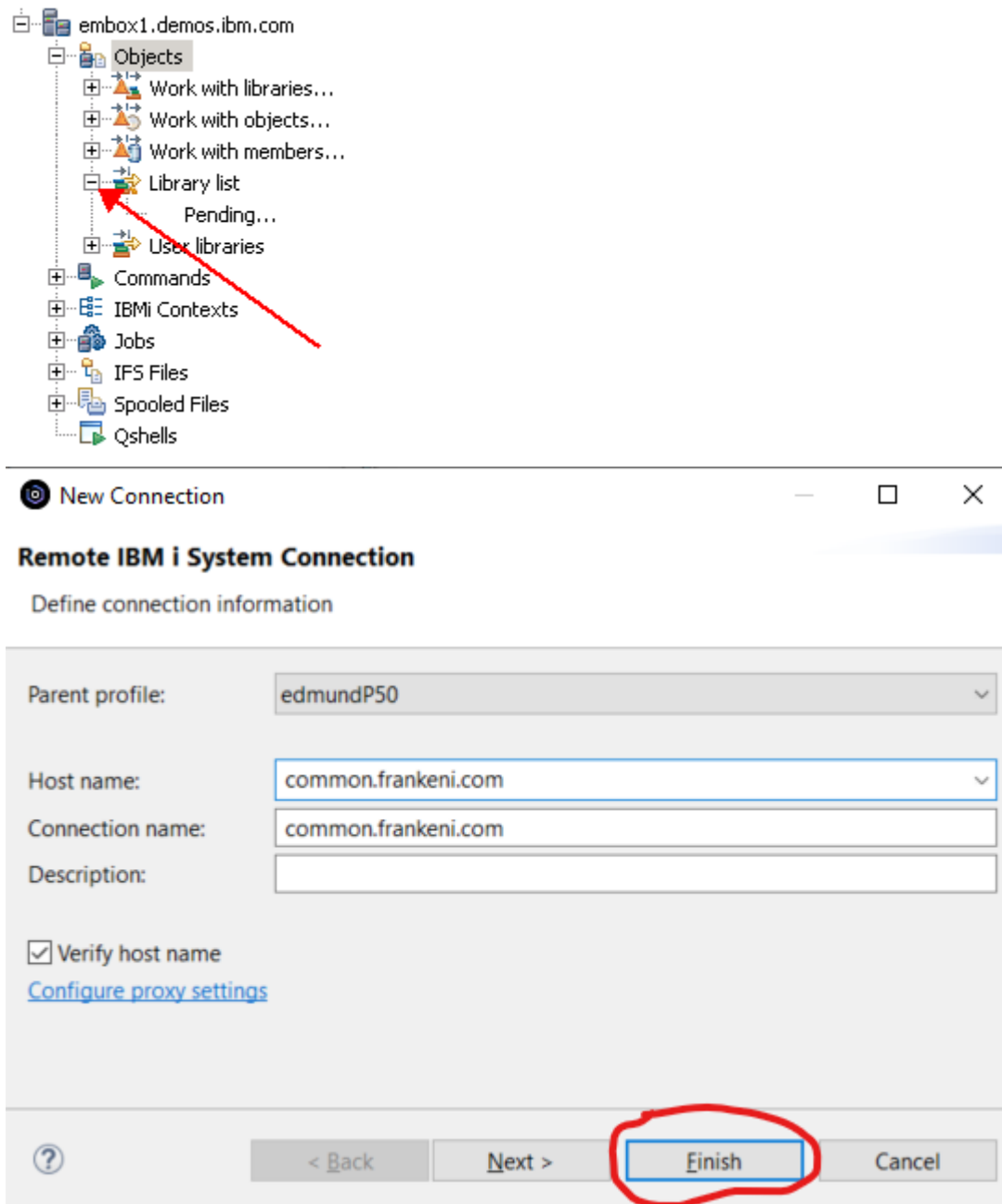
__10.    Now the connection will be activated and you will be prompted for User ID and password. Use your allocated User ID (**not WLAB99 or the example shown here)** and the password you obtained when it was allocated.  Select the **Save user ID** check box.  Select the **Save password** check box.
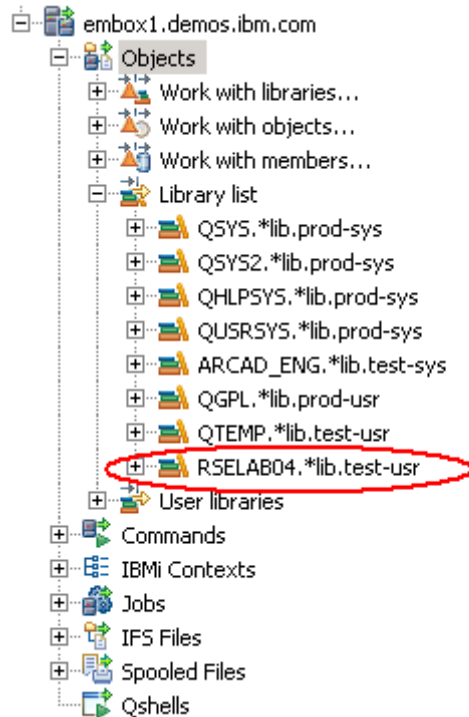
```
Enter Password                                    ×

System type:      IBM i
Host name:        EMBOX1.DEMOS.IBM.COM
Connection name:  embox1.demos.ibm.com
User ID:          WLAB04
Password:         *******
                  ☑ Save user ID
                  ☑ Save password


                      OK            Cancel
```

__11.   Click **OK**.

Back in the Remote Systems view, you will see the libraries in your job's library list appear instead of the word "Pending…"

```
└─ embox1.demos.ibm.com
   └─ Objects
      ├─ Work with libraries...
      ├─ Work with objects...
      ├─ Work with members...
      └─ Library list
         ├─ QSYS.*lib.prod-sys
         ├─ QSYS2.*lib.prod-sys
         ├─ QHLPSYS.*lib.prod-sys
         ├─ QUSRSYS.*lib.prod-sys
         ├─ ARCAD_ENG.*lib.test-sys
         ├─ QGPL.*lib.prod-usr
         ├─ QTEMP.*lib.test-usr
         └─ RSELAB04.*lib.test-usr
      └─ User libraries
   ├─ Commands
   ├─ IBMi Contexts
   ├─ Jobs
   ├─ IFS Files
   ├─ Spooled Files
   └─ Qshells
```

Notice that the connection node now has a small green arrow in the icon to indicate that it is an active connection.

For each library, you can right-click and select from a number of actions.  For example, there is an action to create a new source file within the selected library.  Common actions like delete, move, copy, etc. are valid for all kinds of objects.

You have connected to an IBM i server and used the Remote Systems view to view libraries in the library list.


## 2.4  Viewing and accessing objects in the Remote Systems Explorer

Now you are ready to view and access objects in your user library RSELABxx.

**Tip:**
Remember that the **xx** in RSELAB**xx** represents your assigned User ID number. For example, if you were allocated User ID WLAB**09** use library RSELAB**09** when RSELABxx is mentioned in these workbooks.

## 2.4.1 Using the RSE view

To view and access an object,

__1.     Expand your assigned user library RSELABxx (where xx is your User ID number) by clicking to the left of it.

You will see all objects in this library appear in the Remote Systems view.  For each object you can right-click and select from a number of actions.  The list of actions depends on the object selected and whether you selected one or multiple objects.  For example, for a source file the pop-up menu has an action to create a new member within the selected file.

__2.     Scroll-down through the files in the Remote Systems view until you find **QDDSSRC** source file and expand it.
__3.     Still in the Remote Systems view, locate **QRPGLESRC** source file and expand it as well.
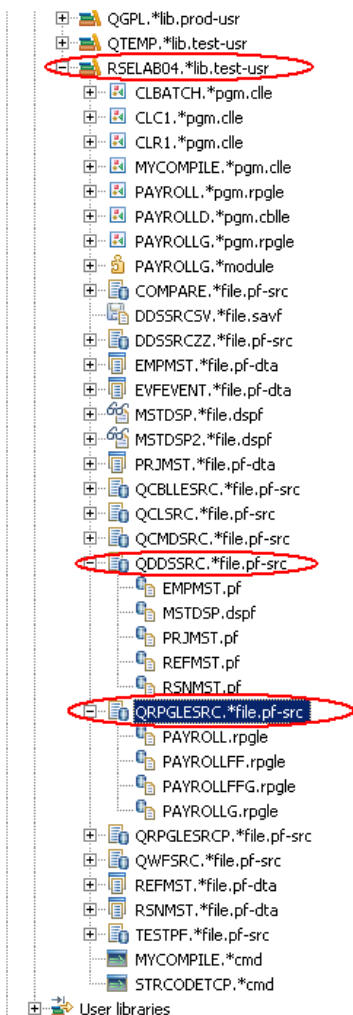


Now you can see and access the members in these two source files. For each member you can right-click and select from a number of actions.  The exact list of actions depends on whether

the member is a data file or source file and whether you select one or multiple members.  For an RPG source member, the pop-up menu actions include:

__a.      Open with
__b.      Browse with
__c.      Verify
__d.      Compile

## 2.4.2  Using the Object Table view

Before you go ahead and work with these members, let's see the members in the Object Table view as well because that is similar to the view you are used to from PDM.  You use this view to display a list of items, for example members or objects, in a table format similar to PDM.  You can also perform actions against these items such as editing and compiling.

__1.      Right-click the **QDDSSRC** file and then click **Show in Table** on the pop-up menu.

The Object Table view takes the selected object in the Remote Systems view as input, and displays the contents in the table.  For source physical files, this step displays the members inside, their names, types, attributes, and text descriptions.
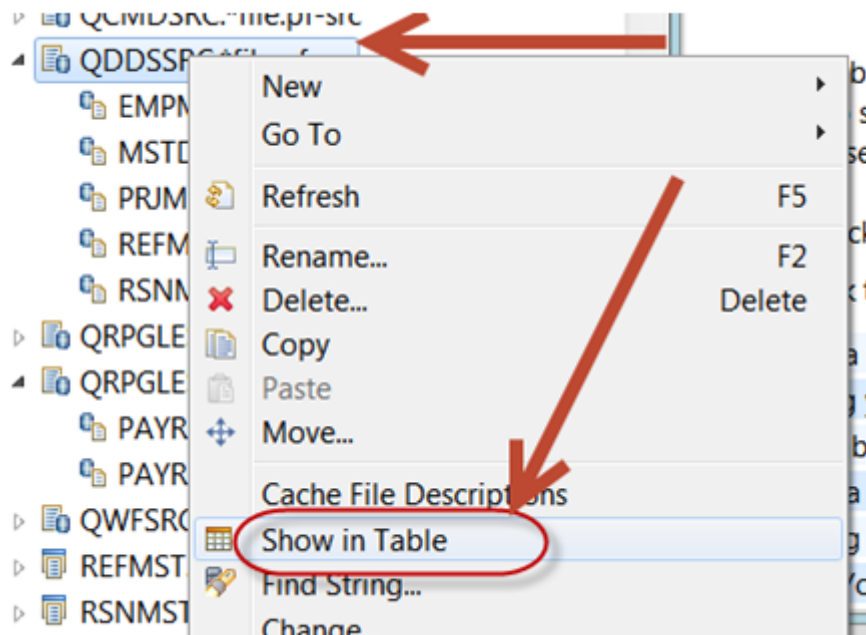


The top of the Object Table view contains a lock icon that controls the correlation between the Remote Systems view and the Object Table view.  If the lock is disabled then whenever you click an object or library in the Remote Systems view, the associated contents of that item automatically populate the Object Table view.  If the lock is enabled then when you click on various items in the Remote Systems view, this view does not change the content of the Object Table view.  To enable or disable the lock, you can click it once to change its state.

You can click on the columns heading to sort the view by column.
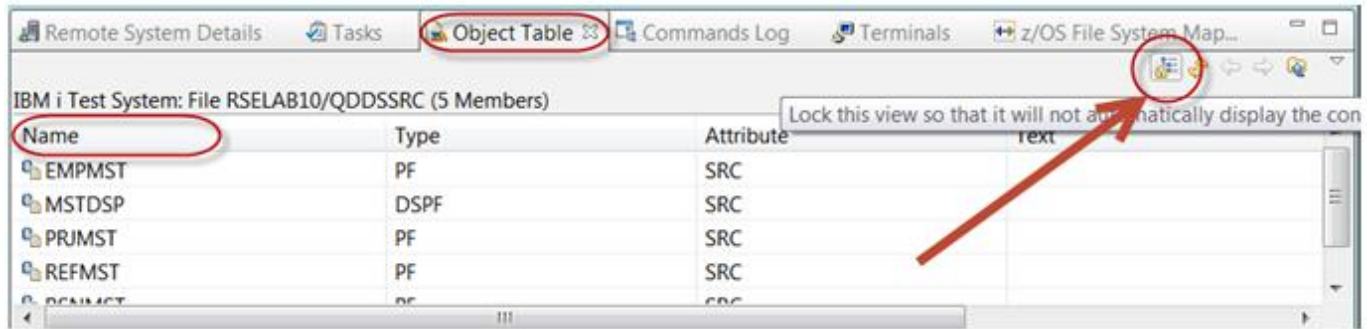
__2.  In the Object Table view toolbar make sure the **lock/unlock button** is in the unlock position. Leave the mouse pointer over the tool button for a second or two to display the flyover help. That way you can check if the view is locked or unlocked.

This means now the table will automatically be updated when a different object is selected in the Remote Systems view.  This is a shortcut to open the pop-up menu for an object in the Remote Systems view and to select Show in Table.
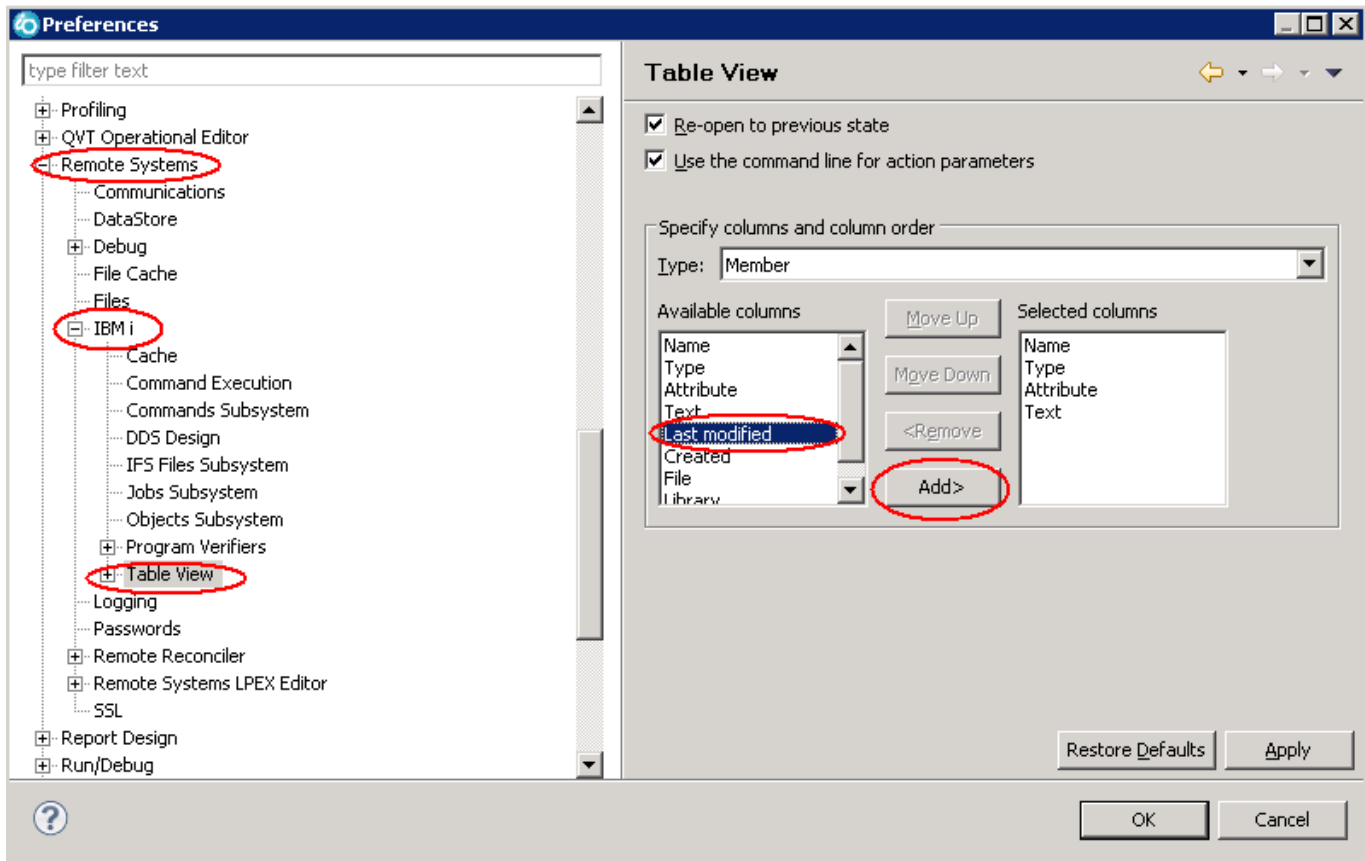
### 2.4.3  Customizing the Object Table view

You can also modify which specific columns you want to see in the **Object Table** view.

To modify the **Object Table** properties:

__1.  Click **Window > Preferences** from the workbench menu. The Preferences Window opens.

__2.  In the left pane of the Preferences window, expand **Remote Systems**.

__3.  Expand **IBM i** under Remote Systems.

__4.  Click **Table View** under IBM i.

__5.  In the right pane of the Preferences window, select **Last modified** in the **Available columns** list

__6.  Click the **Add** button.

__7.     Click **OK**.



Now let's update the **Object Table** view.

__8.     Click the **View Menu** button on the **Object Table** view title bar.
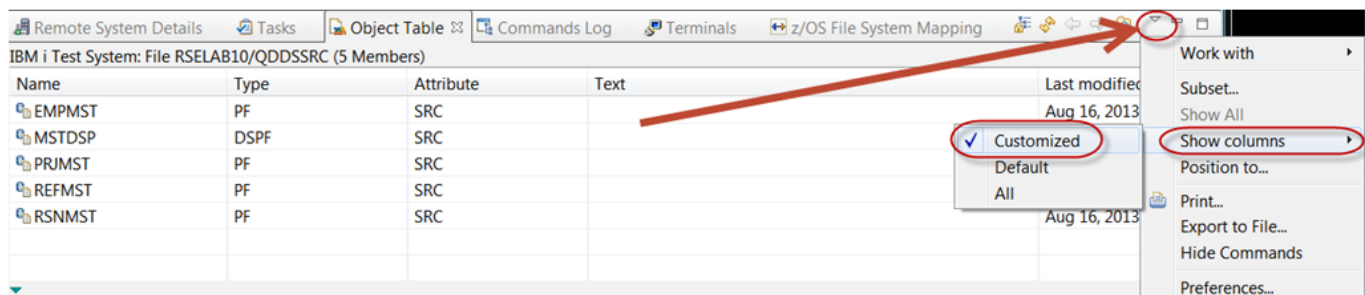
__9.  Click **Show columns > Customized** in the pop-up menu.

Now see the extra column that you've added.
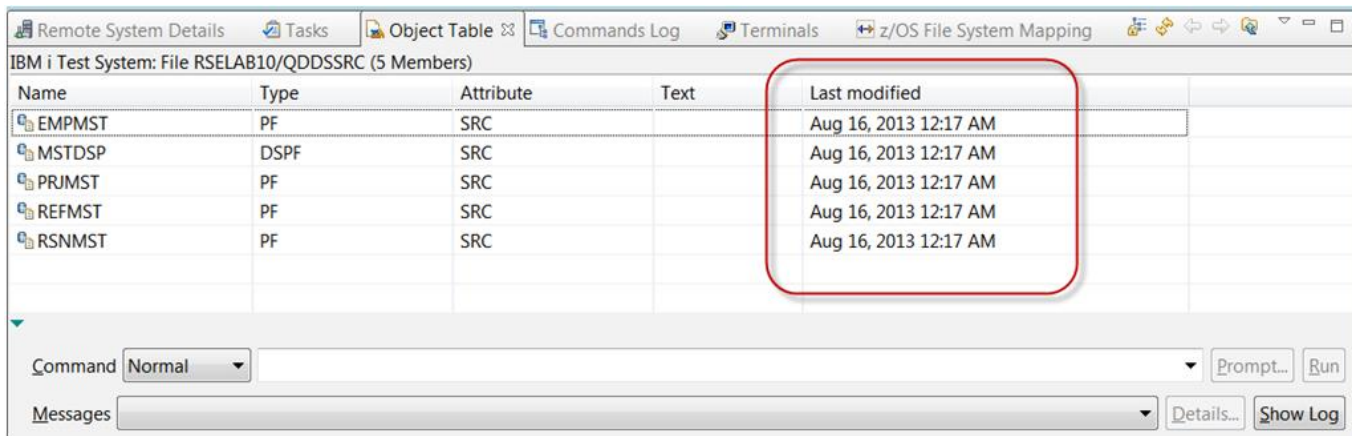


You can also sort the objects in the **Object Table** view by column.

__10.  Click any of the column headings, for example **Name.**
The order of the members changes as they are sorted in alphabetical order of Name.
You can click on the Name heading again to sort in reverse alphabetical order.

__11.  Select **QRPGLESRC** in the RSE navigation view to see a different set of objects.

The Object Table view is updated to show the members in QRPGLESRC.
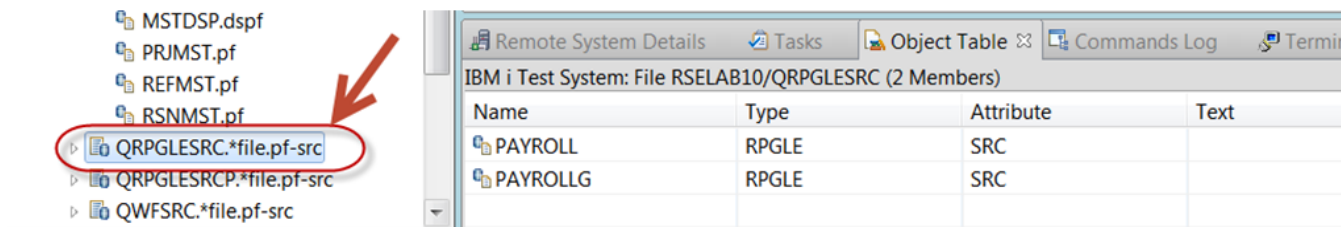


Besides the **Object Table** view, there are also a Field Table view and a Data Table view. For a selected data file, the **Field Table** view shows which fields are defined in the file and their properties. The Data Table view displays the data contained in the file.

## 2.4.4  Using the other Table views

To display the other Table views:

__1.  In the Remote Systems view in library RSELABxx, right-click PRJMST object and select **Show in Table > Fields**.

Make sure you click on the Physical File object in the library, **not the member** in QDDSSRC.
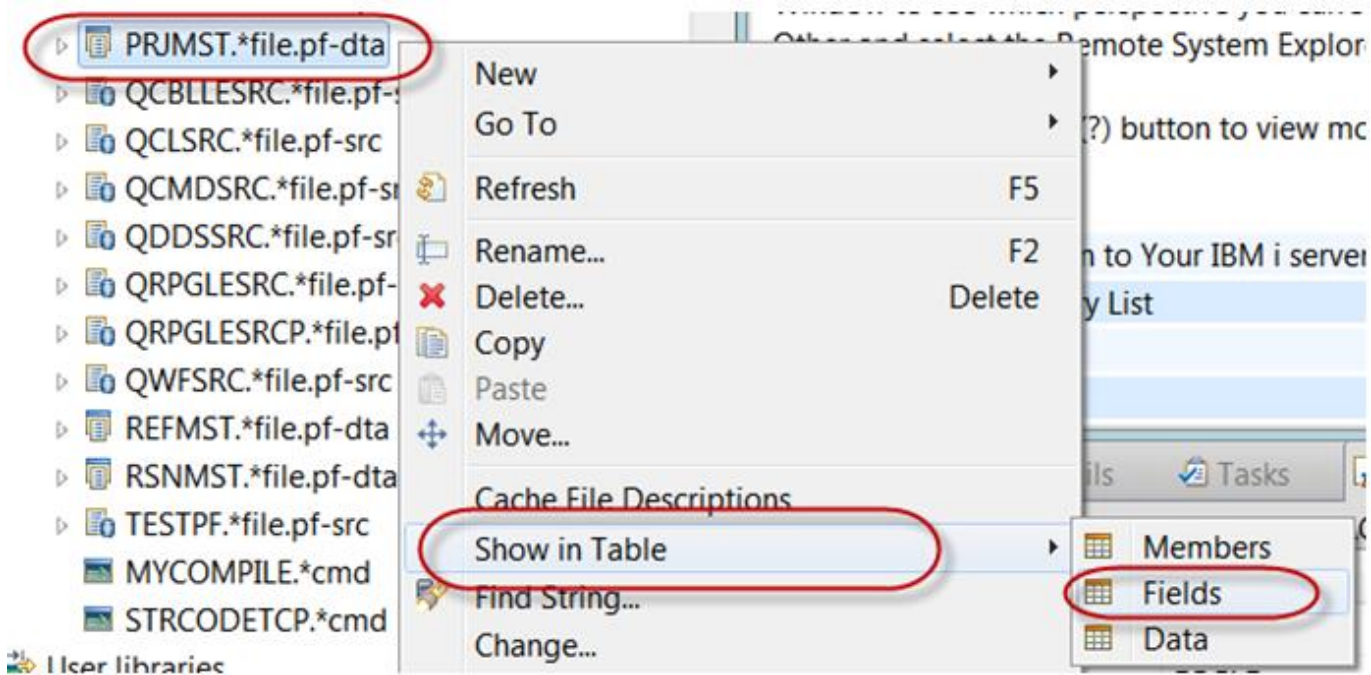
The Field view table opens:



To display the Data Table view:

__2.    In the Remote Systems view, right-click PRJMST again, select **Show in Table > Data.**

# 3  Starting a 5250-emulation session

This module teaches you about how to start a 5250 green screen emulation session.

__1.    Starting in version 9.5 of Rational Developer for I and up to version 9.6.0.10, you can use the built-in Host Connection Emulator.
If you are using a previous version, than any 5250 emulator will work.  The IBM i Access Client Solutions contains a best of breed emulator that is freely available to those who have an IBM i that is V6R1 or later.
If you are using version 9.6.0.11 or later, you will need to open the 5250 emulator via a different button shown below.

To start the Host Connection Emulator on versions 9.6.0.11 and later, in the Remote Systems view, right click on the Objects heading under your remote system and select Launch 5250 Emulator.
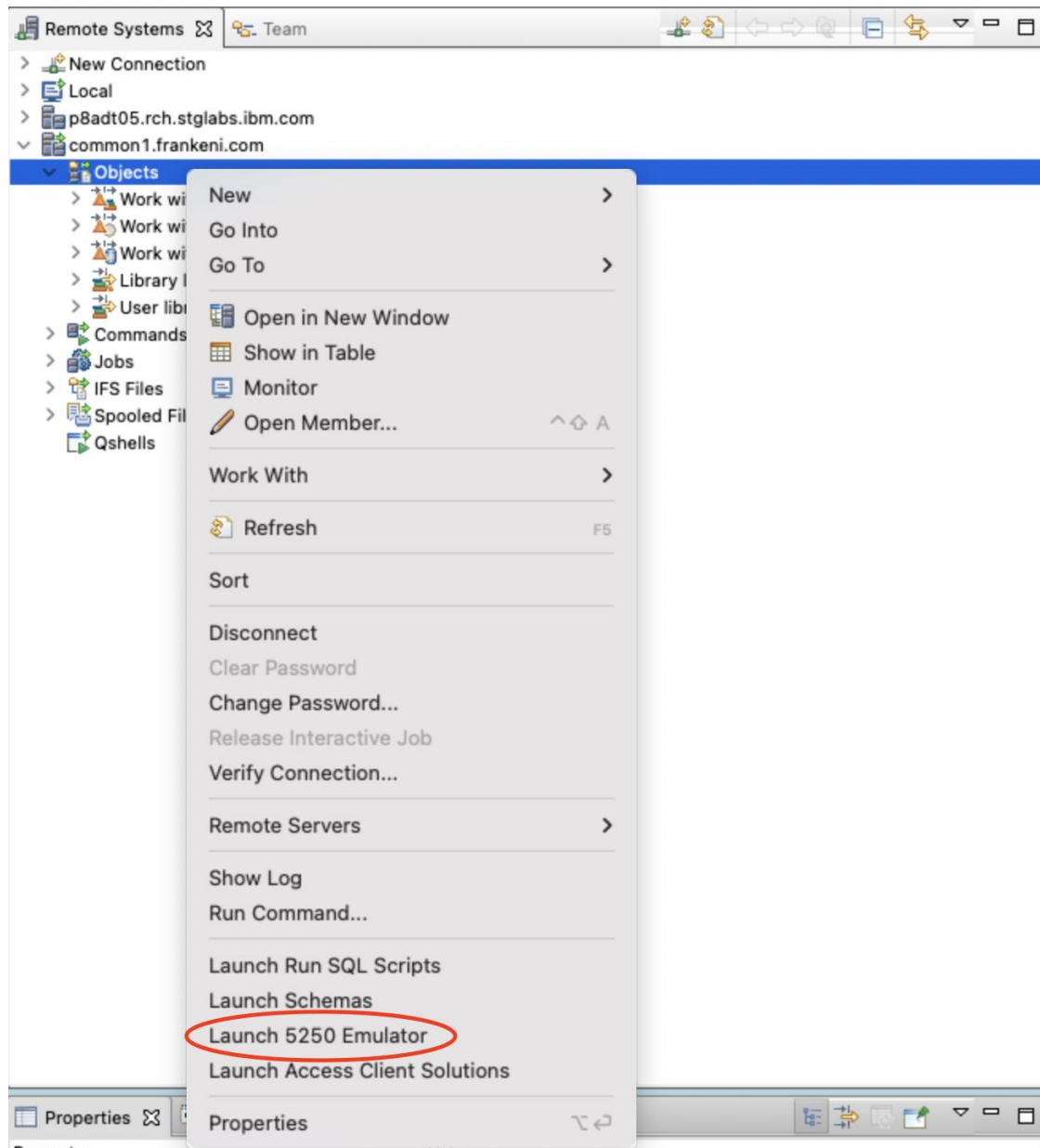
To start the Host Connection Emulator on versions 9.5 to 9.6.0.10, in the Remote Systems view, right click on the IBM i connection name and select Host Connection Emulator.
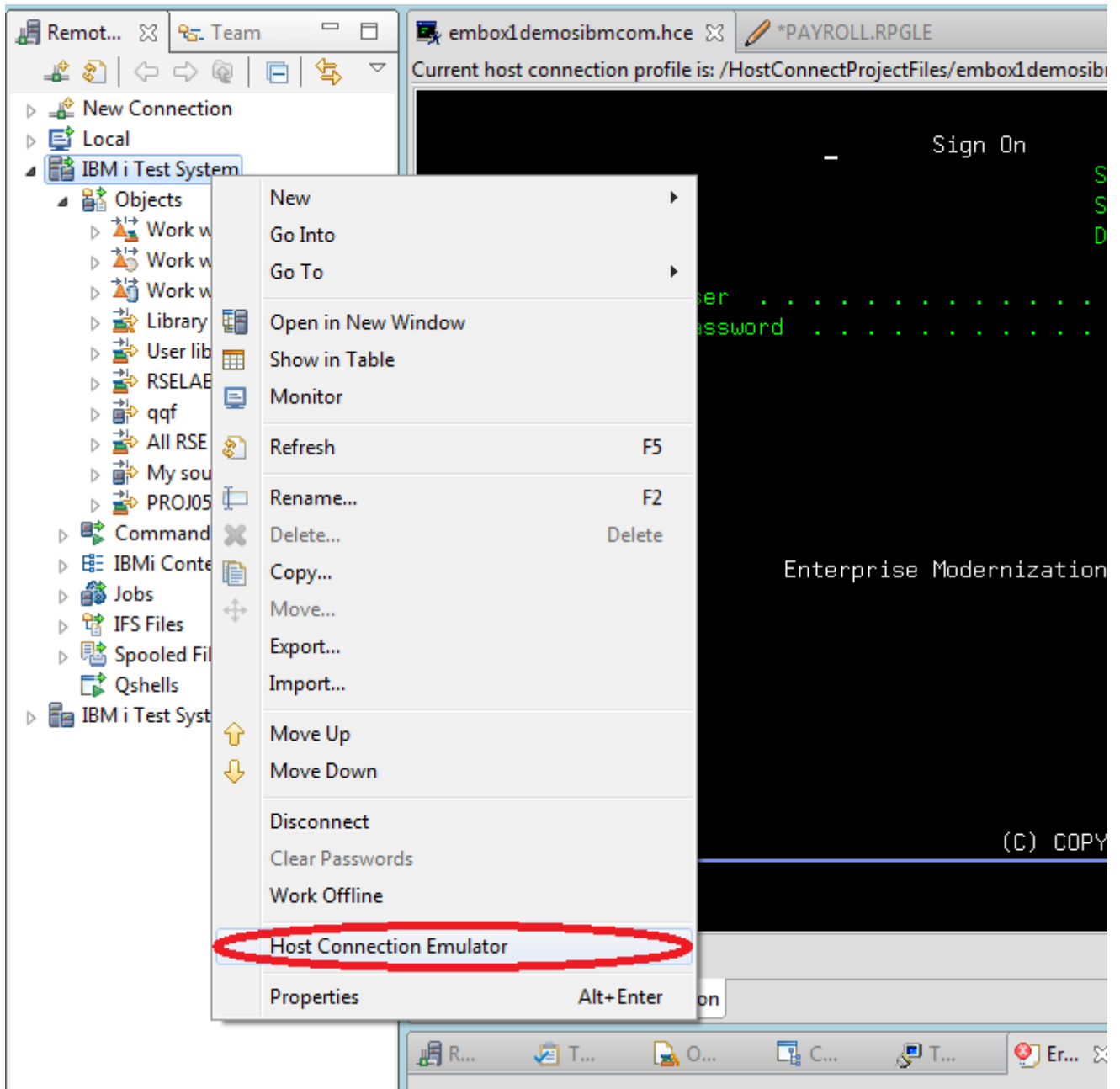
__2.    Sign-on to the server with your User ID and password. (use your allocated User ID: WLABnn, and Password: Wnnxxxx – where nn is your User ID number)

__3.    You can enter a command or selection in the command line.
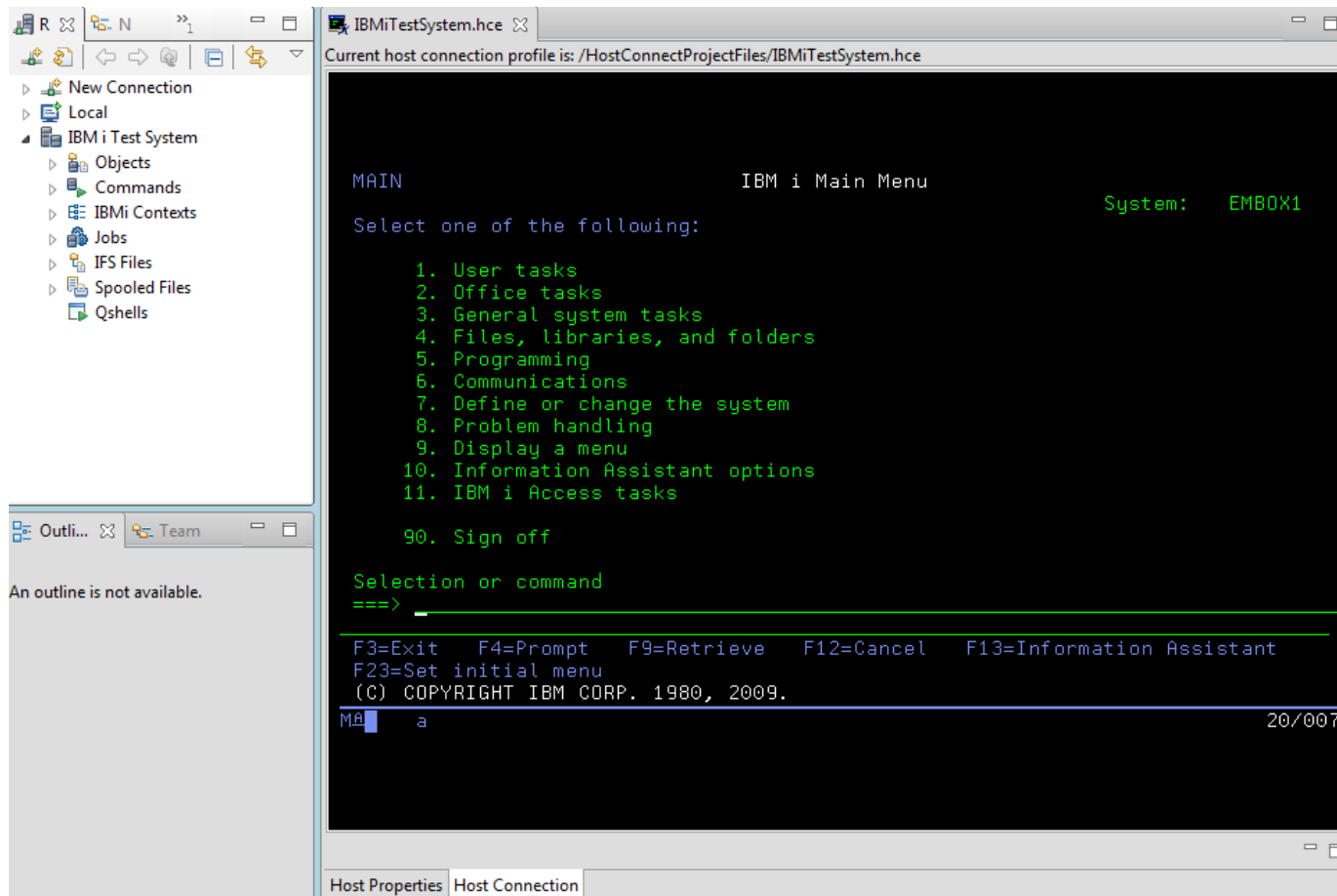
# Congratulations!

You have successfully completed the RDi Lab 01 – Getting Started lab exercises.

We recommend that you move on to the next lab in the sequence; or browse the list of labs on Rational Developer for i - Hands-On Labs at http://ibm.biz/rdi_labs to choose a lab of interest.

More information, material and opportunities to discuss the product can be found at our RDi Hub:

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